LEVEL UP!

ADP MAST ACADEMY

2021 SUMMER CAMP

START

EL PASO HIGH SCHOOL

Navigate through lesson plans by selecting the name of the lesson plan on the Table of Contents.

Table of Contents

Concept Map

Back to Table of Contents

	Monday	Tuesday	Wednesday	Thursday	Friday
8:00 AM					
8:15 AM					
8:30 AM	Introduction		Carts	Eng for Efficiency	
8:45 AM	Elisabet TB	Rain	Rain	Rain	
9:00 AM	Trading cards	Mario Cart			
9:15 AM	Rules/		Ruby	Ruby	
9:30 AM	Expectations				
9:45 AM	Design a Scientist		Hillary	Hillary	
10:00 AM	Daniel		Rain TB		
10:15 AM		Kayla	Rain TB		
10:30 AM		Among Us		B: Guess that Video Game fro	
10:45 AM	Sarahi				
11:00 AM	Up for Adaption			Elisabet	
11:15 AM	Google Slides		Elisabet	Binary	
11:30 AM		Choose your Destiny	Binary	Colors + Connect 4	
11:45 AM		Kayla	Trap Video Game		
12:00 PM					
12:15 PM					
12:30 PM					
12:45 PM	Daniel				
1:00 PM	Pacmania	Sarahi	Eduardo	Eduardo	
1:15 PM		Pokemon	me Builder(Solariu	Biome Builder (Solarium)	
1:30 PM		Evolution			
1:45 PM		Stop Motion		Field Trip	
2:00 PM					
2:15 PM	Wrap Up/Journal/ Preview of Next Day & Materials				
2:30 PM					
2:45 PM					

	Monday	Tuesday	Wednesday	Thursday	Friday
8:00 AM					
8:15 AM					
8:30 AM	Escape Room	Hillary TB	Food to Feces		
8:45 AM	Kayla		Ruby		
9:00 AM				Ruby	
9:15 AM				Body Systems	
9:30 AM		Adrian			
9:45 AM	Kayla	Angry Birds			Makerspace
10:00 AM	Galaxy		Kayla		
10:15 AM	Geometry		Chemistry		
10:30 AM				Sarahi	
10:45 AM				Guess the	
11:00 AM	Elisabet			Pokemon	
11:15 AM	Pixel	Elisabet	Elisabet		
11:30 AM	foldable	Pixel	Pixel	Sarahi/Michelle	
11:45 AM		ixel character & sto	Coding	TB	
12:00 PM					
12:15 PM					Esports at UTEP
12:30 PM				Elisabet	
12:45 PM	Astronomy Pt 2	Angry Birds	Chemistry	Pixel	
1:00 PM		Pt 2	Pt 2	Gallery Walk	
1:15 PM				Closing	
1:30 PM		Citlali	Rain	Field Trip	
1:45 PM	TB	Guest Speaker	Mario Volume		
2:00 PM	Eduardo				
2:15 PM	Wrap Up/Journal/ Preview of Next Day & Materials				
2:30 PM					
2:45 PM					

Back to Table of Contents

Team Builder

Name of Team Builder: Trading Cards

How does your team builder connect to your lesson or the overall theme?
Trading cards are associated with strategy video games (Ex. Pokemon, Yu-Gi-Oh!, etc.)

Day of the Week and Time Monday, June 21st at 8:45AM-9:15AM

Total Length: 30 min

Materials (per student)**:**

- Jamboard slide
-
-

Technology Required (websites, Zoom video, chat, phones, etc.)**:**

- Kumo space
-

Advanced preparation

- Jamboard frames
- Trading card template

Description Option 1 (use if everyone is doing the same thing)	**Notes to Teacher:**
1. Students create a trading card of themselves on a frame on Jamboard (**12min**) a. self-portrait of their video game self/player b. name & video game player name (nickname) c. strength & weakness d. hobby factor e. special power/secret ability (fun fact/talent) f. special info (one thing about themselves that others aren't likely to know) 2. Students "trade" cards at least 3 times through Kumospace. *Every 2-3min*, switch partners *Teachers share a timer on the screen or just keep a timer for yourself and broadcast SWITCH when it's time* (**12min**) a. Approach someone and tell them which card you have by telling them the frame # b. Go to partner's frame # and read it c. Ask a question or make a comment about the trading card you just received and leave it on the margins of the Jamboard slide 3. Come back to whole group and ask for volunteers to share the trading card they ended up with and they may ask a question to the owner (**6min**)	*Have to decide whether everyone will be on Kumo space because if students are in the same room and unmuting their mics, there will be an echo. Teachers decide if you want to make your trading cards ahead of time so that you can help students while creating theirs, or create it along with students as an example. Jamboard only allows for a max of 20 frames. Duplicate the Jamboard as necessary depending on how many students + teachers you have. Name it #1 and #2 to help students differentiate as they trade cards.

Trading Cards Teambuilder

Create a trading card of your video-game-player self on a Jamboard frame!(**12min**)

It must include:

1. Player: Your name
2. Self portrait: You can draw yourself or your video game persona
3. Nickname: what you prefer to be called or your player name
4. Strength: are you really good at communicating? at math? enthusiastic? etc.
5. Weakness: could you ask for help more often? be more patient? etc.
6. Hobby factor: what do you like to do in your free time?
7. Special power/secret ability: fun fact or talent
8. Special info: something about you others aren't likely to know

"Trade" cards at least 3 times through Kumospace! Every 2-3min, you will switch partners. (**12min**)

1. Approach someone and tell them which card you have by telling them the frame #
2. Go to partner's frame # and read it
3. Ask a question or make a comment about the trading card you just received and leave it on a sticky note on the margins of the Jamboard slide

Back to Table of Contents

Draw A Scientist Lesson Plan

First 15 min:

1. Put students into groups of 3.
2. Without any prior discussion, tell the students to work together to draw a scientist using Google Draw.
    a. What do they look like?
    b. Where are they?
    c. What are they doing?
3. Create a master list with students on the board of what a scientist looks like, what gender a scientist is, and what the scientist is doing. Include any specific characteristics such as ‘wears glasses, crazy eyes, weird hair” etc.

Second 15 min:

1. Allow students to peruse the different scientists shared on: https://www.iamascientist.info/collection and choose one that they relate to.
2. Compare the real scientist to their original drawings (could be in a venn diagram or table or even as a whole class)

Back to Table of Contents

Lesson Plan Option 1: Traditional

Name of Lesson: Up for Adapt-ion

Learning (TEKS) Objective:
B.7(E) Analyze and evaluate the relationship of natural selection to adaptation and to the development of diversity in and among species.

Student Outcome: *Students will be able to… Illustrate how an organism changes to fit its environment by adapting the Pokemon to its new habitat.*

Day of the Week and Time
Week 1: Monday, 12:30 PM-2:00 PM

Total Length of Lesson:
1.5 Hours

Materials (per student):

- Laptops
- Printed Template (each student)
- Colored Pencils (each student)
- Pencils (each student)
-
-

Technology

- Google slides - Biome Explorations
- Google slides - Adaptations
-

Advanced preparation

- Make sure students have access to laptops
- Sample of an adapted pokemon using the same template
-

Instructional Delivery Option 1 (use if everyone is doing the same thing)	**Notes to Teacher:**
Activity 1: Introduction to Adaptations **Duration: 10-15 mins**	
Hook: Pokemon - Battle for Survival Jamboard (3 slides) **Click me** → **Jamboard** (Do not share this link with students, just display it for them.) Ask students which pokemon would or would not survive based on its surroundings (3 slides). Ask them to explain their reasoning and what they notice about the organism/ surroundings to initiate class discussions. Each character is labeled just in case the students are not familiar with any of the characters. Example: Jigglypuff stands out in the forest because of the pink color while the other two camouflage and blend right in.	

Answer key:
Slide 1- Jigglypuff would not survive
Slide 2- Pikachu would not survive
Slide 3- Charmander would not survive

Then, the teacher should ask students, "**What is a habitat?**"
Anticipated answers: A home or environment of living organisms, where animals live, etc.

Proceed to ask students to **name different habitats** they may know of.
Anticipated answers: Grassland, forest, mountain, desert, marine, tundra, savanna, etc.

Do all organisms found in these habitats look the same or different?
Answer: Different, because they adapt in different ways due to their diverse surroundings.

Adaptations Song (3 min) -
Click me → **Camel Adaptations Song**
(Start 0:19 seconds & Stop 2:45 minutes or when credits come up)

Ask students **which adaptations they observed from the camel**.
Anticipated answers: Big feet pads, long and thick lashes, thick lips, shaggy fur, etc.

Proceed to tell them that living organisms had to develop adaptations in order to successfully survive in these different habitats. An adaptation is a change or the process of change by which an organism becomes better suited to its environment. (Emphasize the source of an adaptation is a random mutation and mutations are essential for evolution.)

Habitat: refers to the area where an organism lives, including the biotic (living things) and abiotic (nonliving things) factors that affect it.

Start 0:19 seconds
Stop 2:45 minutes or when credits come up

Mutation: change in the DNA sequence that affects genetic information

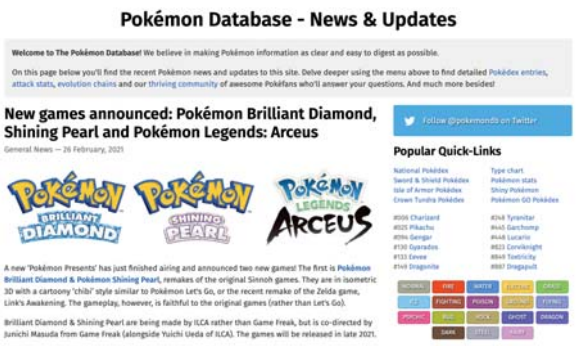
Activity 2: Google slides template (Adapt a Pokemon) **Duration: 50 mins**

Students will fill out a graphic organizer that requires them to select a pokemon, habitat, and develop proper adaptations based on surroundings.

Database Link:
Click me → https://pokemondb.net/

- ★ Students will be asked to select a pokemon of their choice from a database. This database provides essential information about the creature such as name, type, species, height, weight, and abilities.

Let them know that the pokemon they select will be used for this activity and upcoming activity (Tuesday's lesson: Pok-e-volution). There are no limitations on adaptations, they can even include objects.
Remind them to "CHOOSE WISELY"



Students should click here for different Pokemon categories. They are to select a Pokemon, not a Trainer.

Google Slides Adaptations Link:

Click me → **Adapt a Pokemon Activity**

****(Students have the option to fill it out on the printed organizer or electronically)****

- ★ Slide 1 - They must include a "before" picture of the pokemon from the internet.

- ★ Slide 2 - They will then circle one of the habitats on the list and provide a description of it. They must choose a habitat that is ***different*** from where the pokemon originates.

Before they get started...

They will use this biome PPT to independently research the biome they are interested in from the list. Go over the first three slides with them, they are instructions. Then, instruct them to select a biome from the list and adapt their pokemon accordingly in the organizer.

Mini self-exploration: **Click me** → **Biomes Exploration**

Students will visit the biome that caught their attention and will search for details on precipitation, climate, vegetation, and wildlife, etc. -- if available. They will include their findings under "description of habitat" on the organizer.

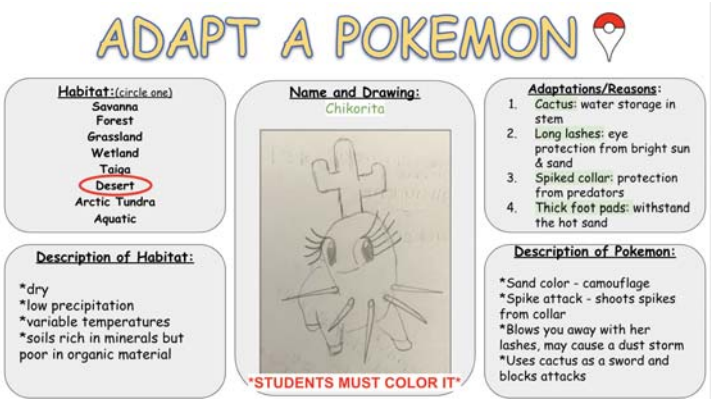
- ★ Next, they will develop adaptations for their creature to be able to survive and successfully reproduce in the habitat of their choice. They must also justify why the pokemon underwent such changes. Students continue to develop adaptations along with reasoning.
- ★ Lastly, they draw the new version of the pokemon they chose and include a fun brief description of the newly evolved pokemon.

Adapt a Pokemon Product Outcome Example:

IMPORTANT:
Remind students to download the file before editing!

Explain to students that the new and evolved creatures will be sent to an adoption center (next activity). Encourage them to bring out their creative and artistic skills as the next activity is a competition to see who gets the most adoption votes for the class mascot.

***Slide 1**



***Slide 2**

*Students will draw the pokemon on a paper and upload a picture of it to their google slides like above. They must color their pokemon drawing.

UPDATE: Students will also be given the choice to use Autodraw (must upload screenshot of drawing). They just need to include the screenshot on their organizer if they choose to fill it out electronically.
2 options: They can draw it by hand or electronically.

Remind them that they must color their pokemon and upload a picture of it to the slide.

Activity 3: Adoption Center (Rounds) **Duration: 25-30 min**

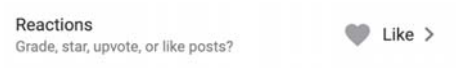
Explain to students that their pokemons have been taken to an adoption center. They must open the padlet link and **upload a screenshot of their <u>second</u> slide**.

The teacher must make sure that the like option is enabled in settings.

Instructions:

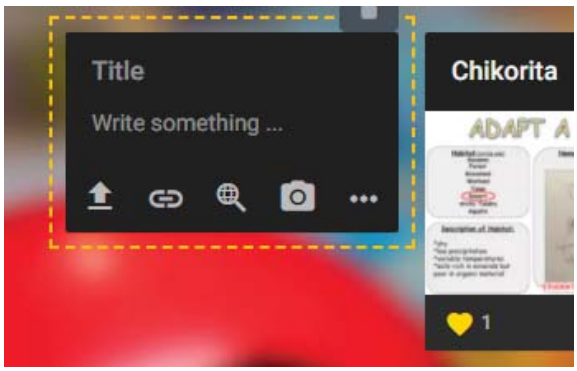
1. *Click on settings widget next to "share".*

2. *Go to "reactions"*



3. *Then, select the LIKE option.*

This will allow students to give a LIKE to creatures they <u>would</u> adopt. It will display a heart under each post along with the number of likes.



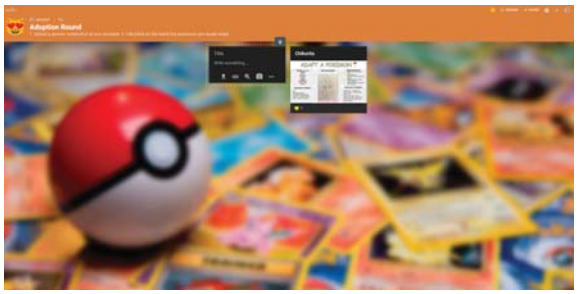
They can select the arrow pointing up to upload their file or select the camera to take a picture.

(They should include a screenshot of their second slide.)
<u>My example:</u>

Write down the presenter's name and score on a piece of paper.

If you are able to, like everyones post and make positive comments about observations.

Congratulate the winner, allow them to present their pokemon 1-2 mins.
clap
Thank everyone else for participating. :)



After there is a gallery from everyones post or as students are posting,
Explain to students that they must click on the post they want to view. This will make the image bigger and clearer. They will also get to read the description of the pokemon before voting.

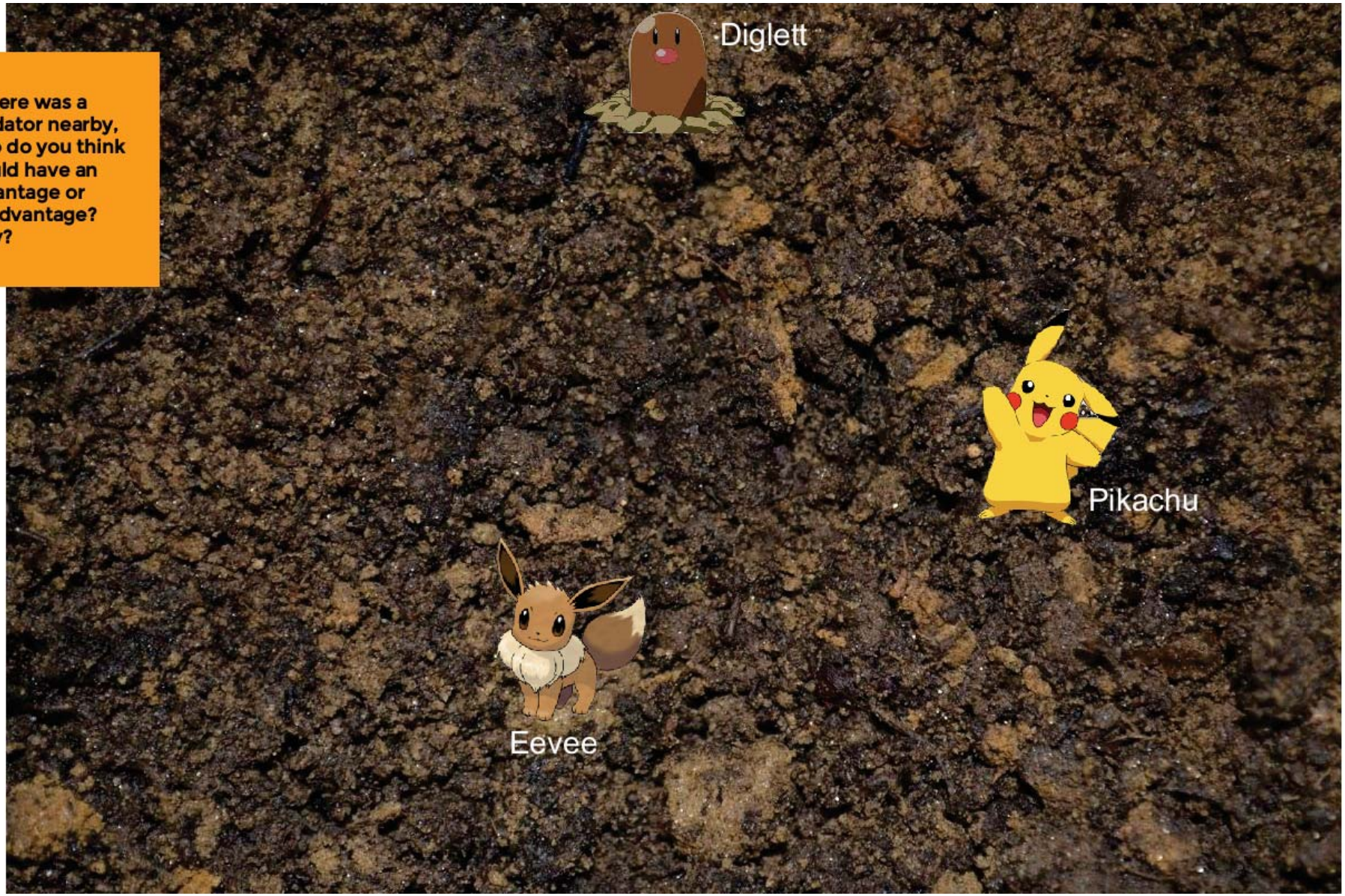
To vote, they must like the post. By liking the post they are saying they would adopt that pokemon.
The pokemon with the **most hearts** under their post will get adopted. This creature will become the classroom's pet. Allow the winner to give a brief presentation on it (1-2 minutes).

If there is time remaining, have other students present their creations! Do not forget to praise them and thank them for their participation! :)

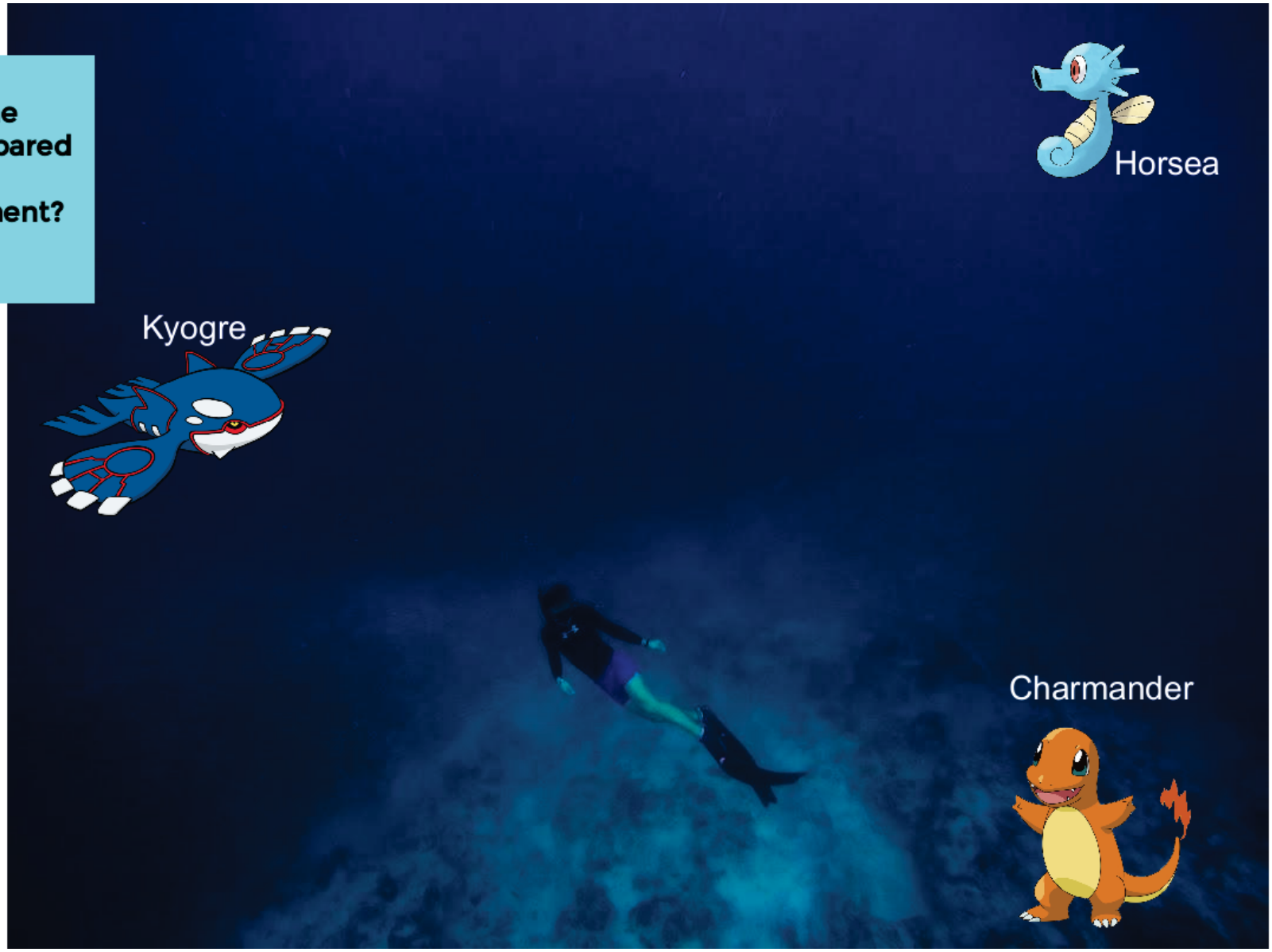
Back to Table of Contents

Who do you think would fail at a game of hide and seek? Why?

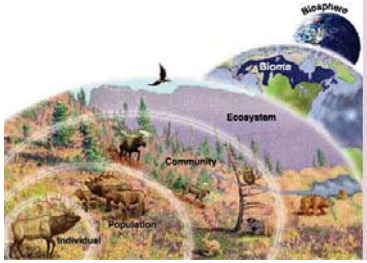
If there was a predator nearby, who do you think would have an advantage or disadvantage? Why?



Who is the least prepared for this environment? Why?



BIOMES



Instructions:

Habitat: (circle one)

Aquatic
Arctic Tundra
Desert
Forest
Grassland
Savanna
Taiga

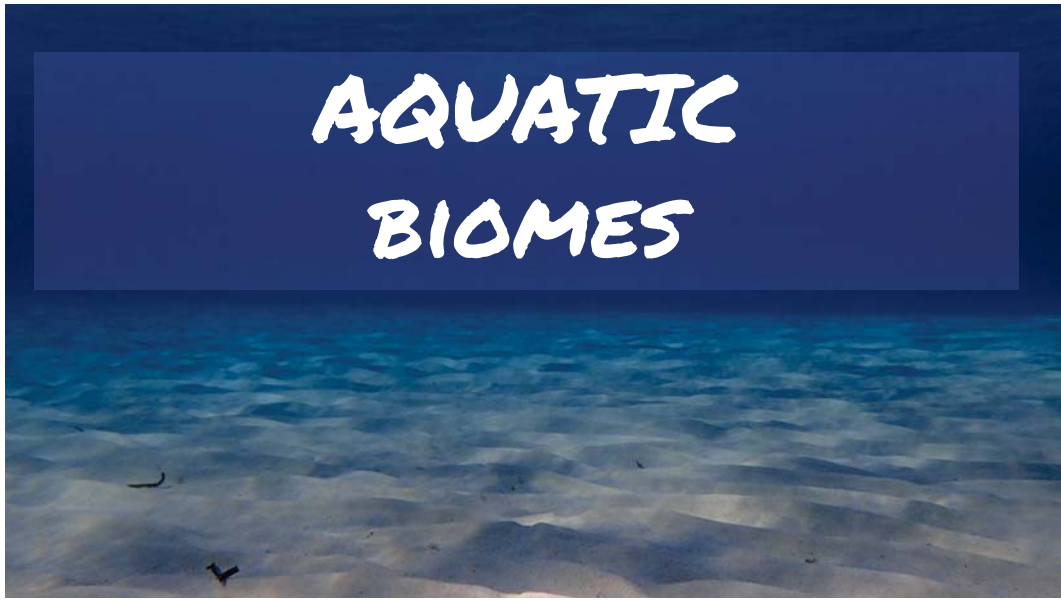
Description of Habitat:

1. Circle a habitat you would like your Pokemon to live in. Choose wisely because you will adapt your pokemon to this environment.
2. You are to use this presentation to explore the different kinds of biomes.
3. You have to include a brief description of the one you have selected. You can use the links provided on the slides or you can conduct further research on your own.
4. Please **include at least 3 bullet points** describing it on your graphic organizer labeled "*Adapt a Pokemon*".
   ***Key Points you can include: precipitation, climate, vegetation, wildlife, location, etc.

Biome List:

Click on the biome you would like to explore
or
Use the **arrow keys** to navigate through the slides
:)

You can explore some biomes through a 360° virtual reality.
Look for this icon:
CHECK IT OUT



Freshwater (Ponds, Lakes, Streams, Rivers):

https://askabiologist.asu.edu/explore/falling-freshwater

OR

Saltwater (Ocean):

https://askabiologist.asu.edu/explore/marine

Terrestrial Biomes

Tundra

https://askabiologist.asu.edu/explore/tundra

https://earthobservatory.nasa.gov/biome/biotundra.php

https://d43fweuh3sg51.cloudfront.net/media/assets/wgbh/tdc02/tdc02_doc_biomesummary/tdc02_doc_biomesummary.pdf

Biome VR 360: CHECK IT OUT

https://askabiologist.asu.edu/sites/default/files/virtual-reality/tundra-biome-VR-360/index.html

Desert

https://askabiologist.asu.edu/explore/desert

https://earthobservatory.nasa.gov/biome/biodesert.php

https://d43fweuh3sg51.cloudfront.net/media/assets/wgbh/tdc02/tdc02_doc_biomesummary/tdc02_doc_biomesummary.pdf

Biome VR 360: CHECK IT OUT

https://askabiologist.asu.edu/sites/default/files/virtual-reality/desert-biome-VR-360/index.html

Forest

Tropical Rainforest:

https://askabiologist.asu.edu/explore/rainforest

https://earthobservatory.nasa.gov/biome/biorainforest.php

https://d43fweuh3sg51.cloudfront.net/media/assets/wgbh/tdc02/tdc02_doc_biomesummary/tdc02_doc_biomesummary.pdf

Biome VR 360: CHECK IT OUT

https://askabiologist.asu.edu/sites/default/files/virtual-reality/rainforest-biome-VR-360/index.html

Temperate Deciduous Forest:

https://askabiologist.asu.edu/explore/temperate-forest

https://d43fweuh3sg51.cloudfront.net/media/assets/wgbh/tdc02/tdc02_doc_biomesummary/tdc02_doc_biomesummary.pdf

Biome VR 360: CHECK IT OUT

https://askabiologist.asu.edu/sites/default/files/virtual-reality/temperate-forest-biome-VR-360/index.html

https://earthobservatory.nasa.gov/biome/biotemperate.php

Coniferous Forest:

https://earthobservatory.nasa.gov/biome/bioconiferous.php

https://d43fweuh3sg51.cloudfront.net/media/assets/wgbh/tdc02/tdc02_doc_biomesummary/tdc02_doc_biomesummary.pdf

Grassland

https://askabiologist.asu.edu/explore/grassland

https://earthobservatory.nasa.gov/biome/biograssland.php

https://d43fweuh3sg51.cloudfront.net/media/assets/wgbh/tdc02/tdc02_doc_biomesummary/tdc02_doc_biomesummary.pdf

Savanna

https://askabiologist.asu.edu/explore/savanna

https://d43fweuh3sg51.cloudfront.net/media/assets/wgbh/tdc02/tdc02_doc_biomesummary/tdc02_doc_biomesummary.pdf

Biome VR 360: CHECK IT OUT

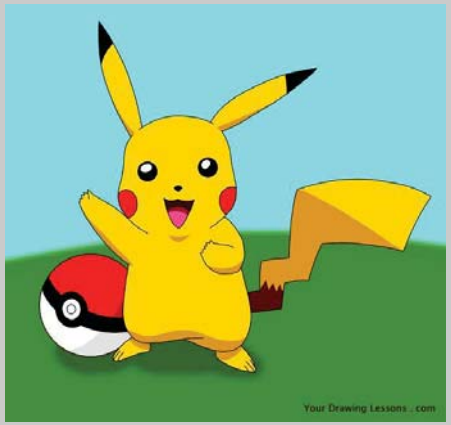
https://askabiologist.asu.edu/sites/default/files/virtual-reality/savanna-biome-VR-360/index.html

Taiga

https://askabiologist.asu.edu/explore/taiga

https://d43fweuh3sg51.cloudfront.net/media/assets/wgbh/tdc02/tdc02_doc_biomesummary/tdc02_doc_biomesummary.pdf

Pokemon Before New Adaptations:



ADAPT A POKEMON

Habitat:(circle one)

Aquatic
Arctic Tundra
Desert
~~Forest~~
Grassland
Savanna
Taiga

Description of Habitat:

1. tall, deciduous trees that form a dense canopy during the wet season; drought-tolerant orchids and bromeliads; aloes and other succulents

2.herbivores such as sloths, tapirs, and capybaras; predators such as jaguars; anteaters; monkeys

3. tropical rainforests are mainly found near the equator in Africa, Central America, and parts of Asia, they receive more intense rays of the sun than you could find anywhere else on Earth

Name and Drawing:

Adaptations/Reasons:

- My pokemon is already short so he would survive well, he would just turn green.

Description of Pokemon:

Pica eats lots of bugs that grow close to the ground. He likes to sleep during the day, come out at night. Lives a lone.

EXAMPLE

Next Slide
:)

Pokemon Before New Adaptations:

Pokédex data

National №	152
Type	GRASS
Species	Leaf Pokémon
Height	0.9 m (2'11")
Weight	6.4 kg (14.1 lbs)
Abilities	1. Overgrow Leaf Guard (hidden ability)
Local №	001 (Gold/Silver/Crystal) 001 (HeartGold/SoulSilver)

https://pokemondb.net/pokedex/chikorita

CHIKORITA

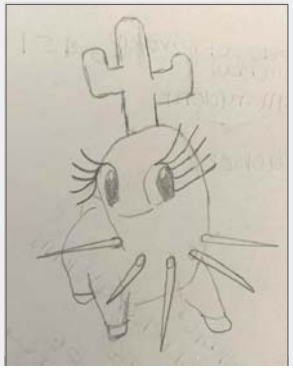
ADAPT A POKEMON

Habitat: (circle one)

Savanna
Forest
Grassland
Wetland
Taiga
Desert
Arctic Tundra
Aquatic

Name and Drawing:

Chikorita



STUDENTS MUST COLOR IT

Adaptations/Reasons:

1. Cactus: water storage in stem
2. Long lashes: eye protection from bright sun & sand
3. Spiked collar: protection from predators
4. Thick foot pads: withstand the hot sand

Description of Habitat:

*dry
*low precipitation
*variable temperatures
*soils rich in minerals but poor in organic material

Description of Pokemon:

*Sand color - camouflage
*Spike attack - shoots spikes from collar
*Blows you away with her lashes, may cause a dust storm
*Uses cactus as a sword and blocks attacks

Up for Adaption - Answer Key & Examples

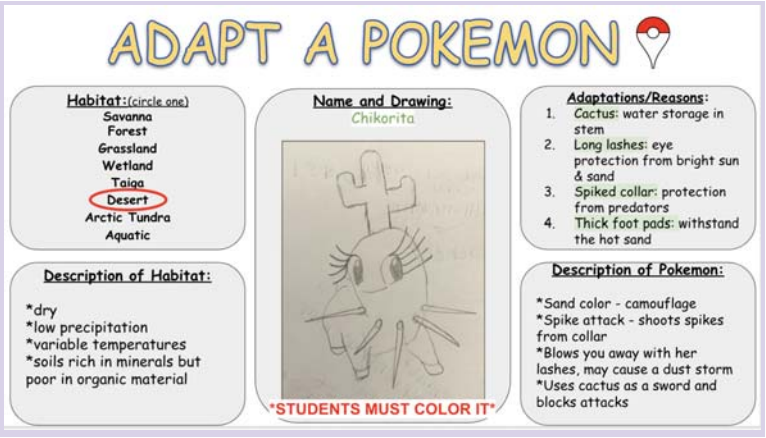
Activity 1: Pokemon - Battle for Survival (Jamboard)

Answer Key:

Slide 1- Jigglypuff would not survive
Slide 2- Pikachu would not survive
Slide 3- Charmander would not survive

Activity 2: Adapt a Pokemon template (Google slides)

My example: **Click me** → Adapt a Pokemon Activity (slides 3-5)



Activity 3: ADoption center round

N/A

ADAPT A POKEMON

Habitat:(circle one)

Aquatic
Arctic Tundra
Desert
Forest
Grassland
Savanna
Taiga

Name of Pokemon:

Drawing of Pokemon:

Adaptations/Reasons:

Description of Habitat:

Description of Pokemon:

Lesson Plan Option 1: Traditional

Name of Lesson: Pacmania

Learning (TEKS) Objective: Simple Math and Science concepts

Student Outcome: *Students will be introduced to different simple concepts and shown different stem careers and the types of careers available in STEM.*

Day of the Week and Time

June 14 2021 (Monday 12:30 pm - 2:00)

Total Length of Lesson: 1 hr 30 min

Materials (per student):

- Laptops
- Worksheet/Paper
- 3 rolls of duct tape/ masking tape
- Bandanas blind-folds, no sharing
- Fake fruit x 4
- Circles for the maze x 100
- Page protector
- three dice
- Dry erase marker w/ eraser
- Blank copy paper
- Bean bags for ghost and pac-man
- Buckets
- Cups x 100

Technology

- **Google Forms Pacmania Trivia**
- **Google Drawings**
- **Google Classroom**

Advanced preparation

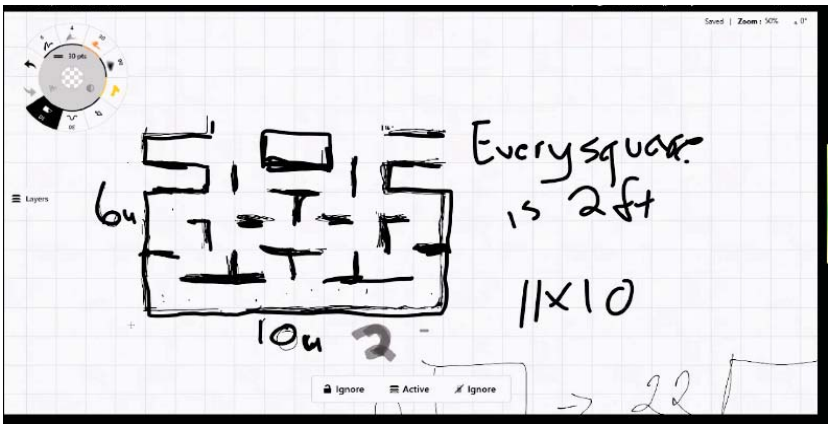
- **Use Duct Tape to create the maze for the activity**
- **Prepare Trivia Questions for game (https://quizizz.com/admin/quiz/60b7f7d3aa2f7f001ba250fe)**
- **Prepare Make Your Own Scientist Activity**
- **Prepare the mystery "what is it?" bags**

How to accommodate activities for students who are English Language Learners or have trouble focusing

- **Pair up students who are english language learners with students who are inclusive and like to encourage others to participate and have fun.**

Instructional Delivery Option 1 (use if everyone is doing the same thing)	**Notes to Teacher:**
Activity 1: Pacmania **Duration: 1:30**	**Because all of the groups will progress at their own pace, all teachers need to be aware and help with**
Pacmania-	

Students will be separated into two types of teams, 1 ghost team and 4 pac-man teams. The Pacman team consists of one member who will be the pac-man; the support who are the ones that answer the trivia questions, the team leader, and the task doers. The ghost team will consist of the four ghosts, the support team and also a team leader and task doer. The pac-man and the ghost will be moving inside a maze that was made on the floor using duct tape. The leaders of the teams will tell the ghosts or pac-man where to move once they get it right.



The purpose of the game is for the pacman to eat all of the dots and for the ghost to catch pacman or eat fruits. In order for either pac-man or the ghosts to move the other team members have to answer trivia questions correctly. If pac-man gets caught, pac-man has to restart from the starting position. If pac-man eats one of the big dots, one of the ghosts must go back to the starting position. If the ghosts collect all the fruits they advanced they advance to the next part of the game, if pac-man collects all the dots then pac-man they get to advance on the next part of the game.

The next part of the camp will be a final game where the pacman and the ghost that collects the most fruits will race toward a final key but in order to move toward the key students need to do the same where they answer trivia questions which allows them to move toward the key.

Overview

giving challenges, replacing fruits, etc. during the game.

-1 group of 4 or 5 = ghost team -4 groups of 5 = pacmen team 1 Ghost team: 1. Red Ghost: can only move forward 2. Pink Ghost: tries to trap the pacmen 3. Orange Ghost: random: rolls a die to determine which ability he gets by chance 4. Blue Ghost: predictive ability- guesses 2 possible dots where Pac man is going, if he's right they catch him! 5. Team leader: the one that has the questions on their screen, share their screen 1 Pacman Teams: 1. Pac man a. The one that moves from dot-to-dot, stays on the maze 2. Task-doer a. Does the challenge to pick up the fruit 3. Task-doer a. Does the challenge to pick up the fruit 4. Team leader: the one that has the questions on their screen, share their screen 5. Point manager: Keeps track of fruits picked up, asks questions for the team	
Once a Pac-man or Ghost lands on a fruit, they must complete the challenge in order to eat the fruit: ● **Blind-folded Cup Stacking: Orange** ○ Teammates give directions to task-doer to help them stack 10 cups into a pyramid shape ○ Teammates see ***how the cups are stacked*** and describes it to the task-doer ● **What is it?: Cherry** ○ Task-doer is blind-folded and puts their hands into the box and picks up an object. ○ They describe the object to their teammates (without saying the name) and their teammates have to guess what the object is correctly ● **Blind-folded drawing: Apple** ○ Task-doer is ***given a word to draw*** and then blind-folded. ○ They have to draw the picture blind-folded. ○ Their teammates guess what the word is. ● **Hit the Target: Strawberry** ○ Task-doer is blind-folded. ○ Their teammate puts a bucket in front of them and everyone is the "spotter". ○ The teammates help the task-doer toss a bean bag into the bucket. ● **Strike a Pose: Melon** ○ Task-doer is blind-folded. ○ One teammate "strikes a pose" and freezes. ○ The rest of the teammates have to give the task-doer instructions on how to imitate the pose. ● **Jumping Jacks Challenge 25:** ○ At-home students if they are task doers they do jumping jacks ● **12 push ups challenge at home:**	The bolded/italics instructions are things the teachers decide whenever the groups get to the challenge. (teacher invents a word to draw, teacher stacks the cups in a pattern.) **The last four challenges are for students at-home who are given the task-doer role which could be applied to any fruit.**

<table>
<tr><td colspan="2">

At-home students if they are task doers they do push ups

Find an item described in your home

At-home students if they are task doers look for an item in their home.

What is happening?

the at home task-doer is going to be given a scenario and must play it out, the team tries to guess what is going on.

</td><td></td></tr>
<tr><td colspan="2">Activity 1: Duration:</td><td></td></tr>
<tr><td>Students in-person:</td><td>Students at-home:</td><td rowspan="2">Try to make the activity more inclusive toward at-home students.</td></tr>
<tr><td>The people in class will be able to be on most of the roles.</td><td>Students in home will be able to participate in most roles except for pacman and ghost who are on the mace, at-home students can still participate as task doers as well.</td></tr>
</table>

Back to Table of Contents

PACMANIA

Welcome to Pacmania, in this activity you will work as a team by communicating, completing a series of task, and using your knowledge to achieve the main objective which is reaching for the key and winning the game.

Teams

Pacman Team

1. Pac man, the one that moves from dot-to-dot, stays on the maze.
2. Task-doers does the challenge to pick up the fruit.
3. Team leader: the one that has the questions on their screen, share their screen.

Ghost team:

1. Red Ghost: can only move forward.
2. Pink Ghost: tries to trap the pacmen.
3. Orange Ghost: random: rolls a die to determine which ability he gets by chance. 4. Blue Ghost: predictive ability- guesses 2 possible dots where Pac man is going, if he's right they catch him!
5. Team leader: the one that has the questions on their screen, share their screen.
6. Task-doers does the challenge to pick up the fruit.

Link to the Trivia Questions(https://quizizz.com/admin/quiz/60b7f7d3aa2f7f001ba250fe)

Rules

1. Assigned each team roles, come up with the a name for the team, and have the team leader share their screen to the questions in quiz.
2. Each character can only move around the maze after answering a question correctly. 3. The amount of spaces to move depending on value of the questions.
4. Pacman cannot leave the maze, only the ghost can through the tunnels.
5. When Pacman is caught, Pacman skips a turn.
6. Task Doers will complete the following task depending on the fruit that a character lands on. (Jumping Jacks, Push-Ups, Blind Folded Cup Stacking, Find The Item, Guess the Drawing, Blind Folded Knockdown The Cups.
7. Team leaders can only decide where the characters move.
8. The team that collects all the fruit gets to move to the final round which a race where they have to get to a key to win the game. Either the Pacman team or the Ghost team must select one of their members to do the race. In order to move forward, the teams must answer a series of questions similar to the maze.
9. Communicate, No Horse Play, Participate, and Have FUN!!!!

Back to Table of Contents

Lesson Plan Option 1: Traditional

Name of Lesson: Engineering for Efficiency

Learning (TEKS) Objective:

(4) Science concepts. The student knows and applies the laws governing motion in a variety of situations. The student is expected to:

(B) describe and analyze motion in one dimension using equations and graphical vector addition with the concepts of distance, displacement, speed, average velocity, instantaneous velocity, frames of reference, and acceleration;

Student Outcome: *Students will be able to… create the most efficient car as they learn kinematics and force components.*

Day of the Week and Time:
Tuesday: 8:30-9:30
Wednesday: 8:30- 10:30
Thursday: 8:30-10:30

Total Length of Lesson:
3 hours

Materials (per student):

- **Blank colored paper (1 per student)Ruby, Victoria, Hillary**
- **pair of scissors per student**
- **Tape**
- **Straw**
- **Coffee Straw**
- **cold glue**
- **colored pencils (1 pack per student)**
- **Something to measure distance with (ruler, meter stick, measuring tape)**
- **20 pennies**
- **Cellphone**
- **Measuring tape/ meter stick.**

Technology

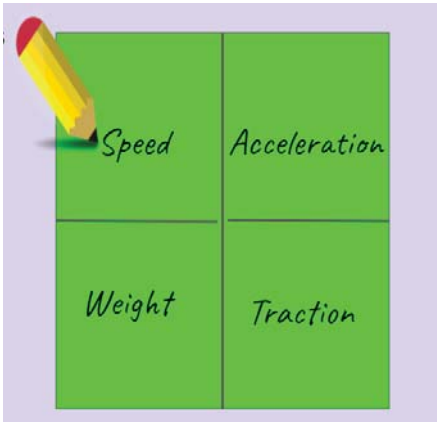
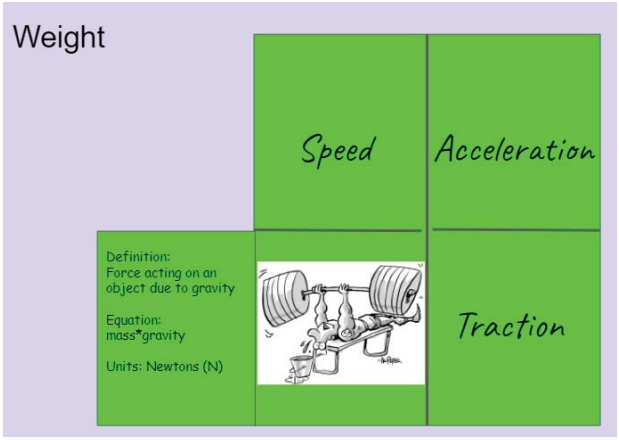
- **Google Slides**
- **Google Docs**
- **Jamboard**
- **Canva**

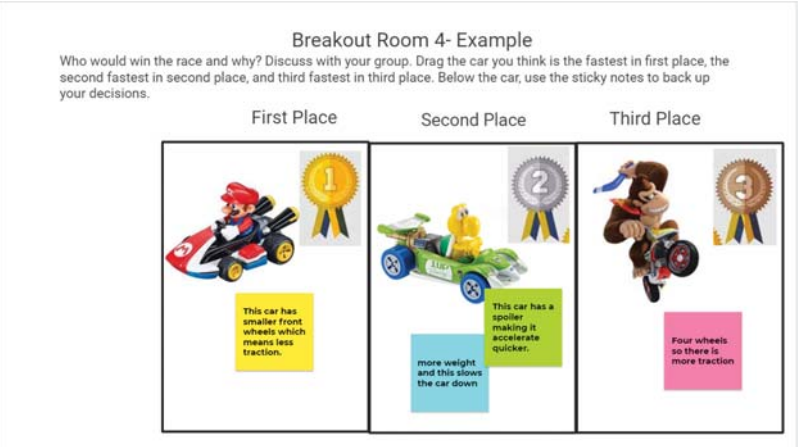
Advanced preparation

- **Create ramp have it ready**
- **Have Jamboard ready for activity 2 (make sure there is a slide for every team)**
- **Have Canva Presentation on Kinematics Ready**

How to accommodate activities for students who are English Language Learners or have trouble focusing

- **Foldable will be accompanied by a Google Slides Presentation. It will contain drawings and writing.**
-
-

Instructional Delivery Option 1 (use if everyone is doing the same thing)	**Notes to Teacher:**
Activity 1: Foldable (Day 1) Duration: 35 minutes **In this activity students will explore different kinematics and force components in order to make wise decisions when it comes to building their car.** **Teacher: "We are going to create a foldable on important things that we should look for when building an efficient car. "** **Share your screen and walk them through the foldable** **Foldable Link:** **https://docs.google.com/presentation/d/1U_pNeOyBouCqVHqnd1gxmLXIP63WP1gGMhFqsW3qkck/edit?usp=sharing** **Example of Foldable:**   	**Individual assignment**
Activity 2: Jamboard Activity- Who will win the race? (Day 1) Duration: 20 minutes **Students will be broken down to breakout rooms and in each breakout room they will use Jamboard to decide which car is more efficient. They will be judges. Let students know one from each group will share what came up with to the class.** **Take 5 minutes to show them what they will do. Navigate through the Jamboard. Give verbal instructions.** **Give students 10 minutes to complete this assignment.** **This is how their jamboard should look once they are finished:**	**Groups of 3 assignment**



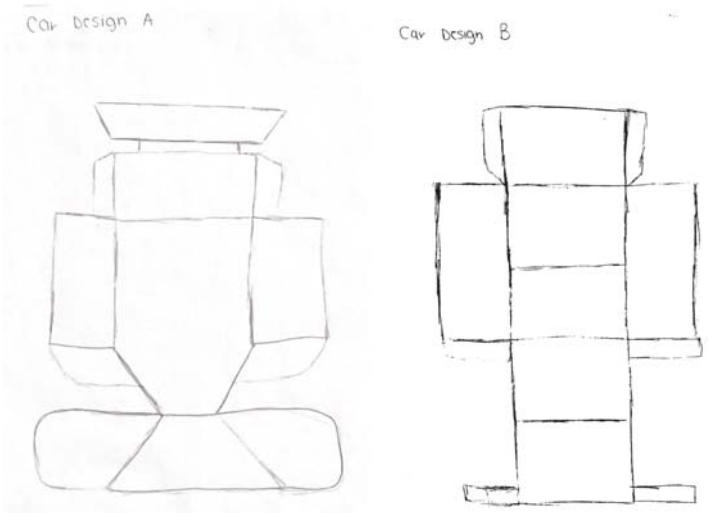
Jamboard Link:
https://jamboard.google.com/d/1USs5peD6Up8nLeeoiy6EZgnLzZY6rmLk5jP8-tYWagc/edit?usp=sharing

Take 5 minutes to discuss.
Bring class back together pick one student from each group to share. For the sake of time just have them share who they picked as their first place and why. If there is plenty of time then they can share who second and third place was and why.

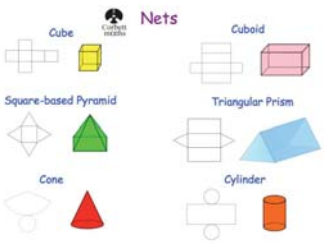
Activity 3: Car Design (Day 2) Duration: 25 minutes

Students will take 10minutes to begin brainstorming ideas to make their own kart. They will have to fit their whole net design on a single sheet of paper.
They will sketch out how they would like their final product to look like and then on a separate piece of paper sketch the net. We will have some ideas they can get inspiration from.

https://docs.google.com/document/d/1bW8RNSW96MwwxaygyFB1E24FBhnapvS9QFZMMLrVdR8/edit?usp=sharing



In this activity ensure students know they must understand what a net is.
A net is a pattern that you can cut and fold to make a model of a solid shape.
Show this example:

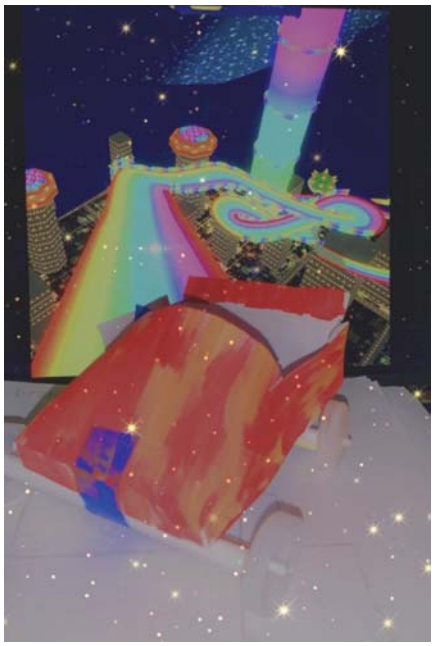


Tell them they can use these shapes or make a net similar to the examples.

Remind them to add extra flap space to be able to connect sides more easily with tape.

Activity 4: Making the Car (Day 2) Duration: 45 minutes

Part 1:
Students will now bring their design to life. They can use colored pencils to customize it as well as draw any other designs on it. Then, assemble it using tape. Lastly, they will put the straw with the wheels and tape them to the base.



Wheels will be assembled with your guidance. Take the coffee straw and insert it through the regular shorter straw. Then, glue the wheels on the coffee straws. Tape or glue to the base of the kart.

Tell students to color nets before folding them.

Activity 5: Kinematic Equations Lesson (Day 2) Duration: 25 minutes

Students will be brought together and given a lesson on kinematic equations.

Presentation link:
https://drive.google.com/file/d/1sWO3LjAv9dRw2ZEx7PxejRP4kE9TJkLX/view?usp=sharing

We will go over an example step by step together.

Students will take their own notes and follow along with any math using this sheet: (Given to them as a handout)
https://docs.google.com/document/d/1UTJmIe-sp8vL1s8Kb_RvQSjSoiS_UAtQYx1X4iVQ6_M/edit?usp=sharing

Teacher Presentation Instructions:

1. **Introduce the kinematic equations. Don't go too much into detail as the following slides will do that for you.**
2. **Go over each individual variable. Allow for students to hypothesize what each variable represents before showing them. Point it out in every equation.**
3. **Give a brief explanation for what each equation solves for.**
4. **Introduce example 1.**
5. **Analyze what variables are given. Point out what you are looking for.**
6. **Using process of elimination choose the equation you will be using to solve the word problem.**

When introducing equations explain how:

1. **equations can be manipulated to solve for different variables.**
2. **Sometimes two equations need to be used.**

This is important for them to understand as it will be applied in the lab.

7. Solve the problem. Go over the math with the students. 8. Answer any questions the students may have.	
Activity 6: Data collection using ramp (Day 3) Duration: 40 minutes	
Students will work in groups of 4. In their groups students will vote for the car to use to record the data by using a fun fact (shortest hair...closest birthday...brightest shirt). The ramp will be premade by the instructors. One students will place the kart on the ramp, one will record the time, the other measure the distance and the virtual student will make sure to record all the data on the worksheet. There will be 2 trials. Students will then use the previous formulas to complete the worksheet. https://docs.google.com/document/d/1bW8RNSW96MwwxaygyFB1E24FBhnapvS9QFZMMLrVdR8/edit?usp=sharing  	Groups will be created so virtual students are placed with some in person students. For Kinematics Activity: Students will need to use equation #2 to first solve for Vo (Initial velocity) from there they can use any equation to solve for acceleration. I would recommend they use equation 1 as it is the easiest. Give them some time to figure this out on their own. If they're struggling guide them to this solution.
Activity 7: Weight Lab (Day 3) Duration: 40 minutes	**Notes to teacher:**
In this activity we will be focusing only on the weight aspect. We will analyze weight. Does a less heavy character such as Dry Bones allow for the car to cover more distance? Or does a more heavy character such as Donkey Kong make the car cover more distance? We will do this by rolling our car down a ramp and recording the distance the car covers with a heavy character (we will represent a heavy character such as Donkey Kong with a weight) vs the distance the car covers with a light character (for the light character we might not put any weights on the car at all). Teacher: "We are now going to look at the "weight" component. We will analyze if weight really matters when choosing your character or not. In other words, does the weight of the character you choose really matter? To do this we will work on the "Weight Lab" which you can access through Classroom." Link to Weight handout: https://docs.google.com/document/d/1DROU-FOStTAK3HRhZY6mKvuIX0d--FaN6gv4EyRhOw8/edit?usp=sharing Students: respond with thumbs up (virtual) or raise hands (in person) when they open up the assignment	The ramp is used because that way we can make sure both cars have the same initial velocity. We don't want one car (either the one with the extra weight or the one without it) to cover more distance just because it had a larger initial velocity than the other. Give students some time to get the Weight Lab open. Ask them to give you a thumbs up when they are ready.

Teacher: Walk students through the lab. Share the screen and walk through their materials. Explain how they will be paired (teams of 2-3). **Explain the process. Explain and show how their setup has to look. Maybe model the activity for them and perform one trial. Tell them that you'll be jumping from room to room to make sure they don't have any questions.**		**As the teacher you might want to assign roles to students. Maybe one of the students can do the lab. The other student or two (depends if its a group of 2 or 3) can fill in the lab results. Maybe have oldest student in each group be the recorder and the youngest be the one who performs the lab.**
Activity 8: Fun Race (Day 3) Duration: 25 minutes		
Students will all race their cars by placing them on the ramp at the same time. Who has the most efficient car? **Then students will reflect on their car performance and why they think that happened.** **Padlet link: https://padlet.com/hillaryquir009/bie9ba5dwietdoc7**		
Activity 1:	**Duration:**	
Students in-person:	**Students at-home:**	
Activity 2:	**Duration:**	
Students in-person:	**Students at-home:**	
Activity 3:	**Duration:**	
Students in-person:	**Students at-home:**	

Back to Table of Contents

INTRO TO KINEMATIC EQUATIONS

KINEMATICS DEFINITION AND VARIABLES

THE FEATURES OR PROPERTIES OF MOTION IN AN OBJECT.

DISPLACEMENT (AND DISTANCE), VELOCITY (AND SPEED), ACCELERATION, AND TIME.

KINEMATIC EQUATIONS

1. $v = v_0 + at$
2. $\Delta x = (\frac{v + v_0}{2})t$
3. $\Delta x = v_0 t + \frac{1}{2}at^2$
4. $v^2 = v_0^2 + 2a\Delta x$

KINEMATIC EQUATION VARIABLES

1. $v = v_0 + at$
2. $\Delta x = (\frac{v + v_0}{2})t$
3. $\Delta x = v_0 t + \frac{1}{2}at^2$
4. $v^2 = v_0^2 + 2a\Delta x$

V= ?

KINEMATIC EQUATION VARIABLES

1. $v = v_0 + at$
2. $\Delta x = (\frac{v + v_0}{2})t$
3. $\Delta x = v_0 t + \frac{1}{2}at^2$
4. $v^2 = v_0^2 + 2a\Delta x$

V= FINAL VELOCITY

VO= ?

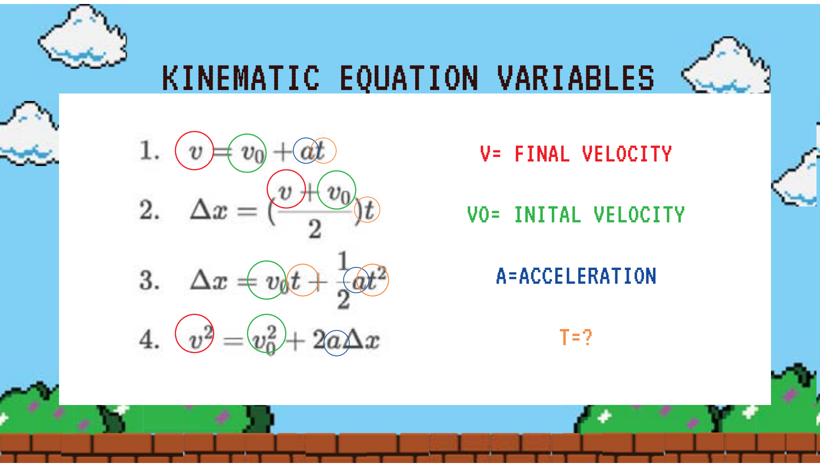
KINEMATIC EQUATION VARIABLES

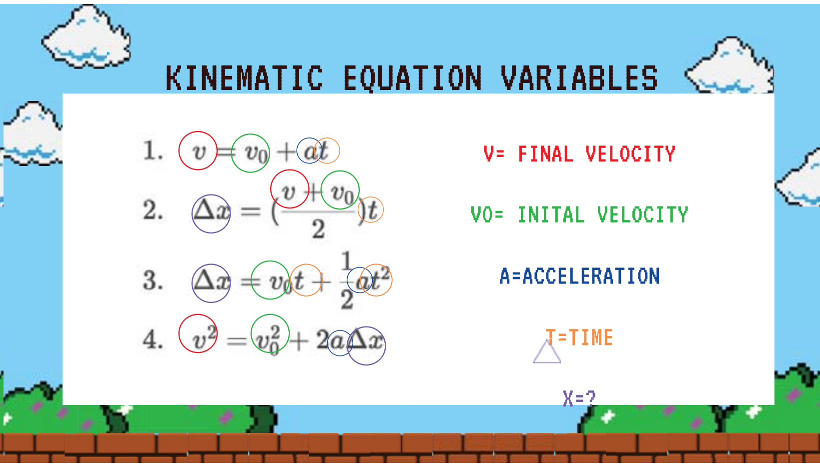
1. $v = v_0 + at$
2. $\Delta x = (\frac{v + v_0}{2})t$
3. $\Delta x = v_0 t + \frac{1}{2}at^2$
4. $v^2 = v_0^2 + 2a\Delta x$

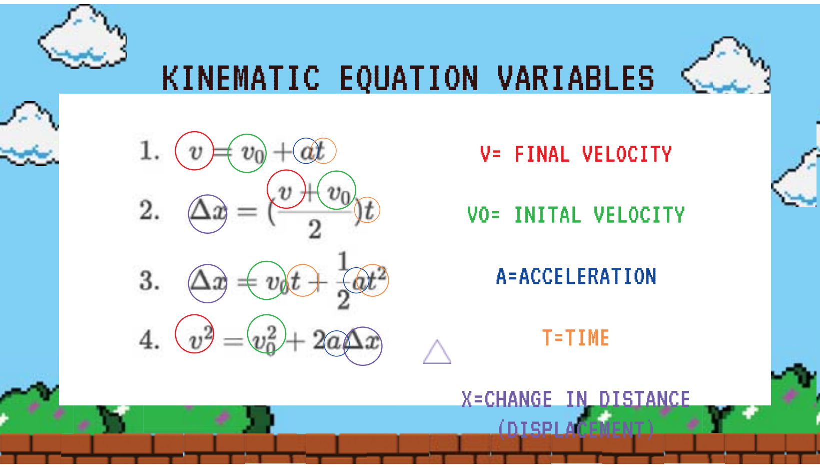
V= FINAL VELOCITY

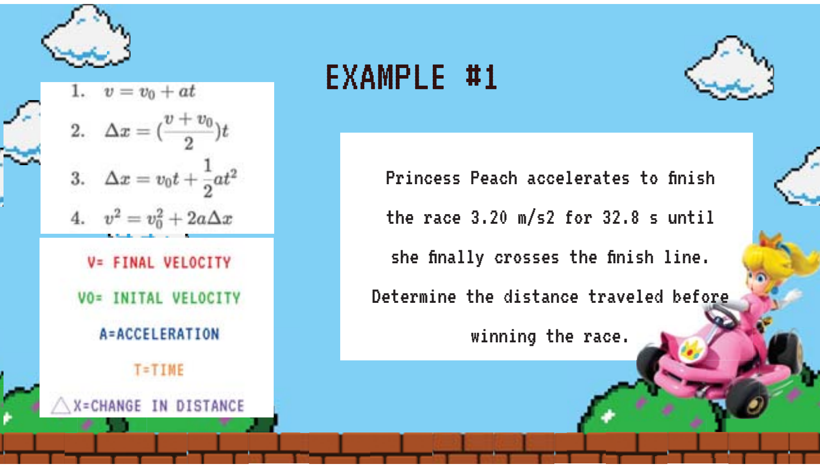
VO= INITAL VELOCITY

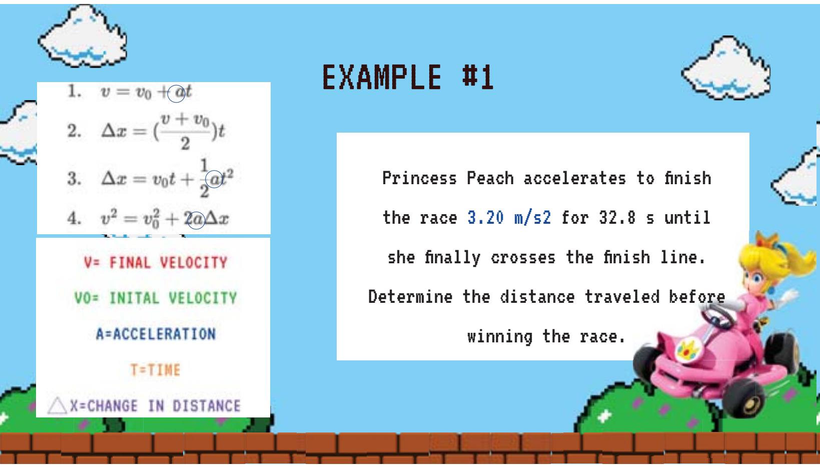
A=?

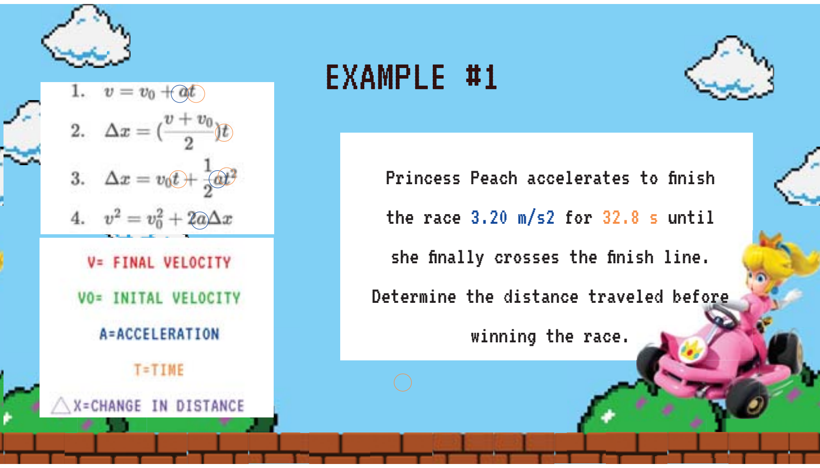

KINEMATIC EQUATION VARIABLES
1. $v = v_0 + at$
2. $\Delta x = (\frac{v + v_0}{2})t$
3. $\Delta x = v_0 t + \frac{1}{2}at^2$
4. $v^2 = v_0^2 + 2a\Delta x$
V= FINAL VELOCITY
VO= INITAL VELOCITY
A=ACCELERATION
T=?


KINEMATIC EQUATION VARIABLES
1. $v = v_0 + at$
2. $\Delta x = (\frac{v + v_0}{2})t$
3. $\Delta x = v_0 t + \frac{1}{2}at^2$
4. $v^2 = v_0^2 + 2a\Delta x$
V= FINAL VELOCITY
VO= INITAL VELOCITY
A=ACCELERATION
T=TIME
X=?


KINEMATIC EQUATION VARIABLES
1. $v = v_0 + at$
2. $\Delta x = (\frac{v + v_0}{2})t$
3. $\Delta x = v_0 t + \frac{1}{2}at^2$
4. $v^2 = v_0^2 + 2a\Delta x$
V= FINAL VELOCITY
VO= INITAL VELOCITY
A=ACCELERATION
T=TIME
X=CHANGE IN DISTANCE (DISPLACEMENT)


EXAMPLE #1
1. $v = v_0 + at$
2. $\Delta x = (\frac{v + v_0}{2})t$
3. $\Delta x = v_0 t + \frac{1}{2}at^2$
4. $v^2 = v_0^2 + 2a\Delta x$
V= FINAL VELOCITY
VO= INITAL VELOCITY
A=ACCELERATION
T=TIME
X=CHANGE IN DISTANCE
Princess Peach accelerates to finish the race 3.20 m/s2 for 32.8 s until she finally crosses the finish line. Determine the distance traveled before winning the race.


EXAMPLE #1
1. $v = v_0 + at$
2. $\Delta x = (\frac{v + v_0}{2})t$
3. $\Delta x = v_0 t + \frac{1}{2}at^2$
4. $v^2 = v_0^2 + 2a\Delta x$
V= FINAL VELOCITY
VO= INITAL VELOCITY
A=ACCELERATION
T=TIME
X=CHANGE IN DISTANCE
Princess Peach accelerates to finish the race 3.20 m/s2 for 32.8 s until she finally crosses the finish line. Determine the distance traveled before winning the race.


EXAMPLE #1
1. $v = v_0 + at$
2. $\Delta x = (\frac{v + v_0}{2})t$
3. $\Delta x = v_0 t + \frac{1}{2}at^2$
4. $v^2 = v_0^2 + 2a\Delta x$
V= FINAL VELOCITY
VO= INITAL VELOCITY
A=ACCELERATION
T=TIME
X=CHANGE IN DISTANCE
Princess Peach accelerates to finish the race 3.20 m/s2 for 32.8 s until she finally crosses the finish line. Determine the distance traveled before winning the race.

1. $v = v_0 + at$
2. $\Delta x = (\frac{v + v_0}{2})t$
3. $\Delta x = v_0 t + \frac{1}{2}at^2$
4. $v^2 = v_0^2 + 2a\Delta x$

V= FINAL VELOCITY

VO= INITAL VELOCITY

A=ACCELERATION

T=TIME

△X=CHANGE IN DISTANCE

EXAMPLE #1

Princess Peach accelerates to finish the race 3.20 m/s2 for 32.8 s until she finally crosses the finish line. Determine the distance traveled before winning the race.

Assume V=0 m/s

1. $v = v_0 + at$
2. $\Delta x = (\frac{v + v_0}{2})t$
3. $\Delta x = v_0 t + \frac{1}{2}at^2$
4. $v^2 = v_0^2 + 2a\Delta x$

V= FINAL VELOCITY

VO= INITAL VELOCITY

A=ACCELERATION

T=TIME

△X=CHANGE IN DISTANCE

EXAMPLE #1

Princess Peach accelerates to finish the race 3.20 m/s2 for 32.8 s until she finally crosses the finish line. Determine the distance traveled before winning the race.

Assume Vo=0 m/s

1. $v = v_0 + at$
2. $\Delta x = (\frac{v + v_0}{2})t$
3. $\Delta x = v_0 t + \frac{1}{2}at^2$
4. $v^2 = v_0^2 + 2a\Delta x$

V= FINAL VELOCITY

VO= INITAL VELOCITY

A=ACCELERATION

T=TIME

△X=CHANGE IN DISTANCE

EXAMPLE #1

Princess Peach accelerates to finish the race 3.20 m/s2 for 32.8 s until she finally crosses the finish line. Determine the distance traveled before winning the race.

Assume Vo=0 m/s

1. $v = v_0 + at$
✗ $\Delta x = (\frac{v + v_0}{2})t$
3. $\Delta x = v_0 t + \frac{1}{2}at^2$
✗ $v^2 = v_0^2 + 2a\Delta x$

V= FINAL VELOCITY

VO= INITAL VELOCITY

A=ACCELERATION

T=TIME

△X=CHANGE IN DISTANCE

EXAMPLE #1

Princess Peach accelerates to finish the race 3.20 m/s2 for 32.8 s until she finally crosses the finish line. Determine the distance traveled before winning the race.

Assume Vo=0 m/s

1. $v = v_0 + at$
✗ $\Delta x = (\frac{v + v_0}{2})t$
✓ $\Delta x = v_0 t + \frac{1}{2}at^2$
✗ $v^2 = v_0^2 + 2a\Delta x$

V= FINAL VELOCITY

VO= INITAL VELOCITY

A=ACCELERATION

T=TIME

△X=CHANGE IN DISTANCE

EXAMPLE #1

Princess Peach accelerates to finish the race 3.20 m/s2 for 32.8 s until she finally crosses the finish line. Determine the distance traveled before winning the race.

Assume Vo=0 m/s

1. $v = v_0 + at$
2. $\Delta x = (\frac{v + v_0}{2})t$
✓ $\Delta x = v_0 t + \frac{1}{2}at^2$
4. $v^2 = v_0^2 + 2a\Delta x$

V= FINAL VELOCITY

VO= INITAL VELOCITY

A=ACCELERATION

T=TIME

△X=CHANGE IN DISTANCE

EXAMPLE #1

Princess Peach accelerates to finish the race 3.20 m/s2 for 32.8 s until she finally crosses the finish line. Determine the distance traveled before winning the race.

Assume Vo=0 m/s

EXAMPLE #1

Princess Peach accelerates to finish the race 3.20 m/s2 for 32.8 s until she finally crosses the finish line. Determine the distance traveled before winning the race.

Assume Vo=0 m/s

EXAMPLE #1

$$\Delta x = v_0 t + \frac{1}{2}at^2$$

WHAT WE HAVE:

Vo= 0m/s

a= 3.2 m/s2

t=32.8

SOLVING FOR: △

x=?

EXAMPLE #1

Princess Peach accelerates to finish the race 3.20 m/s2 for 32.8 s until she finally crosses the finish line. Determine the distance traveled before winning the race.

Assume Vo=0 m/s

$$\Delta x = v_0 t + \frac{1}{2} a t^2$$

x=(0)m/s(32.8)s+(0.5)(3.2)m/s2(32.8)2

x=(0)+(0.5)(3.2)m/s2(32.8)2

x=(0)+(1720)

△ x=1720 m

QUESTIONS?

LAB ACTIVITY

Kinematics Equations Notes

Kinematics Definition:

Kinematics Equations:

Variables:

Practice Problem Math

Lesson Plan Option 1: Traditional

Name of Lesson: Algebra Among Us

Learning (TEKS) Objective:

A (5) Linear functions, equations, and inequalities. The student applies the mathematical process standards to solve, with and without technology, linear equations and evaluate the reasonableness of their solutions. The student is expected to:

(A) Solve linear equations in one variable, including those for which the application of the distributive property is necessary and for which variables are included on both sides

(B) Solve the linear inequalities in one variable, including those for which the application of the distributive property is necessary and for which variables are included on both sides; and

(C) Solve systems of two linear equations with two variables for mathematical and real-world problems.

(c) Knowledge and skills

(3) Linear functions, equations, and inequalities. The student applies the mathematical process standards when using graphs of linear functions, key features, and related transformations to represent in multiple ways and solve, with and without technology, equations, inequalities, and systems of equations. The student is expected to:

(A) determine the slope of a line given a table of values, a graph, two points on the line, and an equation written in various forms, including $y = mx + b$, $Ax + By = C$, and $y - y_1 = m(x - x_1)$;

(B) calculate the rate of change of a linear function represented tabularly, graphically, or algebraically in context of mathematical and real-world problems;

(C) graph linear functions on the coordinate plane and identify key features, including x-intercept, y-intercept, zeros, and slope, in mathematical and real-world problems;

(10) Number and algebraic methods. The student applies the mathematical process standards and algebraic methods to rewrite in equivalent forms and perform operations on polynomial expressions. The student is expected to:

(A) add and subtract polynomials of degree one and degree two;

(B) multiply polynomials of degree one and degree two;

(C) determine the quotient of a polynomial of degree one and polynomial of degree two when divided by a polynomial of degree one and polynomial of degree two when the degree of the divisor does not exceed the degree of the dividend;

(D) rewrite polynomial expressions of degree one and degree two in equivalent forms using the distributive property;

(E) factor, if possible, trinomials with real factors in the form $ax^2 + bx + c$, including perfect square trinomials of degree two; and

(F) decide if a binomial can be written as the difference of two squares and, if possible, use the structure of a difference of two squares to rewrite the binomial.

Student Outcome: *Students will be able to…*
Understand how to solve, graph, and analyze linear equations
Understand how to find x and y from two linear equations
Understand how to factor polynomials and find the x value(s)

Day of the Week and Time
1st week, Tuesday 9:30 am - 11:30 am

Total Length of Lesson:
2 hours

Materials (per student):

- Algebra Foldable
- formula sheet with resources
- Task Recording sheet
- Among Us Instructions handout
- pencil
- highlighters
- colored pens

Technology

- Laptop
- phone (optional)
- Kahoot
- Calculator (online/in hand)
- Nearpod

Advanced preparation

- Students will have links to khan academy or short math videos. It will be a QR code and a link.
- Have colored labels or something so the students can know who is in their group
- Randomize students for groups
    - The one or two members that are not teaching will be creating groups and randomizing imposters for both games during the lesson to save time.
    - https://www.drawnames.com/secret-santa-generator

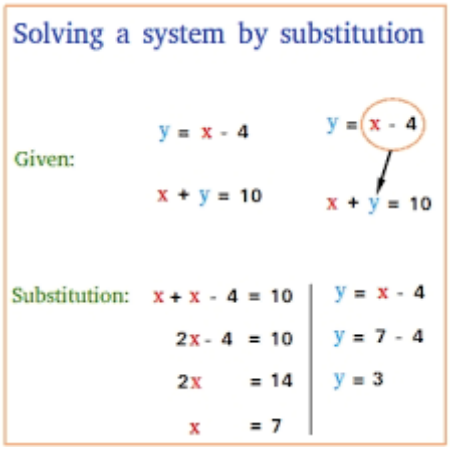
- Get a copy of the kahoot that was created
- there will be at two versions of the google Among Us so there will be 2 games to play.

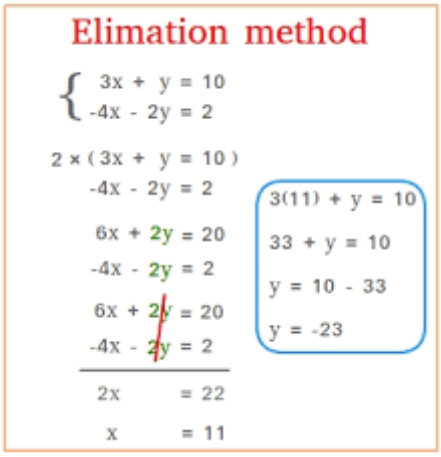
How to accommodate activities for students who are English Language Learners or have trouble focusing

- Color code your notes to make the steps and definitions stand out more
- Try to use more numbers and illustrations
- Try not to complicate the sentences and statements (prioritize using present tense, avoid idioms, use simple sentences)

Instructional Delivery Option 1 (use if everyone is doing the same thing)	**Notes to Teacher:**
Activity 1: Algebra Kahoot **Duration:** 15 minutes You will be using the **Nearpod** for all three activities. (Note: Since we are in three different classrooms, send me an email and I'll send a copy of the Nearpod for your classroom unless student-pace works for everyone) Start with the Nearpod, then do the Kahoot when it says it on the slide. Since this is like a review for most students. We will use Algebra Kahoot to test and see how much the students know about linear equations. **(The problems they missed will be covered the Foldable. The Kahoot is to test and see how much the students know/remember)**	To avoid doing calculations since it may take students a while. Check to see whether students know variables, terms, formulas, and equations. **Nearpod teacher needs to use!** **Use live participation or live participation + zoom** **The Kahoot is here!**
Activity 2: Linear Equation/Polynomial Foldable **Duration:** 35 minutes We head back to the Nearpod and continue with filling in the foldable. You will be writing notes down for the students since this will allow students the time to take notes rather than speeding through the slides. (NOTE: I converted these slides to draw it since this will allow you to write on the slides). (Lesson) Foldable linear equations/ how to solve for two or more linear equations/ polynomial equations FOLDABLE HERE FILLED IN FOLDABLE HERE • types of slope • slope formula • point-slope form • standard form • linear equation	There will be lessons for the students but it may also be a review for the students who have already taken Algebra 1.

- substitution
- elimination
- factorization of
    - 2nd degree
- finding the polynomials





Activity 3: Algebra Among Us **Duration:** 1 hr 10 minutes

Continue the Nearpod. Read and explain the game to the students. The students will have printed instructions for themselves as reference.
Among Us game, students will have:

- their calculator
- phones (if they have any)
- the instructions
- their foldable
- resources sheet
- Task Recording sheet
- pencil
- laptop

Algebra Among Us Game

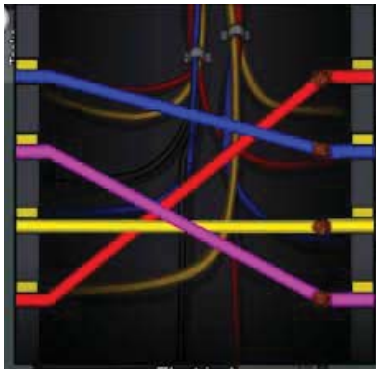
The classroom will contain 8 stations:

- Wire task
- Reactor task
- Polus Map task
- Download File task
- Sample task
- Card scan task
- Reactor room (for the imposters to sabotage)
- Oxygen (for the imposters to sabotage)

Wire task • match 4 of the linear equations to their other form (point-slope form). It will be 1 to 1.	Reactor task • The students will create and find the correct list of values they found for y. • Ex) f(x) = x + 2, x = 2 **(f(x) = 4)**

The teacher will have to consider how much time to put into each among us games. They can hopefully have at least 2 games. They will also have to consider how long the imposter's cool down will be. Somewhere between 5 and 10 minutes.

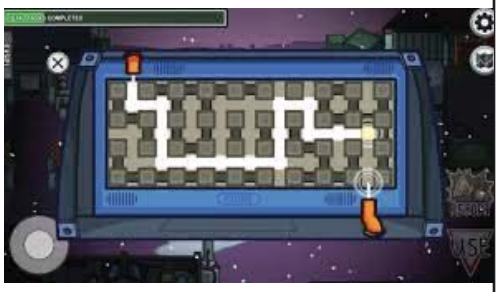
The teacher will also have to make sure the students are participating and being a team player. The idea of finding the imposter can also be added if there is enough time.



- y = 2x + 5 , x = -2 **(x = 1)**
- (1) y = 4
- (2) x = 1

Polus Map task

- there will be three routes where the students need to find the factors of the polynomials in order to advance
- x^2 + 4x - 12 = (x - 2)(x + 6)



Download File task

- there will be two or three questions that involve the students to find x and y from two linear function through substitution or elimination

Samples task

- the students will have to multiply and distribute factors in order to match them to their functions
- Ex: (x - 3) (x + 5) = x^2 + 2x - 15

Card Scan task

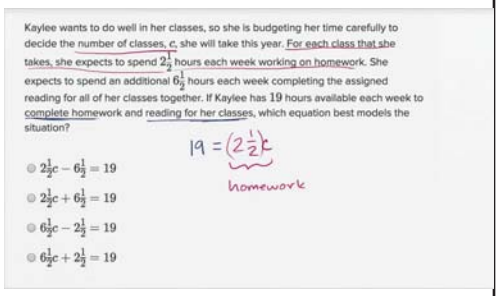
- Find the standard from that matches the given linear equation
- linear equation (y = mx + b) -> standard form (Ax + By = C)

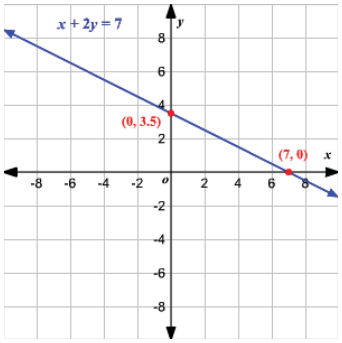
Reactor room (for the imposters to sabotage)

- two students volunteer to work on a word problem together **(it can't be the same ones each time)**

Oxygen (for the imposters to sabotage)

- a student volunteer to graph a function **(it can't be the same one each time)**
- graph x + 2y = 7





The students will be given a packet where the tasks (problems) are given. Students will be put into groups of 5 or 6. One student will be the imposter while the rest are the crewmates.

Teachers:

- *Keeping Track of the Imposters*
  - At least one teacher needs to be tasked with keeping track of the imposters both for online and in person.
  - The "Imposter Sabotage Tracking" Document is in the **For Teacher folder**
- *Checking the Tasks*
  - At least two teachers *(3 teachers will be best)* need to be tasked with verifying the completion of the task as weel as the Sabotage Tasks
    - If the answer is **correct**: Mark the box with a symbol or stamp it
    - If the answer is **incorrect**: Tell the students that they will need to do the task again
  - The "Answer Sheets" for both the tasks and sabotage tasks are in the **For Teacher folder**

Crewmates:

- Each student gets 4 of the 6 tasks (REFER to the **For Teacher folder**)

- The students write their complete work and solutions in a given box in the Task Recording Sheet
- They will have to verify their answers and work with one of the teachers in order to complete the task **(the teachers will either stamp or right a symbol to indicate that they completed the students completed their task) (You will have the answer sheet for each game)**
- After each task the students are required to either do (20 jumping jacks or stretch for 20 seconds)

- All members in their group need to finish their tasks before the time expires. (**35 minutes since that is how long the game is**)
- Even if you're a ghost, you still do your tasks.
- **Win:** The group wins if all their group members complete their tasks before the time expires
  - When you finish your task, return to your table (cafeteria if at-home) to signify to your group mates that you are finished with your tasks.
- **Lose:**
  - There is one person remaining, or
  - The group does not finish their tasks when the time expires.
  - Even if you lose, finish working on your tasks till the next game.
- When the imposter sabotages
  - Reactor: 2 students must go to the reactor station and solve the problem. If the students do not work on the reactor within 45 sec to a minute *(This is the time for SOMEONE in the group to CLAIM that they will fix the "Oxygen/Reactor". They have plenty of time to work on the problem but the person working on this cannot go back to their tasks till they have finished and got it correct)*, the imposter wins.
  - oxygen: 1 student is required to graph a function
  - Taken out by an imposter: They still work on their tasks and must complete it in order for their group to win.
- Crewmates **win** by completing their tasks
- Crewmates **lose** by running out of time (Recall the time limit is 35 minutes) or when 1 student is left.
- If they lose, they work on the remaining questions till the next among us game

Imposters:

- These students still do their “tasks”
- When it comes to sabotage
    - it can be like heads up seven up. The students stop working for say 30 sec - 1 minute.
    - The teacher is the one who calls for sabotage every 5 or 10 minutes
    - the students will have their heads on their arms which is on the desk with their thumbs up
    - the teacher will ask if the imposters want to sabotage reactors, oxygen, take out group members, or do nothing. We will tell by their fingers.
        - pointer finger: Sabotage
        - 2 fingers: Oxygen
        - 3 fingers: take out a groupmate
        - 4 fingers: do nothing
    - Imposters can sabotage every 5 or 10 minutes
- the imposters **win** by stopping the students from finishing their tasks before the time is up or taking out all but one of their group members
- the imposters **lose** when their group members finish their tasks

<table>
<tr><td colspan="2"> 

For checking: We can set a place for the teachers to check the student's work. This is because the students can just keep pressing the button till they get it right. We can check by having a key sheet and the teachers will put a stamp on the stations they got right. If they did not do the work, we can send them back and have them solve for it.</td><td></td></tr>
<tr><td colspan="2">Instructional Delivery Option 2 (use if students are doing different things)
If at any point students are doing the same thing, you can just copy and paste into both columns.</td><td>Notes to Teacher:</td></tr>
<tr><td colspan="2">Activity 1: Algebra Kahoot Duration: 15 minutes</td><td></td></tr>
<tr><td>Students in-person:</td><td>Students at-home:</td><td rowspan="2"></td></tr>
<tr><td>(Refer back to Option 1)</td><td>(Refer back to Option 1)</td></tr>
<tr><td colspan="2">Activity 2: Linear Equation/Polynomial Foldable Duration: 35 minutes</td><td></td></tr>
<tr><td>Students in-person:</td><td>Students at-home:</td><td rowspan="2"></td></tr>
<tr><td>(Refer back to Option 1)</td><td>(Refer back to Option 1)</td></tr>
<tr><td colspan="2">Activity 3: Algebra Among Us Duration: 1 hr 10 minutes</td><td></td></tr>
<tr><td>Students in-person:</td><td>Students at-home:</td><td rowspan="2"></td></tr>
<tr><td>(Refer back to Option 1)</td><td>(Refer back to Option 1)
Through Zoom breakout rooms

Imposters
The main difference is for the imposters. They can private message the teacher in the chat when time comes for sabotage.</td></tr>
</table>

	Crewmates The groups will be put into breakout rooms. They can discuss and use whiteboards if they are having any issues on any of the problems. For checking online: students hold it up to the camera.	

Back to Table of Contents

Algebra Among Us

Instructions

- **Time**
  - Each game will be 35 minutes long.
  - Imposters will sabotage every 5 minutes
  - Everyone will be playing the game on google slides

- **Groups of 5 or 6**
  - 1 Imposter
  - Remaining members of the group are Crew members

- **Stations**
  - Normal tasks
    - Wire task
    - Reactor task
    - Polus Map task
    - Download File task
    - Samples room task
    - Card Scan task
  - Sabotage tasks
    - Reactor room (for the imposters to sabotage)
    - Oxygen (for the imposters to sabotage)

- **Crew members' objective**
  - Each of you need to complete your 4 tasks that you are given.
    - Write your complete work and solutions in a given box in your Task Recording Sheet

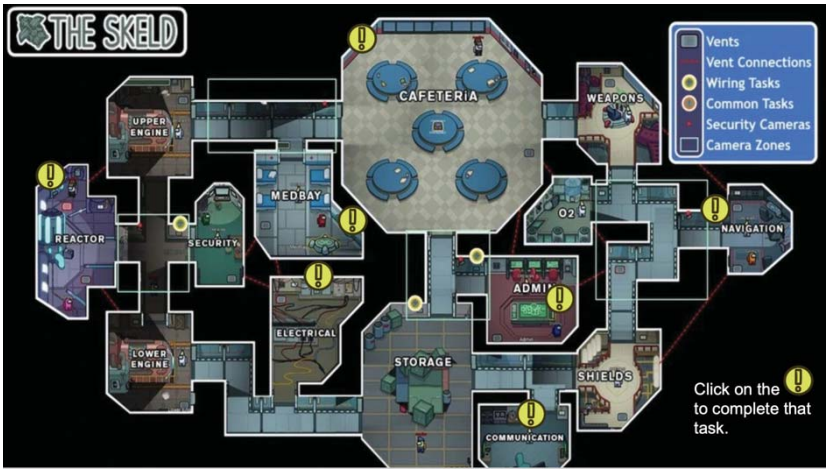
        - You will have to verify your answers and work with one of the teachers in order to complete each task.
        - After each task you are required to either do (20 jumping jacks or stretch for 20 seconds)
    - All members in their group need to finish their tasks before the time expires.
    - Even if you're a ghost, you still do your tasks.
    - When it comes to **sabotage tasks**:
        - Reactor:
            - 2 crewmates must work together to solve the problem that is given to them.
            - If no one claims to work on it within a minute, the crewmates lose
            - Both crewmates need to verify their work with the teachers.
        - Oxygen:
            - 1 crewmate must work together to solve the problem that is given to them.
            - If no one claims to work on it within a minute, the crewmates lose
            - The crewmate need to verify their work with the teachers.
        - **For both Oxygen and Reactor:** There is no time limit to completing the sabotage but keep in mind that you cannot do your other tasks till sabotage is complete.
    - **Win:** The group wins if all their group members complete their tasks before the time expires
        - When you finish all your tasks, notify your group.
    - **Lose:**
        - There is one person remaining, or

- The group does not finish their tasks when the time expires.

- Even if you lose, finish working on your tasks till the next game.

- **Imposter's objective**
  - You will still do the "tasks" and trying to stop your group from finishing the tasks
  - When it comes to sabotage
    - It can be like heads up seven up. Everyone will stop working for say 30 sec - 1 minute.
    - The teacher is the one who calls for sabotage every 5
    - Everyone will have their heads on their arms which is on the desk with their thumbs up
  - the teacher will ask if the imposters want to sabotage reactors, oxygen, take out group members, or do nothing. The teacher will tell by the number of fingers the imposter has up.
    - pointer finger: Sabotage Reactor room
    - 2 fingers: Sabotage Oxygen
    - 3 fingers: take out a groupmate
    - 4 fingers: do nothing
  - Imposters can sabotage every 5
  - **Win:** The imposter wins by:
    - Stopping their group members from finishing their tasks before the time is up or
    - taking out all but one of their group members
  - **Lose:** the imposter loses if:
    - when their group members finish their tasks

This is the map that you will be playing on.



Formulas / Equations / Terms

Variables:

Slope: y-intercept:

Slope formula:

Linear equation:

Point-slope equation:

Standard form:

Combine like terms:

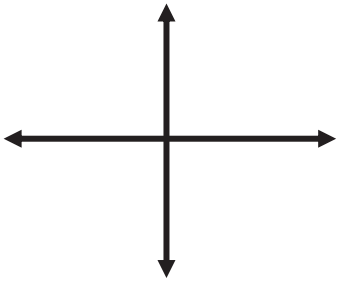
Distribution:

GLUE HERE

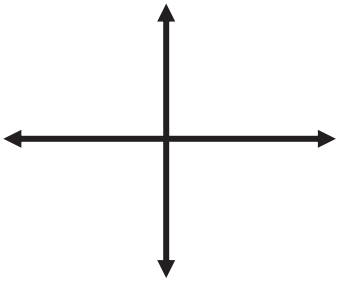
Algebra I
(Linear Equation / Polynomials)

Types of Slope:

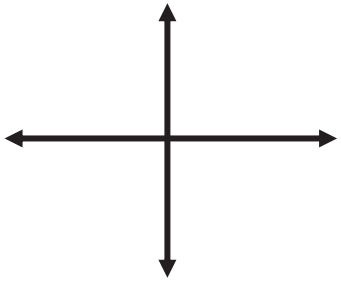
Positive



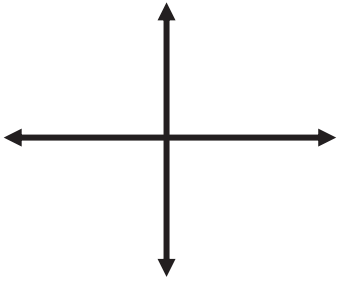
Negative



Zero



Undefined



Example: (4, 7) (6, 8)

Step 1) Find slope

Step 2) Find point-slope equation

Step 3) Find linear equation

Step 4) Find standard form

Two Methods of Solving 2 Linear Equations

Substitution Method

Step 1) Solve one of the equations for one of the variables.

Step 2) **Substitute** the value of the variable in the other equation.

Example: $-x + 2y = 4$
$5x - 3y = 1$

Elimination Method

Step 1) Set the variables to be the same amount and different signs

Step 2) **Eliminate** the variable in both equations and add the remaining variable and value together.

Example: $2x + y = 9$
$-3x + y = -16$

Polynomials

F – the First term
O – the Outer term (outside)
I – the Inner term (inside)
L – the Last term

$(x + 3)(x - 2)$ $(x - 5)(x + 7)$

Example:

$(2x + 3)(6x - 7)$

Factor "Blocks & Box"

Factor: $x^2 - x - 2$

Factors:

Example: $x^2 + 12x + 32$

Factors:

Just click to go to the next slide.

AMONG US

Just click to go to the next slide.

INTRODUCTION

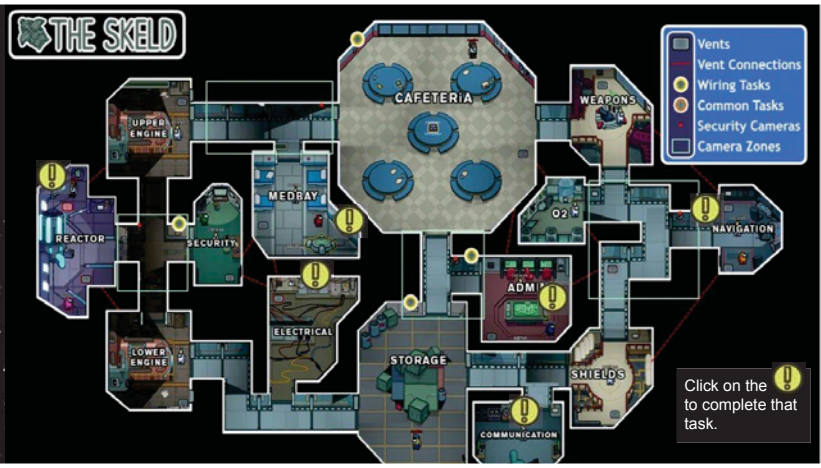
WELCOME TO ALGEBRA AMONG US!!

DO YOUR BEST TO FINISH YOUR TASKS AND BEAT THE IMPOSTER.

Just click to go to the next slide.

RULES

AFTER EACH TASK, HAVE ONE OF THE TEACHERS CHECK YOUR TASK IN ORDER TO FULLY COMPLETE THEM.



OH NO! THE IMPOSTORS HAVE DISCONNECTED THE WIRES AND CUT THE ELECTRICITY! RECONNECT THE WIRES TO BRING THE ELECTRICITY BACK UP.

CLICK ON THE WIRE PICTURE TO GO TO THE QUESTION.

FIND THE LINEAR EQUATION THAT CAME FROM THE FOLLOWING POINT-SLOPE EQUATIONS:
$y + 3 = 2(x - 4)$; $y - 4 = 1(x + 3)$; $y + 1 = 5(x + 2)$; $y - 7 = 3(x - 1)$

$y = 2x + 11$; $y = x + 7$;
$y = 5x + 9$; $y = 3x + 4$

$y = 2x - 11$; $y = x + 7$;
$y = 5x + 9$; $y = 3x + 4$

$y = 2x - 11$; $y = x - 1$;
$y = 5x + 9$; $y = 3x + 4$

$y = 2x - 11$; $y = x + 7$;
$y = 5x + 9$; $y = 3x - 4$

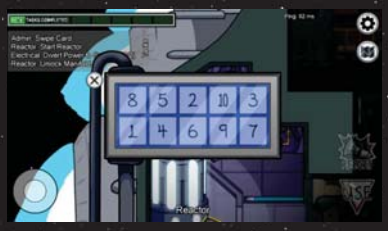
Defeat

That was the wrong answer):
Click "Play Again" to Go Back to the Question

PLAY AGAIN

The reactor needs to be started im order to keep the ship going!

Click on the reactor picture to go to the question.



Find the value of y for each linear equation and order your sdlutions from least to greatest.
$y = 3x + 2$; $y = -2x - 5$; $y = -5x + 4$; $y = 7x - 3$
$(x = -4)$ $(x = -7)$ $(x = 3)$ $(x = 1)$

$y = -10$, $y = -19$, $y = -11$, $y = 4$

$y = -10$, $y = 9$, $y = -11$, $y = 4$

$y = -19$, $y = -11$, $y = -10$, $y = 4$

$y = -11$, $y = -10$, $y = 4$, $y = 9$

Defeat

That was the wrong answer):
Click "Play Again" to Go Back to the Question

PLAY AGAIN

We need to fix our map to find out where to navigate to!

Click on the map picture to go to the question.

Factor the following polynomials. Use the "Blocks & Box" to factor
$x^2 + 4x - 21$; $x^2 + 11x + 30$; $x^2 - 3x - 18$

$(x + 3)(x - 7)$; $(x + 3)(x + 10)$; $(x - 6)(x + 3)$

$(x + 3)(x - 7)$; $(x + 6)(x + 5)$; $(x - 6)(x + 3)$

$(x + 3)(x - 7)$; $(x + 6)(x + 5)$ $(x - 3)(x + 9)$

$(x - 3)(x + 7)$; $(x + 6)(x + 5)$; $(x - 6)(x + 3)$

Defeat

That was the wrong answer):
Click "Play Again" to Go Back to the Question

PLAY AGAIN

Our communications are down! Download the files with the latest intel.

Click on the file picture to go to the question.

Solve for two linear equations using either of the two methods (elimination or substitution)

(1) $2x + y = 3$ (2) $x + y = 5$

$5x + 2y = -1$ $2x - 3y = 10$

(1) $x = -7$; $y = 17$
(2) $x = 5$; $y = 0$

(1) $x = 17$; $y = -7$
(2) $x = 5$; $y = 0$

(1) $x = -7$; $y = 17$
(2) $x = 0$; $y = 5$

(1) $x = 7$; $y = -17$
(2) $x = 5$; $y = 0$

Defeat

That was the wrong answer):
Click "Play Again" to Go Back to the Question

PLAY AGAIN

We need to analyze the samples in the medbay!

Click on the anomaly picture to go to the question.

"Foil" the following factors and match them the polynomials.

$(x + 2)(x + 4)$; $(x - 5)(x - 3)$; $(x + 7)(x - 5)$

$x^2 + 6x + 8$; $x^2 - 8x + 15$;
$x^2 + 2x - 35$

$x^2 + 6x + 6$; $x^2 - 8x + 15$;
$x^2 + 2x - 35$

$x^2 + 6x + 8$; $x^2 - 8x - 15$;
$x^2 + 2x - 35$

$x^2 + 6x + 8$; $x^2 - 8x + 15$;
$x^2 - 2x - 35$

Defeat

That was the wrong answer):
Click "Play Again" to Go Back to the Question

There might be an imposter, but we still have to do the boring tasks...

Click on the card swipe picture to go to the question.

Convert the following linear equations to Standard Form.
Y = (-4/3)x + 3: Y = (⅙)x - 4

4X + 3Y = 3
-X + 5Y = -20

4X + 3Y = 9
-X + 5Y = 4

4X + 3Y = 9
-X + 5Y = -20

4X + 3Y = 9
-X + 5Y = 20

Defeat

That was the wrong answer):
Click "Play Again" to Go Back to the Question

Victory

That was the Right answer (:
Click "The skeld" to Go Back to the map

Algebra AMONG US (ANSWERS)

Directions: Write the name of the given task in a given box.

Show all your work for each task and CIRCLE/BOX your answer.

Game 1

Task 1 (Wires):

$y-2=1(x+3)$

$y-2=x+3$

$\boxed{y=x+5}$

$y+5=3(x-1)$

$y+5=3x-3$

$\boxed{y=3x-8}$

$y-1=2(x+4)$

$y-1=2x+8$

$\boxed{y=2x+9}$

$y+3=4(x-5)$

$y+3=4x-20$

$\boxed{y=4x-23}$

Task 2 (Reactor): [in order, least to greatest]

$y=4x-1$

$(x=2)$

$y=4(2)-1=\underline{7}$

$y=-5x+2$

$(x=1)$

$y=-5(1)+2=\underline{-3}$

$y=2x+5$

$(x=5)$

$y=2(5)+5=\underline{15}$

$y=-2x-3$

$(x=-3)$

$-2(-3)-3$

$=6-3=\underline{3}$

$\boxed{y=-3,\ y=3,\ y=7,\ y=15}$

Task 3 (Map):

x^2+x-6

	x	-2
x	x^2	$-2x$
3	$3x$	-6

$\boxed{(x-2)(x+3)}$

x^2-6x+8

	x	-2
x	x^2	$-2x$
-4	$-4x$	8

$\boxed{(x-2)(x-4)}$

x^2+3x+2

	x	1
x	x^2	x
2	$2x$	2

$\boxed{(x+1)(x+2)}$

Task 4 (Download Files): (Elimination or Substitution)

(Elimination) [a lot of ways to solve]

$x+2y=4$

$3x+y=-3$

$-3x-6y=-12$

$3x+y=-3$

$-5y=-15$

$\boxed{y=3}$

$x+2(3)=4$

$\boxed{x=-2}$

$-2x+3y=3$

$x-y=2$

$-2x+3y=3$

$3x-3y=6$

$\boxed{x=9}$

$9-y=2$

$-y=-7$

$\boxed{y=7}$

(Substitution) [a lot of ways to solve]

$x=4-2y$

$3(4-2y)+y=-3$

$12-6y+y=-3$

$-5y=-15$

$\boxed{y=3}$

$x=4-2(3)$

$\boxed{x=-2}$

$x=y+2$

$-2(y+2)+3y=3$

$-2y-4+3y=3$

$\boxed{y=7}$

$x=7+2$

$\boxed{y=9}$

Task 5 (Sample):

$(x-3)(x+2)$

$x^2+2x-3x-6$

$\boxed{x^2-x-6}$

$(x+1)(x-2)$

$x^2-2x+x-2$

$\boxed{x^2-x-2}$

$(x+5)(x-3)$

$x^2-3x+5x-15$

$\boxed{x^2+2x-15}$

Task 6 (Card scan):

$y=\left(-\frac{1}{3}\right)x-2$

$3(y)=\left(\left(-\frac{1}{3}\right)x-2\right)3$

$3y=-x-6$

$\boxed{x+3y=-6}$

$y=\left(\frac{5}{2}\right)x+3$

$2(y)=\left(\left(\frac{5}{2}\right)x+3\right)2$

$2y=5x+6$

$\boxed{-5x+2y=6}$

Reactor **(a)** :

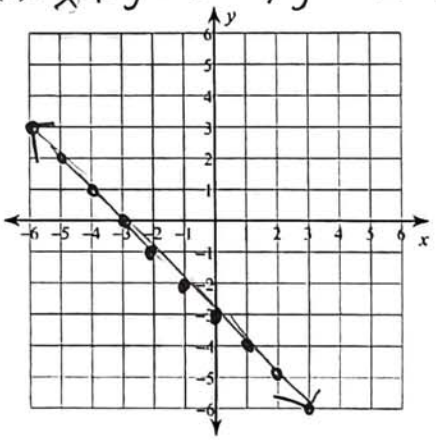
$\$40{,}000+\$300x$

$\boxed{y=\$300x+\$40{,}000}$

or

$\boxed{y=300x+40{,}000}$

Oxygen **(a)**: $x+y=-3 \Rightarrow y=-x-3$



Reactor **(b)**:

$y=300x+40{,}000$

(1)

$y=300(150)+40{,}000$

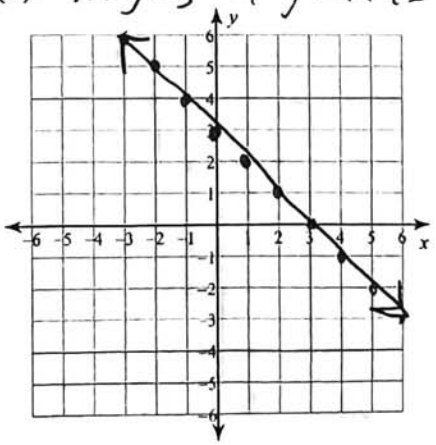
$=45{,}000+40{,}000=\boxed{\$85{,}000}$

(2) $100{,}000=300x+40{,}000$

$\frac{60000}{300}=\frac{300x}{300}$

$\boxed{x=200 \text{ machines}}$

Oxygen **(b)**: $x+y=3 \Rightarrow y=-x+3$



Reactor (c):

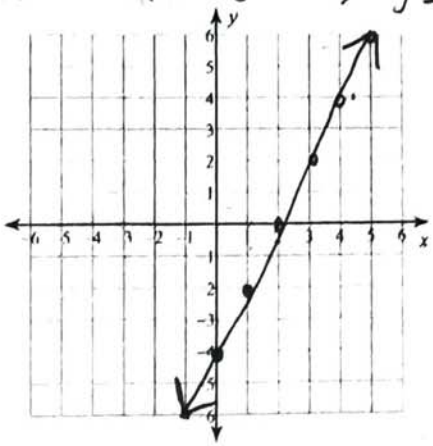
$3c $7a

$3c + 7a = 210$

or

$3x + 7y = 210$

Oxygen (c): $2x - y = 4 \Rightarrow y = 2x - 4$



Reactor (d):

$260 - 4m$

(1) $y = -4x + 260$ or $y = 260 - 4m$

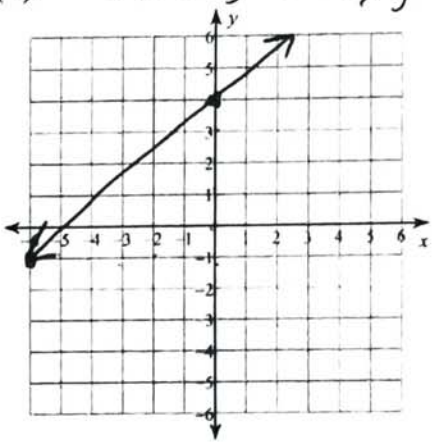
(2)

$220 = -4x + 260$

$\frac{-40}{-4} = \frac{-4x}{-4}$

$x = 10$ months

Oxygen (d): $6x + 5y = 20 \Rightarrow y = \frac{5}{6} + 4$



Reactor (e):

$\$350 + \$150x$

(1) $y = 150x + 350$ or $y = 350 + 150m$

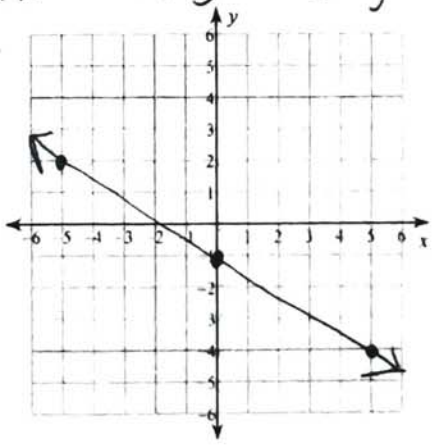
(2)

$2,000 = 150x + 350$

$\frac{1650}{150} = \frac{150x}{150}$

$x = 11$ months

Oxygen (e): $3x + 5y = -5 \quad y = \frac{-3}{5}x - 1$



Game 2

Task 1 (Wires):

$y+3=2(x-4)$

$y+3=2x-8$

$\boxed{y=2x-11}$

$y-4=1(x+3)$

$y-4=x+3$

$\boxed{y=x+7}$

$y+1=5(x+2)$

$y+1=5x+10$

$\boxed{y=5x+9}$

$y-7=3(x-1)$

$y-7=3x-3$

$\boxed{y=3x+4}$

Task 2 (Reactor): [in order, least to greatest]

$y=3x+2$

$(x=-4)$

$y=3(-4)+2=\underline{-10}$

$y=-2x-5$

$(x=-7)$

$y=-2(-7)-5$

$=14-5=\underline{9}$

$y=-5x+4$

$(x=3)$

$=-5(3)+4=\underline{-11}$

$y=7x-3$

$(x=1)$

$=7(1)-3=\underline{4}$

$\boxed{y=-11,\ y=-10,\ y=4,\ y=9}$

Task 3 (Map):

$x^2+4x-21$

	x	7
x	x^2	$7x$
-3	-3	-21

$\boxed{(x-3)(x+7)}$

$x^2+11x+30$

	x	6
x	x^2	$6x$
5	$5x$	30

$\boxed{(x+5)(x+6)}$

$x^2-3x-18$

	x	-6
x	x^2	$-6x$
3	$3x$	-18

$\boxed{(x-6)(x+3)}$

Task 4 (Download Files): (Elimination or Substitution)

(Elimination)

$2x+y=3$

$5x+2y=-1$

$-4x-2y=-6$

$5x+2y=-1$

$\boxed{x=-7}$

$2(-7)+y=3$

$-14+y=3$

$\boxed{y=17}$

$x+y=5$

$2x-3y=10$

$-2x-2y=-10$

$2x-3y=10$

$-5y=0$

$\boxed{y=0}$

$x+0=5$

$\boxed{x=5}$

(Substitution)

$y=3-2x$

$5x+2(3-2x)=-1$

$5x+6-4x=-1$

$\boxed{x=-7}$

$2(-7)+y=3$

$-14+y=3$

$\boxed{y=17}$

$x=5-y$

$2(5-y)-3y=10$

$10-2y-3y=10$

$-5y=0$

$\boxed{y=0}$

$x+0=5$

$\boxed{x=5}$

Task 5 (Sample):

$(x+2)(x+4)$

$x^2+4x+2x+8$

$\boxed{x^2+6x+8}$

$(x-5)(x-3)$

$x^2-3x-5x+15$

$\boxed{x^2-8x+15}$

$(x+7)(x-5)$

$x^2-5x+7x-35$

$\boxed{x^2+2x-35}$

Task 6 (Card scan):

$y=\left(\frac{-4}{3}\right)x+3$

$3(y)=\left(\left(\frac{-4}{3}\right)x+3\right)3$

$3y=-4x+9$

$\boxed{4x+3y=9}$

$y=\left(\frac{1}{5}\right)x-4$

$5(y)=\left(\left(\frac{1}{5}\right)x-4\right)5$

$5y=x-20$

$\boxed{-x+5y=-20}$

Reactor **(f)** :

$35{,}000+750p$

(1)

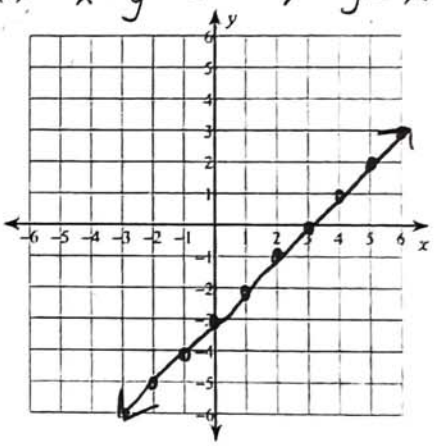
$\boxed{y=750x+35{,}000}$ or

$\boxed{y=35{,}000+750p}$

(2) $50{,}000=750x+35{,}000$

$\frac{15{,}000}{750}=\frac{750x}{750}$ $\boxed{x=20 \text{ years}}$

Oxygen **(f)**: $x-y=3 \Rightarrow y=x-3$



Reactor **(g)**:

$\$25{,}000-\$1{,}500m$

(1)

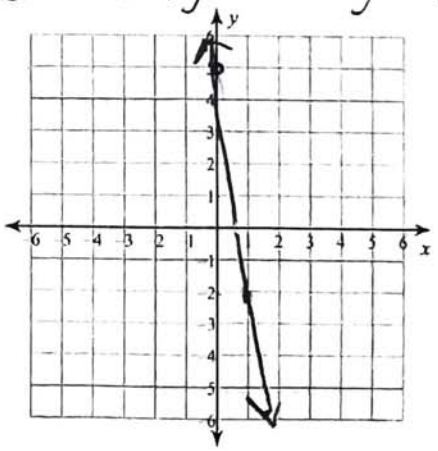
$\boxed{y=-1{,}500x+25{,}000}$ or

$\boxed{y=25{,}000-1{,}500x}$

(2) $y=-1{,}500(8)+25{,}000=-12{,}000+25{,}000$

$\Rightarrow \boxed{y=\$13{,}000}$

Oxygen **(g)**: $7x+y=5$ $y=-7x+5$



Reactor **(h)**:

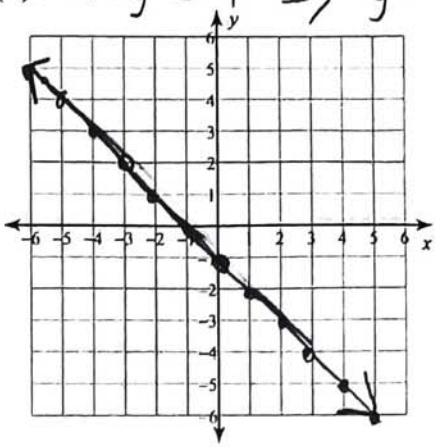
$\$30 + \$0.15x$

(1) $y = 0.15x + 30$ or $y = \$30 + \$0.15x$

(2) $y = 0.15(200) + 30$

$y = \$60$

Oxygen **(h)**: $x + y = -1 \Rightarrow y = -x - 1$

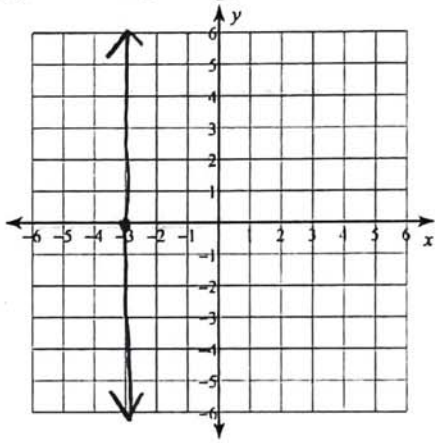


Reactor **(i)**:

$3w + 6r$

$3w + 6r = 210$ or $3x + 6y = 210$

Oxygen **(i)**: $x = -3$



Reactor **(j)**:

$2x + 3y$

(1) $2x + 3y = 60$

(2) $y = 10$

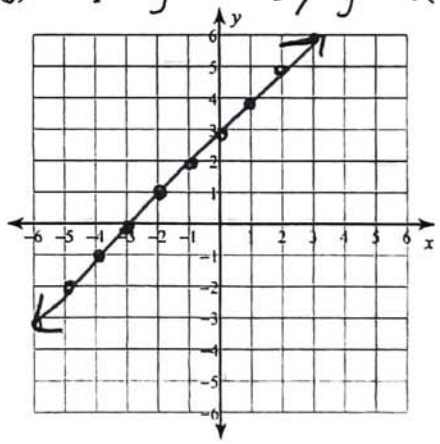
$2x + 3(10) = 60$

$2x + 30 = 60$

$2x = 30$

$x = 15$ 2-pound books

Oxygen **(j)**: $x - y = -3 \Rightarrow y = x + 3$



Imposter Sabotage Tracking

Mark the problems with x's, check marks, etc.

Game 1

Group A Imposter:

Group B Imposter:

Group C Imposter:

Group D Imposter:

Group E Imposter:

(Reactor Sabotage Problems)

	a	b	c	d	e
Groups					
Group A					
Group B					
Group C					
Group D					
Group E					

(Oxygen Sabotage Problems)

	a	b	c	d	e
Groups					
Group A					
Group B					
Group C					
Group D					
Group E					

(Eliminating Crewmates)

[Note: put lines through the imposters since they do not count as crewmates]

	Group A	**Group B**	**Group C**	**Group D**	**Group E**
Student 1					
Student 2					
Student 3					
Student 4					
Student 5					
Student 6					

Game 2

Group A Imposter:

Group B Imposter:

Group C Imposter:

Group D Imposter:

Group E Imposter:

(Reactor Sabotage Problems)

	f	g	h	i	j
Groups					
Group A					
Group B					
Group C					
Group D					
Group E					

(Oxygen Sabotage Problems)

	f	g	h	i	j
Groups					
Group A					
Group B					
Group C					
Group D					
Group E					

(Eliminating Crewmates)

[Note: put lines through the imposters since they do not count as crewmates]

	Group A	**Group B**	**Group C**	**Group D**	**Group E**
Student 1					
Student 2					
Student 3					
Student 4					
Student 5					
Student 6					

Resources Sheet

⇒ **Linear Equation and its forms**

https://www.khanacademy.org/math/algebra/x2f8bb11595b61c86:forms-of-linear-equations/x2f8bb11595b61c86:summary-forms-of-two-variable-linear-equations/v/point-slope-and-standard-form

⇒ **Two methods of solving 2 Linear Equations**

- Substitution

https://www.khanacademy.org/math/cc-eighth-grade-math/cc-8th-systems-topic/cc-8th-systems-with-substitution/v/the-substitution-method

- Elimination

https://www.khanacademy.org/math/algebra-home/alg-system-of-equations/alg-equivalent-systems-of-equations/v/solving-systems-of-equations-by-elimination

⇒ Factoring

https://www.khanacademy.org/math/algebra/x2f8bb11595b61c86:quadratics-multiplying-factoring/x2f8bb11595b61c86:factor-quadratics-intro/v/factoring-simple-quadratic-expression

Name:_____

Date:_____

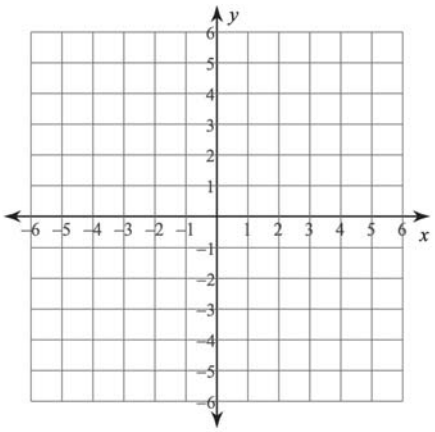
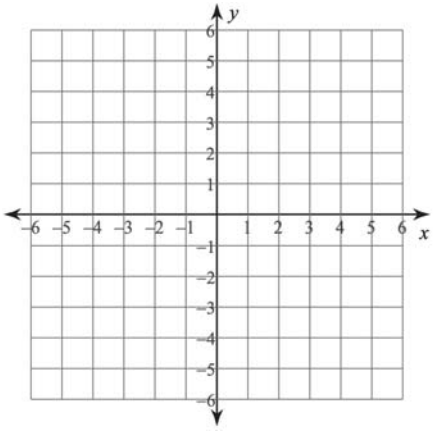
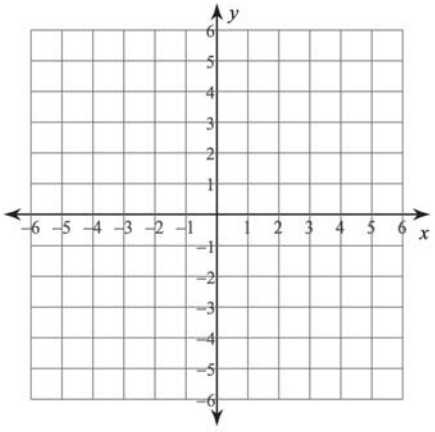
Algebra AMONG US

Directions: Write the name of the given task in a given box.

Show all your work for each task and CIRCLE/BOX your answer.

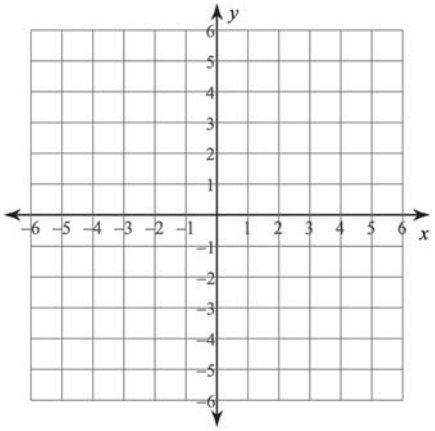
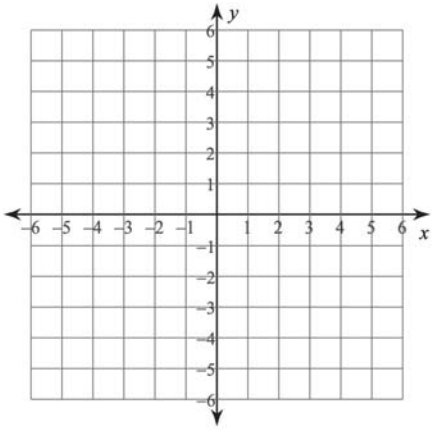
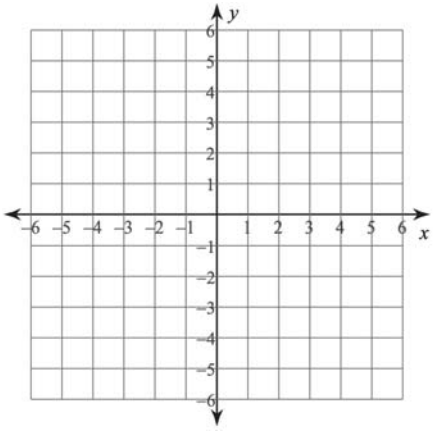
Game 1

Task:	**Task:**
Task:	**Task:**

Reactor:	Oxygen: 
Reactor:	Oxygen: 
Reactor:	Oxygen: 

Game 2

Task:	**Task:**
Task:	**Task:**

Reactor:	Oxygen: 
Reactor:	Oxygen: 
Reactor:	Oxygen: 

Lesson Plan Option 1: Traditional

Name of Lesson: Pok-E-volution

Learning (TEKS) Objective:
B.7(E) Analyze and evaluate the relationship of natural selection to adaptation and to the development of diversity in and among species.

Student Outcome: *Students will be able to… demonstrate that adaptations lead to an organism's evolution by modeling clay to show their pokemon's phases of evolution.*

Day of the Week and Time
Week 1: Tuesday, 12:30 PM-2:00 PM

Total Length of Lesson:
1.5 Hours

Materials (per student):

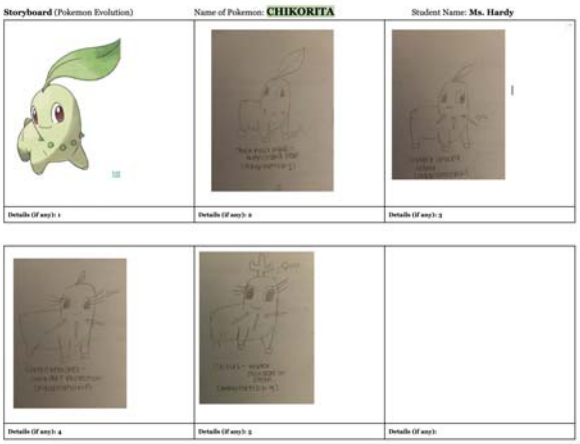
- Modeling clay/ playdough (pack per student?)
- Storyboard template (printed)
- Pencils

Technology

- Laptops
- Electronic device to take pictures (phone, laptop camera, tablet)
- Stop Motion Studio

Advanced preparation

- Make sure students have access to laptops
-
-

Instructional Delivery Option 1 (use if everyone is doing the same thing)	**Notes to Teacher:**
Activity 1: Evolution Storyboard (Individually) **Duration: 20 min**	
Remind students about the activity they completed Monday about their Pokemon and adaptations. ★ Students will refer to the previous activity (Up for Adapt-ion). They will use the **same Pokemon** they selected from the previous activity. Students will be asked to sketch/fill out a storyboard of their creature's evolution as a rough draft for the stop motion video's outline (6 squares). The first square should be the original state of the pokemon and the last square should be the final outcome. The other squares in between will just show how it changes to get from the first phase to the last phase. Storyboard Template: **Click me** → **Storyboard Template**  *Students can include a short description under the sketch such as why it adapted that way or any details they feel are important to share. *They do not have to use all 6 squares as this can be time-consuming, but they must use at least 3 squares. They are to do a rough sketch without coloring it. Maybe each square can be a particular trait for an adaptation, but it is their choice. This should be a quick sketch as most of their time should be focused on modeling clay and editing the video. The faster they fill out the storyboard, the more time they have to work on their stop motion video. Pokemon Storyboard Example: 	They cannot change the Pokemon choice and must stick to the same one they have already selected. They do not need to color the drawings as they will be brought to life once they begin modeling which is already time-consuming. They can if they want to, but it is optional.
Activity 2: Clay Modeling/ Picture Taking (Individually) **Duration: 50-55 min**	

Students will then get to shape the clay into their Pokemon and take pictures during the process. ★ After the storyboard, students will start shaping the clay into the Pokemon's different stages. ★ While they are molding their pokemon, they should also be taking pictures. They have to take 10-15 pictures. This activity also helps students understand the development of diversity in species through evolution.  	Remind them to take pictures as they are creating models of their Pokemons. They are to include 10-15 pictures to make their video.
Activity 3: Video Editing (Individually) **Duration: 20 min** ★ At the end, they are asked to compile all their pictures to make a stop motion video and exhibit their pokemon's evolution. Students will organize pictures in order for the video (original pokemon → new pokemon). ★ They will address the TEKS concept by including a caption at the end of their video answering *"What is the connection of adaptations to increased diversity among species?"* Anticipated answer: Those who are better adapted get to pass on their traits to their offspring and those who are not die off. Those who survive or have a greater "fitness" contribute to diverse populations as they have a variety of traits to contribute. • Must add music and captions along with the pictures! Laptop: iMovie UPDATE: iMovie will be used. I will create a set of instructions or a video to aid students who are not familiar with the program.	Have them share their videos if there is time left over.

Back to Table of Contents

*YOU MUST USE **AT LEAST 3** SQUARES FOR THE OUTLINE

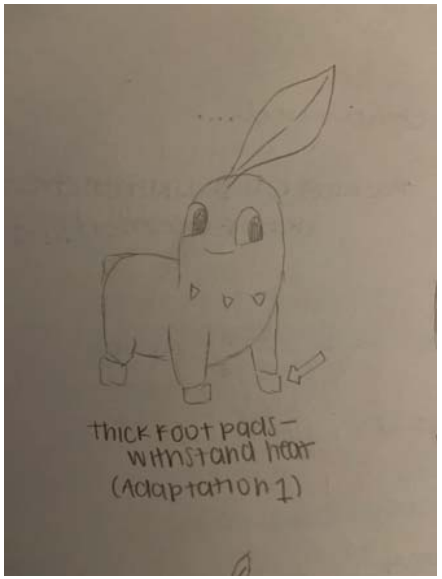
Storyboard (Pokemon Evolution) **Name of Pokemon:** **Student Name:**

Details (if any):	**Details (if any):**	**Details (if any):**

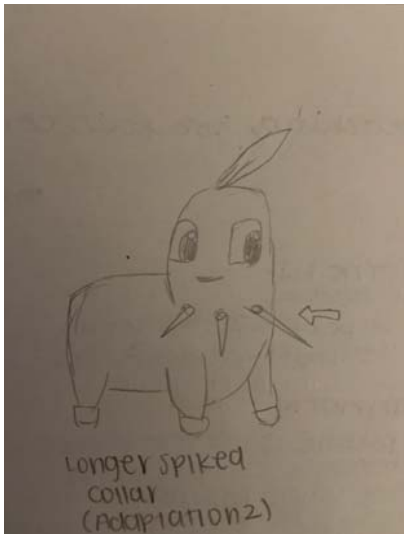
Details (if any):	**Details (if any):**	**Details (if any):**

Storyboard (Pokemon Evolution) Name of Pokemon: **CHIKORITA** Student Name: **Ms. Hardy**

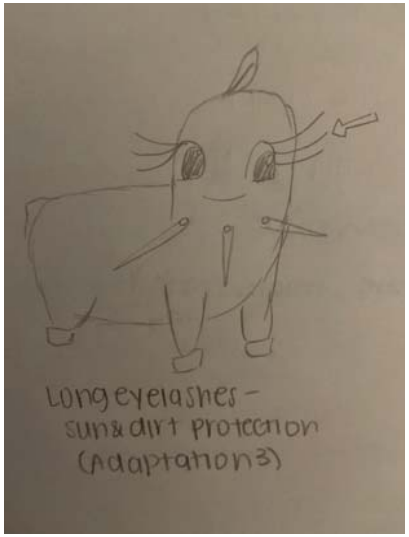
Details (if any): 1

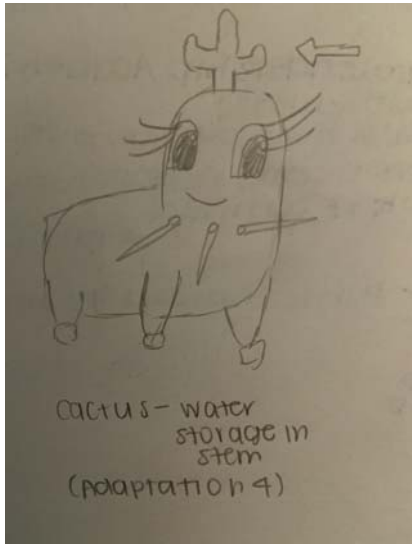


Details (if any): 2



Details (if any): 3





Details (if any): 4	**Details (if any): 5**	**Details (if any):**

How to use iMovie

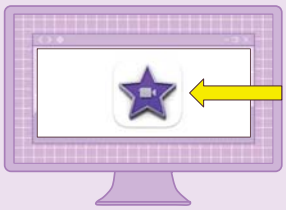
Creating a Stop Motion Clip

Stop Motion Clip

Example: Evolution of Chikorita

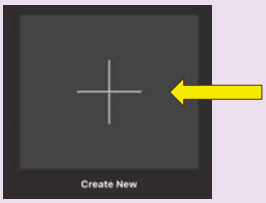
You will create something like this today!

Step 1:



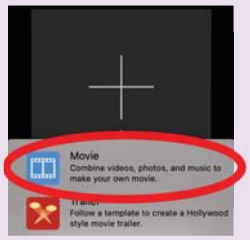
Launch the iMovie Application

Step 2:



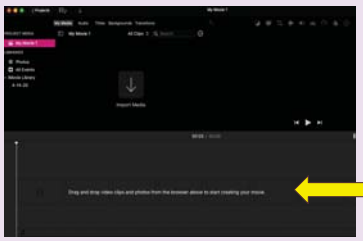
Select “Create New”

Step 3:



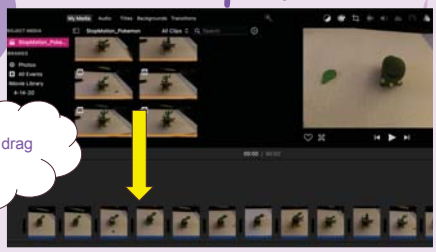
Select “Movie”

Step 4:



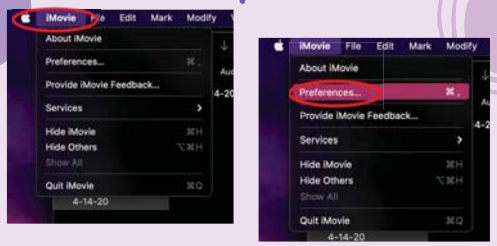
Locate the photos you have saved of your Pokemon. Then, upload the photos by selecting all and dragging them into iMovie.

Step 5:



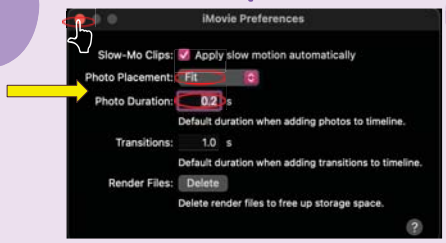
Once you have imported the media, make sure the photos are in order by organizing them accordingly.

Step 6:



At the top left corner of your screen, select “iMovie” and then “Preferences”

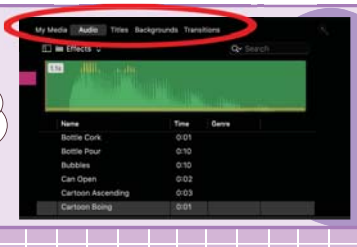
Step 7:



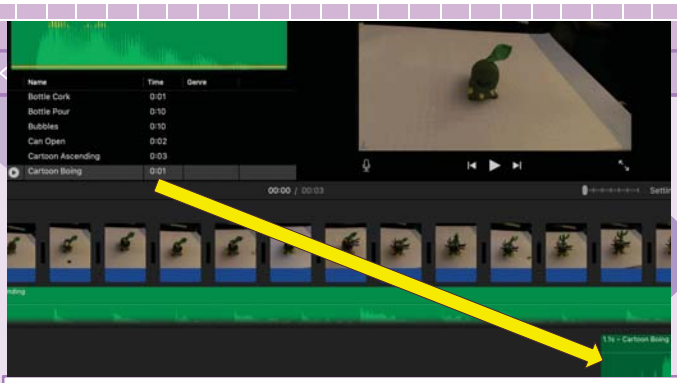
Change “Photo Placement” to “Fit”
Then, change “Photo Duration” to “0.2 s”
Hit enter and then close the window by clicking the red button or “x” at the top left.

Step 8:

Add special effects such as Audio, Titles, Backgrounds, & Transitions.



*You are **required** to add audio + captions only!*



You will drag and drop your (audio/text) choices at the bottom too! Place them where needed.

You can view your clip by clicking the “play button”
This will help you review and see if any adjustments need to be made.


IMPORTANT
DO NOT FORGET TO SAVE YOUR CLIP!
Projects
Titles
Name: My Movie
Name: Your Name: (Your Pokemon Name) Evolution
Example:
Student Name - Chikorita's Evolution
Cancel
OK

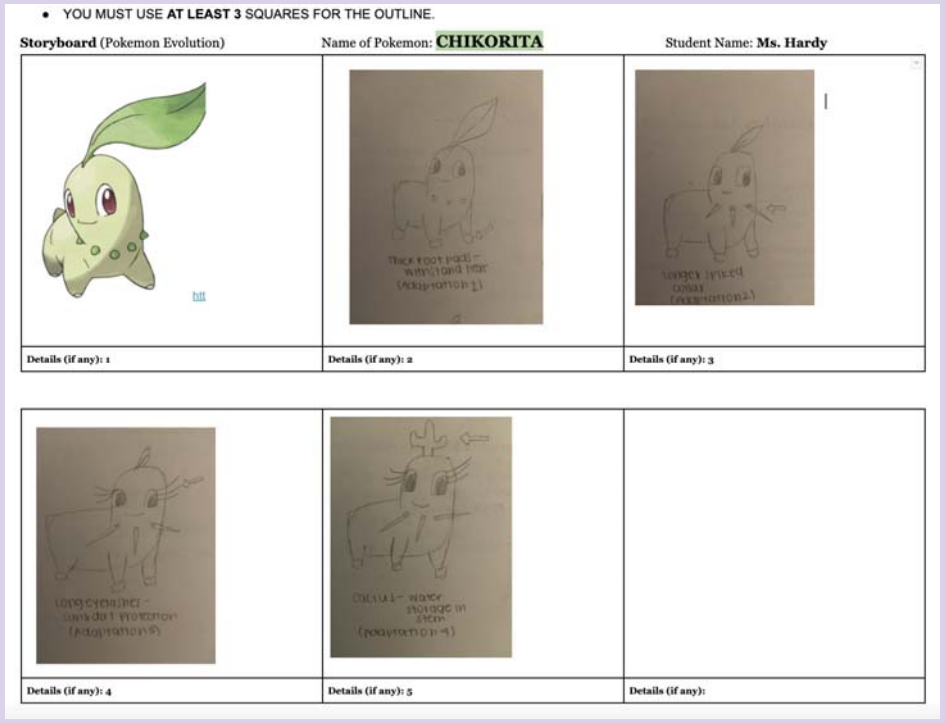

Tutorial Video: Creating a Stop Motion


WHOA!
You are an iMovie expert now!

POK-E-VOLUTION - ANSWER KEY & EXAMPLES

ACTIVITY 1: POKEMON STORYBOARD

MY EXAMPLE: **Click me →** **Storyboard Template** (PAGE 2)



- YOU MUST USE **AT LEAST 3** SQUARES FOR THE OUTLINE.

Storyboard (Pokemon Evolution) | Name of Pokemon: **CHIKORITA** | Student Name: **Ms. Hardy**

Details (if any): 1	Details (if any): 2	Details (if any): 3
Details (if any): 4	Details (if any): 5	Details (if any):

ACTIVITY 2: CLAY MODELING / PICTURE TAKING

N/A

ACTIVITY 3: VIDEO EDITING

MY EXAMPLE: **Click me →** **Stop Motion Example**

USING IMOVIE - INTRO VIDEO: **Click me →** **https://docs.google.com/presentation/d/1quaFZIx-I9WM_v311SwDjvgjCSrscOVBKQMcVfX6R-4/edit#slide=id.p**

*****MADE FOR STUDENTS. ^ Just in case they are not familiar with the program.**

Pokémon Evolution

1

Instructions:

Part 1: Evolution Storyboard

★ Refer to the previous activity (Up for adapt-ion), you will use the Same pokemon you have chosen for this activity.

★ You will now sketch a storyboard demonstrating your pokemon's evolution as a rough draft for your stop motion video's outline .

Instructions continued...

This will NOT be colored.

Part 1: Evolution Storyboard

★ The storyboard template contains 6 squares, you need to use a minimum of 3 squares.

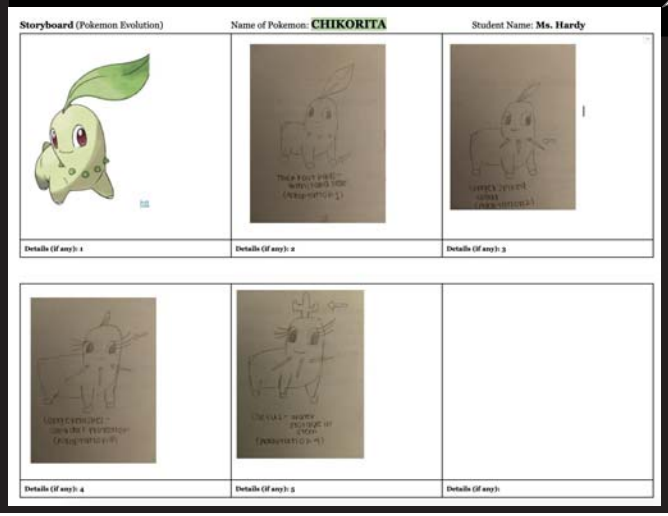
★ The first square should be the original state of the pokemon and the last square should be the final outcome.

★ The other squares used in between will just show how your pokemon changes to get from the first phase to the last phase. Example: Each square can be a particular trait for a new adaptation.

★ You can also include details under your sketch such as why it has adapted that way or any other details you would like to include.

Example:

This will NOT be colored.



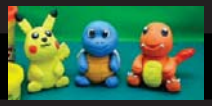
★ This is just an example, you will have to sketch every square and include details under it in its appropriate box.

20 MINS

★ The faster you complete the storyboard, the more time you have to complete your stop motion video.

2

Instructions:



Part 2: Clay modeling / picture taking

- ★ Next, you will get to shape the clay and bring your pokemon to life. After the storyboard, you will start shaping the clay into your pokemon's different stages.

  IMPORTANT: You must also take pictures during the process. While you are molding your pokemon, you should be taking pictures as you add parts to it.

- ★ You are only molding one pokemon figure and adding body parts to it, you are not making multiple figures.
- ★ As you make additions, take pictures of your pokemon.

  You should take 10-15 pictures.

*you can use your laptop's or phone's camera to take pictures.

50-55 MINS

3

Instructions:

Part 3: Editing video

- ★ Then, you will put your pictures together to create a stop motion video exhibiting your pokemon's evolution.
- ★ You will organize your pictures from its original stages → new and evolved pokemon.
- ★ iMovie will be used, there is a tutorial presentation+video to guide you. You can add text, audio, special effects to your video.
- ★ Do not forget to save your video!

20 MINS

Requirements:

- ★ refer to the iMovie instructions presentation
- ★ Your video will only be a few seconds long
- ★ Add captions describing adaptations, music, & special effects
- ★ At the end, you will answer this question by adding text at the end of your video:

  What is the connection of adaptations to increased diversity among species?

Lesson Plan Option 2: Experiment/Investigation

Name of Lesson: Binary Code

Learning (TEKS) Objective:
CS1.6L: Understand the binary representation of numeric and nonnumeric data in computer systems.
CS1.6N: Perform numerical conversions between the decimal and binary systems and count in the binary number system.
CS1.2B: Communicate and collaborate with peers to create and properly display meaningful output.

Student Outcome: *Students will be able to…send and decode secret messages and colors by using binary code.*

Day of the Week and Time
Wednesday, June 23rd, 2021 at 10:30AM-12:00PM
Thursday, June 24th, 2021 at 10:30AM-12:00PM

Total Length of Lesson: 3hrs

Materials (per student):

- Set of 5 binary cards (breakable cards)
- 3 blank binary cards
- Computer
- Pencil
- Sticky notes (5 different colors per classroom) DAY 2 ONLY
- Binary-->Hex--->Colors Handout DAY 2 ONLY

Technology

DAY 1

- Nearpod pt 1 **You might want to make a copy in your Drive so that you can transfer it to your Nearpod account and do the live lesson from there
- Jamboard **Make sure to make copies so each group in your class has one Jam

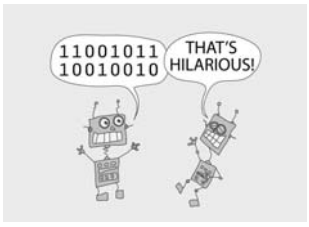
DAY 2

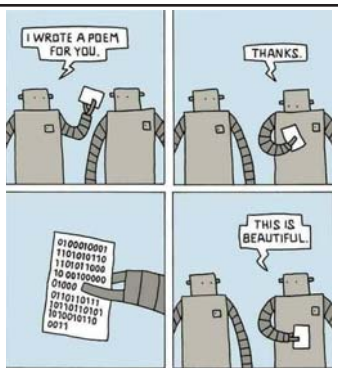
- Nearpod pt 2 **You might want to make a copy in your Drive so that you can transfer it to your Nearpod account and do the live lesson from there
- Named Colors and Hex Equivalents https://css-tricks.com/snippets/css/named-colors-and-hex-equivalents/
- Google Form (exit ticket) **Make sure to make a copy so you can get the responses for your class!

Advanced preparation

- Make copies of Group Jamboards
- Make copy of Google Form exit ticket
- Print Handout

Day 1: Binary Code	**Notes to Teacher:**
Engage **Duration: 10min**	When you ask them how many dots would be on the next 3 cards to the left, have them write the corresponding number in them (drawing the dots would be too time consuming). Then, put them away. We will be using them until later.
Predict: What does it mean that computers think in 1s and 0s?	





Binary code is the building blocks of video games because computers think, talk, act, and even joke in 1s and 0s! Binary code is the language of computers, and we are going to learn how to speak it today.

What do you notice about the number of dots on the cards? (Each card has twice as many dots as the card to its right)
How many dots would be on the next card to the left? (32) What about the next? (64) And the next? (128)

Each student will have their own set of cards including 3 more blank cards.

Explore **Duration: 20min**

We can use these cards to represent numbers by turning some of them face down and adding up the dots that are showing on the cards facing up.
For example, we can make 6 by leaving the 4-dot and 2-dot cards face up. You try making 12 (8- and 4-dot). Now make 15 (8-, 4-, 2-, and 1-dot). Now make 21 (16-, 4-, 1-dot). Is there more than one way to make each of these numbers? (No, there is a unique representation for any number).

Now try counting by 1s starting with 0. In your small group, answer the following questions:

1. Come up with a rule or a pattern of how to flip the cards to do so (To increase any number by one, flip all the cards from right to left until you turn one face up./Each card flips half as often as the card to its right).
2. What is the biggest number you can make with the 5 cards? (31)
3. What is the smallest number you can make with the 5 cards? (0)
4. How many numbers TOTAL can you represent with 5 cards? (32)
5. If you had the next card, 32, what is the biggest number you could make? (63)
6. How many numbers TOTAL can you represent with 6 cards? (64)
7. Bonus: What is the relationship between the amount of cards that you have and the amount of numbers that you can represent? (with n cards, you can represent a total of 2^n numbers)

Make sure students are using only 5 binary cards to count by 1s. They may pull in the 6th card to answer questions 5 and 6, and pull in the 7th and 8th cards if needed for question 7.

Split up students into **6 groups**. They will answer the questions on a Group Jamboard. Make sure you give them the links to their respective group Jamboards on Slide 15.

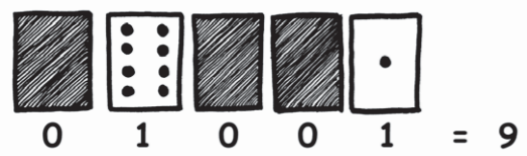
Explain **Duration: 20min**

These cards are named BINARY cards. Repeat after me, BI-NARE-EE. “Bi-” is a prefix for two. Take a guess at WHY they are called this.

1. The values of the cards are powers of 2 (2^0=1, 2^1=2, 2^2=4, 2^3=8, etc)
2. There are only 2 states for the cards: face up or face down

Place your first 5 binary cards on top of a whiteboard or a paper (or on a Jamboard) and write the 1s and 0s below each card, respectively.

Cards take up a lot of space and not everybody has access to these cards, so we will encode them in 1s and 0s . Let the cards face up be 1s and the cards face down be 0s, like turning them on and off, respectively.



What day of the month were you born? Write it in binary. (Make the number with your cards first, and then turn it into 0s and 1s).
Find out what your group's birthdays are in binary.

We said binary code is the language of computers, and you just learned how to count in Computer!

Words, numbers, pictures, videos, and sound are all needed to display a video game, and they are all stored in codes of 0s and 1s. Each 0 or 1 is called a bit (short for **b**inary dig**it**).

Now, in your group, work out these coded numbers. Remember: there's 2 parts to binary. The state of being "on" or "off" AND the value of that state depending on its position (at the very right, the values are smaller. At the very left, the values are bigger.). Use your binary cards to help you.

Try to work out these coded numbers:

☒☑☒☒☑ = (☑=1, ☒=0)

👍👎👍👎 = (👍=1, 👎=0)

⇧⇩⇧ = (⇧=1, ⇩=0)

✚✚✖✚ = (✚=1, ✖=0)

○○○○○ = (⊙=1, ○=0)

↻↻↻↻↻ = (↻=1, ↺=0)

📬📪 = (📬=1, 📪=0)

▲▼▲▼▼ = (▲=1, ▼=0)

☹ = (☺=1, ☹=0)

♠♠♠♠♠ = (♠=1, ♣=0)

To work out the binary codes, students may not need all 5 binary cards. BUT they still need to start from the right-most (least significant position).

Ask certain students what their binary code was and have whole group decode it to know what day of the month that student was born. Additionally, ask the month and comment on it ("oh, you're a winter baby!" "Oh, you were born on Valentine's Day, cool!" "Oh, I was born in that month too!") If you want, share YOUR birthday too and have them decode it. If they need more practice, write month in code for another round.)

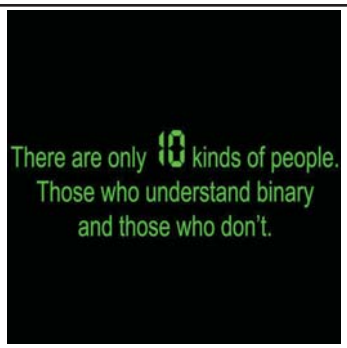
Extend **Duration: 30min**

You are trapped in a video game and you have to write a ONE WORD secret code in binary to the team in the other room to break you out.

1	2	3	4	5	6	7	8	9	10	11	12	13
a	b	c	d	e	f	g	h	i	j	k	l	m
14	15	16	17	18	19	20	21	22	23	24	25	26
n	o	p	q	r	s	t	u	v	w	x	y	z

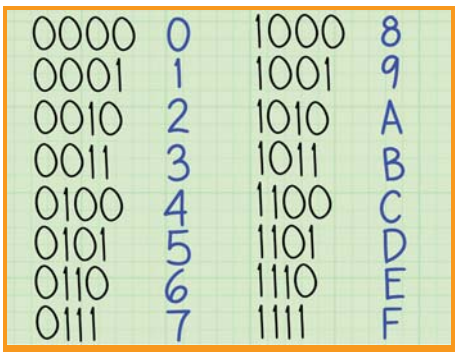
Students will be trapped in 1 of 6 different video games. Their secret message must be a clue to the other team so they can guess which video game they are trapped in and come break them out. Their secret message obviously cannot include the name of the video game, only a clue.

1. Choose your binary alphabet (you may use 1s and 0s, or you may choose another binary representation like the codes provided before [ex. happy face=1, sad face=0, etc.) Make sure you include the key to your binary symbols. 2. Choose your ONE WORD secret message 3. Find the letters you need in the table, find its corresponding base-10 number, and encode it in binary using your binary alphabet 4. Work backwards to decode the other group's secret message to you. **Early finishers: Write your name in binary code. Decode binary jokes (Ex. A group of 8 bits is called a byte. What is a group of 4 bits called? A 00001111 00001001 00000010 00000010 00001100 00000101.)	Ex. Trapped in Among Us. Clue can be: "Green is Sus" or "Imposter" 6 options of video games will be known by all students (like a word bank). **20min to create message. 10min to decode incoming message.** Coordinate with teachers in other classroom so they share the folder with their class Jamboards. Share with students and Group 1 will open other class's Group 1 Jam, etc. **This is why it's important that all classrooms make the same amount of groups.** -Team Techno-KEE sends to Nintendogs -Nintendogs sends to Team 1 (Rain's team) -Team 1 (Rain's team) sends to Team Techno-KEE
Elaborate/Evaluate **Duration: 10min** For our alphabet A-Z, we needed 5 bits for each letter (because we have 26 letters and 5 bits allow for up to 32 different characters. Even though we only use 26, if we used 4 bits it would only allow for 16 different characters.) A computer has to know whether letters are capitals or lowercase, and also recognize digits, punctuation, and special symbols such as $ or ~. Look at your keyboard and work out how many characters a computer has to represent. So how many bits does a computer need to store all the characters? A computer needs 7 bits to store all the characters. This allows for up to 128 characters. Usually the computer uses groups of 8 bits, called a byte, with one bit wasted. Exit Ticket:	



Which kind of person are you?

Day 2: Binary--->Hexadecimal--->Colored pixels--->Images

Activity 1: Introduce Binary to Hexadecimal and Colors **Duration: 15min**	**Notes to Teacher:**
We said that binary code is the building blocks of video games because it is the way that computers store information. We also saw how exactly numbers, letters, and words are stored and represented in binary. But what about pictures and videos? Those are a HUGE part of video games. Potato Anne B. is going to show us: https://youtu.be/176--PjbB5k?t=62 (will play from 1:02) *After the first video, complete pg 1 of the handout* Let's find what Potato Anne B.'s favorite color is. *Teacher models how to find color #8b0000 on this website:* https://css-tricks.com/snippets/css/named-colors-and-hex-equivalents/ Ctrl+F and type in "#8b0000". We include the hashtag at the beginning because that is what signals to the computer that it is a code for a color. Find your favorite color and write it in hex! *At this point, make sure students keep the website open on a separate tab* Let's find out how these codes instruct the computer WHAT color to show: https://youtu.be/1ZSvyfqD_Ag *At the end of the video, model how to turn the mystery color code to binary, and then to hex, and then to a color by completing pg 2 of the handout.* Use the cards to turn (255,127,80) to binary: (11111111, 01111111, 01010000) Split each byte in half and use the binary to hexadecimal table to turn each byte into 2 hexadecimals: (FF,7F,50) Use the website above to find the color: coral 	For first video: Pause at 1:14-In base-10, we have 10 different symbols we can use to represent a number (0,1,2,3,4,5,6,7,8,9). In binary (or base-2), we have 2 different symbols to represent a number (0,1). In hexadecimal (or base-16), we have 16 different symbols we can use to represent a number (0,1,2,3,4,5,6,7,8,9,A=10,B=11,C=12,D=13,E=14,F=15). Pause at 1:24-Remember how we said that the computer likes to store bits in groups of 8 called bytes? This is one of the reasons: a group of 4 bits, also called a nibble, directly translates to one digit in hex. To convert a byte to hex, you split it in half and then you can use a table to see what hex digit each group of 4 corresponds to. For second video: Pause at 0:59-Again, remember that the computer likes to store bits as bytes=groups of 8. Each color gets a byte, so if a color is turned up to full shade, its value is 255. Pause at 1:22-Use your binary cards to verify that they translated the base-10 numbers to binary correctly.

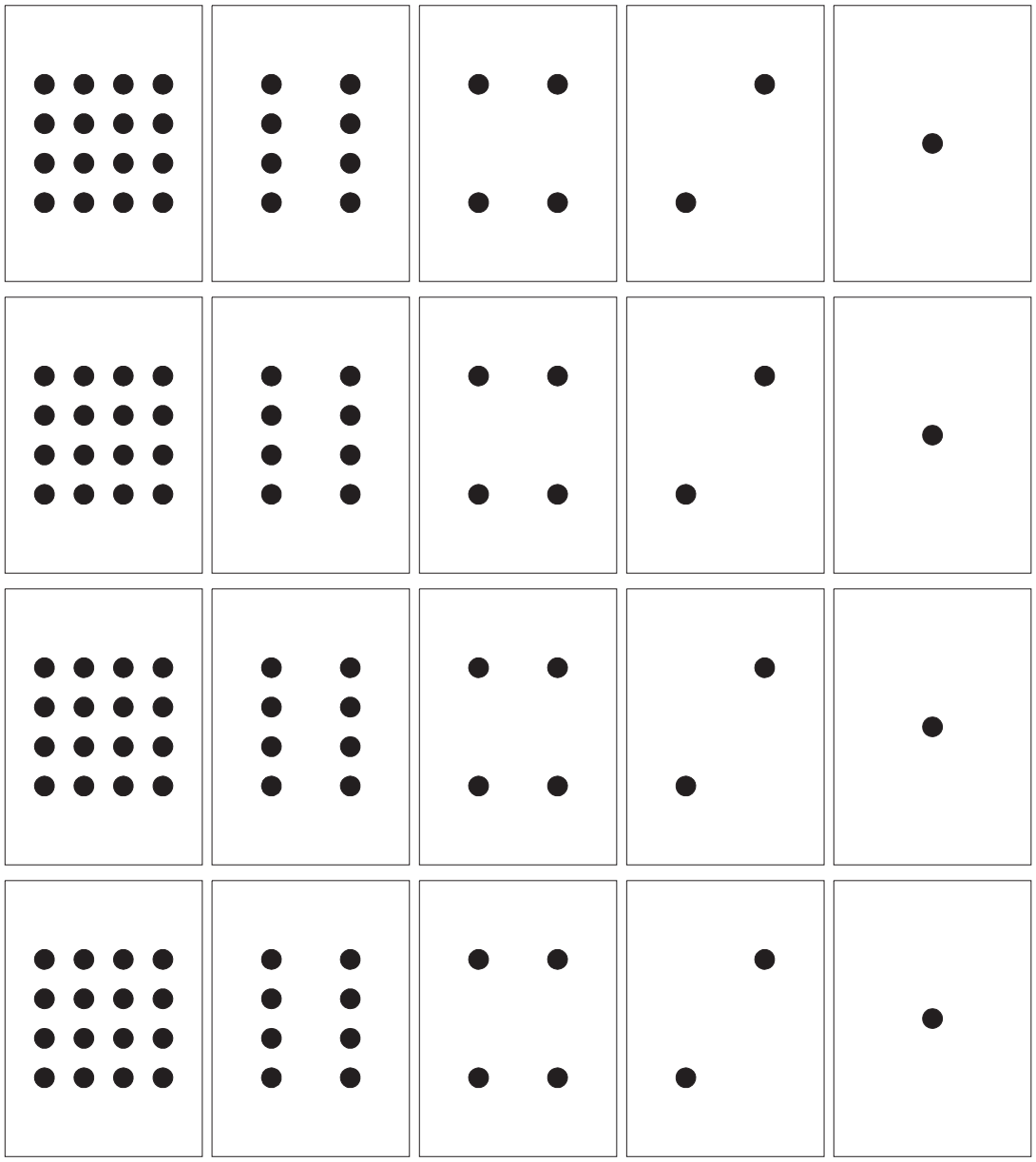
	Remember, a 1 means face up and a 0 means face down, and count the dots left over. You will need all 8 binary cards. Pause at 1:38-Let students take a guess. Note at 1:58-The painting referenced uses a technique called pointillism (it's completely made out of dots.)
Activity 2: Mystery Colors **Duration: 20min**	
Example Assign students to groups of 5 (they will work with the same group for the Connect Four game). Ask each group to make up a color code in base-10: 1. Must be in parentheses, like an ordered pair but with 3 coordinates. (###,###,###) 2. Each "coordinate" can range between 0 and 255. 3. Turn each of the 3 base-10 numbers to binary, using the binary cards as needed. Teacher picks two of the group's codes and guides students to turn them into hexadecimal: 1. Must start with "#" 2. Split each byte in half so now you have 6 groups of 4 bits (or 6 nibbles). 3. Use the Binary to Hexadecimal table to turn each nibble into a hexadecimal digit. 4. Remember: RGB. The first two digits are for the strength of the shade of red. The second two digits are for the strength of the shade of green. The third two digits are for the strength of the shade of blue. #RRGGBB 5. Predict what your color may be. Explain. 6. Look it up on the colors website: was your prediction close?	This activity in pgs3-4 in handout.
Activity 3: Connect Four **Duration: 30min**	
1. Students receive a list of color codes in binary and a colored set of sticky notes. 2. They use the Binary to Hexadecimal table to turn them into hexadecimal codes, and then use the colors website to find the color. 3. Write the problem number (from the list), hexadecimal representation, and color name on a sticky note and run to the board to place it on a valid space on the Connect Four board (must be down-up). 4. Team who connects four first, wins. 5. If an answer is incorrect, the sticky note is removed and all stickies on top drop down one space.	Instructions: pg5 of handout Work space: pg6-7 of handout Teacher has an answer key and monitors answers on the board to make sure they are correct.

Students in-person:	Students at-home:	
Recorder: writes answers on sticky note Runner: runs to place the sticky note on the board	Binary compiler: uses binary to hex table Hex compiler: uses hex to color name website to find color name	

Manager: delegates tasks, verifies answers, and watches board to come up with game plan (blocking other teams, etc.)		
Activity 3: Closure & Exit Ticket	**Duration: 10min**	
What were 3 things we learned today? 1. Binary code is the building blocks of video games 2. Words, numbers, pictures, video and sound are stored in binary 3. Binary is turned into hexadecimal to code colors and tell the computer what color each pixel in an image should be to display a picture and video Finally, the speed of a computer depends on the number of bits it can process at once. For example, a 32-bit computer can process 32-bit numbers/images in one step. But a 16-bit computer would have to break the 32-bit numbers/images into two smaller pieces, making it slower. That is why the graphics on 8-bit and 16-bit consoles, like the Nintendo Entertainment System (NES), couldn't display that great graphics back in the day.  What is your favorite color in base-10, binary, and hex? You used the color website earlier to find your favorite color and write it in hex. Now, work backwards to write it in binary and in base-10. Color name: _____ Hexadecimal: #_ _ _ _ _ _ Binary: (_ _ _ _ _ _ _ _ , _ _ _ _ _ _ _ _ , _ _ _ _ _ _ _ _) Decimal/Base-10: (_ _ _, _ _ _ , _ _ _)		Collaborate board on Nearpod for 3 things we learned. Google Form for Exit Ticket (favorite color)

Back to Table of Contents

Photocopy Master: Binary Numbers



Binary Code Pt. 10

The building blocks of video games!

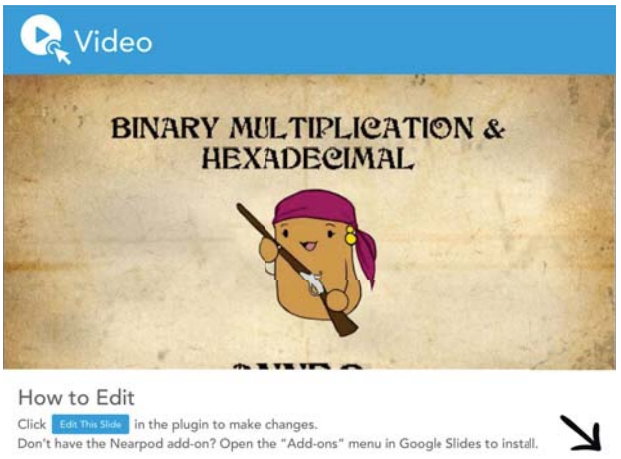
Materials

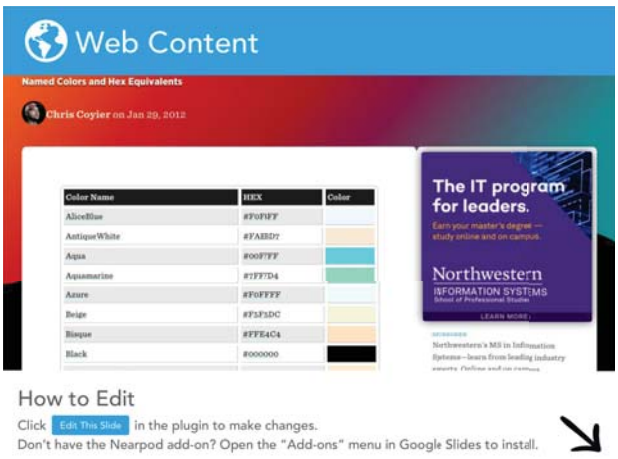
- 8 binary cards
- Binary Pt 10: Binary-->Hex-->Colors Handout
- Pencil
- Open mind ready to learn!

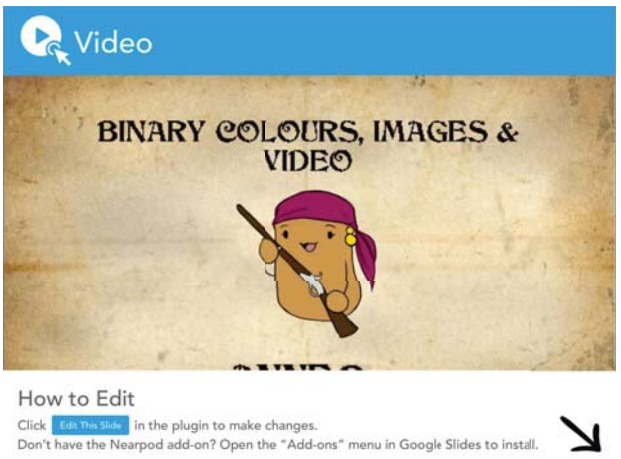
Recap

➔ Binary code is the building blocks of video games because it is the way that computers store information
➔ We also saw how numbers, letters, and words are stored and represented in binary

What about pictures and videos? Those are a HUGE part of video games. Potato Anne B. is going to show us...







Collaborate Board

What were 3 things we learned today?

Write at least 1 thing and at most 3 things.

How to Edit

Click Edit This Slide in the plugin to make changes.
Don't have the Nearpod add-on? Open the "Add-ons" menu in Google Slides to install.

Evolution of Video Game Graphics

- Speed of a computer = number of bits it can process at once
  - 32-bit computer processes 32-bit numbers/images in one step
  - 16-bit computer has to break the 32-bit numbers/images into two smaller pieces = slower
- Back in the day, consoles like the Nintendo Entertainment System were 8-bit and 16-bit consoles

Web Content

Color name: _____
Hexadecimal: #_____
Binary: (_____)
Decimal/Base-10: (_____)

* Required

Email *

Your email

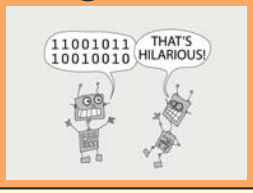
Color name *

Your answer

How to Edit

Click Edit This Slide in the plugin to make changes.
Don't have the Nearpod add-on? Open the "Add-ons" menu in Google Slides to install.

Binary Code

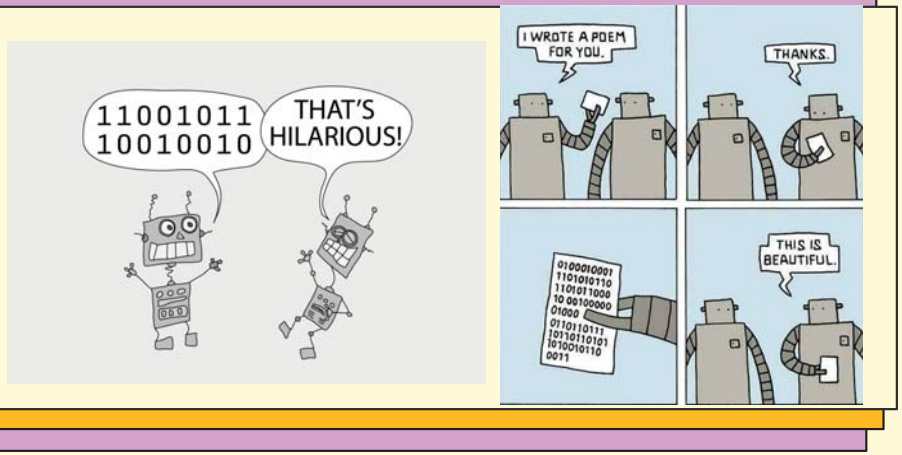


The building blocks of video games!

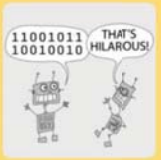
Materials

- Binary cards: 5 with dots, 3 blank
- Open mind ready to learn!

Predict: What does it mean that computers think in 1s and 0s? (You will answer in the next slide)



Collaborate Board



What does it mean that computers think in 1s and 0s?

How to Edit

Click Edit This Slide in the plugin to make changes.
Don't have the Nearpod add-on? Open the "Add-ons" menu in Google Slides to install.

BINARY CODE

Binary code is the building blocks of video games because computers think, talk, act, and even joke in 1s and 0s! Binary code is the language of computers, and we are going to learn how to speak it today.

Collaborate Board

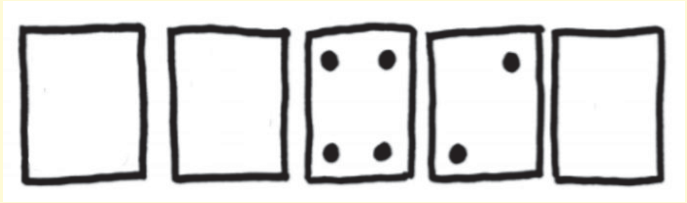
What do you notice about the number of dots on the cards?

How to Edit

Click Edit This Slide in the plugin to make changes.

Don't have the Nearpod add-on? Open the "Add-ons" menu in Google Slides to install.

We can make numbers with the cards!



= 6

You try making 12!

Answer:

= 12

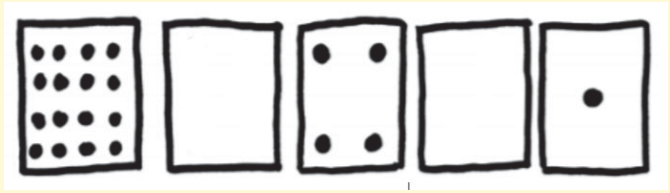
Now try making 15!

Answer:

= 15

Now make 21!

Answer:



= 21

Reflect

Is there more than 1 way to make each of these numbers? Test your theory!

Now, you will try counting by 1s starting with 0!

In your small group, you will answer the following questions:

1. Come up with a rule or a pattern of how to flip the cards to do so.
2. What is the biggest number you can make with the 5 cards?
3. What is the smallest number you can make with the 5 cards?
4. How many numbers TOTAL can you represent with 5 cards?
5. If you had the next card, 32, what is the biggest number you could make?
6. How many numbers TOTAL can you represent with 6 cards?
7. Bonus: What is the relationship between the amount of cards that you have and the amount of numbers that you can represent? (Hint: test your theory with the other blank cards we filled in at the beginning of the lesson)

You will go into breakout rooms and click on your Breakout Room # Jamboard on Google Classroom.

BINARY CARDS

WHY are they called this?

Collaborate Board

Take a guess at WHY they are called BINARY cards.

How to Edit

Click Edit This Slide in the plugin to make changes.
Don't have the Nearpod add-on? Open the "Add-ons" menu in Google Slides to install.

BINARY CARDS

1. The values of the cards are powers of 2 (2^0=1, 2^1=2, 2^2=4, 2^3=8, etc)
2. There are only 2 states for the cards: face up or face down

BINARY CARDS

Cards take up a lot of space and not everybody has access to them. Let's encode them in 1s and 0s.

Face up = 1 Face down = 0

Collaborate Board

What day of the month were you born? Write it in binary.

Make the number with your cards first, and then turn it into Os and 1s.

How to Edit

Click Edit This Slide in the plugin to make changes.
Don't have the Nearpod add-on? Open the "Add-ons" menu in Google Slides to install.

BINARY CODE

You just learned how to count in Computer!

Words, numbers, pictures, videos, and sound are all needed to display a video game, and they are all stored in codes of 0s and 1s.

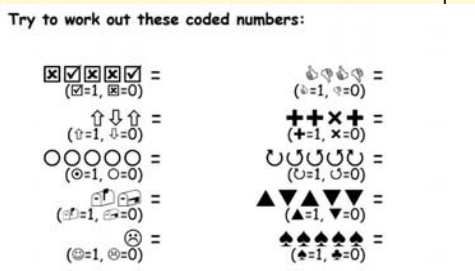
Each 0 or 1 is called a bit (short for **b**inary dig**it**).

In your group, Jamboard Slide 3

Remember there's 2 parts to binary:

1. The state of being "on" or "off" AND
2. The value of that state depending on its position (at the very right, the values are smaller. At the very left, the values are bigger.).

Use your binary cards to help you!



TRAPPED IN A VIDEO GAME!

You are trapped in a video game and you have to write a secret code in binary to another team in the room so they can break you out. You will also receive a secret code in binary from the other team so YOU can break THEM out!

Video Games
Mortal Kombat
Minecraft
Call of Duty
Roblox
Pacman
Mario Kart

[GO TO JAMBOARD SLIDE 4 TO EXPLAIN ACTIVITY]

BITS

For our alphabet A–Z, we needed 5 bits for each letter (5 bits = 32 different characters).

A computer has to know: capitals and lowercase letters, numbers, punctuation, special symbols, etc. Look at your keyboard and work out how many characters a computer has to represent.

How to Edit

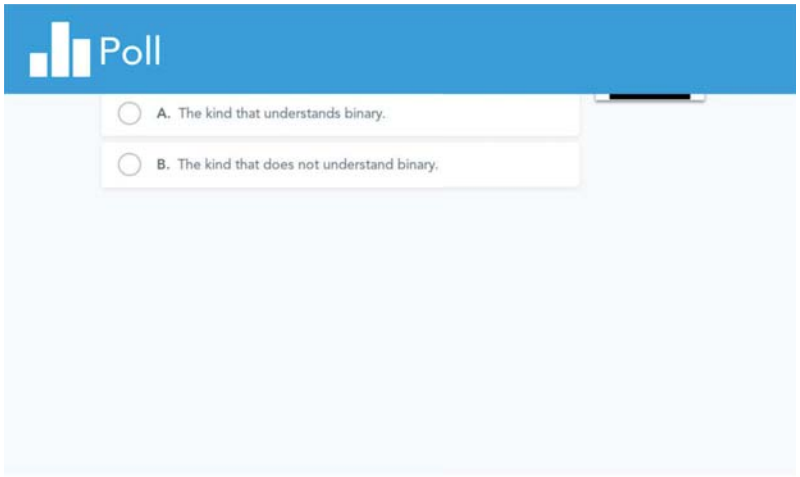
Click Edit This Slide in the plugin to make changes.
Don't have the Nearpod add-on? Open the "Add-ons" menu in Google Slides to install.

BITS

A computer needs 7 bits to store all the characters!

7 bits = 128 characters.

Usually the computer uses groups of 8 bits, called a **byte** (1 bit is wasted).



How to Edit

Click Edit This Slide in the plugin to make changes.
Don't have the Nearpod add-on? Open the "Add-ons" menu in Google Slides to install.

Fonts & colors used

This presentation has been made using the following fonts:

Montserrat
(https://fonts.google.com/specimen/Montserrat+bold)

Cantarell
(https://fonts.google.com/specimen/Cantarell)

#191919 #fffbd6 #8dcad3 #ff8087 #feac6a #42a7de #d7a5d7 #6bce95

TO PRACTICE YOURSELF:

Live Session Co-Teacher Link: https://share.nearpod.com/f6emtljeygb

Student paced session: https://share.nearpod.com/vsph/dQd7VBfoMu

TO GET IT ON YOUR NEARPOD ACCOUNT:

Option 1:

1. Open Google Slides presentation
2. Go to Add-ons (make sure you have Nearpod installed in there)
3. Open Nearpod
4. Log in to Nearpod
5. Click Save and Go To Nearpod

Option 2: This link will let you copy it to your Nearpod account, but keep in mind the teacher notes are in the Google Slides and you will only be able to edit it from Slides
https://share.nearpod.com/zHkoG29dygb

TO PRACTICE YOURSELF:

Live Session Co-Teacher Link: https://share.nearpod.com/C4R562qeygb

Student paced session: https://share.nearpod.com/1ZGRravAyab

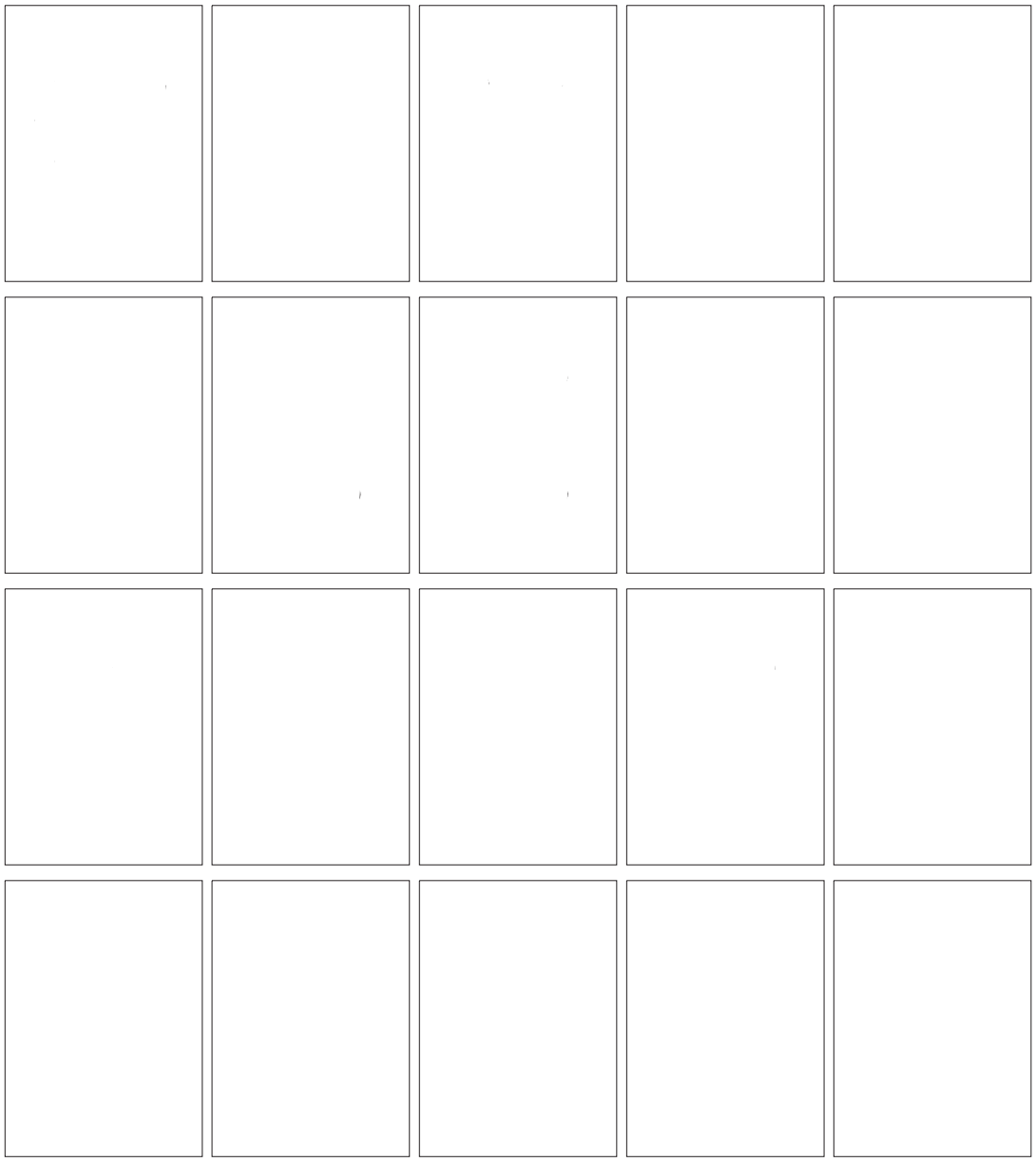
TO GET IT ON YOUR NEARPOD ACCOUNT:

Option 1:

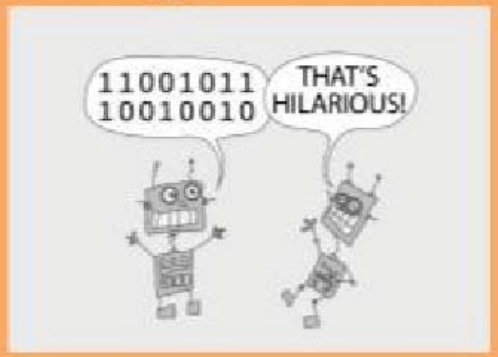
1. Open Google Slides presentation
2. Go to Add-ons (make sure you have Nearpod installed in there)
3. Open Nearpod
4. Log in to Nearpod
5. Click Save and Go To Nearpod

Option 2: This link will let you copy it to your Nearpod account, but keep in mind the teacher notes are in the Google Slides and you will only be able to edit it from Slides
https://share.nearpod.com/pZO8OHfdygb

Photocopy Master: Binary Numbers



Binary Code



The building blocks of video games!

Now try counting by 1s starting with 0.

1. Come up with a rule or a pattern of how to flip the cards to do so.

2. What is the biggest number you can make with the first 5 cards? _____

3. What is the smallest number you can make with the first 5 cards? _____

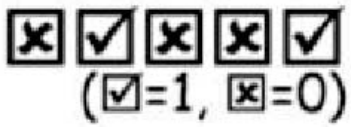
4. How many numbers TOTAL can you represent with the first 5 cards? 32___

5. If you had the next card, 32, what is the biggest number you could make? _____

6. How many numbers TOTAL can you represent with 6 cards? _____

7. Bonus: What is the relationship between the amount of cards that you have and the amount of numbers that you can represent?

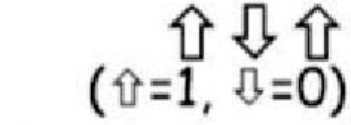
Try to work out these coded numbers


=

(☑=1, ☒=0)


=

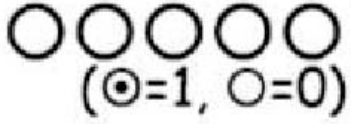
(👍=1, 👎=0)


=

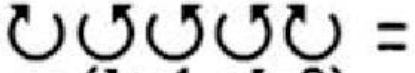
(⇧=1, ⇩=0)


=

(✚=1, ✖=0)


=

(⊙=1, ○=0)


=

(↻=1, ↺=0)


=

(📬=1, 📪=0)


=

(▲=1, ▼=0)


=

(☺=1, ☹=0)


=

(♠=1, ♣=0)

You are trapped in a video game!

You have to write a ONE WORD secret code in binary to the team in the other room to break you out.

1	2	3	4	5	6	7	8	9	10	11	12	13
a	b	c	d	e	f	g	h	i	j	k	l	m
14	15	16	17	18	19	20	21	22	23	24	25	26
n	o	p	q	r	s	t	u	v	w	x	y	z

1. Choose your binary alphabet (you may use 1s and 0s, or you may choose another binary representation like the codes provided before [ex. happy face=1, sad face=0, etc.]) Make sure you include the key to your binary symbols!
2. Choose your ONE-WORD secret message
3. Find the letters you need in the table, find its corresponding base-10 number, and encode it in binary using your binary alphabet (WRITE IT IN THE NEXT PAGE)
4. Work backwards to decode the other group's secret message to you.

You are trapped in a video game!

*Check this box to let your partner group know you are finished!

1	2	3	4	5	6	7	8	9	10	11	12	13
a	b	c	d	e	f	g	h	i	j	k	l	m
14	15	16	17	18	19	20	21	22	23	24	25	26
n	o	p	q	r	s	t	u	v	w	x	y	z

*Each dash is a bit (decide if it is a 1 or a 0)
*Each group of 5 dashes is a letter

_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

Early Finisher:

If your partner group has not finished creating their code, decode the following pun. Write the corresponding letter under each group of bits:

1	2	3	4	5	6	7	8	9	10	11	12	13
a	b	c	d	e	f	g	h	i	j	k	l	m
14	15	16	17	18	19	20	21	22	23	24	25	26
n	o	p	q	r	s	t	u	v	w	x	y	z

A group of 8 bits is called a byte. What is a group of 4 bits called? A

01110 01001 00010 00010 01100 00101

Your partner group's Jamboard:

Binary Code Pt. 10
Binary-->Hex-->Colors

System	Base	Symbols
Decimal	10	0,1,2,3,4,5,6,7,8,9
Binary	2	0,1
Hexadecimal	16	0,1,2,3,4,5,6,7,8,9,A,B,C,D,E,F

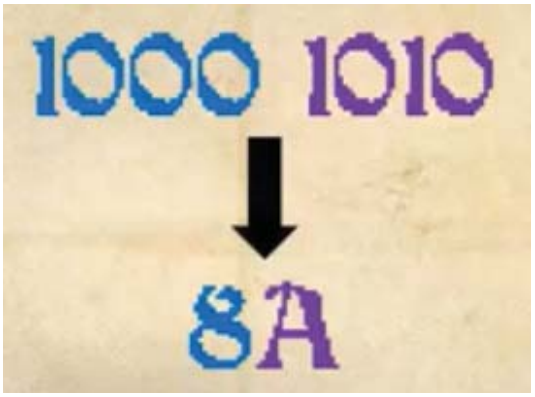
In code, colors are usually represented in **hexadecimal**. For example, Potato Anne B's favorite color is #8b0000, which is ___dark red_____.

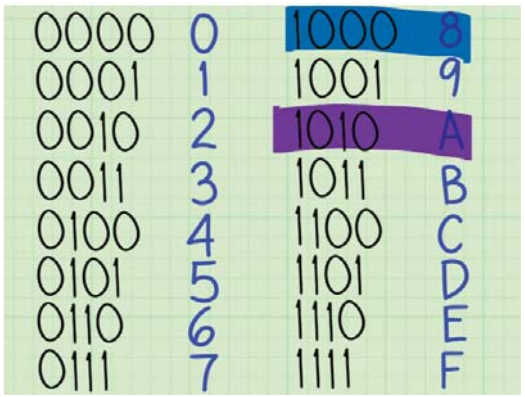
Find your favorite color and write it in hex!

Color name: __light pink____ Hex: __#FFB6C1___.

A long 8-bit binary number (a ___byte__) can be converted into just 2 hex digits.

Example:





A color is encoded by using the additive primary colors Red, Green, and Blue (RGB for short). Each color's shade is represented by a number between 0 and 255.

R G B

(0 to 255, 0 to 255, 0 to 255)

Potato Anne B's challenge!

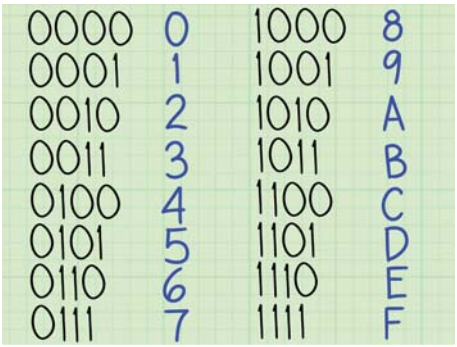
Decimal

Step 1: Use your binary cards to turn the decimal representations of each shade of Red, Green, and Blue into binary.

Binary (1 1 1 1 1 1 1 1 , 0 1 1 1 1 1 1 1 , 0 1 0 1 0 0 0 0)

Step 2: Split each byte (*group of 8 bits*) in half and use the Binary to Hex table to turn each byte into hexadecimal. ****Hint**: you will end up with 2 hex digits for every byte = 6 hex digits total****

Hexadecimal (F F , 7 F , 5 0)



Usually, the computer represents colors in hexadecimal in the following format: # F F 7 F 5 0

Step 3: Use the *"Named Colors and Hex Equivalents"* website to find the color by using Ctrl+F and typing in the code for the color above.

Color: _____coral_____

Let's Practice!

Instructions: In your group, make up a color code in base-10.

1. Must be in parentheses, like an ordered pair but with 3 coordinates

R G B

(### , ### , ###)

2. Each coordinate can range between 0 and 255 (determine how strong you want each shade of each primary color to be).

(0 to 255 , 0 to 255 , 0 to 255)

3. Turn each of the coordinates to binary using your binary cards as needed.

Ready...set...create your color!

Decimal (_____ , _____ , _____)

Binary (_ _ _ _ _ _ _ _ , _ _ _ _ _ _ _ _ , _ _ _ _ _ _ _ _)

Guided Practice: Now, we will practice turning your colors coded in decimal into hexadecimal together. We will need the following table:

0000	0	1000	8
0001	1	1001	9
0010	2	1010	A
0011	3	1011	B
0100	4	1100	C
0101	5	1101	D
0110	6	1110	E
0111	7	1111	F

Example 1:

Decimal (_____ , _____ , _____)

Binary (_ _ _ _ _ _ _ _ , _ _ _ _ _ _ _ _ , _ _ _ _ _ _ _ _)

Hexadecimal # ___ ___ ___ ___ ___ ___

Prediction: _____ Color: _____

Example 2:

Decimal (_____ , _____ , _____)

Binary (_ _ _ _ _ _ _ _ , _ _ _ _ _ _ _ _ , _ _ _ _ _ _ _ _)

Hexadecimal # ___ ___ ___ ___ ___ ___

Prediction: _____ Color: _____

Connect Four!

Rules:

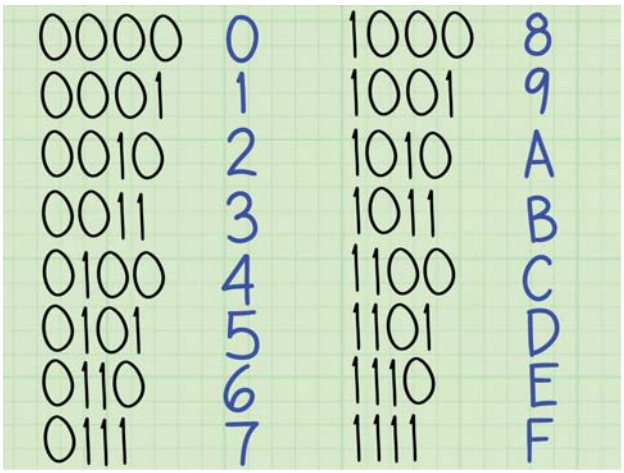
1. Use the Binary to Hexadecimal table to turn the binary colors listed below into hexadecimal representation.
2. On a sticky note, write:
    a. Problem number
    b. Hexadecimal representation
    c. Color name

3. Runner will run to the board and place sticky note on a valid space on the Connect Four board (sticky notes are stacked down-up/above each other)
4. Team who connects four first, WINS!
5. If an answer is incorrect, sticky note is removed and all stickies on top drop down one space

Role	Responsibilities
Recorder (*in person*)	Writes answers on sticky note.
Runner (*in person*)	Runs to place the sticky note on the board.
Manager (*in person*)	Delegates tasks, verifies answers, and watches board to come up with game plan (blocking other teams, etc.).
Binary compiler* (*at home*)	Uses Binary→Hex table to turn binary code into hexadecimal code.
Hex compiler* (*at home*)	Uses Hex→Color Name website to find color name.

***Compiler**: the computer's translator. It translates code into instructions the computer can understand.

Binary to Hex Table



0000	0	1000	8
0001	1	1001	9
0010	2	1010	A
0011	3	1011	B
0100	4	1100	C
0101	5	1101	D
0110	6	1110	E
0111	7	1111	F

****Remember**:**

Step 1: split the bytes in half

Step 2: find the groups of 4 on the table to match it to a hex digit!

1. (01001011 , 00000000 , 10000010)

   Hexadecimal # _4_ _B_ _0_ _0_ _8_ _2_

   Color: ___indigo____

2. (11111111 , 10110110 , 11000001)

   Hexadecimal # _F_ _F_ _B_ _6_ _C_ _1_

   Color: ___light pink____

3. (00000000 , 11111111 , 01111111)

   Hexadecimal # _0_ _0_ _F_ _F_ _7_ _F_

   Color: ___spring green____

4. (11111111 , 10100101 , 00000000)

   Hexadecimal # _F_ _F_ _A_ _5_ _0_ _0_

   Color: ___orange____

5. (11011010 , 01110000 , 11010110)

Hexadecimal # _D_ _A_ _7_ _0_ _D_ _6_

Color: ___orchid____

6. (01000000 , 11100000 , 11010000)

Hexadecimal # _4_ _0_ _E_ _0_ _D_ _0_

Color: ___turquoise____

7. (11101110 , 10000010 , 11101110)

Hexadecimal # _E_ _E_ _8_ _2_ _E_ _E_

Color: ___violet____

8. (10011010 , 11001101 , 00110010)

Hexadecimal # _9_ _A_ _C_ _D_ _3_ _2_

Color: ___yellow green____

9. (11111111 , 11100100 , 10110101)

Hexadecimal # _F_ _F_ _E_ _4_ _B_ _5_

Color: ___moccasin____

10. (00101110 , 10001011 , 01010111)

Hexadecimal # _2_ _E_ _8_ _B_ _5_ _7_

Color: ___sea green____

Binary Code Pt. 10
Binary-->Hex-->Colors

System	Base	Symbols
Decimal	10	0,1,2,3,4,5,6,7,8,9
Binary	2	0,1
Hexadecimal	16	0,1,2,3,4,5,6,7,8,9,A,B,C,D,E,F

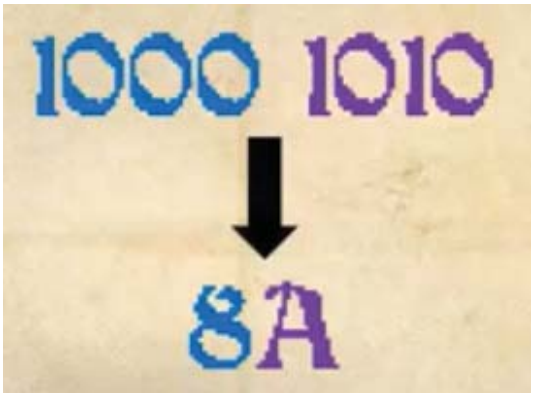
In code, colors are usually represented in **hexadecimal**. For example, Potato Anne B's favorite color is #8b0000, which is ___dark red_____.

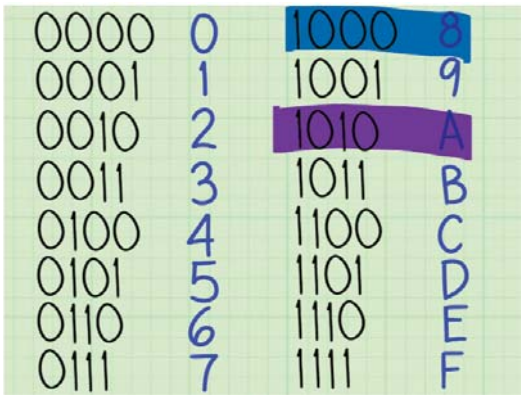
Find your favorite color and write it in hex!

Color name: __light pink____ Hex: __#FFB6C1___.

A long 8-bit binary number (a ___byte__) can be converted into just 2 hex digits.

Example:





A color is encoded by using the additive primary colors Red, Green, and Blue (RGB for short). Each color's shade is represented by a number between 0 and 255.

R G B

(0 to 255, 0 to 255, 0 to 255)

Potato Anne B's challenge!

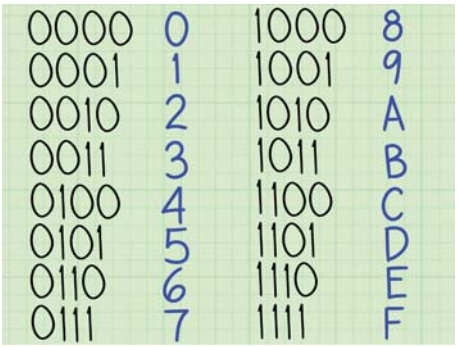
Decimal

Step 1: Use your binary cards to turn the decimal representations of each shade of Red, Green, and Blue into binary.

Binary (1 1 1 1 1 1 1 1 , 0 1 1 1 1 1 1 1 , 0 1 0 1 0 0 0 0)

Step 2: Split each byte (*group of 8 bits*) in half and use the Binary to Hex table to turn each byte into hexadecimal. ****Hint**: you will end up with 2 hex digits for every byte = 6 hex digits total****

Hexadecimal (F F , 7 F , 5 0)



Usually, the computer represents colors in hexadecimal in the following format: # F F 7 F 5 0

Step 3: Use the *"Named Colors and Hex Equivalents"* website to find the color by using Ctrl+F and typing in the code for the color above.

Color: _____coral_____

Let's Practice!

Instructions: In your group, make up a color code in base-10.

1. Must be in parentheses, like an ordered pair but with 3 coordinates

R G B

(### , ### , ###)

2. Each coordinate can range between 0 and 255 (determine how strong you want each shade of each primary color to be).

(0 to 255 , 0 to 255 , 0 to 255)

3. Turn each of the coordinates to binary using your binary cards as needed.

Ready...set...create your color!

Decimal (_____ , _____ , _____)

Binary (_ _ _ _ _ _ _ _ , _ _ _ _ _ _ _ _ , _ _ _ _ _ _ _ _)

Guided Practice: Now, we will practice turning your colors coded in decimal into hexadecimal together. We will need the following table:

0000	0	1000	8
0001	1	1001	9
0010	2	1010	A
0011	3	1011	B
0100	4	1100	C
0101	5	1101	D
0110	6	1110	E
0111	7	1111	F

Example 1:

Decimal (_____ , _____ , _____)

Binary (_ _ _ _ _ _ _ _ , _ _ _ _ _ _ _ _ , _ _ _ _ _ _ _ _)

Hexadecimal # ___ ___ ___ ___ ___ ___

Prediction: _____ Color: _____

Example 2:

Decimal (_____ , _____ , _____)

Binary (_ _ _ _ _ _ _ _ , _ _ _ _ _ _ _ _ , _ _ _ _ _ _ _ _)

Hexadecimal # ___ ___ ___ ___ ___ ___

Prediction: _____ Color: _____

Connect Four!

Rules:

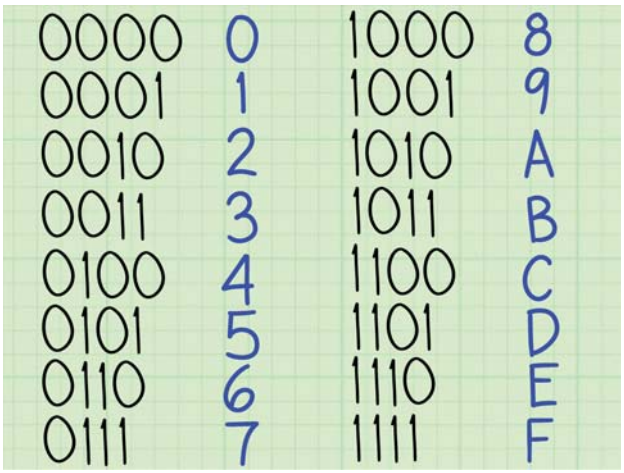
1. Use the Binary to Hexadecimal table to turn the binary colors listed below into hexadecimal representation.
2. On a sticky note, write:
    a. Problem number
    b. Hexadecimal representation
    c. Color name

3. Runner will run to the board and place sticky note on a valid space on the Connect Four board (sticky notes are stacked down-up/above each other)
4. Team who connects four first, WINS!
5. If an answer is incorrect, sticky note is removed and all stickies on top drop down one space

Role	Responsibilities
Recorder (*in person*)	Writes answers on sticky note.
Runner (*in person*)	Runs to place the sticky note on the board.
Manager (*in person*)	Delegates tasks, verifies answers, and watches board to come up with game plan (blocking other teams, etc.).
Binary compiler* (*at home*)	Uses Binary→Hex table to turn binary code into hexadecimal code.
Hex compiler* (*at home*)	Uses Hex→Color Name website to find color name.

***Compiler**: the computer's translator. It translates code into instructions the computer can understand.

Binary to Hex Table



0000	0	1000	8
0001	1	1001	9
0010	2	1010	A
0011	3	1011	B
0100	4	1100	C
0101	5	1101	D
0110	6	1110	E
0111	7	1111	F

****Remember**:**

Step 1: split the bytes in half

Step 2: find the groups of 4 on the table to match it to a hex digit!

1. (01001011 , 00000000 , 10000010)

   Hexadecimal # _4_ _B_ _0_ _0_ _8_ _2_

   Color: ___indigo____

2. (11111111 , 10110110 , 11000001)

   Hexadecimal # _F_ _F_ _B_ _6_ _C_ _1_

   Color: ___light pink____

3. (00000000 , 11111111 , 01111111)

   Hexadecimal # _0_ _0_ _F_ _F_ _7_ _F_

   Color: ___spring green____

4. (11111111 , 10100101 , 00000000)

   Hexadecimal # _F_ _F_ _A_ _5_ _0_ _0_

   Color: ___orange____

5. (11011010 , 01110000 , 11010110)

Hexadecimal # _D_ _A_ _7_ _0_ _D_ _6_

Color: ___orchid____

6. (01000000 , 11100000 , 11010000)

Hexadecimal # _4_ _0_ _E_ _0_ _D_ _0_

Color: ___turquoise____

7. (11101110 , 10000010 , 11101110)

Hexadecimal # _E_ _E_ _8_ _2_ _E_ _E_

Color: ___violet____

8. (10011010 , 11001101 , 00110010)

Hexadecimal # _9_ _A_ _C_ _D_ _3_ _2_

Color: ___yellow green____

9. (11111111 , 11100100 , 10110101)

Hexadecimal # _F_ _F_ _E_ _4_ _B_ _5_

Color: ___moccasin____

10. (00101110 , 10001011 , 01010111)

Hexadecimal # _2_ _E_ _8_ _B_ _5_ _7_

Color: ___sea green____

Team Builder

Name of Team Builder: Guess the Video Game with Emojis

How does your team builder connect to your lesson or the overall theme?
My team builder connects to the lesson/overall theme by having students guess different video games, which is the main theme of the camp.

Day of the Week and Time:
Thursday, July 1
11:30-11:45

Total Length: 15 minutes

Materials (per student)**:**

- **Laptop**

Technology Required (websites, Zoom video, chat, phones, etc.)**:**

- **Zoom**
- **cell phones**

Advanced preparation

- **open up Powerpoint with google slides**

Description Option 1 (use if everyone is doing the same thing)	**Notes to Teacher:**
• **You will explain the rules on slide two to the students** • **You or a coteacher needs to be clicking on the slides to move the game along** • **Students will write down their guesses on the chat and keep score by themselves**	**Tell the students to keep score, so we can see the winner(s) at the end** **If no student is getting it then you can offer help and clues to the students**

Description Option 2 (use if students are doing different things) *If at any point students are doing the same thing, you can just copy and paste into both columns.*		**Notes to Teacher:**
Students in-person:	**Students at-home:**	**-**
-Students in person will write their answers in the chat	**-Students will write their answers in the chat and keep score as well**	

Back to Table of Contents

Gues The Video Game with Emojis

How to play:

1. You will have 10-15 seconds to guess the video game
2. There will be emojis, pictures, and character to help you
3. If you don't know, sometimes if you read the emojis, they will help you name the video game
4. Most importantly have fun!

15

Space Invaders

10

Angry Birds

10

Watch Dogs

10

Donkey Kong

10

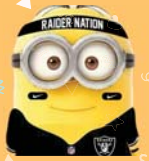


Super Mario

10


Call of Duty

15

Tomb Raider

Hint: What team is the Minion supporting

15


Resident Evil

Hint: what is another word for home

10


Fall Out

10

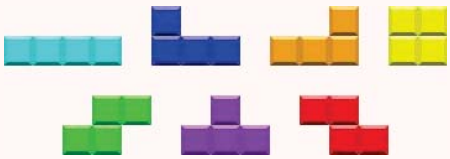



Minecraft

10

Animal Crossing

10



Tetris

10

Spider-Man

10

Star Wars

15

World of Warcraft

10

Grand Theft Auto

10

The Legend of Zelda

10

FIFA

10

Candy Crush

10

Pokémon Go

10

Among Us

10

Just Dance

10

Rocket League

25

10

Fortnite

15

Knockout City

10

Fall Guys

28

15

No Man’s Sky

10

Planet vs Zombie

15



Little Nightmares

10

NBA 2K21

10


Cup Head

10






Super Smash Bros

10

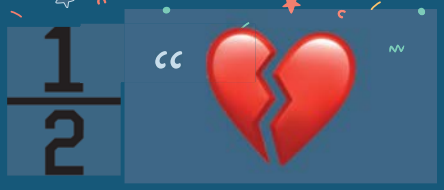

Street Fighter

10



Dark Souls

10

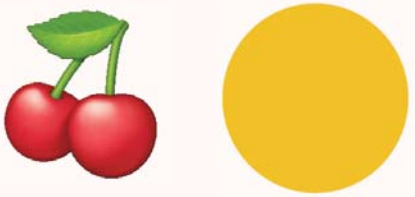


Half-Life

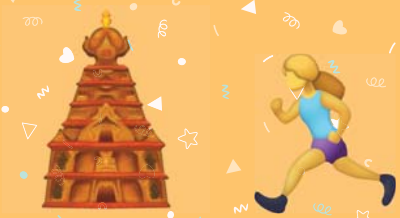
37

10

Pac-Man



10



Temple Run

10

Injustice

40

10

MLB

10

Mortal Kombat

10

Halo

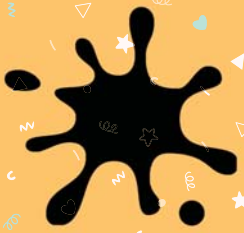
43

15

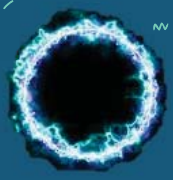
Dead by Daylight

10

Splat Tomb



10



Apex Legends

46

10

Sonic

10

Madden

10

Assassin's Creed

10

Lugi's Haunted Mansion

10

Destiny

10

5 Nights at Freddy's

10

Phasmophobia

10

Slime Rancher

10

Bioshock

10

Borderlands

10

G-mod

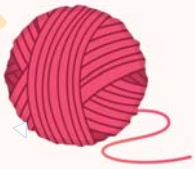
G

10

Batman- Arkham Asylum

10

It Takes Two



10

Kurby

10

Dragon Ball Z-Fighters

61

10

Guitar Hero

10

Sea of Thieves

63

10

Subway Surfers

10

Clash of Clans

Lesson Plan Option 2: Experiment/Investigation

Name of Lesson: Biome Builder

Learning (TEKS) Objective:
Ecology Science TEKS 8.11A
8.11 Organisms and environments. The student knows that interdependence occurs among living systems and the environment and that human activities can affect these systems. The student is expected to:
8.11A Describe producer/consumer, predator/prey, and parasite/host relationships as they occur in food webs within marine, freshwater, and terrestrial ecosystems.
Readiness Standard
8.11B Investigate how organisms and populations in an ecosystem depend on and may compete for biotic and abiotic factors such as quantity of light, water.

Student Outcome: *Students will be able to…*
Utilize different aspects from the biomes such as biotic/abiotic factors within a few separate biomes.
Students will be creating their own biomes which they will be able to present to the class.
Incorporate different animals into their own biome's food web/chain

Day of the Week and Time:

- **Wednesday 12:30 pm to 2:00 pm. (1hr 30 min)**
- **Thursday 12:30 pm to 1:30 pm.(1 hr 15 min)**

Total Length of Lesson:

- **60- 90 minutes**

Materials (per student):

- **Laptop/computer/smart device.**
- **Drawing/sketching paper, color pencils, markers.**

Technology

- **Google chrome, google documents, google Jamboard, Nearpod**
- **Solarium Software**
- **Zoom/google meet.**
- **Cell phones.**
- **Autodraw (https://www.autodraw.com/)**
- **Mouse (if not possible use trackpad on laptops)**

Advanced preparation

- **Autodraw tutorial (https://www.youtube.com/watch?v=9A9ZsNDf5tM)**
- **Solarium software tutorial.**
- **Possible tutorial on foldable.**

Instructional Delivery Option 1 (use if everyone is doing the same thing) **5 E's TEMPLATE for me (What are the 5 E's.)**	**Notes to Teacher:**

Engage	Duration: 10-12 minutes.	
Warmup (5 mintues Total) : ● Students will watch a short video on Biomes.. (3 minute video) **(ADD _popup at the end of the url after watch, this will embed videos)** Before they watch the video look out for characteristics of the biome, take notes about important biomes. Students must take note of the biome's climate and/or one animal that belongs to the biome. **Warmup pt.2 One word Activity (5 to 6 minutes):** ● Once they watch the videos they will do a ONE word activity in which I will provide them with these 4 words and ask them to share whatever they know about any of these 4 words(desert, Tiagra/alpine, savanna, or Deciduous Forest) Link to One word activity ● Students will be asked to put their Name on the sticky notes/Initials to show their participation. ● Students will be asked to share what they contribute to the board which will be completed in small groups of 4 students to include those online within Breakout rooms.		- Play youtube video for students and ask them to think about the main ideas they will see in the video. - Make sure to let students know they have to write the climate of the biomes, and think of an animal that lives in that biome. - have students write Biome builder notes in the notes page - Once you begin the One-word activity, mention one fact that you know on a sticky note in advance or have come up with one fact on the spot. It is important to remember that it can be fun things too. - Show the students how to add sticky notes, show them the various panels. - Put students in breakout rooms, have them pick a biome, put a 3 minute timer, have them discuss for an additional 3 minutes about the biome they picked. - Have pre-made breakout rooms for each biome and place kids in that breakout room.
Explore	**Duration: 8-15 minutes.**	
Second part: From there I will have students complete the Nearpod to help activate their Background knowledge (Biome warmup) - Students will be given 3 minutes to discuss within their small group of 4 the answers. They will be allowed to complete the Nearpod as a group so we will have the students put their group number and their names when they do the nearpod. - Students will be given a list of sentence stems they can use such as 1) We Believe that ___ Because of ____ 2) Our Cactus would have the adaptations _____, the reason for that is because____ 3) We noticed that our organism has _____, this can be explained by _____		- This is a student paced Nearpod for the students to complete. - Teacher will have the nearpod open to follow along with students. - Have students individually follow along (live on nearpod). - Here students will be given 3-4 minutes to brainstorm a definition or give the definition they look up. - Project sentences' stems' for students to use in discussion. - Students' responses will be recorded in Nearpod after the activity is complete and ask students to possibly share as they go along. - Have set examples for the kids to follow. - This will provide the opportunity of 4 terms to be answered within time set up in nearpod which can be adjusted to give students more time!

	discussion can be kept within groups or as an entire class.
Explain **Duration: 5 min.** **Third part-** ~~Class discussion→ Carousel discussion (Call on students, tell them who's next, and who's up next) (Do breakout rooms)~~ ~~Introduce the Solarium game and how to install and move around in the game. From here they assign students the biome they need to answer questions on from the Solarium game onto a chart, and then a rubric for their biome brochure.~~ **Day 1-Biomes background** **After that follow with brainstorming for their biome board game. Create a biome game.** **Tell students to Pick one of the 7 world Biomes.** **5 minutes** ********Assign students their new assignment creating a Board Game based on Biomes******** **1st--- Have students pick the biome they want to do. USE signup sheet. If two groups pick the same biome use the Dice roller to have them pick a different biome. (Groups of Two)** **2nd- Students will brainstorm their Board game. Come up with characters, the goal of the game, and other ideas outlined in the worksheet.** **(Students can even use characters created in sarahi's lesson in their board game as game pieces.)** **-Present students with examples of game cards, show them the types of game cards they can create** **3rd- Have students use google slides as visuals for the worksheet.** **GOOGLE slides**	- **Place students in their assigned breakout rooms. Help students brainstorm their game ideas.** - **Assign students the task of assigning roles for their game such as game designer, game manager, game material manager.** - **Help students by the end of the first day come up with a solid plan for the game and start on their game development.** - **For 1st and 2nd parts of the lesson, tell the students the instructions they have to pick their biome, and then come up with the goal of their biome.**
Extend **Duration: 40 minutes** ****concept-self connections, concept-concept connections, concept world connections, Anchor Investigative phenomena** ~~**Fourth Part-Have students begin to produce their brochure. Put sample brochure.Have them read into their biomes, assign them a specific biome that they will be using.Have doubles ready students will create the same biome.**~~ **DAY 2:** **Students will be shown the instruction sheet for Flippity.** **Students can be shown completed game (Still in process of being created) FLIPPY GAME EXAMPLE SPREADSHEET** **Day :2 Students will be given 30 minutes to build and finalize their flippity board game update pictures, finalize questions, etc.**	- **Teacher needs to make sure to recap vocabulary with the students, specifically BIOTIC AND ABIOTIC FACTORS. Also mention the animals and their relationships within the biome, what are carnivores, and what are primary producers.**

<table>
<tr><td colspan="2">Elaborate/Evaluate Duration: 20
If time is permitted we will have presentations on their board games.
Exit ticket: If presentations on day 2 are short-students will be given an opportunity to reflect on a google form about their experience with the game (This IS Optional)</td><td>- have students play their own game, check to make sure it works.
- Ask the students to share their games if possible with the class to test out how to play their games. Students will be sharing the link to their board games from their flippity links.
- Give feedback in a whole group/classroom setting.</td></tr>
<tr><td colspan="2">Instructional Delivery Option 2 (use if students are doing different things)
If at any point students are doing the same thing, you can just copy and paste into both columns.</td><td>Notes to Teacher:</td></tr>
<tr><td colspan="2">Engage Duration:</td><td></td></tr>
<tr><td>Students in-person:</td><td>Students at-home:</td><td rowspan="2">You will be doing either entire class discussion to get students to think about the big ideas. If there are half the students online you can create breakout rooms. I would assign a method to help the students start discussion. (Tools to discussion)</td></tr>
<tr><td>Students will include ONE word into the google jamboard</td><td>Students will include ONE word into the google jamboard</td></tr>
<tr><td colspan="2">Explore Duration:</td><td></td></tr>
<tr><td>Students in-person:</td><td>Students at-home:</td><td rowspan="2">Help out students by making sure you moderate the discussions by staying active in the in-person and online conversations by jumping around into breakout rooms.</td></tr>
<tr><td>Have students write on whiteboards</td><td>Students at home will be the Team leaders so they can remain important in the discussion. This can be alternated from assignment to assignment for fairness purposes.</td></tr>
<tr><td colspan="2">Explain Duration:</td><td></td></tr>
<tr><td>Students in-person:</td><td>Students at-home:</td><td rowspan="2">Help out the students with questions for their notes, they will probably need help with optimization you will just need to make sure they stay on topic during the assignment. Teach them how to interact with one or two of the questions because it can be difficult if they are using a laptop. Be there for tech support in case they don’t pay attention during the tutorial.
-</td></tr>
<tr><td>Make sure to utilize notebooks in person to take notes for board game ideas.</td><td>Take notes in notebooks or have them handle the recording of answers.</td></tr>
<tr><td colspan="2">Extend Duration:</td><td></td></tr>
<tr><td>Students in-person:</td><td>Students at-home:</td><td rowspan="2"></td></tr>
<tr><td></td><td></td></tr>
<tr><td colspan="2">Elaborate/Evaluate Duration:</td><td></td></tr>
<tr><td>Students in-person:</td><td>Students at-home:</td><td rowspan="2"></td></tr>
<tr><td></td><td></td></tr>
</table>

Back to Table of Contents

Examples of Boardgames the kids can explore:

https://www.dicebreaker.com/games/catan-1/how-to/how-to-play-catan-board-game Catan is campaign example

Dungeon Crawler examples:

https://www.hp.com/us-en/shop/tech-takes/best-dungeon-crawler-games

Roll and move board game example Monopoly-

https://en.wikipedia.org/wiki/Monopoly_(game)

Dice roller	Tropical rainforests	Temperate forests	Taiga(boreal forests)	Deserts	Tundra	Grasslands	Savanna
Group Place an x on the biome you want.							
Group 1			x				
Group 2					X		
Group 3	X						
Group 4							X
Group 5				=			

Biome:Unknown Animal: Coyote Diet: Omnivore Where does it go? 	Biome:Unknown Animal: Muskox Diet: Herbivore Where does it go? 	Biome:Unknown Animal: Blue whale Diet: Carnivores Where does it go? 
Biome:Unknown	Biome:Unknown	Biome:Unknown

Biome:Unknown	Biome:Unknown	Biome:Unknown

BIOMES

Biome List:

Aquatic
Arctic Tundra
Desert
Forest
Grassland
Savanna
Taiga

Click on the biome you would like to explore
or
Use the **arrow keys** to navigate through the slides
:)

You can explore some biomes through a 360° virtual reality.
Look for this icon:
CHECK IT OUT

AQUATIC BIOMES

Freshwater (Ponds, Lakes, Streams, Rivers):

https://askabiologist.asu.edu/explore/falling-freshwater

OR

Saltwater (Ocean):

https://askabiologist.asu.edu/explore/marine

TERRESTRIAL BIOMES

Tundra

https://askabiologist.asu.edu/explore/tundra

https://earthobservatory.nasa.gov/biome/biotundra.php

https://d43fweuh3sg51.cloudfront.net/media/assets/wgbh/tdc02/tdc02_doc_biomesummary/tdc02_doc_biomesummary.pdf

Biome VR 360: CHECK IT OUT

https://askabiologist.asu.edu/sites/default/files/virtual-reality/tundra-biome-VR-360/index.html

Desert

https://askabiologist.asu.edu/explore/desert

https://earthobservatory.nasa.gov/biome/biodesert.php

https://d43fweuh3sg51.cloudfront.net/media/assets/wgbh/tdc02/tdc02_doc_biomesummary/tdc02_doc_biomesummary.pdf

Biome VR 360: CHECK IT OUT

https://askabiologist.asu.edu/sites/default/files/virtual-reality/desert-biome-VR-360/index.html

Forest

Tropical Rainforest:

https://askabiologist.asu.edu/explore/rainforest

https://earthobservatory.nasa.gov/biome/biorainforest.php

https://d43fweuh3sg51.cloudfront.net/media/assets/wgbh/tdc02/tdc02_doc_biomesummary/tdc02_doc_biomesummary.pdf

Biome VR 360: CHECK IT OUT

https://askabiologist.asu.edu/sites/default/files/virtual-reality/rainforest-biome-VR-360/index.html

Temperate Deciduous Forest:

https://askabiologist.asu.edu/explore/temperate-forest

https://d43fweuh3sg51.cloudfront.net/media/assets/wgbh/tdc02/tdc02_doc_biomesummary/tdc02_doc_biomesummary.pdf

Biome VR 360: CHECK IT OUT

https://askabiologist.asu.edu/sites/default/files/virtual-reality/temperate-forest-biome-VR-360/index.html

https://earthobservatory.nasa.gov/biome/biotemperate.php

Coniferous Forest:

https://earthobservatory.nasa.gov/biome/bioconiferous.php

https://d43fweuh3sg51.cloudfront.net/media/assets/wgbh/tdc02/tdc02_doc_biomesummary/tdc02_doc_biomesummary.pdf

Grassland

https://askabiologist.asu.edu/explore/grassland

https://earthobservatory.nasa.gov/biome/biograssland.php

https://d43fweuh3sg51.cloudfront.net/media/assets/wgbh/tdc02/tdc02_doc_biomesummary/tdc02_doc_biomesummary.pdf

Savanna

https://askabiologist.asu.edu/explore/savanna

https://d43fweuh3sg51.cloudfront.net/media/assets/wgbh/tdc02/tdc02_doc_biomesummary/tdc02_doc_biomesummary.pdf

Biome VR 360: CHECK IT OUT

https://askabiologist.asu.edu/sites/default/files/virtual-reality/savanna-biome-VR-360/index.html

Taiga

https://askabiologist.asu.edu/explore/taiga

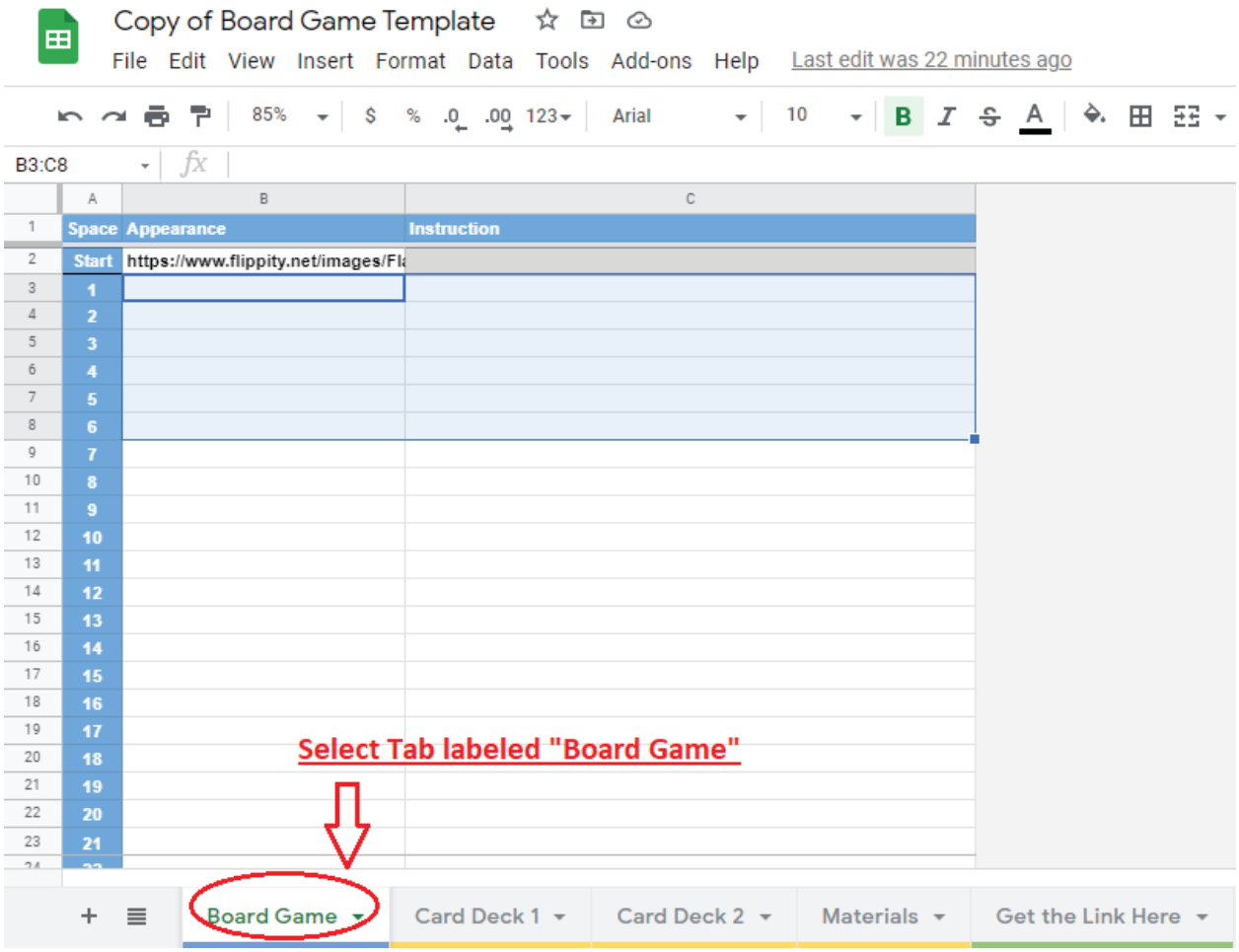
https://d43fweuh3sg51.cloudfront.net/media/assets/wgbh/tdc02/tdc02_doc_biomesummary/tdc02_doc_biomesummary.pdf

Link to flippity instructions sheet directly from Flippity-https://www.flippity.net/BoardGame.htm

1. Make a copy of the google sheet to your own google drive.

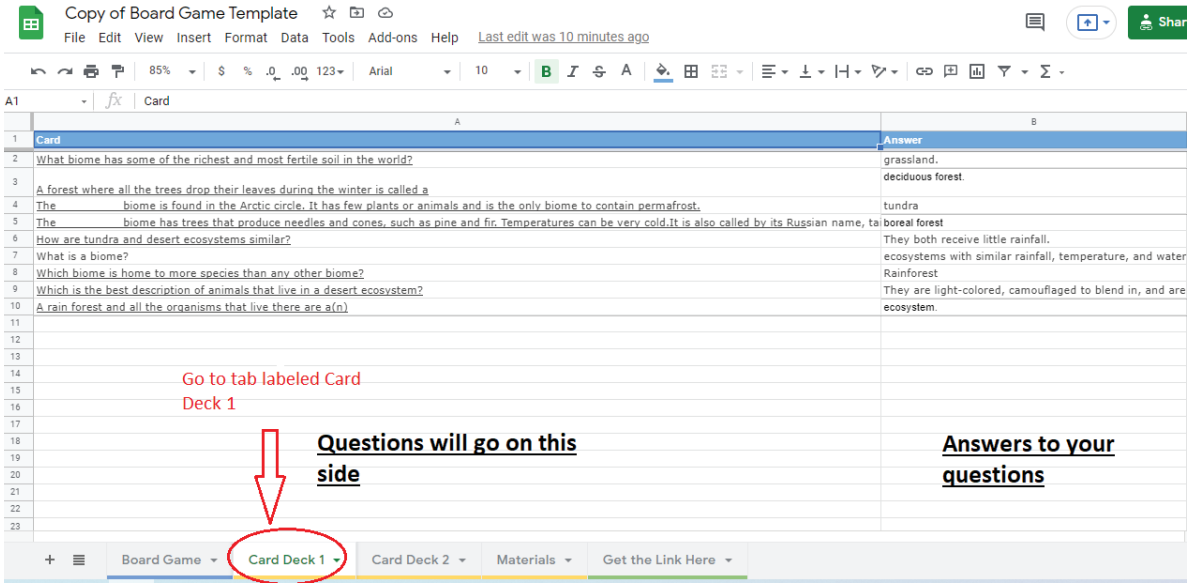
To edit the board: Click on the board game tab in google sheets, next highlight the text boxes and clear them out, follow the following link to pick your colors, pick 4 colors to use for your board game that match up the colors, write down the color name or color code for example (**Aqua**,**#00FFFF**) (https://www.w3schools.com/colors/colors_names.asp).

If you would like, you can add specific instructions for the spaces such as go back one space, go back 2 spaces, or whatever special spaces you would like.***This is an optional step***

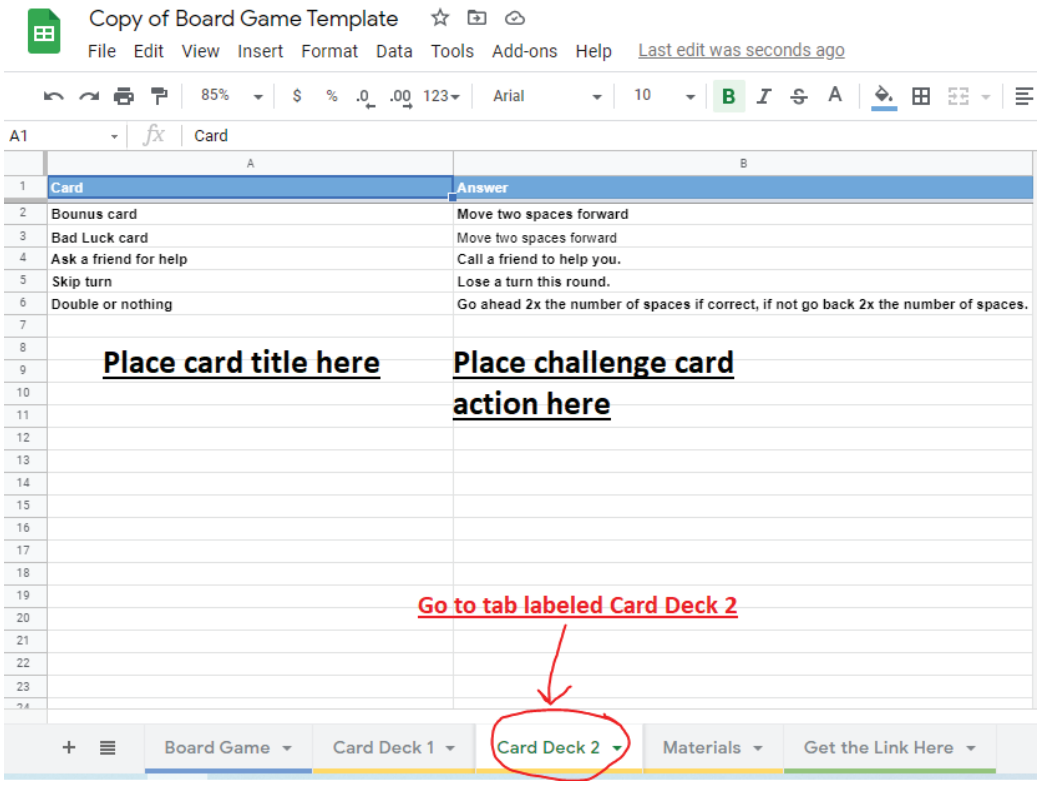


This is an example of the color(s) that you will see. Pick out 4 colors and copy the Names or codes for the board.

2. Tab 2, Card Deck 1. To edit the board: Click on the Card Deck 1 tab in google sheets, next highlight the text boxes and clear them out. Use this worksheet and pick questions from Quizlet. Pick 5 to 10 questions to include for your board game left side labeled card you will be putting your question, and the answers will be on the right side labeled answer.

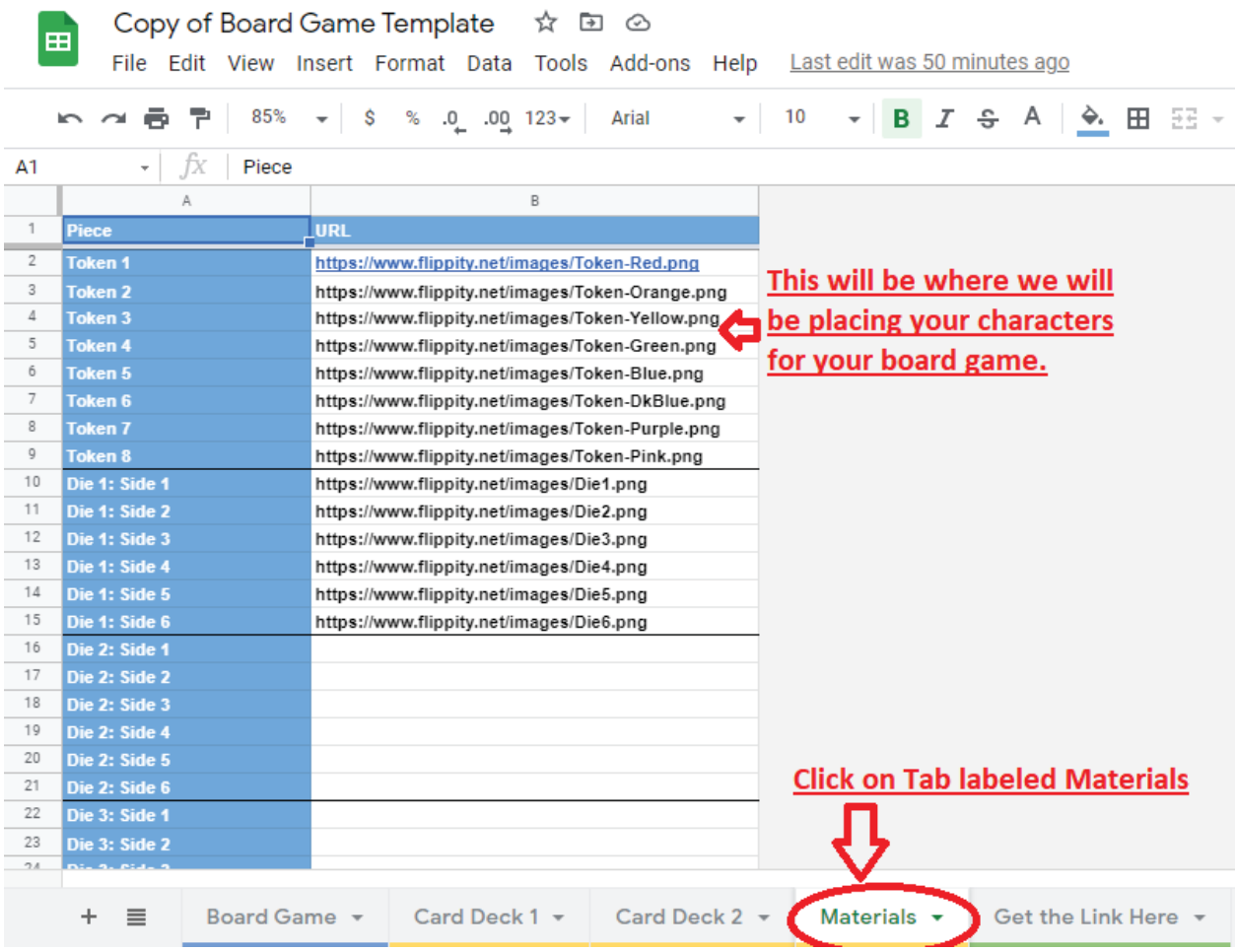


3. Card deck 2: To edit the board: Click on the card deck 2 tab in google sheets, next highlight the text boxes and clear them out. Next come up with your 5 challenge questions box. These questions are going to be your own questions so make sure they feature a specific animal, or feature a geographical element of your biome(Abiotic and Biotic factors). They may also be fun facts but try to have it relate to your specific biome.

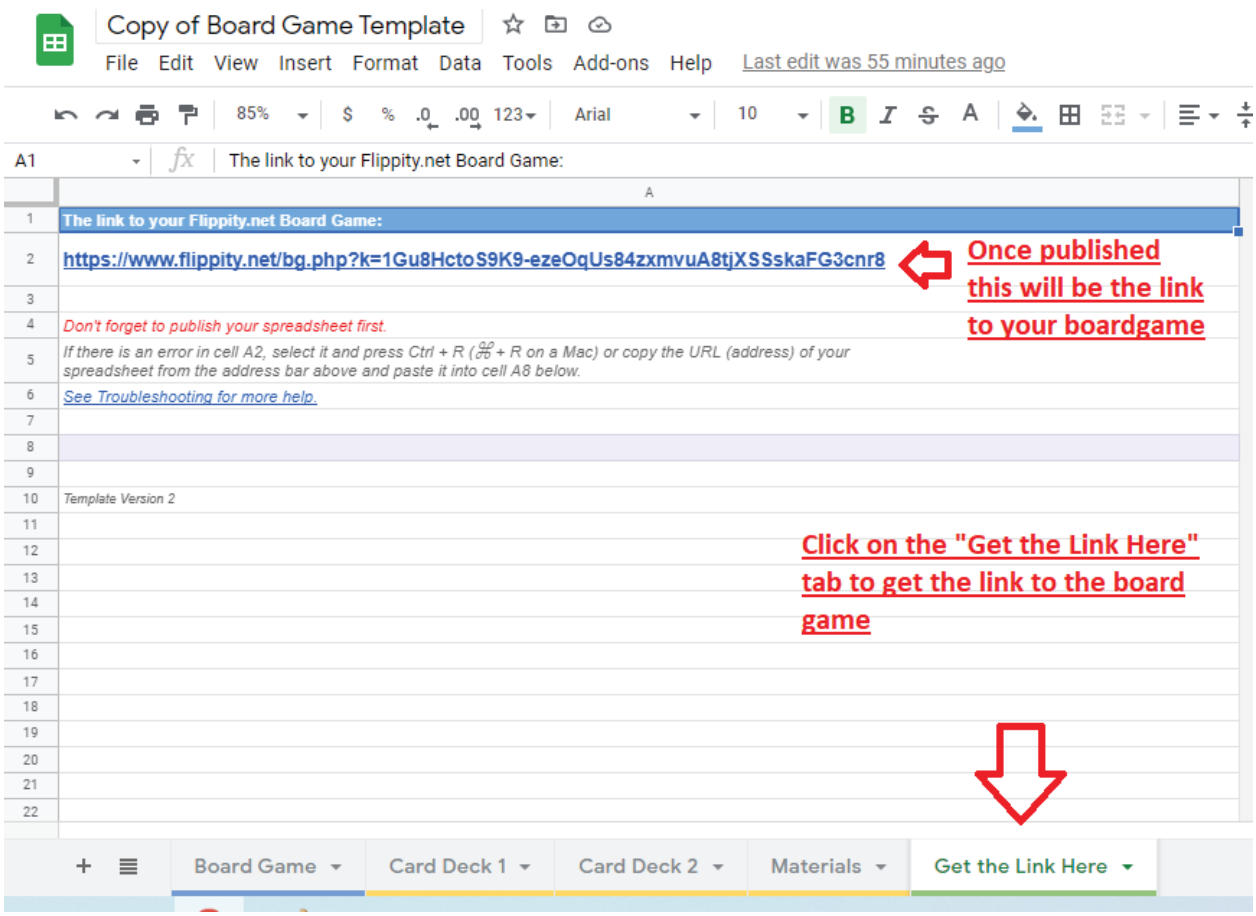


4. This is where we will be inserting pictures from Pixels website to be part of your board games. We will need to find and copy the Pictures URL from Pixels. Once you find the image you would like to use, place the image URL on the right side column labeled B (In

Blue at the top of the spreadsheet).



5. This is the final step to creating your board games. First you will go to the spreadsheet, go to the **File** tab at the top, in the dropdown menu find the option that says **Publish to the web**, once published you will go on to review your board game. You will now click on the “Get the Link Here” tab to find the URL to your specific board game. You will be needing to make changes to the board game as you find errors, wrong color coded board spaces, or errors in your question/challenge cards you will be able to edit your board game *changes should update automatically even once it is published to the web. **Only one student can “play” their board game at a time so there will be a role assigned to check for errors.



Example Board Game- https://docs.google.com/spreadsheets/d/1uw-7vR1Utim-QpSHOWTnK-1_e4uel8gthTnZ2Ud8ANY/edit?usp=sharing

Answer the sections for the following biomes:

	Include details from the video like location, precipitation, is it hot/cold, or any other details, etc.	One animal or plant that lives in that biome.
Desert	Little to no rainfall.	
Grassland	Average rainfall.	
Savanna	Wet and dry season	
Rainforest	Humid. Rains any season	Tiger
Deciduous forest		
Taiga		
Tundra		
Ocean Biome		

Group 1:
Biome:

Game Designer	
Materials manager	
Game master/rule maker	
Fact checker (checks to make sure all questions and answers are accurate)	
Group Delegator.	

Group 2:
Biome:

Game Designer	
Materials manager	
Game master/rule maker	
Fact checker (checks to make sure all questions and answers are accurate)	
Misc.	

Group 3:
Biome:

Game Designer	
Materials manager	
Game master/rule maker	
Fact checker (checks to make sure all questions and answers are accurate)	
Misc.	

Group 4:
Biome:

Game Designer	
Materials manager	
Game master/rule maker	

Fact checker (checks to make sure all questions and answers are accurate)	
Misc.	

Group 5:
Biome:

Game Designer	
Materials manager	
Game master/rule maker	
Fact checker (checks to make sure all questions and answers are accurate)	
Misc.	

Group 6:
Biome:

Game Designer	
Materials manager	
Game master/rule maker	
Fact checker (checks to make sure all questions and answers are accurate)	
Misc.	

Team Builder

Name of Team Builder: Team Escape Room

How does your team builder connect to your lesson or the overall theme?
This will build on their teamwork skills and be able to have some more interaction after the Algebra Among Us Activity. Teamwork will be vital in not just the classroom but in the real-world as well. Students will also know that contributing to the group is essential to completing objectives/assignments in life.

Day of the Week and Time
2nd week, Monday 8:30 am - 9:00 am

Total Length:
30 minutes

Materials (per student)**:**

- composition book
- pencil

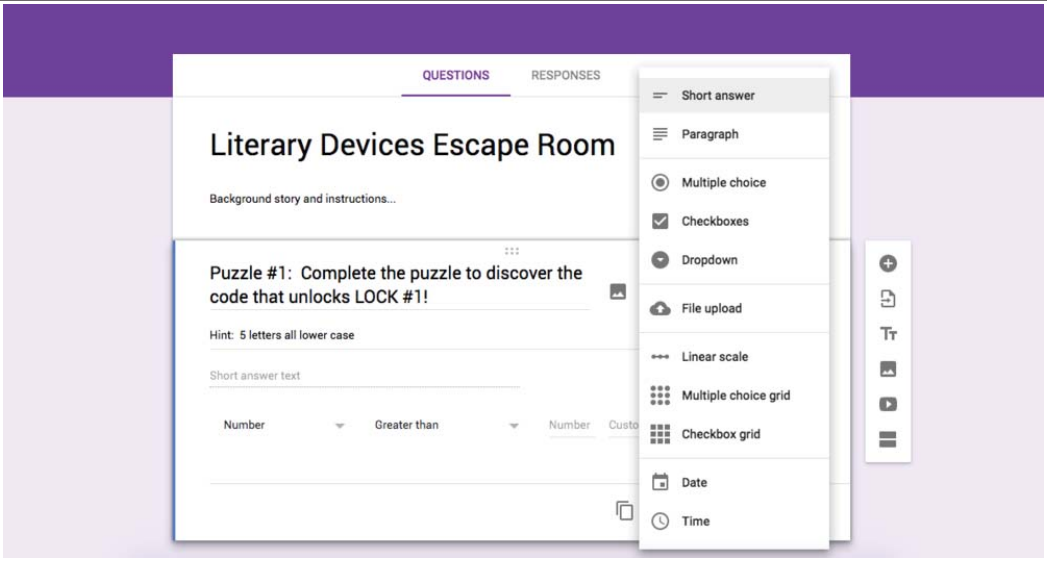
Technology Required (websites, Zoom video, chat, phones, etc.)**:**

- phone (optional for in person)
- laptop
- Zoom Breakout rooms

Advanced preparation

- Have the escape room link on the board
- Assign groups for those who are in-class or at-home (at random)

Description Option 1 (use if everyone is doing the same thing)	**Notes to Teacher:**
The students will be divided into groups of 3 or 4. **[Note: Be sure to give them their group number since they will put their group number in the escape room]** The escape room is a Google Form. The Escape Room will be a video game theme with a bit of trivia from the MaST summer camp. Each group is tasked with answering questions and finding keys in order to get through the escape room. Everyone will work on it but **only one** student needs to submit. So each group will choose who they want to be that one student to submit and they share their screen with the rest of the students. Spend the first 5 - 7 minutes getting the students set up for kumospace.	Will also have to consider that some students will be looking things up which is fine. Can make it into a competition if students are not interested. Will need to ensure that all the students are either using their laptops or phones



Description Option 2 (use if students are doing different things)
If at any point students are doing the same thing, you can just copy and paste into both columns.

Notes to Teacher:

Students in-person:	**Students at-home:**
(Refer back to Option 1)	(Refer back to Option 1) Students will be put into breakout rooms so they can converse and work on the escape room. Otherwise, it is the same as the in-person students.

Kumo Space is a good way for the students to be in a comfortable environment online. Zoom would not be ideal while students are on Kumospace. This will make the students more interactive than being in the zoom breakout rooms

Back to Table of Contents

Escape Room Answer Sheet

- Lock 1
  - 4213
- Lock 2
  - Animal Crossing
- Lock 3
  - Pokemon Eevee
- Lock 4
  - dfaebc
- Lock 5
  - 12
- Lock 6
  - Engineering for Efficiency
- Lock 7
  - daebc
- Lock 8
  - Luigi's Mansion
- Lock 9
  - Splatoon
- Lock 10
  - bcad
- Lock 11
  - Pacman
- Lock 12
  - Pokemon Snap
- Lock 13
  - 0,1
- Lock 14
  - Little Nightmares
- Lock 15
  - Crash Bandicoot
- Lock 16
  - Po-Key Mon Evolution

- Lock 17
  - Centipede
- Lock 18
  - Tetris
- Lock 19
  - afdgbec
- Lock 20
  - Pokemon

Team Builder

Name of Team Builder: Video Game Story Book

How does your team builder connect to your lesson or the overall theme?

My team builder will connect to the overall theme because the students will create a book based on video game characters, topics from previous lessons in the camp, video game settings, etc..

This team builder will have students practice their writing skills for the next activity.

Students will also learn how to communicate with one another and think as a class.

Day of the Week and Time
Week 2 Tuesday 8:30am-9:15am

Total Length:
45 minutes

Materials (per student)**:**

- **Book Creator App (1 account for the whole class $10)**
-
-

Technology Required (websites, Zoom video, chat, phones, etc.)**:**

- **Zoom**
- **Somewhere whole class can chat with each other (other than zoom)**

Advanced preparation

- **Prepare the topics that will be given to each student**
-

Description Option 1 (use if everyone is doing the same thing)	**Notes to Teacher:**
Students will be paired and each pair will be given one video game camp topic, such as character, or setting. Each pair will also get a number. For example, one pair could have their topic be "codes -1" from Elisabet's binary lesson. Another pair could get "pikachu -2 " as their topic. Another could get "sus -3" (among us) as their topic, and so on. **Also we could get students to go to whatever platform where they get their topic and page number.** **Example:** **https://docs.google.com/presentation/d/1t05oxhIed_rkzYi-BSQ-F3IYU8n032b5b8al0l-ggBc/edit?usp=sharing** **FOR RUN THOUGH USE THIS ONE :)** **https://docs.google.com/presentation/d/1xDJupjCTozSmrfGzIVz5tgPBFo-ZwzKKnPT1wKSn1pg/edit?usp=sharing**	**If possible pair an online student with a face-to-face student so that communication between online and face-to-face students is easier. It will also allow teachers to hear what is happening in the breakout rooms without joining them.**

The word before the "-" will be their topic, and the number to the right of the "-"sign will be their number. For example, if Juanita and Panchito get the following topic: "codes-1", this means that they will be creating page 1 of the book and page 1 has to be about codes from Elisabet's binary code lesson. The text of that page has to have the word "code" or "codes" or "coding" in there and has to be about codes.

Break out students into breakout rooms of two. (1 pair per breakout room)

Students will have 15 minutes to create a video game story book as a class. This will require lots of class teamwork and communication. They need to develop a strategy themselves to be able to get from the first page to the last page of their story in those 15 minutes. Story has to flow nicely. Teacher can project the following rules and explain them the first 5 minutes of class along with modeling so that students know how to navigate through the app.

Rules:

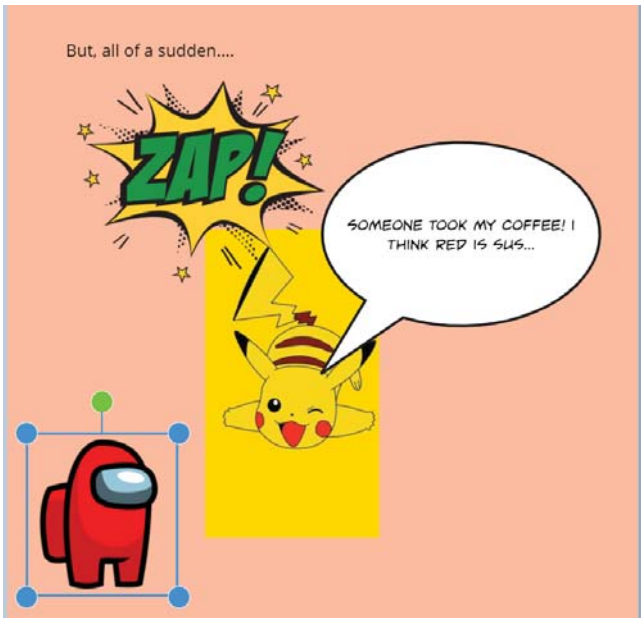
1. **Use the topic given to you. For example, if you were given the word "pokemon" we might not want the page to be on Dragon Ball Z.**
2. **Each page has to have at least one sentence that uses the word given to you.**
3. **The story has to flow nicely!**
4. **Work together and have fun!**

Students can communicate through some messaging platform. (I am not sure if zoom allows people to chat across breakout rooms… I don't think so).

After the 15 minutes use the remaining 5 minutes to read the book as a class if they have time!

Example of a page I created: Topic is "Pokemon-2"

Example of page 2 created: Topic was “sus-3”



Description Option 2 (use if students are doing different things)
If at any point students are doing the same thing, you can just copy and paste into both columns.

Notes to Teacher:

Students in-person:	**Students at-home:**

Back to Table of Contents

Lesson Plan Option 1: Traditional

Name of Lesson: Marvel Galactus Geometry Galaxy

Learning (TEKS) Objective:

Astronomy

(c) Knowledge and skills

(5) Science concepts. The students develop a familiarity with the sky. The student is expected to:

(C) recognize and identify constellations such as Ursa Major, Ursa Minor, Orion Cassiopeia, and constellations of the zodiac.

(6) Science concepts. The student knows our place in space. THe student expects to:

(A) compare and contrast the scale, size, and distance of the Sun, Earth, and Moon system through the use of data and modeling;

(B) compare and contrast the scale, size, and distance of objects in the solar system such as the Sun and planets through the use of data and modeling;

(C) examine the scale, size, and distance of the stars, Milky Way, and other galaxies through the use of data and modeling;

Geometry

(c) Knowledge and skills

(4) logical argument and constructions. The student uses the process skills with deductive reasoning to understand geometric relationships. The student is expected to:

(D) compare geometric relationships between Euclidean and spherical geometries, including parallel lines and the sum of the angles in a triangle

(5) Logical argument and constructions. The student uses constructions to validate conjectures about geometric figures. The student is expected to:

(A) investigate patterns to make conjectures about geometric relationships, including angles formed by parallel lines cut by a transversal, criteria required for triangle congruence, special segments of triangles, diagonals of quadrilaterals, interior and exterior angles of polygons, and special segments and angles of circles choosing from a variety of tools;

(11) Two-dimensional and three-dimensional figures. The student uses the process skills in the application of formulas to determine measures of two- and three-dimensional figures. The student is expected to:

(D) apply the formulas for the volume of three-dimensional figures, including prisms, pyramids, cones, cylinders, spheres, and composite figures, to solve problems using appropriate units of measure.

Student Outcome: *Students will be able to…*

Understand how what the Milky Way is and what it consists of
Understand and identify constellations
Understand the concept of circles
Understand how to find and construct angles

Day of the Week and Time:

2nd week, Monday: 9:00 am - 10:45 am, 12:30 pm - 1:45 pm

Total Length of Lesson:

3 hours total
Part 1: 1 hr 45 min
Part 2: 1 hr 15 min

Materials (per student):

- Foldable Handouts
- Handouts
- Compasses (different sized cups if there are no compasses)
- Protractors
- Rulers
- Pencil
- 12 colored color pencils
- Markers
- paper
- graph paper
- scissors
- glue
- black paper
- white papers
- Silver Sharpie

Technology

- Laptop
- Calculator
- Nearpod
- Phone (optional)
- Jamboard

Advanced preparation

- Make sure the laptops are there
- Print foldable handouts
- Make one foldable to use as reference

How to accommodate activities for students who are English Language Learners or have trouble focusing

- **The instructions are pre-written so there will be sentence stems for the activity**
- **The notes can be color coded.**
-

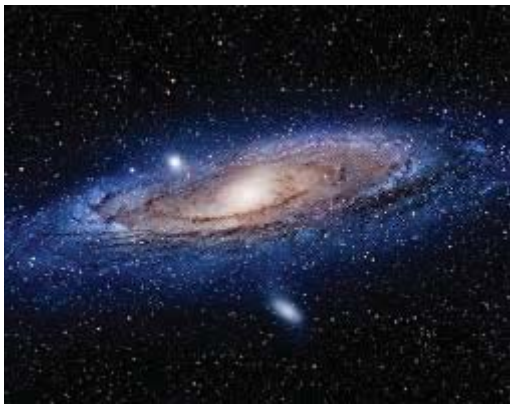
Instructional Delivery Option 1 (use if everyone is doing the same thing)	**Notes to Teacher:**
(Part 1) **Activity 1: Milky Way Trivia Duration: 15 minutes** **[Note: Nearpod will be used for all of *Part 1*]** We will begin with a Nearpod. Nearpod Activity ● Time to Climb will have the students answering astronomy based questions such as ○ planets ○ stars ○ constellations ○ light years (**Note: We will go over this in the foldable)** **Do the space version of time climb** 	**Nearpod teacher needs to use!** **Use live participation or live participation + zoom**
Activity 2: Astronomy Foldable Duration: 40 minutes We will go back to the Nearpod. We will begin the class with reading the synopsis of Galactus (like a storyline): If know one remembers Galactus, he's a being that eats planets. The basic synopsis is that the Guardians of the Galaxy fought Galactus but Galactus already diminished a universe. Now it is the students' job to create a new universe to replace the destroyed one. But first they need to gain knowledge in order to have the abilities to create a universe hence **Geometry Galaxy!!** **[NOTE: Answers for both foldables are in the For Teachers folder]** This will be mainly the students watching 2 short videos for most of the foldable. (Make sure to pause in order to give the students some time) There will be a mini activity	

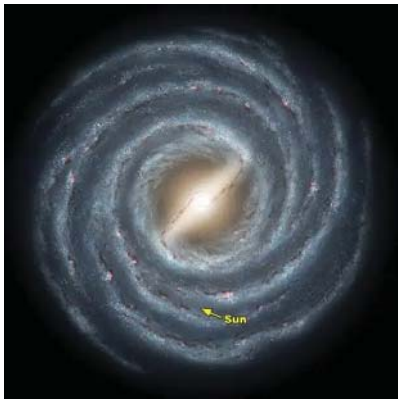
instilled. (NOTE: **Time will be included in this lesson plan once I include it. Be sure to take it off interactive mode and pause the videos.**)

- Video 1
- the website "Build Your Earth (Show the students how to use it)
  - http://www.buildyourownearth.com/index.html
  - Click **Get Started**
  - Under the **Earth** Topic, click **Alien**
  - Then click **Aquaplanet** (you will see different kinds of planets listed)
- Video 2
- short powerpoint on the continuation of stars
- Constellation powerpoint

(Lesson) Milky Way Galaxy
https://www.ducksters.com/science/physics/astronomy_glossary_and_terms.php

- Solar system
- Constellation
- Scale, size, and distance of the planets and stars
- units of measurement in astronomy, including Astronomical Units and light years.





Activity 3: Constellation Matching Duration: 10 minutes

We do another short activity for the students. Once the students are done, they can get up and stretch.

Nearpod
matching pairs (individual activity)

- Students will match the constellation to the picture (5 constellations)

Activity 4: Geometry Foldable Duration: 40 minutes

We will continue the Nearpod and be filling in the foldable for geometry. You will be writing notes down for the students since this will allow students the time to take notes rather than speeding through the slides. (NOTE: I converted these slides to draw it since this will allow you to write on the slides).

Tools needed:
foldable
protractor
pencil
compass

(Lesson) Circle and Angles
Circle

- two dimensional circle
  - circumference (C = 2 x pi x r)
  - area (A = pi x r^2)
- three dimensional circle (sphere)
  - volume (V = (4/3) x pi x r^3)
  - surface area (A = 4 x pi x r^2)

Angles

- acute angle
- right angle
- obtuse angle
- complementary angle
- supplementary angle

Compass

- Have the students pull out their composition book
- Do at least two examples of drawing a circle with a compass
- Use the protractor and make a line that is (1 in and 2 in) Then use the compass to draw the circle.
- How to Use a Compass Video

(Part 2)
Activity 5: Geometry Kahoot Duration: 15 minutes

The Kahoot is here.

We will then do a kahoot as an opening activity for a refresher.
Kahoot on circles and angles from the geometry lesson. (It will be simple questions)

Activity 6: Geometry Galaxy **Duration: 1 hour**

You will go over the instructions with the students. You will go over the word document and highlight any key points. The teachers will be walking around and checking on the students. In the last 10 or 15 minutes. The teachers can display the work on the board that the students did for their galaxy in front of the class from Jamboard

Teacher:

- Assign groups (The group assignment sheet is in the For Teacher Folder.
- While the students are working, walk around and see if any student needs any help

(NOTE: The students will be showing their galaxy through Jamboard.)

Group of 4 or 5 students

Objective:

To create a galaxy using the knowledge that was gained from astronomy and geometry.

Instructions:

Each student will be given a role at random. Each student is tasked with finishing the requirements from their role. Students will need to work together efficiently to complete their galaxy. The students are free to add more planets, stars, and/or constellations but the whole group has to be in agreement before doing so.

If any student in their group is done, they will ask their group mates to assist in finishing their task. The whole group will come up with the name of their galaxy. Individual students in their group can come up the name of their planet(s), star(s), and/or constellation(s).

Roles and Tasks:

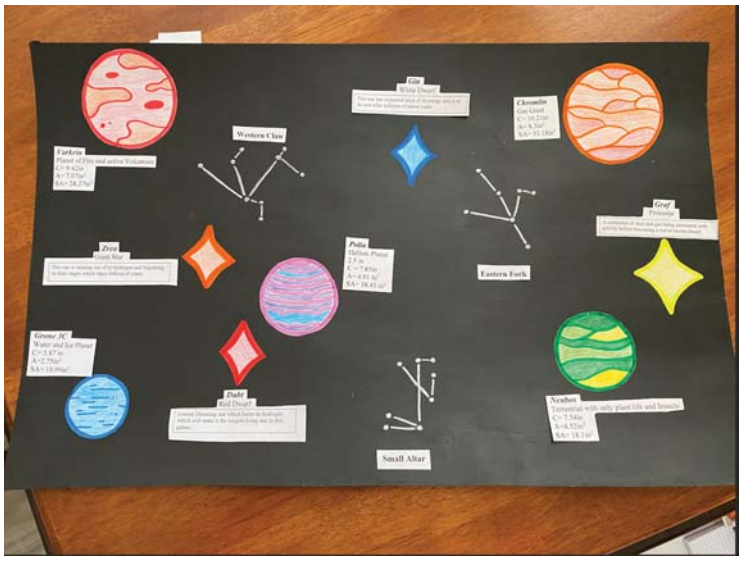
- **Orien Organizer:**
  - Create 2 planet
  - Create 1 constellations
- **Stellar Scripter:**
  - Create 2 constellations
  - Create 2 stars
- **Galactic Record Keeper:**
  - Create 2 planets
  - Create 2 stars
- **Celestial map maker:**
  - Create 2 planet

- In your notebook, write down all the names of the planets, stars, and constellations along with the name of your groups galaxy
- When the group is done, take a picture of the galaxy all of you created and insert it into the Jamboard

(If there is a fifth member, the student will be the **Hidden Overseer:** create another planet and 2 more constellations)

Students will be put into pairs/groups. Each group will create their own galaxy and complete the checklist.

- Name of their galaxy
- Their galaxy must consist of at least:
  - 6 circular planets (different sizes)
    - name
    - description
    - measure the distance between the planets (in light years)
    - the radius
    - circumference, area, volume, and surface area of the planets
    - measurements next to the planets
  - 4 stars
    - name
    - Description
  - 3 constellations **(using protractors)**
    - name
    - 1 right angle
    - 1 obtuse angle
    - 1 acute angle
    - 1 pair of complementary
    - 1 pair of supplementary

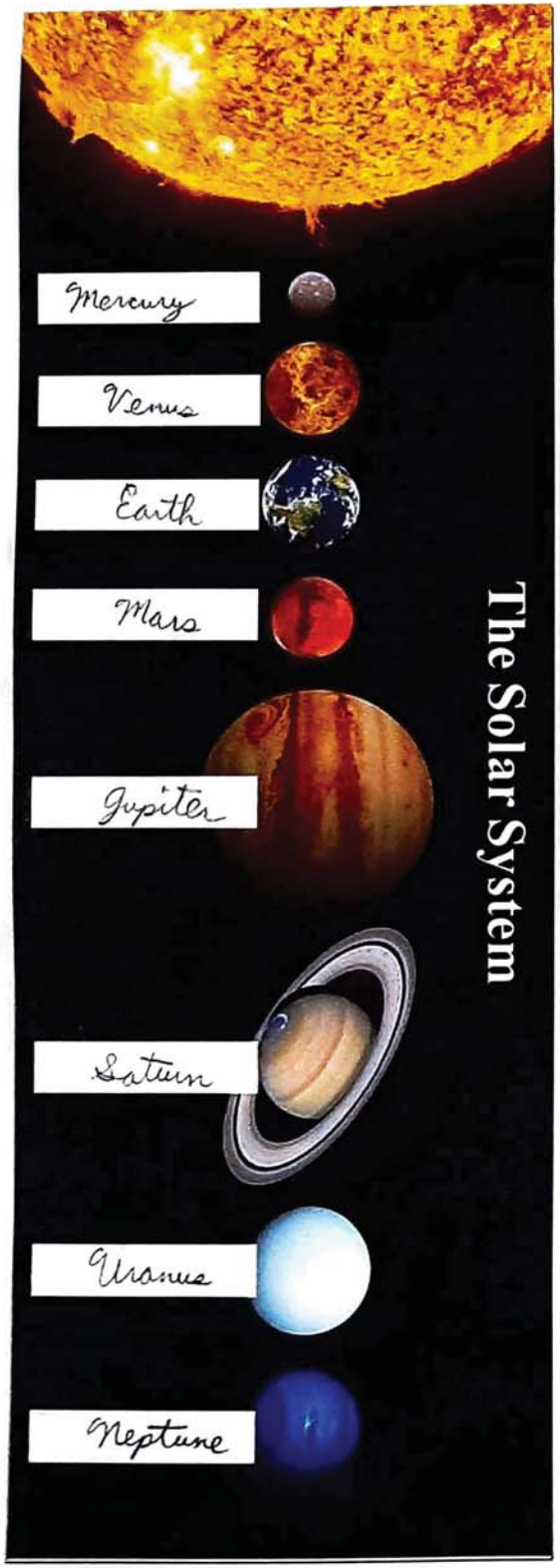


Instructional Delivery Option 2 (use if students are doing different things)
If at any point students are doing the same thing, you can just copy and paste into both columns.

Notes to Teacher:

Activity 1:	Duration:	
Students in-person:	**Students at-home:**	
(Refer back to Option 1)	(Refer back to Option 1)	
Activity 2:	**Duration:**	
Students in-person:	**Students at-home:**	
(Refer back to Option 1)	(Refer back to Option 1)	
Activity 3:	**Duration:**	
Students in-person:	**Students at-home:**	
(Refer back to Option 1)	(Refer back to Option 1)	
Activity 4:	**Duration:**	
Students in-person:	**Students at-home:**	
(Refer back to Option 1)	(Refer back to Option 1)	
Activity 5:	**Duration:**	
Students in-person:	**Students at-home:**	
(Refer back to Option 1)	(Refer back to Option 1)	
Activity 6:	**Duration:**	
Students in-person:	**Students at-home:**	
(Refer back to Option 1)	It is roughly the same as Option 1. The only difference is that the students will have to take pictures of their pieces of the galaxy and put it onto the Jamboard. The students will be put into Zoom breakout rooms.	

Back to Table of Contents



GLUE HERE

Marvel Galactus Geometry Galaxy

Astronomy

The Solar System & planets

2 categories of planets:

- Terrestrial
  - Made of rocky material
  - Don't have rings
  - Very few moons
  - Relatively small
- Jovian
  - gas giants
    - Predominantly helium & hydrogen
  - ice giants
    - Contains rock, ice, and mixture of water

(For all the planets)

- All have multiple moons
- No solid surface
- Support ring systems
- immense in size

More types of planets:

Build Your Own Earth

http://www.buildyourownearth.com/index.html

Stars

Stars are all born in nebuli, clouds of dust and hydrogen gas.

Stars begin life as protostars.

Thermonuclear Fusion generates heat and energy and causes stars to shine

Stars are categorized by

- Surface temperature called spectral classes.
- The amount of light they emit called luminosity classes.

white dwarves are the smallest and least bright stars.

Hypergiants are the biggest and most bright stars.

When a small star like our sun dies, it releases its energy and leaves behind a a white dwarf.

When a more massive star dies, it becomes a supernova and leaves behind a neutron star.

The most massive stars (at least three times our sun's mass) collapses on themselves and becomes a black hole.

Constellations

What are constellations? (You will need to write this down for the students)

a configuration (or arrangement) of stars

Constellations were used for three main purposes:

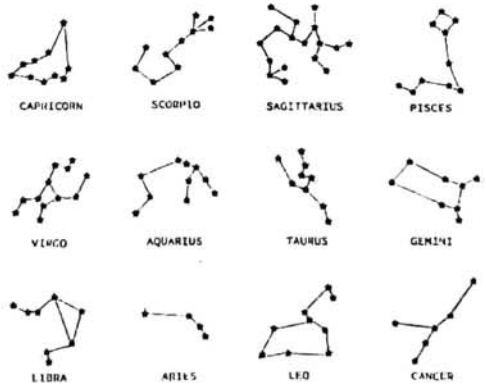
Agriculture, Navigation, and Religion/Storytelling

Famous Constellations

- Orion
  - a fabled hunter
- Castor or Pollux
  - the twins
- The Pleiades
  - the seven sisters
- Ursa Minor (Little Dipper)
  - a bear
- Ursa Major (Big Dipper)
  - points towards the North Star, Polaris

Draw the big & little dipper

Zodiac Constellations:



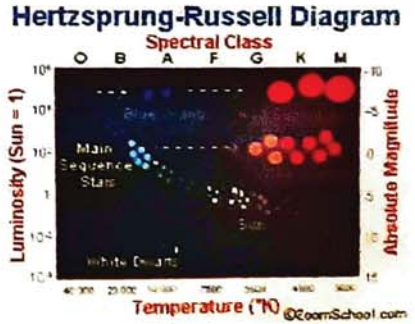
Stars cont.

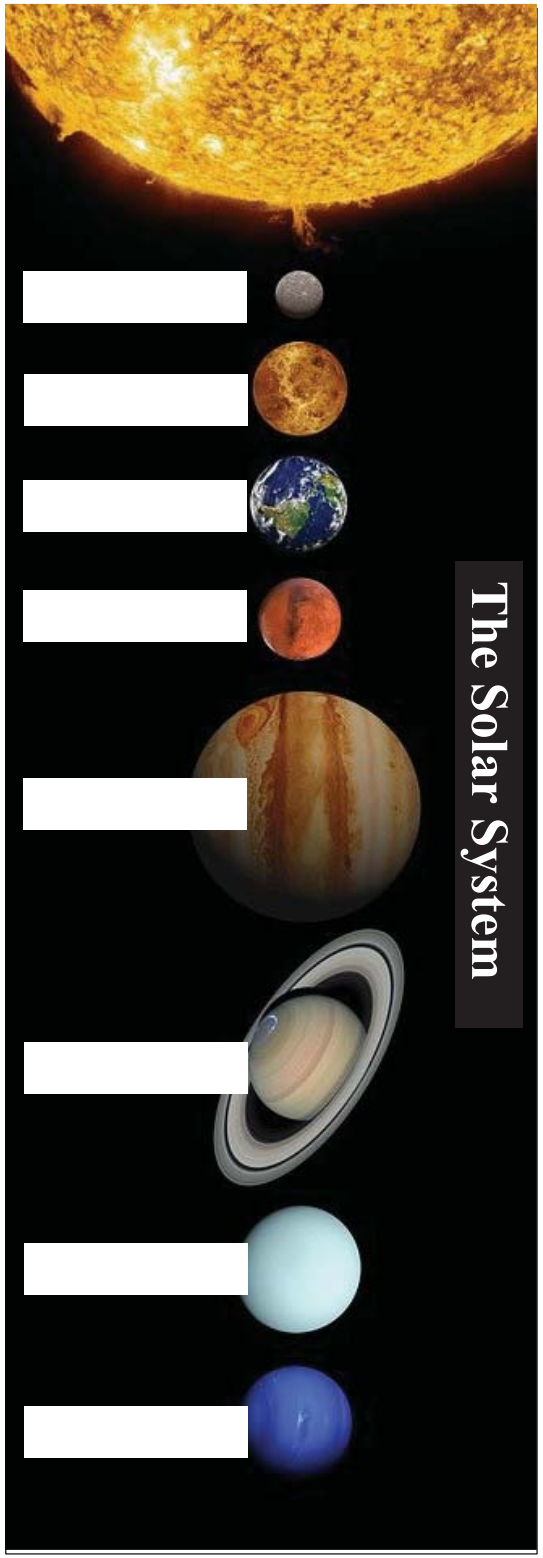
Spectral Classes
(Hottest to coldest)

Star Type	Color
O	Blue
B	Blue
A	Blue
F	Blue to White
G	White to Yellow
K	Orange to Red
M	Red

Luminosity Classes
(Brightest to dimmest) (on the video pause here)

Type	Star
O	Hypergiants
Ia	Supergiants
Ib	Supergiants
II	Bright giants
III	Giants
IV	Sub-Giants
V	Main Sequence
sd	Sub-Dwarfs
D	White Dwarfs





GLUE HERE

Marvel Galactus Geometry Galaxy

Astronomy

The Solar System & planets

2 categories of planets:

O

- Made of _____
- Don't have _____
- Very few _____
- Relatively _____

O

-
    - Predominantly helium & hydrogen
-
    - Contains rock, ice, and mixture of water

(For all the planets)

- All have _____
- No _____
- Support _____
-

More types of planets:

Build Your Own Earth

http://www.buildyourownearth.com/index.html

Stars

Stars are all born in _____ , clouds of dust and hydrogen gas.

Stars begin life as _____.

_____

generates heat and energy and causes stars to shine

Stars are categorized by

- Surface temperature called _____.
- The amount of light they emit called _____ _____.

_____ are the smallest and least bright stars.

_____ are the biggest and most bright stars.

When a small star like our sun dies, it releases its energy and leaves behind a _____.

When a more massive star dies, it becomes a _____ and leaves behind a _____ star.

The most massive stars (at least three times our sun's mass) collapses on themselves and becomes a _____.

Constellations

What are constellations?

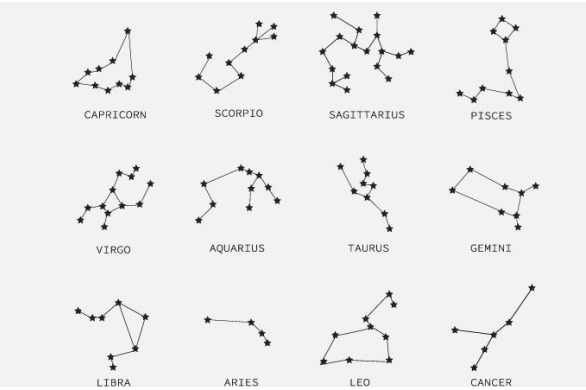
Constellations were used for <u>three</u> main purposes:

_____.

Famous Constellations

-
  - o
-
  - o
-
  - o
-
  - o
-
  - o

Zodiac Constellations:



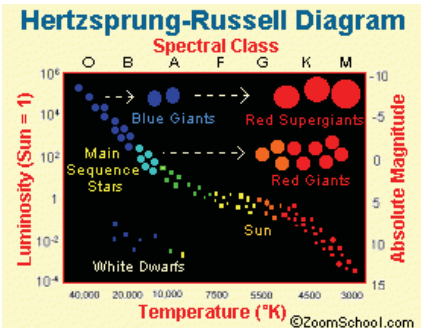
Stars cont.

Spectral Classes
(Coldest to hottest)

Star Type	Color
O	
B	
A	
F	
G	
K	
M	

Luminosity Classes
(Brightest to dimmest)

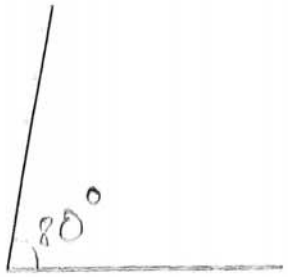
Type	Star
O	
Ia	
Ib	
II	
III	
IV	
V	
sd	
D	



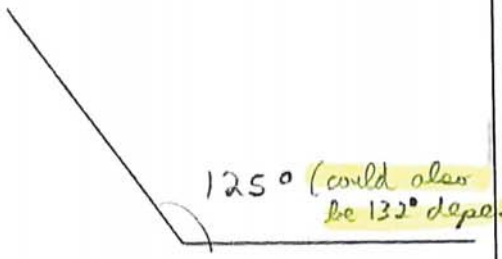
Examples: (Use protractors)

Find the angle(s) and clarify the type.

1)



2)



(could also be 132° depending on the protractor)

Draw two supplementary angles. (create one using a protractor)

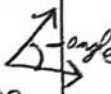
GLUE HERE

[teacher note] (can lead to an open ended question for students to answer →

Marvel Galactus Geometry Galaxy

Geometry

What is an angle? (∠) symbol
Formed by two rays (↗) that meet at a common pt &



Acute angle: measures degree
- is less than 90°

Right angle:
- is 90° exactly

Obtuse angle:
- is greater than 90° & is less than 180°

Straight angle:
- is exactly 180°

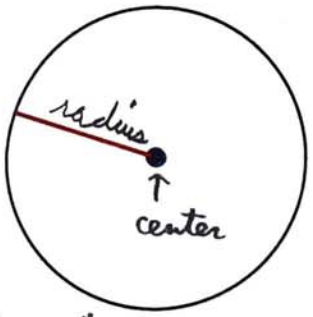
Complementary angles:
- two angles that add up to 90°

20° + 70° = 90° ✓

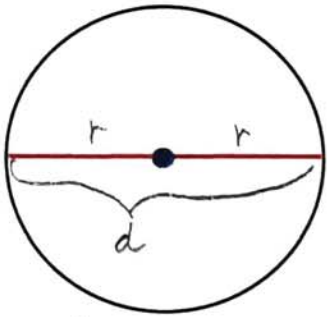
Supplementary angles:
- two angles add up to 180°

60° + 120° = 180° ✓

Parts of the Circle



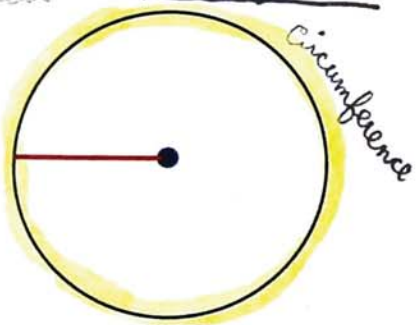
r: radius



d: diameter

$d = 2r$

Perimeter of a circle is called a Circumference



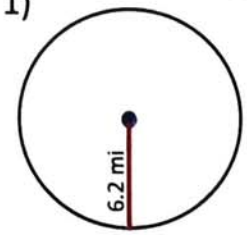
π: pi

Examples:

Need Calculators

Find the circumference and area. (round to the hundredth place)

1) $r = 6.2$



$C = 2(\pi)(6.2) = 38.96 \text{ mi}$

$A = \pi(6.2^2) = 120.76 \text{ mi}^2$

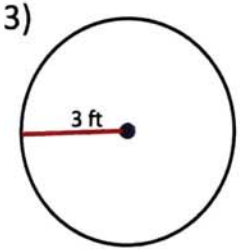
2)

$C = 2(\pi)(8) = 50.27 \text{ in}$

$A = \pi(8^2) = 201.06 \text{ in}^2$

Find the volume and surface area.

3)



$V = \frac{4}{3}\pi(3^3) = \frac{4}{3}\pi(27)$

$= 113.10 \text{ ft}^3$

$SA = 4\pi(3^2) = 113.10 \text{ ft}^2$

4)

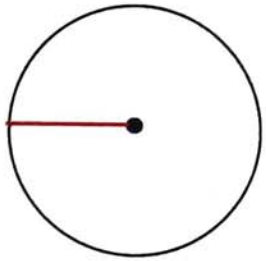
$V = \frac{4}{3}\pi(5.5^3)$

$= 696.91 \text{ m}^3$

$SA = 4\pi(5.5^2)$

$= 380.13 \text{ m}^2$

Two-dimensional circle



Circumference: (unit)

$C = 2\pi r$ or $2 \cdot \pi \cdot r$

Area: (unit^2)

$A = \pi r^2$ or $\pi \cdot r^2$

Three-dimensional circle

(called a sphere)

Volume: (unit^3)

$V = \frac{4}{3}\pi r^3$ or $\frac{4}{3} \cdot \pi \cdot r^3$

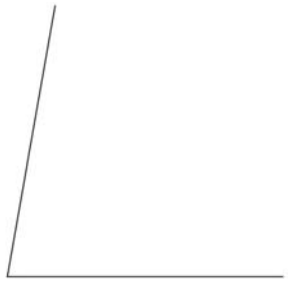
Surface Area: (unit^2)

$SA = 4\pi r^2$ or $4 \cdot \pi \cdot r^2$

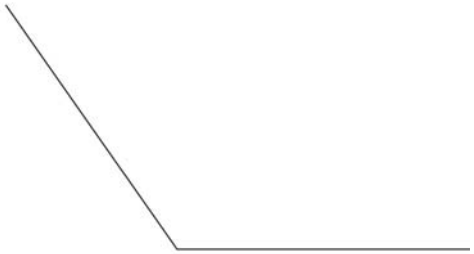
Examples:

Find the angle(s) and clarify the type.

1)



2)



Draw two supplementary angles.

GLUE HERE

Marvel Galactus Geometry Galaxy

Geometry

What is an angle?

Acute angle:

Right angle:

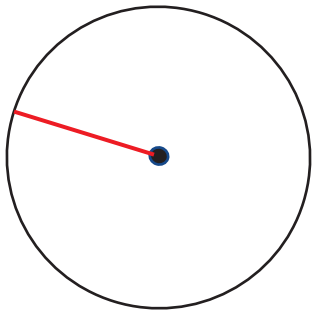
Obtuse angle:

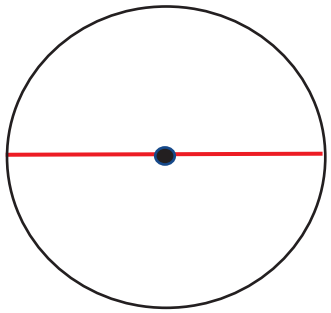
Straight angle:

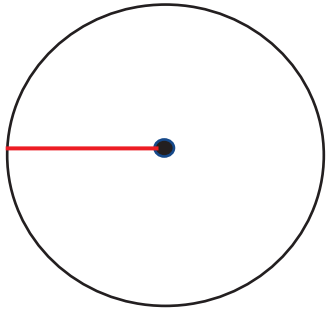
Complementary angles:

Supplementary angles:

Parts of the Circle



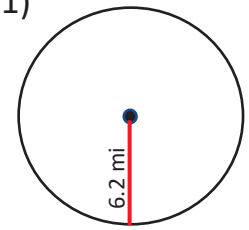




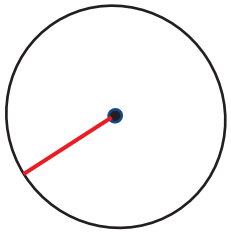
Examples:

Find the circumference and area.

1)

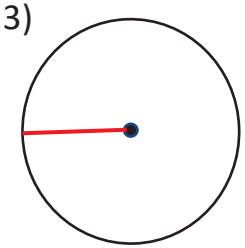


2)

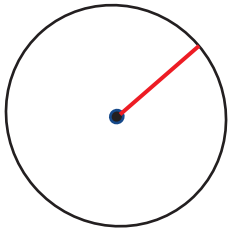


Find the volume and surface area.

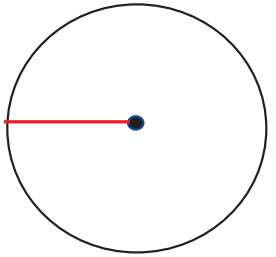
3)



4)



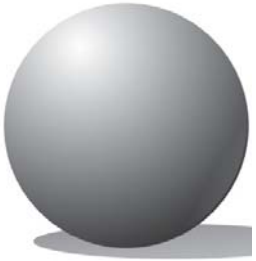
Two-dimensional circle



Circumference:

Area:

Three-dimensional circle



Volume:

Surface Area:

Lesson Plan Option 1: Traditional

Name of Lesson: Pixel Art

Learning (TEKS) Objective:

G.3A Describe and perform transformations of figures in a plane using coordinate notation.
G.3B Determine the image or pre-image of a given two-dimensional figure under a composition of rigid transformations, a composition of non-rigid transformations, and a composition of both, including dilations where the center can be any point in the plane.
G.3C Identify the sequence of transformations that will carry a given pre-image onto an image on and off the coordinate plane.

Scaffolding TEKS:

8.10A Generalize the properties of orientation and congruence of rotations, reflections, translations, and dilations of two-dimensional shapes on a coordinate plane.
8.10C Explain the effect of translations, reflections over the x- or y-axis, and rotations limited to 90, 180, 270, and 360 degrees as applies to two-dimensional shapes on a coordinate plane using algebraic representation.

Student Outcome: *Students will be able to…create and animate a pixel video game character to show slides, turns, flips, and resizing on Scratch.*

Day of the Week and Time

- Day 1: Monday, June 28th at 10:45AM-12:00PM
- Day 2: Tuesday, June 29th at 11:00AM-12:00PM
- Day 3: Wednesday, June 30th at 11:00AM-12:00PM
- Day 4: Thursday, July 1st at 12:30PM-1:15PM

Total Length of Lesson: 4hrs

Materials (per student):

- Tracing paper
- Coordinate graph paper
- Transformations Foldable
- Pencil
- Colored pencils or highlighters or markers
- Scissors
- Glue
- Ruler or straight edge
- Storyboarding a Video Game Handout or Jamboard
- RAFT Close Google Form
- I Have, Who Has? Cards or Jamboard (in pairs)
- Computer
- Scratch account

Technology

- PixilArt
- Scratch
- Google Slides
- Google Form

Advanced preparation

- Surprise pixel video game character coordinates (Pacman)
- Foldable and tracing paper demonstrations for geometric transformation notes
- Tutorial for PixilArt
- Scratch intro tutorial and sample program

Instructional Delivery Option 1 (use if everyone is doing the same thing)	**Notes to Teacher:**
Day 1: Transformations Graphic Organizer/Foldable (Review) **Duration: 1hr 15min**	
Warmup: Graph Points on Coordinate Plane (Review) An image is a grid of pixels (**pic**ture **el**ement**s**) arranged in columns & rows. A digital image is a list of coordinates that identifies what color each pixel is. Graph the list of points given to you, connect the points, and see what surprise video game character you graph! Place your tracing paper on top of your coordinate grid and trace the x-axis, y-axis, and Pacman again! Computer graphics make use of geometric transformations to make things happen on the screen. *Show Slide 4* All of these transformations that Mario undergoes in his game are geometric transformations. Do you remember the names for any of these?	**10min** **Slides 1-4**
Intro to transformations/activating prior knowledge with Mario: Use **Slides 5-13** to fill in front of foldable. Title page in notebook "Transformations" and write definition below it: "To change a figure by using a slide, flip, turn, or resizing" Also, "Preimage-figure *before* being transformed" and "Image-figure *after* being transformed" Instruct students to fold and cut **Transformations Foldable** accordingly and glue it to their notebook. *Demonstrate transformation with Mario* What other words make you think of this transformation? Let's write it down on the flap for each transformation. Did the shape and size of the figure stay the same (preserved) or change (not preserved) with this transformation? Highlight it under Congruence. Did the location on the graph of the figure stay the same (preserved) or change (not preserved) with this transformation? Highlight it under Position. Did the facing of the figure stay the same (preserved) or change (not preserved) with this transformation? Highlight it under Orientation. Additional points of discussion: what are some video game examples of this transformation?	**10min**
Transformations Foldable Using tracing paper and coordinate graphing paper, fill in the inside of the foldable for rules of translations, rotations, reflections, and dilations and properties of each. Pick 1 point/corner of Pacman that you will use to practice the transformations. We will be looking at what happens to the coordinates of that point after applying each transformation.	**35min**

Option 1: Tell them the rule and then demonstrate it with the tracing paper to make the example.
Option 2: Guide them in making the transformation with the tracing paper so they deduce the rule by asking what happened to the coordinates.

You can use a mix of both options depending on the transformation.

<u>Translation:</u>

- So, when we are sliding a figure on the coordinate plane, we have 2 sets of directions we can go: right or left AND up or down.
- Let's do an example so we can figure out what is the rule for the coordinates. We are going to slide our figure left 5 and up 2.
- Write down the coordinates of the point you picked and then an arrow, and let's see what happens to them after we slide the figure.
- Slide your figure 5 units to the left. Write your new x-coordinate.
- Slide your figure up 2 units. Write your new y-coordinate.
- Now, let's generalize what happened. We had a point (x,y), and what happened to the x-coordinate? It got subtracted by 5.
- What happened to the y-coordinate? It got added 2.
- Let's try one more example: we will slide our figure right 1 and down 7.
- Write down the coordinates of the point you picked and then an arrow, and let's see what happens to them after we slide the figure.
- Slide your figure 1 unit to the right. Write your new x-coordinate.
- Slide your figure down 7 units. Write your new y-coordinate.
- Now, let's generalize what happened. We had a point (x,y), and what happened to the x-coordinate? It got added 1.
- What happened to the y-coordinate? It got subtracted by 7.
- Okay! So it looks like our rule is something like every point on the figure (x,y) becomes (x plus or minus a number a, y plus or minus a number b). This means that each point on the figure shifts a units horizontally, +a if it goes to the right and -a if it goes to the left. And each point on the figure shifts b units vertically, +b if it goes up and -b if it goes down.

<u>Reflection:</u>

- For reflections, we also have 4 directions. Let's write them next to the bullet points and show what it looks like on the graph next to the bullet point.
- Remember we said it is like mirroring over a line, that is called the line of reflection.
- Our first line of reflection is going to be the y-axis, so write "over y-axis:" and on the little graph, it's like going over left and right
- Next, we are going to reflect over the x-axis and on the little graph, it's like going over up and down
- Third, we have over the line y=x, so on the little graph we are going to graph that line with dashes and then it's like going over it diagonally
- Finally, we have over the line y=-x, so on the little graph we are going to graph the line with dashes and then it's like going over it diagonally
- Now let's try an example of each so that we can figure out the rule of what happens to the coordinates for each direction
- Write the same point that you focused on for translation, flip your tracing paper over to reflect over the y-axis, and write your new coordinates. What happened to them? The x became negative

- Right! Now what if my preimage was what we have now with Pacman on Quadrant II, what would happen to the coordinates of my image (when it ends up on Quadrant I)? The x becomes positive
- Exactly! So it would be more accurate to just say that x becomes the opposite sign, so we have that for any point (x,y) on the figure it will become (-x,y). Let's circle/highlight the -x so we can remember more easily.
- One more thing to notice, which we have next to the star in our notes, is that every point on the figure remains the same distance from the line of reflection before and after the transformation. That is usually very helpful when you are trying to do these without the tracing paper.
- **Repeat previous process of demonstration for other 3 directions**

Rotation:

- For rotation, we said that it's a turn in a circle/a turn around. What two directions can you go in when you are going in a circle? Clockwise (to the right) and counterclockwise (to the left)
- Exactly! Now, in math, usually when you go clockwise it is considered a negative direction and counterclockwise is a positive direction
- Remember that when we are rotating, we are circling around a center of rotation, so every point in the figure must stay the same distance from that point. For our purposes today, our center of rotation will be the origin
- Let's try an example with the tracing paper on our grid so we can figure out the rules of rotations
- We start with a 0 degree rotation, so we're not going anywhere quite yet. That means that we write our original point that we have been focusing on from our Pacman figure
- We are going to start by rotating Pacman 90 degrees counterclockwise, which is the same as how many degrees clockwise? 270 degrees
- So to do it on the graph, hold your tracing paper with your pencil on the origin (our center of rotation), and let's rotate it. The way you make sure it is exactly 90 degrees is by lining up the axes again. What are the new coordinates of your point? Write them in the table
- Okay, now we are rotating it 180 degrees counterclockwise, which is the same as how many degrees clockwise? 180 degrees
- Again, hold your tracing paper with your pencil on the origin and rotate it 180 degrees from where our original Pacman started.
- Write the new coordinates for your point on the table.
- **Repeat for 270 degrees counterclockwise/90 degrees clockwise and 360 degrees counterclockwise/360 degrees clockwise**
- Alright, so let's generalize what happened to the coordinates after every rotation.
- For the first rotation, what happened to the coordinates compared to the original ones? The x and y switched and the y became negative
- Exactly! But remember that it doesn't necessarily become negative, it just becomes the **opposite** sign
- What happened after the 180 rotation? The x and y switched and they became the opposite sign as well
- What happened after the third rotation? The x and y switched and this time the x became the opposite sign
- What happened after the full turn? The coordinates stayed the same as the original/we came back to start

Dilation:

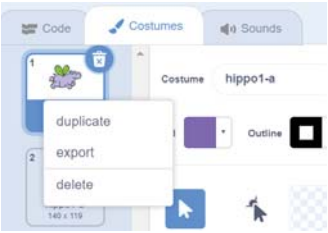
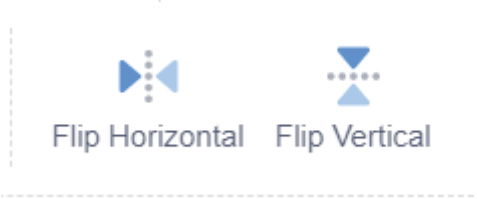
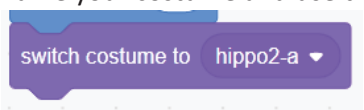
- ➢ For dilation, the size of our figure is going to change! It will become bigger or smaller in relation to a center of dilation. In our case, our center of dilation will just be the origin
- ➢ Now, to specify how much our figure is going to grow or shrink, we have a scale factor which we call k
- ➢ The rule is that you take every point on your preimage and multiply both the x and y times the scale factor
- ➢ What do you think will happen if k<1? Hint: this means we are multiplying each point by a fraction The figure will shrink/become smaller
- ➢ What do you think will happen if k>1? Hint: for example, we multiply each point times 2, that's like doubling, no? The figure will grow/become bigger
- ➢ For an example of a reduction where k=½, we would take every point on the figure and divide their x and y by 2. Let's actually try this one on our graph and shrink Pacman to half its size! *If necessary, display the points for the original Pacman from the warmup so it is easier to half them*
- ➢ For an example where an enlargement where k=2, we would take every point on the figure and double their x and y. We won't actually try this one because we have a point that is (10,0) and if we double it, we would need (20,0) and that won't fit on our graph.

Guided Practice: I Have, Who Has? Practice

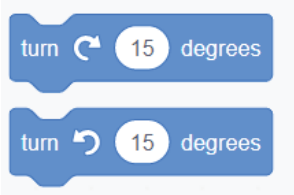
15min

Students in-person:	**Students at-home:**
Put students into groups of 4-6 (this way, each student gets 4-6 cards to play). 1. One student deals out the cards to all players 1. The player to the left of the dealer will choose a card to start by reading the question on the bottom out loud and placing it facing up in front of them 2. The student who has the correct answer to the first student's card then reads their card and places it on top or right below the first card. The cards will loop back to the original card at the end. 3. Option: The first person to turn over all of their cards, wins the game. 4. Shuffle the cards and repeat the game. OPTION: Round 1, let everyone help each other in getting the answers. Round 2, no talking at all and they have to find a different way to communicate to arrange the cards.	Pair students and assign them a Jamboard. Pairs are just working together to arrange the cards in order as quickly as possible. If they finish before time is up and there's time for them to do another round, have them try to beat their first time. OPTION: Have the online pairs/teams race against each other.

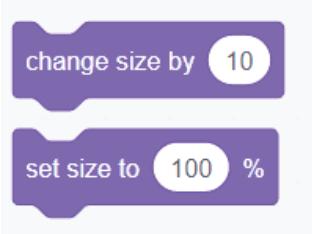
Close: Pick one of the transformations and describe it in your favorite video game. Send it in the chat!	**5min**
Day 2: Create your own digital Pixel Character & Video Game Duration: 1hr Between yesterday and last week, we mentioned that an image is a grid of pixels (**pic**ture **el**ement**s**) arranged in columns & rows. A digital image is a list of coordinates that identifies what color each pixel is through code in hexadecimal. Today, you will create your own video game pixel character on PixilArt. Use at least 3 different colors. You may use already existing characters as inspiration but you must recreate them from scratch pixel by pixel (do not use the stamps) OR you may create your original pixel character. **https://www.pixilart.com/** **PixilArt Tutorial** I forgot to include how to download. You will click the Download icon next to the Settings gears and download as PNG file. Make sure students do this and save it somewhere on their computer or turn it in on Google Classroom because they will need it tomorrow!!!	**20min** Before they begin, instruct students to resize graph to 20x20 or 30x30 pixels.
Storyboarding a Video Game Handout or Jamboard* Video game designers use geometric transformations to make the characters and things in their video games move. A storyboard is the planning of a story/video frame by frame. Use the template to create a chase video game for your pixel character. It must include a sketch of what the setting will look like, your main character in it, a positive points factor/character, and a negative points factor/character. You may also include conditions in which you win and lose the game. Your character(s) must undergo at least 3 out of the 4 transformations that we discussed yesterday. Rubric Pixel character is at least 3 different colors Pixel character has a clear video game world that it comes from depicted by the background of each frame (Setting) Positive points factor/character Negative points factor/character Conditions to win/lose (OPTIONAL) Character undergoes at least 3 out of 4 geometric transformations. List them: _____, _____, and _____.	**30min** *Students have the option of making their storyboard on a Jamboard. This way, they can use images from the internet that they can also upload to Scratch when they begin coding it.
Close: Google Form Role- Video Game Player Audience- Video Game Designer Format- Interview Topic- Design 2-3 questions you can ask a video game designer about how to bring your video game to life or how they create their own video games.	**10min** In the afternoon of this day, we will have a guest speaker who is a videogame designer. Students should have 2-3 questions ready to ask them.
Day 3: Animate/Program on Scratch Duration: 1hr Sample Game: https://scratch.mit.edu/projects/518504548	**5min** Students will have to create

Teachers update link for the sample game that one of YOU created during our run through so that each of our classes is commenting on a different game and so that it is different than the one you showed them as an example on Day 2 **Warm Up:** Have students play the game and comment where they see at least 1 geometric transformation	a Scratch account so that their work is saved and they can come back to it.
We will be using Scratch to bring your video game to life. I will show you how to program each of the transformations on Scratch with a quick tutorial. Follow along, please. **Teachers: when you are preparing for this lesson, follow the **Create a Chase Video Game tutorial on Scratch** to learn it. Then, you may prompt students to follow the same tutorial along with you OR you may guide them yourselves. Here is a sample teach video I made for this lesson (ignore the Kahoot warmup, it was for a different project).** Translation:  Reflection: Under Costumes tab, right-click on your character, and select duplicate  Now, you can create a new “costume” where your character is reflected across the y-axis or the x-axis  Name your costume and use the “Switch costume to” block  	**45min**

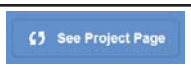
Rotation:



Dilation:



Use your graphic organizer/foldable/notes to help you with the coordinate notation.

Close: Click 

and write Instructions for how to play your game. In the notes and credits, explain where you see the geometric transformations you decided to use.

Update on how close they are to finishing coding their video game. Send in the chat.

10min

Day 4: Gallery Walk & Peer to Peer Feedback **Duration: 45min**

Share your project on Scratch and put link on a shared Google Doc. Go through and play at least 3 of your classmate's games and leave a constructive message in the comments! Use Glows & Grows sentence starters to help you:

GLOW	GROW
I like how you... You did a wonderful/excellent/great job... You succeeded in.... Terrific work on... This is quality work because... I like the way you included... I really enjoyed this because.... I think the best thing about your work is... The most outstanding aspect of your work is...	It might be helpful to... Perhaps you could... Would it be better if...? You may need more... You may need less... Your next steps might be... You might try... Your response may be more effective if you... The part about _____ is a little confusing. You could... One suggestion would be to... The task was to....Be sure to...

Use any time needed at the beginning of class to make sure that everyone finishes coding their video game.

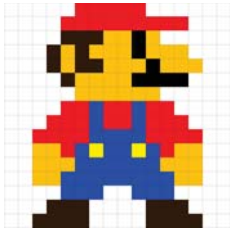
Remaining time (prioritize leaving ~25min) is for students to play each other's games and leave feedback in the comments.

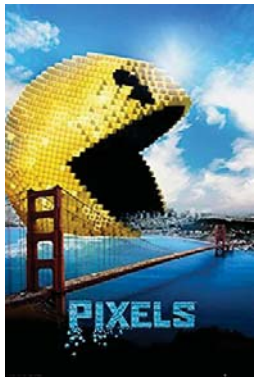
Back to Table of Contents

Pixel Art

An image is a grid of pixels (**pi**cture **el**ement**s**) arranged in columns & rows.

A digital image is a list of coordinates that identifies what color each pixel is.





Warm Up

Graph the following list of points, connect the points, and see what surprise video game character you graph!

START

(4,5)
(5,5)
(5,6)
(6,6)
(6,7)
(10,7)
(10,6)
(11,6)
(11,4)
(8,3)
(11,3)
(11,1)
(10,1)
(10,0)
(6,0)
(6,1)
(5,1)
(5,2)
(4,2)
(4,5)
END

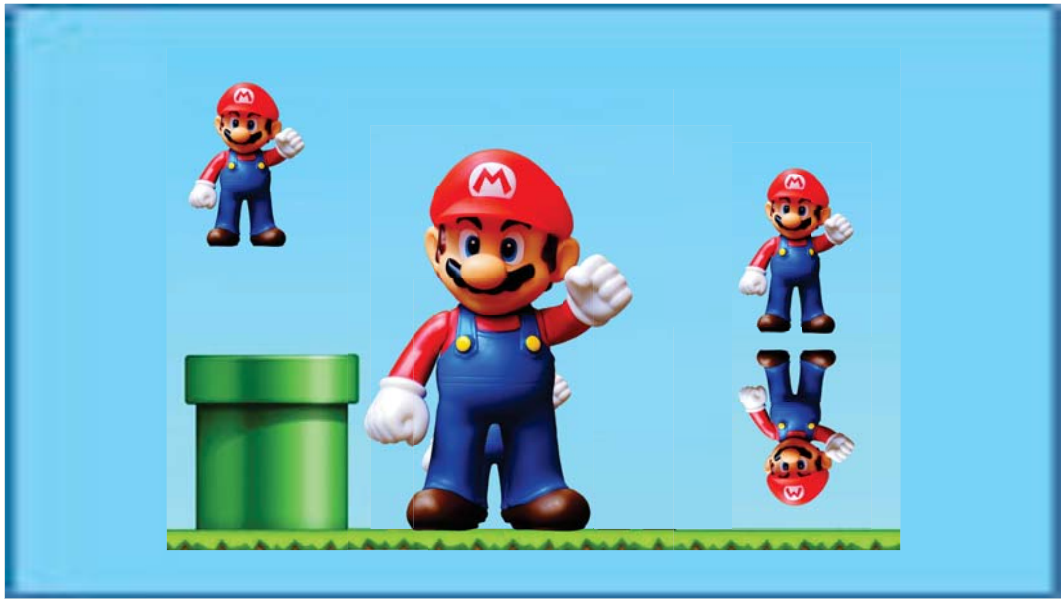
Do not connect this point: (9,5)

Place your tracing paper on top of your coordinate grid and trace the x-axis, y-axis, and Pacman again!

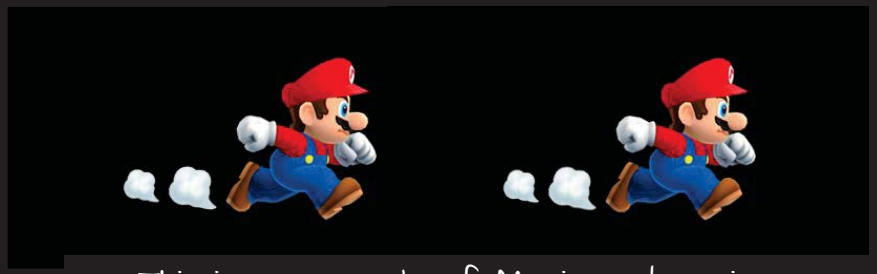
Computer graphics make use of geometric transformations to make things happen on the screen.

Do You Know Your Transformations?

Let's ask Mario for help!

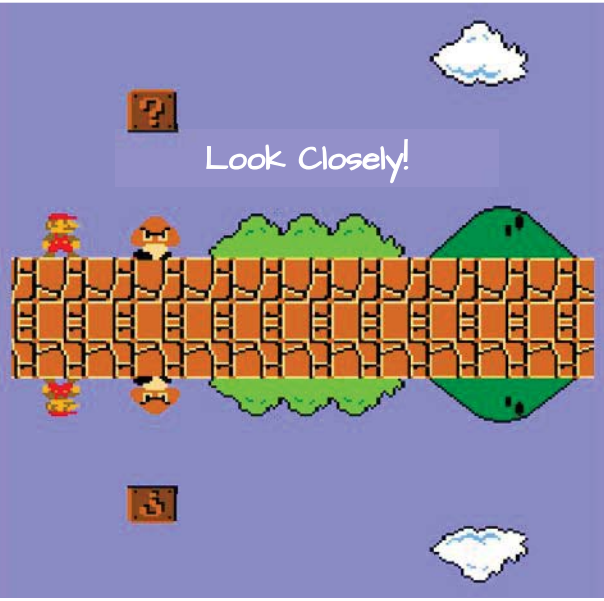


On a Mission!

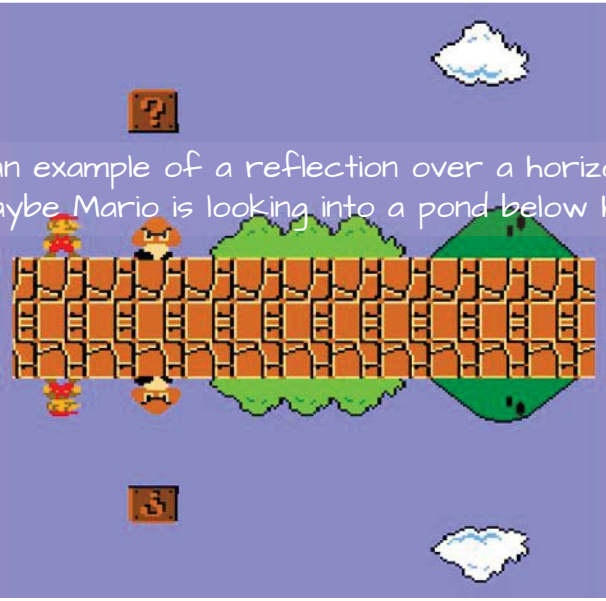


This is an example of Mario undergoing a translation. He is changing positions.

Look Closely!

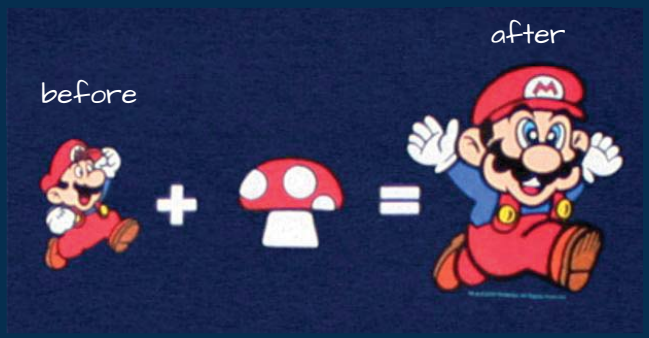


This is an example of a reflection over a horizontal line. Maybe Mario is looking into a pond below him.

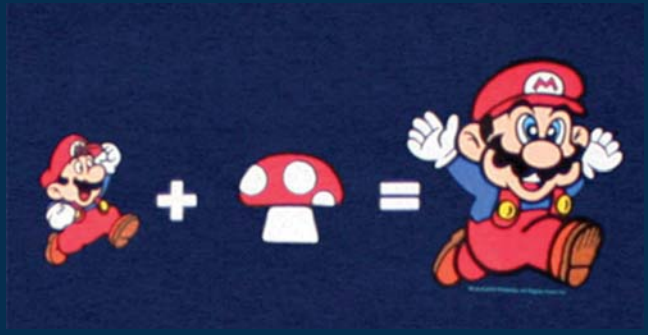


click for answer

This is an example of Mario undergoing a rotation. Which direction and how far?



What happened?



This is an example of Mario undergoing a dilation. When he eats a super mushroom, he grows!

Thank you for your help, Mario!

I Have, Who Has?

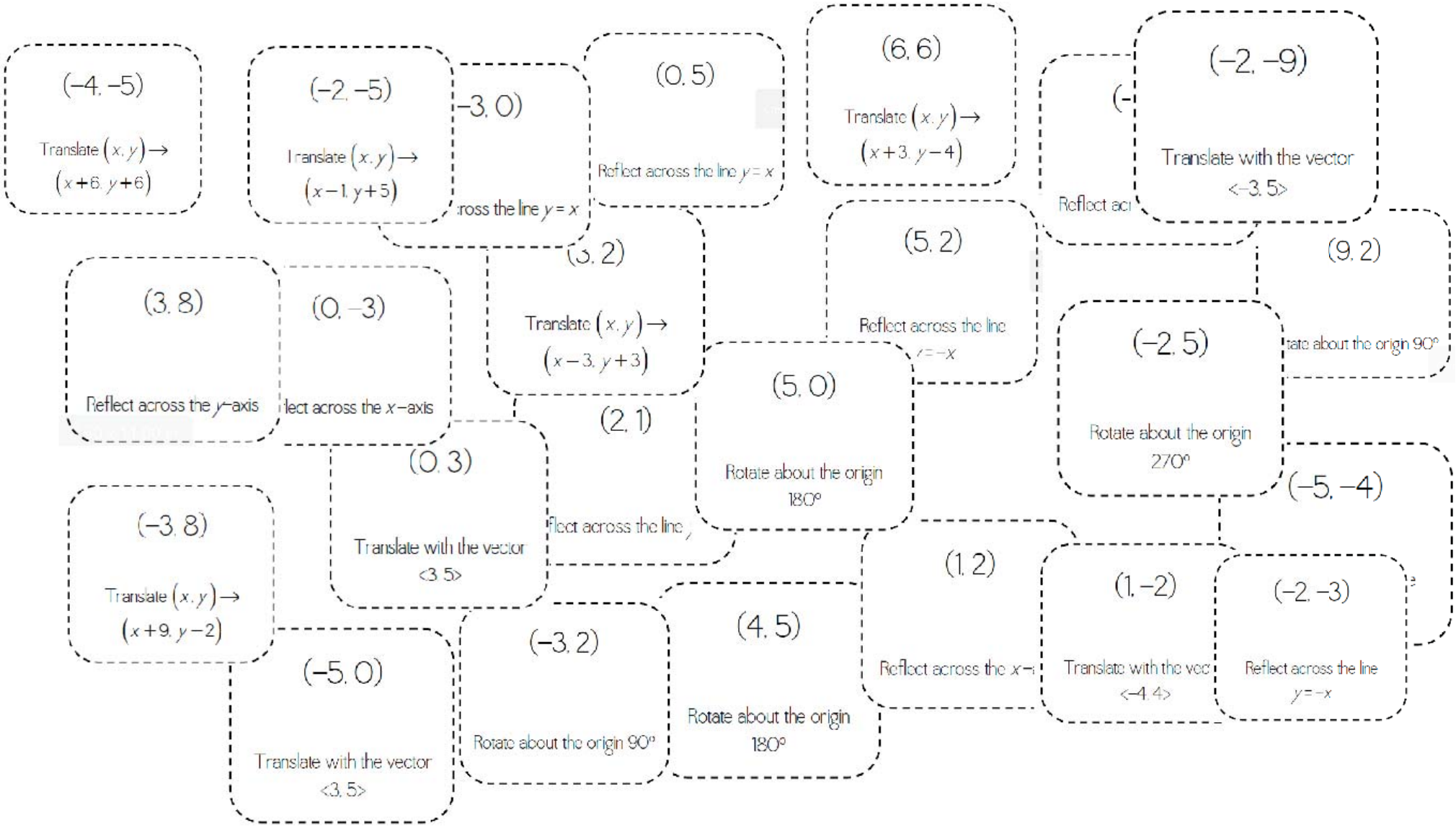
Your goal as a team is to arrange the cards in the next slide in order as quick as possible!

1. Decide on a card to start with and read the question at the bottom of the card.

2. Find the card that has the correct answer on the top part.

3. Line the cards up so that the question and the answer are touching.

4. Keep going until the last card loops back to the top of the first card!


(−4, −5)
Translate $(x, y) \rightarrow (x+6, y+6)$
(−2, −5)
Translate $(x, y) \rightarrow (x-1, y+5)$
−3, 0)
ross the line $y = x$
(0, 5)
Reflect across the line $y = x$
(6, 6)
Translate $(x, y) \rightarrow (x+3, y-4)$
(−2, −9)
Translate with the vector <−3, 5>
Reflect act
(3, 8)
Reflect across the y−axis
(0, −3)
lect across the x−axis
(3, 2)
Translate $(x, y) \rightarrow (x-3, y+3)$
(5, 2)
Reflect across the line $y = -x$
(9, 2)
ate about the origin 90°
(2, 1)
(5, 0)
Rotate about the origin 180°
(−2, 5)
Rotate about the origin 270°
(−5, −4)
(0, 3)
Translate with the vector <3, 5>
flect across the line
(−3, 8)
Translate $(x, y) \rightarrow (x+9, y-2)$
(1, 2)
Reflect across the x−
(1, −2)
Translate with the vec
<−4, 4>
(−2, −3)
Reflect across the line $y = -x$
(−5, 0)
Translate with the vector <3, 5>
(−3, 2)
Rotate about the origin 90°
(4, 5)
Rotate about the origin 180°

ReFLection

"FLip"

reverses, mirror over a line

Congruence
preserved / not preserved

Position
preserved / not preserved

Orientation
preserved / not preserved

TranSLation

"SLide"

moving from one place to another, glide, shift, relocation, transportation

Congruence (shape & size)
preserved / not preserved

Position (location on graph)
preserved / not preserved

Orientation (facing of figure)
preserved / not preserved

DIlatIon

"ResIzIng"

grow/shrink, stretch, enlarge, expand/ reduce, minimize/ maximize

Congruence
preserved / not preserved

Position
preserved / not preserved

Orientation
preserved / not preserved

RoTaTion

"Turn"

turn around, spin, cycle, cartwheel, revolve around a point

Congruence
preserved / not preserved

Position
preserved / not preserved

Orientation
preserved / not preserved

DIRECTIONS: ⇄ or ⇅

Ex: Left 5, Up 2

$(4,5) \rightarrow (-1,7)$

$(x,y) \rightarrow (x-5, y+2)$

Ex: Right 1, Down 7

$(4,5) \rightarrow (6,-2)$

$(x,y) \rightarrow (x+1, y-7)$

RULES

$(x,y) \rightarrow (x \pm a, y \pm b)$

shifts a units horizontal

+a right

−a left

shifts b units vertically

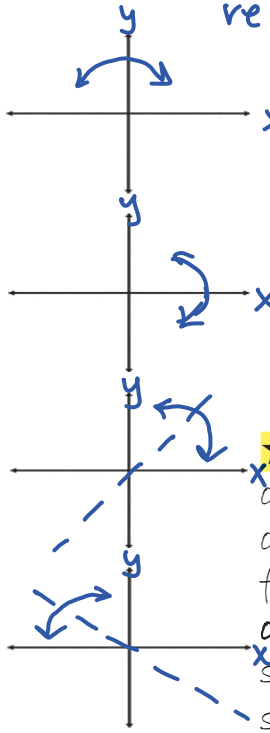
+b up

−b down

RULES

- over y-axis:
  $(4,5) \rightarrow (-4,5)$
  $(x,y) \rightarrow (-x, y)$
- over x-axis:
  $(4,5) \rightarrow (4,-5)$
  $(x,y) \rightarrow (x, -y)$
- over line $y=x$:
  $(4,5) \rightarrow (5,4)$
  $(x,y) \rightarrow (y,x)$
- over line $y=-x$:
  $(4,5) \rightarrow (-5,-4)$
  $(x,y) \rightarrow (-x,-y)$

DIRECTIONS: over line of reflection



★ Distance of each point on the figure from the **line of reflection** stays the same!

DIRECTIONS: around center of rotation (origin)

CC counter-clockwise (+)

C clockwise (−)

★ Distance of each point on the figure from the **center of rotation** stays the same!

RULES

CC (+)			C (−)
0°	(4,5)	(x,y)	0°
90°	(−5,4)	(−y, x)	270°
180°	(−5,−4)	(−x, −y)	180°
270°	(5,−4)	(y, −x)	90°
360°	(4,5)	(x,y)	360°

RULES

k = scale factor

$(x,y) \rightarrow (kx, ky)$

$k<1$: reduction/ shrink

$k>1$: enlargement/ grow

DIRECTIONS: center of dilation (origin)

Ex: Reduction $k=\frac{1}{2}$

$(x,y) \rightarrow (\frac{1}{2}x, \frac{1}{2}y)$

Ex: Enlargement $k=2$

$(x,y) \rightarrow (2x, 2y)$

★ Distance of each point on the figure from the **center of dilation** is multiplied by scale factor!

S

Lesson Plan Option 1: Traditional

Name of Lesson: Angry Birds

Learning (TEKS) Objective:A.7(A) & A.6(B)

Student Outcome: *Students will be able to identify the key attributes of a parabola to write the quadratic function given the vertex and another point on the graph*

Day of the Week and Time
Tuesday 9 am - 9:45 am

Total Length of Lesson: 45 minutes

Are the 3 activities the same as the 3 learning centers? Can you make it clearer? Tools, Tasks and Strategies?

You also need to integrate the components of the 5-E lesson plan into this format (i.e. make sure all is addressed somewhere in this format).

Engage

Explore

Explain

Elaborate (Expand)

Evaluate

Keep going!

Materials (per student):

- Paper
- Pencil

Technology

- Laptop
- Calculator (Math can be done through the website DESMOS)

Advanced preparation

- Set up the tables in 3 different for each group
- Create markings on the floor of 10 ft - 15 ft - 20ft
- Find out multiple IXLs just in case students finish earlier

- **Create a lesson to review the methods of creating quadratic equations using different key items gathered in the graph**

How to accommodate activities for students who are English Language Learners or have trouble focusing

- **The lessons will be mainly visual rather than auditory based and they are allowed to ask for help should they need it from their peers.**

Instructional Delivery Option 1 (use if everyone is doing the same thing)		**Notes to Teacher:**
Activity 1: Desmos Duration: 15 minutes **The instructors will review the content using the examples on the desmos activity which will be presented on a touch screen /shared screen.** **Teacher Activity link:** **https://teacher.desmos.com/activitybuilder/custom/60d8fba26054b7f1edba3727** **Student:** **https://student.desmos.com/activitybuilder/student-greeting/60d9058ea79807f358987e45**	**This will be an extension of the notes** **Please stop the presentation after you have reached to the slide labelled "Real Life Examples"** **Stop on slide 10 then move onto the desmos activity** **Please tell students the "a" or amplitude will either be .25, .5 .75, 1, 2, 3, 4, 5**	
Activity 2: Review Duration: 15 min **There will be a youtube video linked in the website to get the students in the process of reviewing for the upcoming test.**	**You will instruct the students on how to take the notes, definitions go in the back of the formula and each formula gets their own flap**	**Ask them to think of real life examples of the use of quadratic equations**
Activity 3: IXL Duration: 15 min		

The instructors will review the content using the examples on the desmos activity which will be presented on a touch screen /shared screen. **Teacher Activity link:** **https://teacher.desmos.com/activitybuilder/custom/60d8fba26054b7f1edba3727** **Student:** **https://student.desmos.com/activitybuilder/student-greeting/60d9058ea79807f358987e45**		

Back to Table of Contents

Making
Quadratic Equations through Zeros

A guide by MaST Summer Camp 2021 Scholars

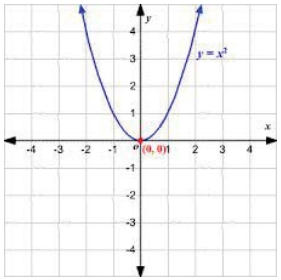
Before we start let's create a foldable

https://youtu.be/lvj0tFYYoLA?t=37
Title the foldable: Quadratic functions
1. Standard Form
2. Vertex Form
3. Intercept Form

Each will be the titles of each flap

What is a Quadratic Function?

- A quadratic function is a polynomial function with one or more variables with the highest-degree term is of the second degree
  - Second degree?
    - That just means that 2 is the highest exponent the equation can have
  - Polynomial function?
    - There are more than one terms in the equation.



What do I need to look for?

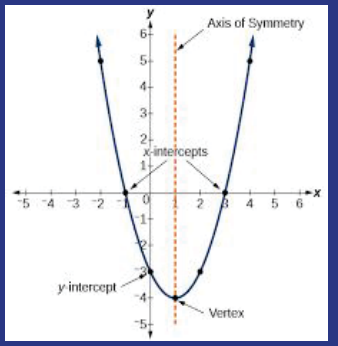
When looking at the graph of a quadratic equation look for these key characteristics:

- X - intercepts - the point at which the line crosses the x-axis-

  -Are also known/have the names "Zeros' and "Solutions"

- Vertex - the point at which the function crosses the line of Symmetry
- Line of Symmetry - A vertical line that divides the parabola into two congruent halves

(Put these on the back of the foldable)



How many ways can we write a Quadratic Function?

- There are a total of 3 ways to write a quadratic function
  - Standard Form
    - $f(x) = ax^2+bx + c$
  - Vertex Form
    - $f(x) = a(x-h)^2+k$
  - Intercept Form
    - $f(x) = a(x-r)(x-s)$

Tip

There is the possibility of have either 2, 1, or no x-intercepts so be weary and make sure to read the graph carefully!.

The Effects of “a”

- All formulas come with the inclusion of “a”
- “A ” can affect the way a graph is drawn in four ways
  - A > 0 (+), the parabola opens **UP**
  - A < 0 (-), the parabola opens **DOWN**
  - |A| < 1 (decimal), the parabola is wider than y=x^2
  - |A| > 1 (Greater than 1), the parabola is narrow than y = x^2

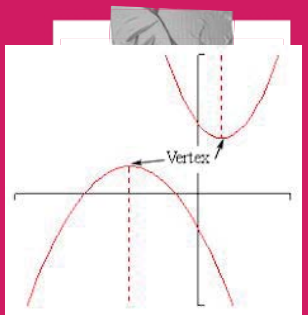
Standard Form

This form presents the most simplified version of the quadratic equation

- Presents itself from the highest degree to the smallest
- You’ll be able to identify the *a, b,* and *c*

How do I create a quadratic function with the vertex?

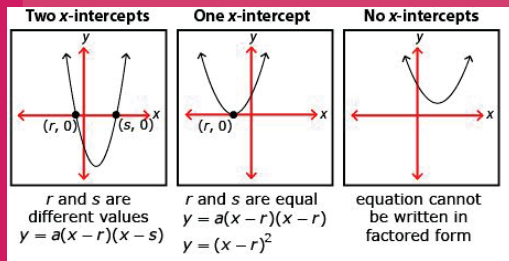
- The vertex will be read as (h,k) or (r,s)
- When written in the vertex form, the sign of the x-value will switch
- Remember the vertex is either the min or max of the function



Vertex Form

When using this form it's very easy to identify the vertex
Along with this you are also able to identify the "a" which tells you the shape of the parabola

When can I use the intercept form?



When?

To put it simply, when there's an x-intercept you can use it but based off the figures there's sometimes no intercepts to use

However...

When you do find your intercepts:

Use the functions given in the picture to create fill in the blanks

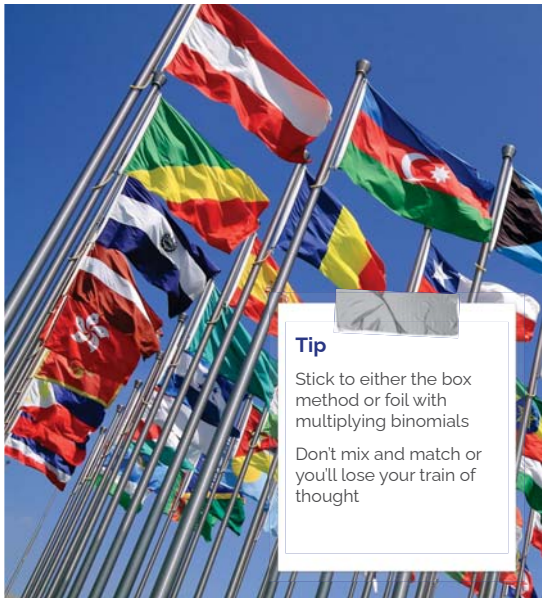
Tip

Use the box method or Foil to help you distribute in order to change it to Standard

What about finding the standard form?

SIMPLIFY YOUR ANSWER

There is nothing more to it, you may use foil or the box method to simplify the function you have made using the other two strategies. REMEMBER you must change the signs accordingly



Tip

Stick to either the box method or foil with multiplying binomials

Don't mix and match or you'll lose your train of thought

Real World Examples

What are some examples you may ask?

It's used for important jobs and some not so much, such as:

- The military finding the trajectory of their cannon
- Athletes subconsciously do it while doing Olympic events such as Javelin and Shot Put

And most importantly In the Popular video game...

Angry Birds!!!

Stop Catapults construction will begin tomorrow!

Time for some Catapults!

By now you should have received your materials to construct your own catapult and fire at the pigs before you

Firstly, why a catapult?

Well, to put it simply.

- Slingshots like the ones the video games hurt
- Just like quadratics with a fixed x-intercept, the catapult and pig will be at a fixed distance
- When moving you it is known that the equations will never stay the same if the zeroes or x-intercept change

How to build the catapult

Listed here are various links to youtube videos that can help you in your building process. You may choose to try it out yourself if you're up for the challenge.

- https://youtu.be/WpLFC_SOpXs
- https://youtu.be/wx9rXwn_hSs
- https://youtu.be/S0hjoZbVqfk (This one says it requires glue but it can be easily replicated with a rubber band)

Team Builder

Name of Team Builder: Food to Feces

How does your team builder connect to your lesson or the overall theme?
Students will work as a class to successfully arrange how food goes from food to feces.

Day of the Week and Time
Week 2: Wednesday, 8:15-8:45 AM

Total Length:
30 minutes

Materials (per student)**:**

- **Colors**
- **pencil**
- **puzzle piece**

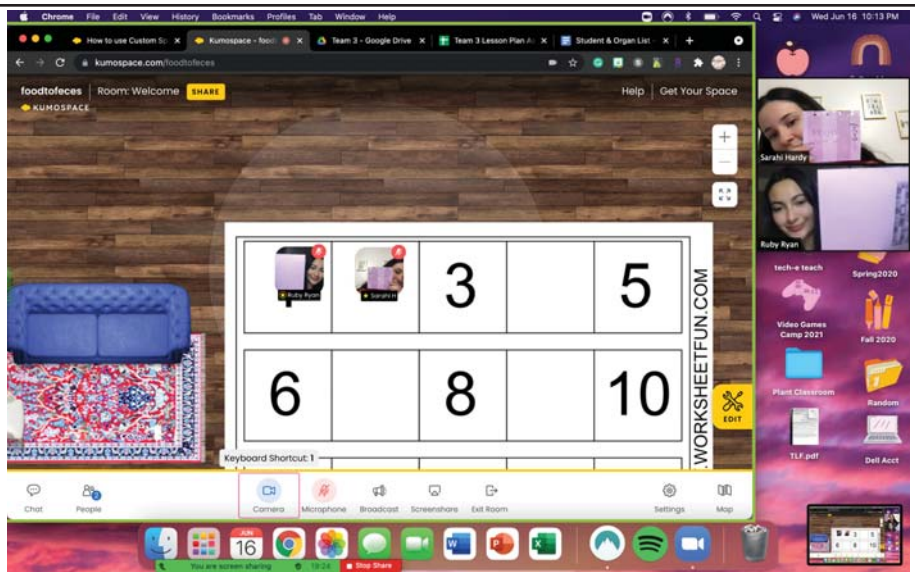
Technology Required (websites, Zoom video, chat, phones, etc.)**:**

- Laptop for class grouping/ discussion (Zoom)

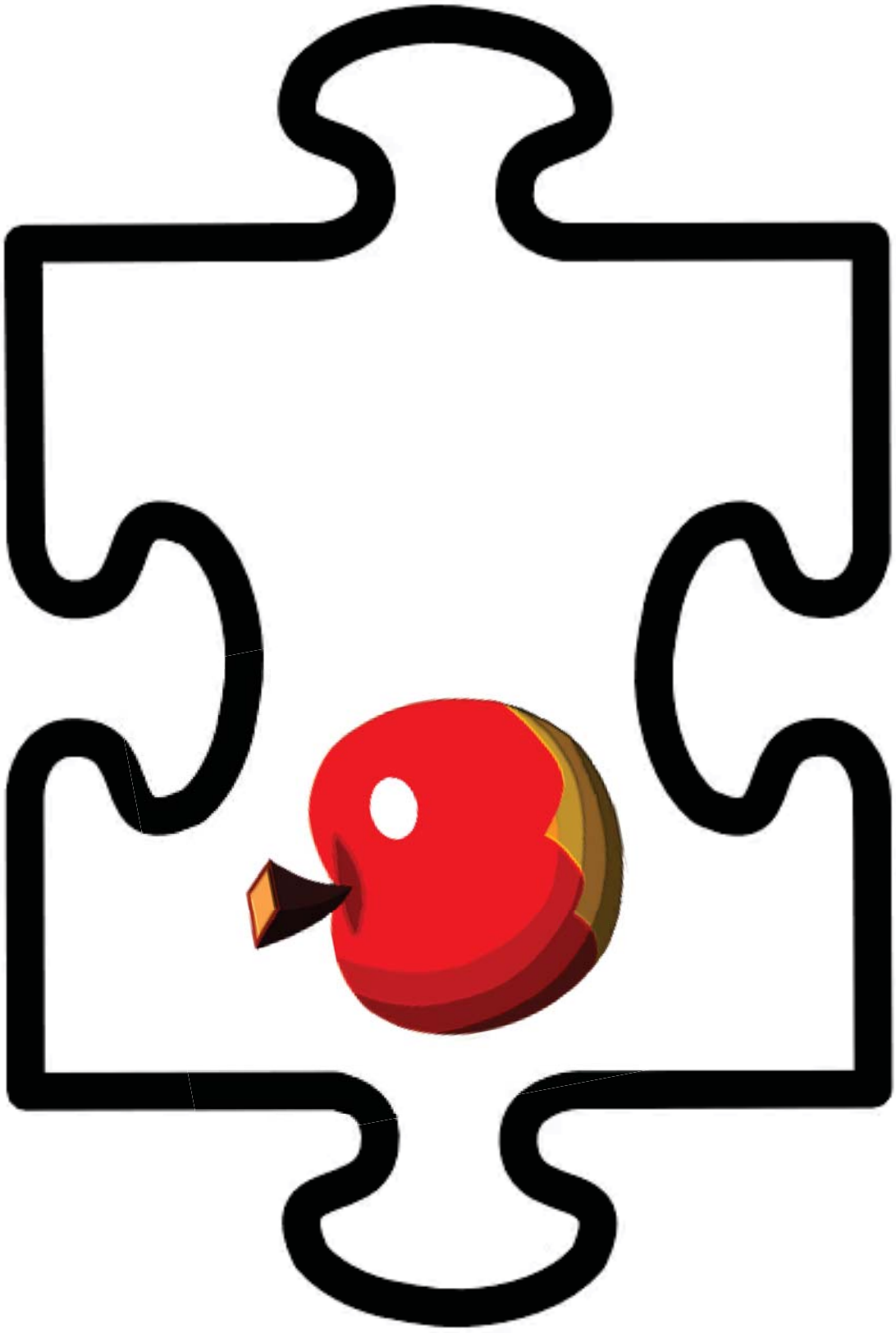
Advanced preparation

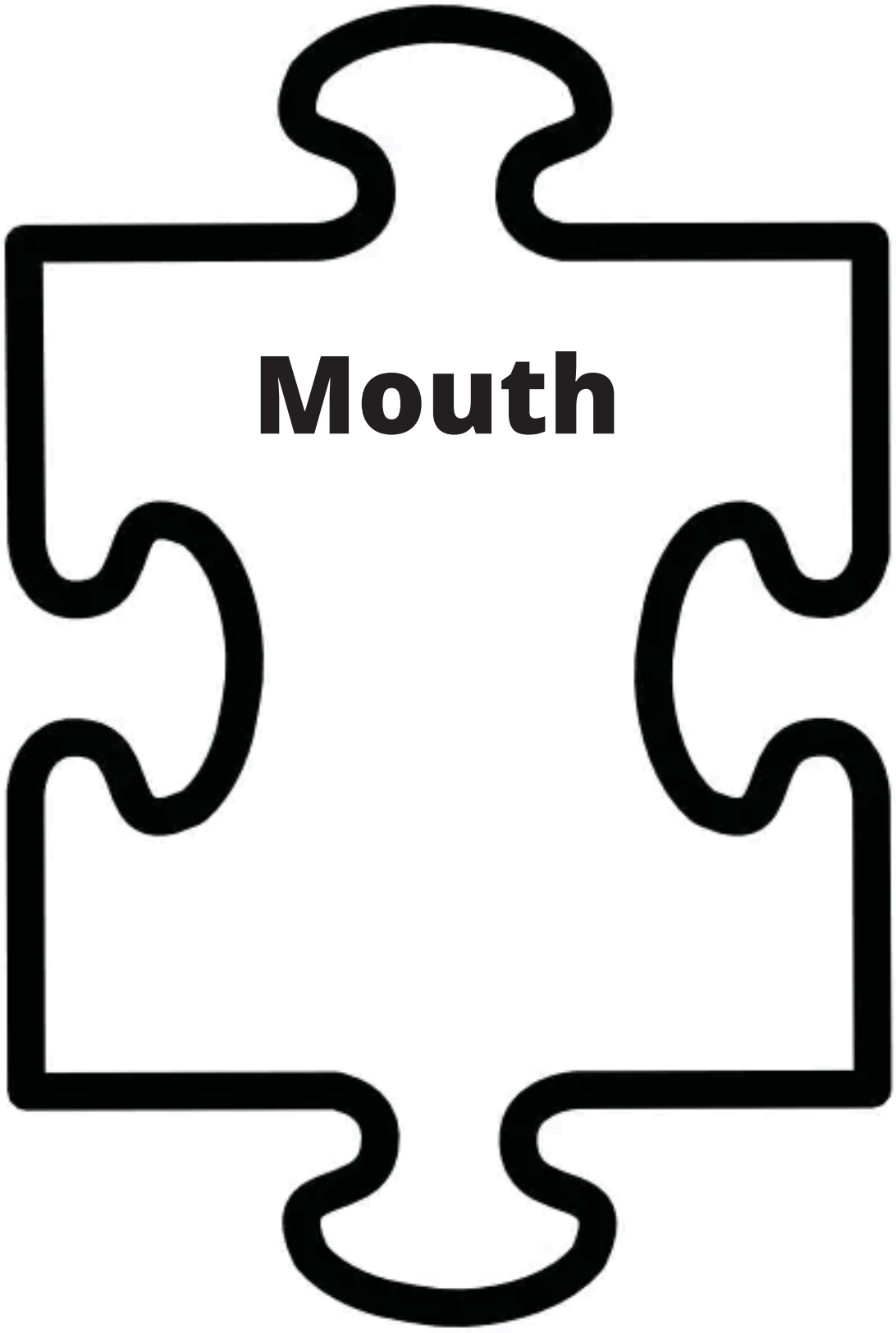
- Choosing roles (puzzle pieces) for the students to draw and decide order

Description Option 1 Assign and Decorate	**Notes to Teacher:**
Randomly assign students a puzzle piece from the class set. Give students 15 minutes to decorate and color their piece(s). They must also cut out their puzzle piece! Once decorated- Students must discuss as a class what pieces are needed to get from food to feces! Extra pieces with body parts not a part of the digestive system were given. Let's see if they can figure out the correct order of the puzzle as a team! https://www.kumospace.com/foodtofeces	There may be left over pieces so give students multiple pieces if needed. All pieces from the class set must be used.

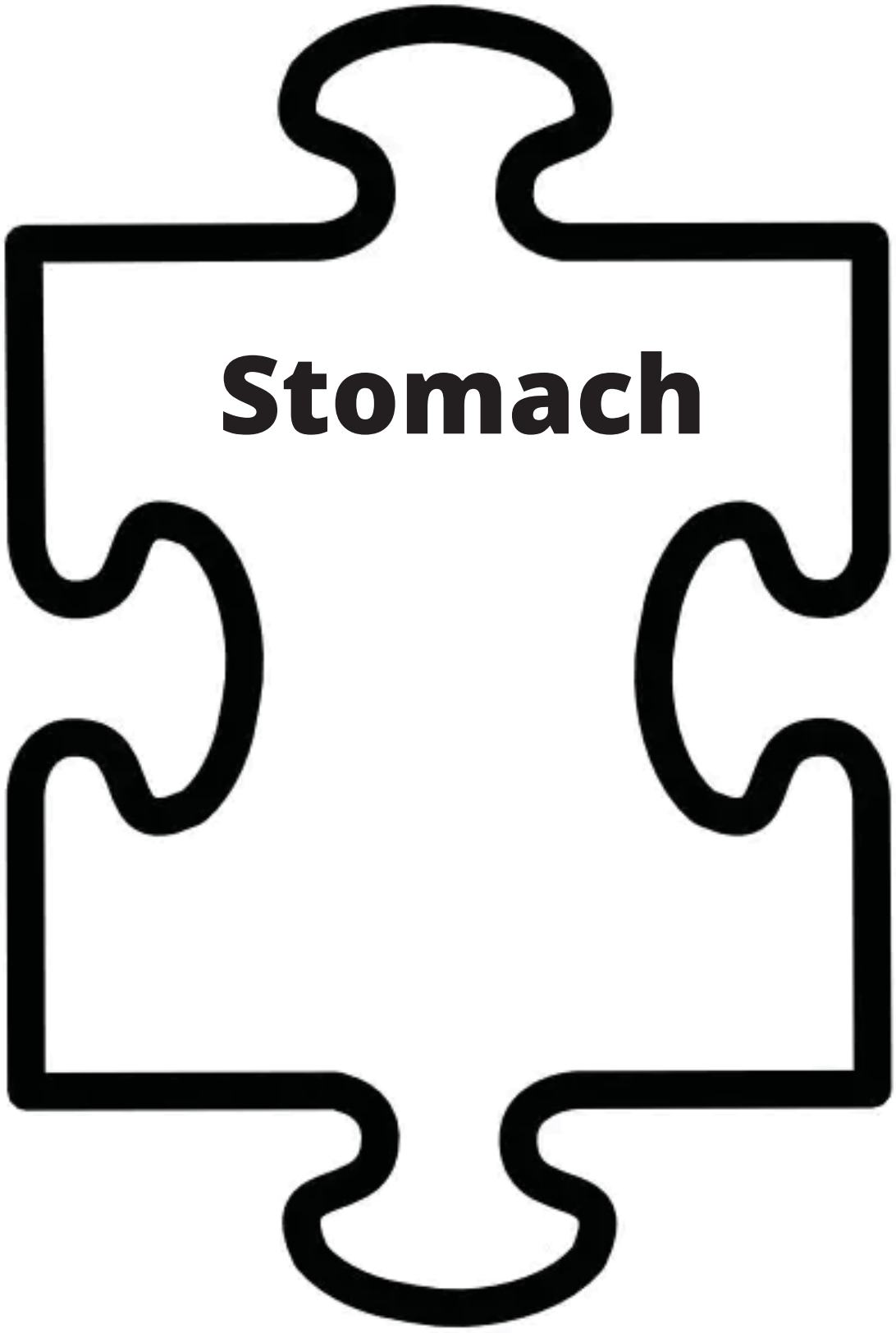


Back to Table of Contents

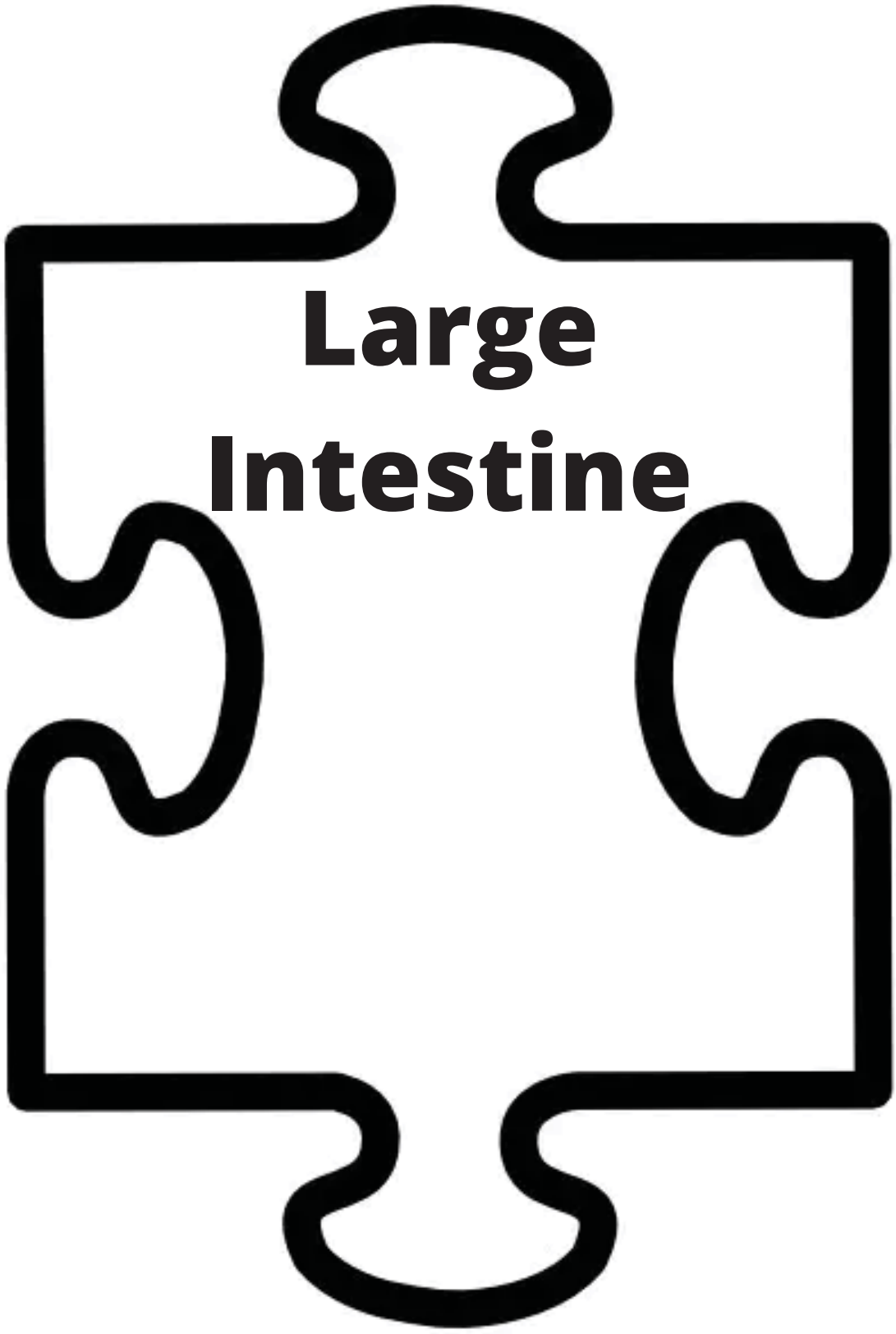


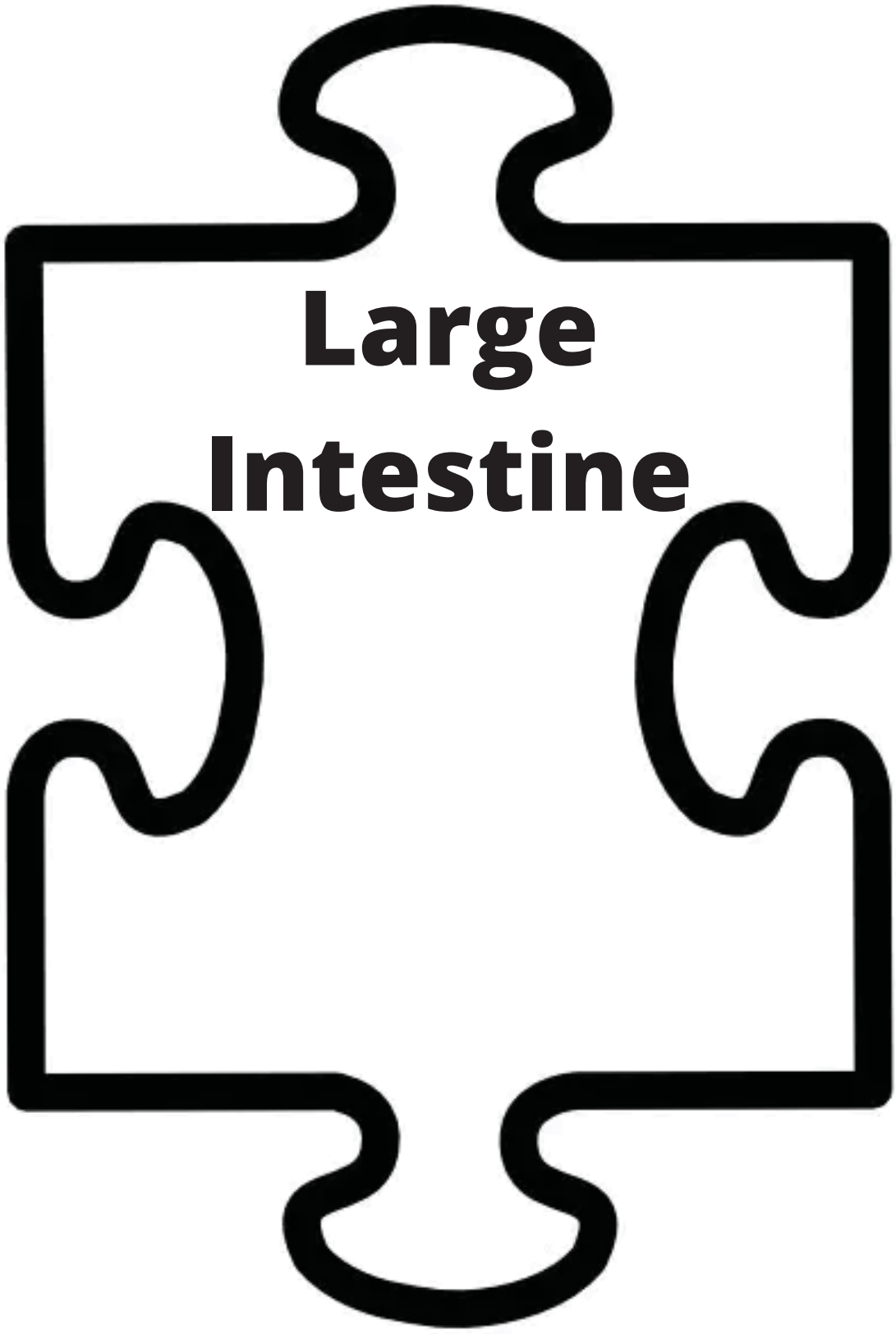

Mouth

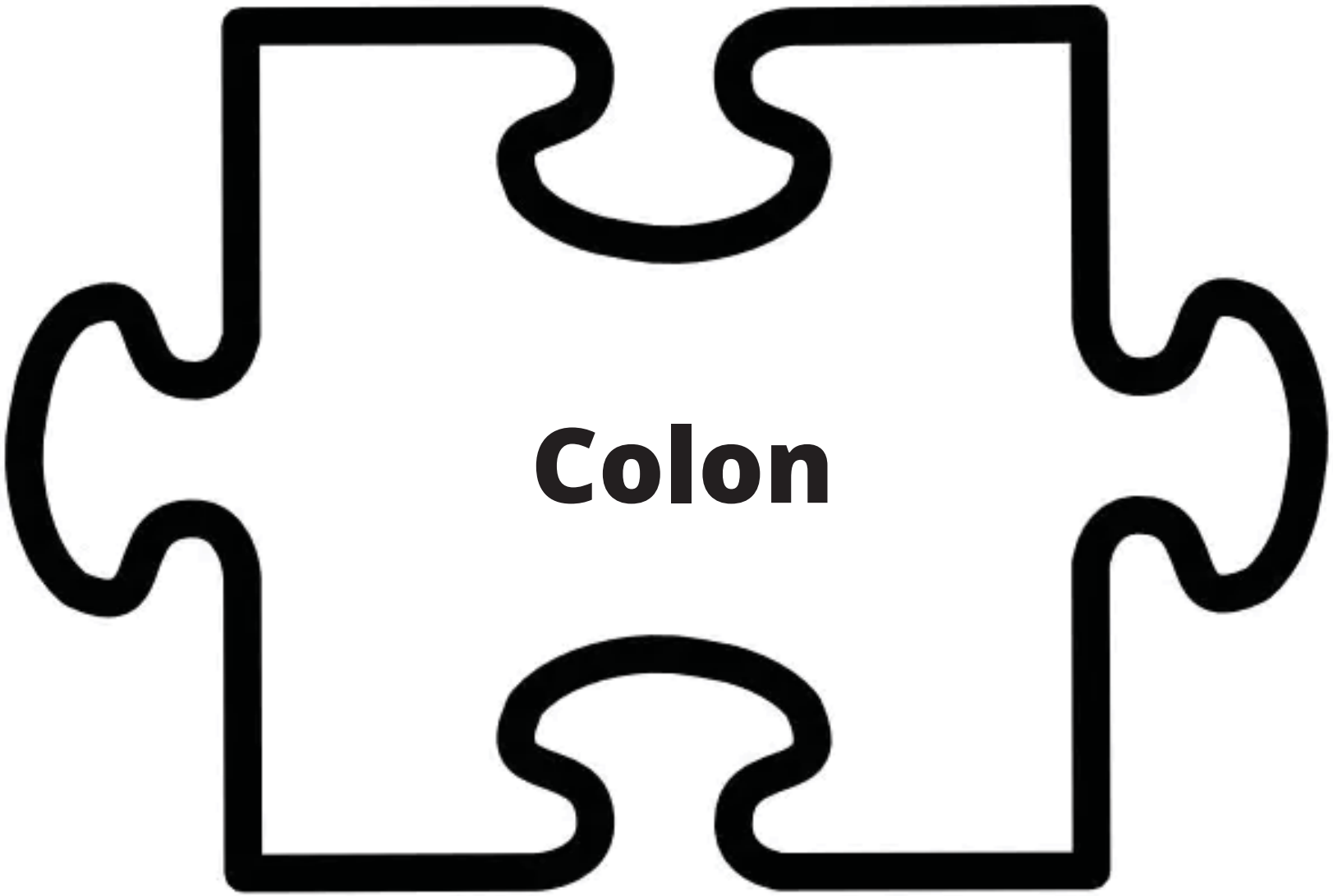

Esophagus

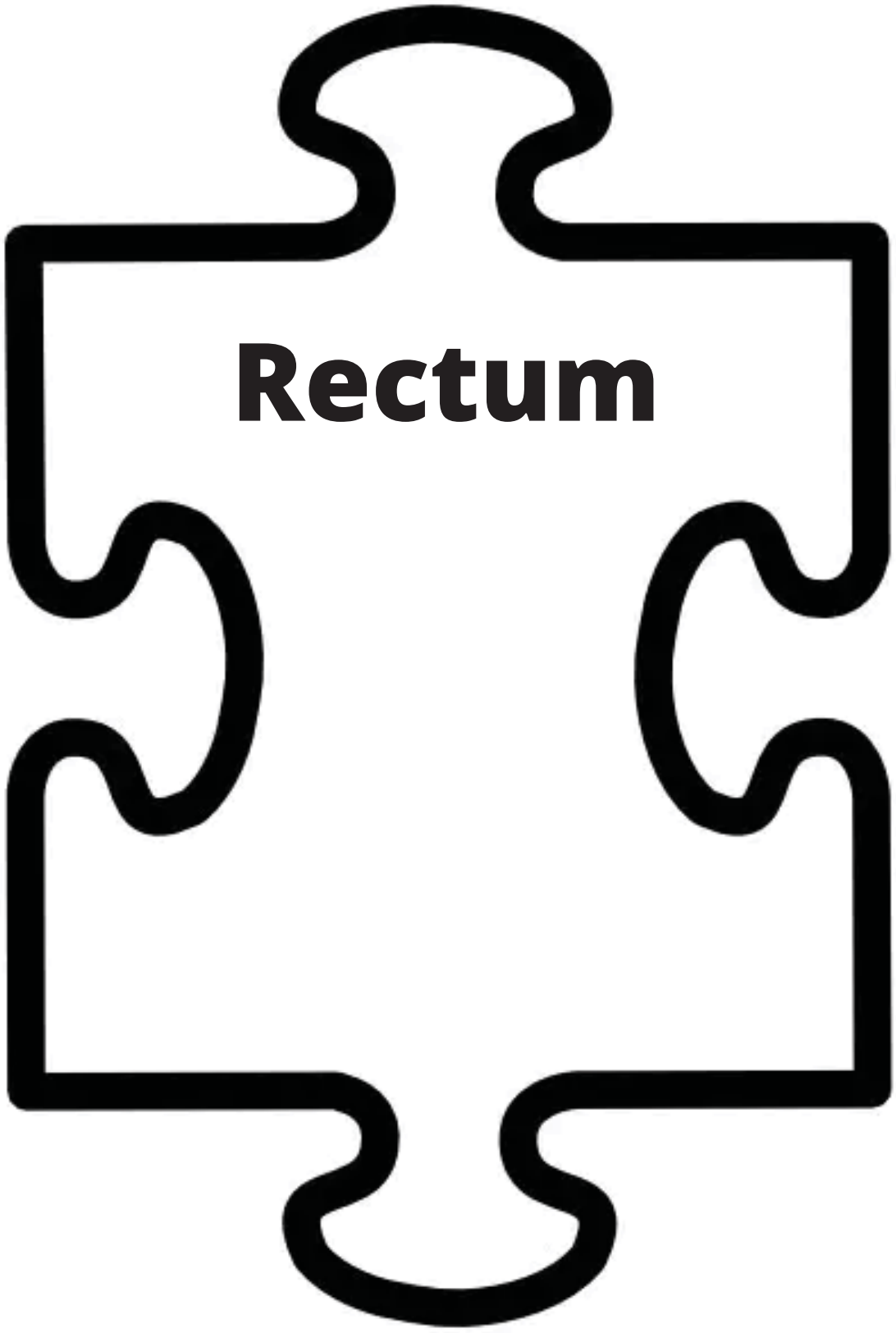

Stomach

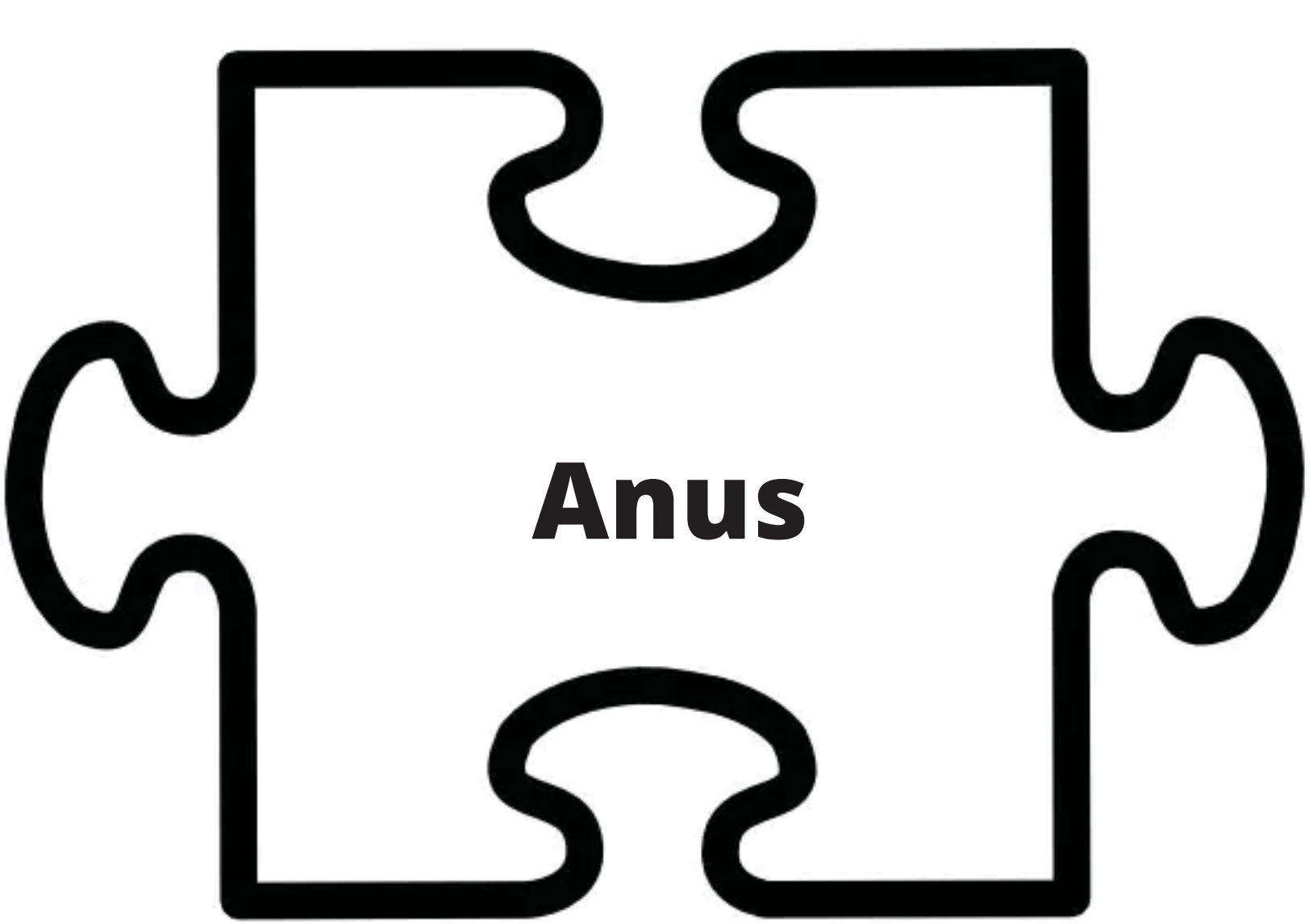

Small Intestine

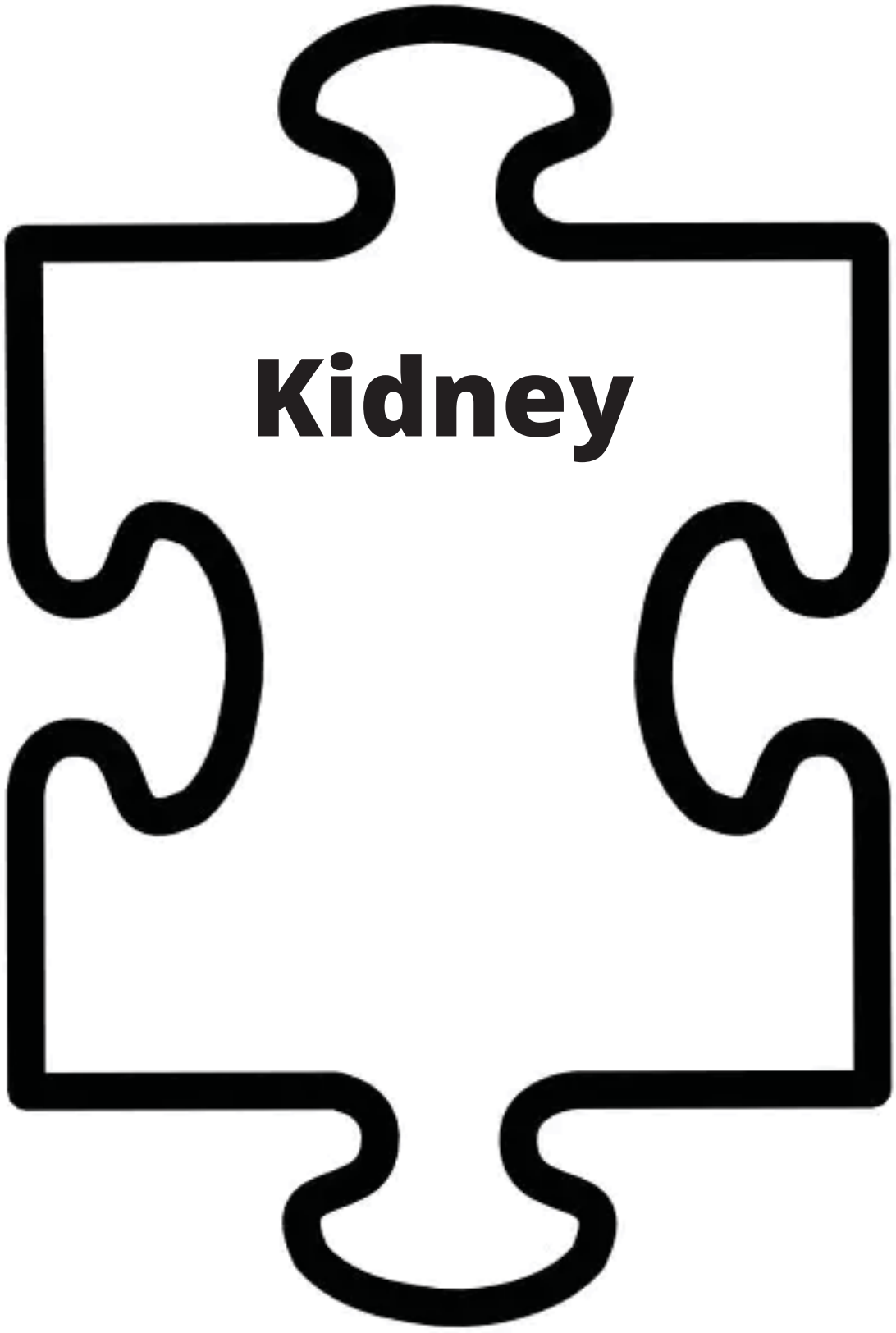

Large
Intestine

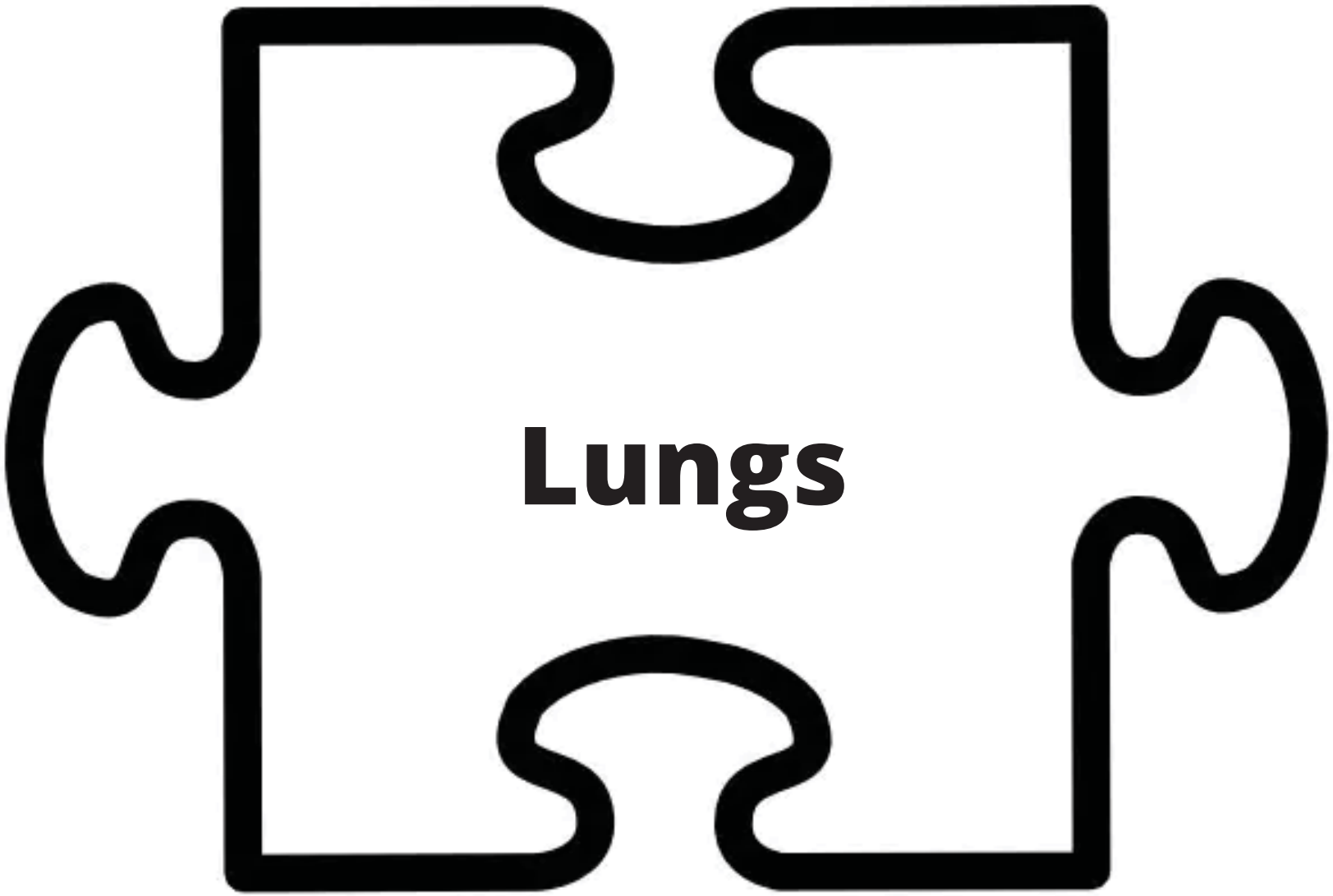

Large
Intestine

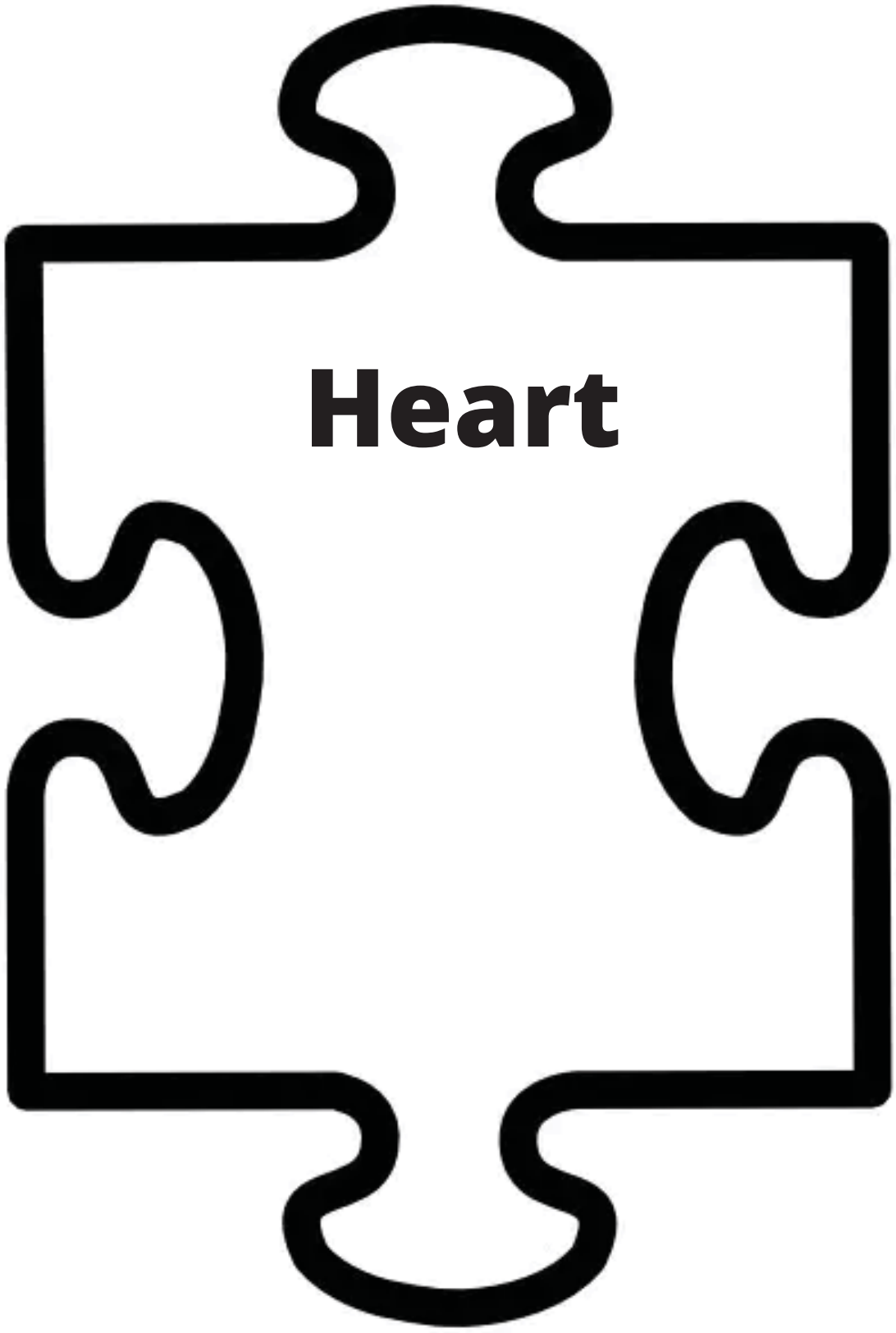

Colon

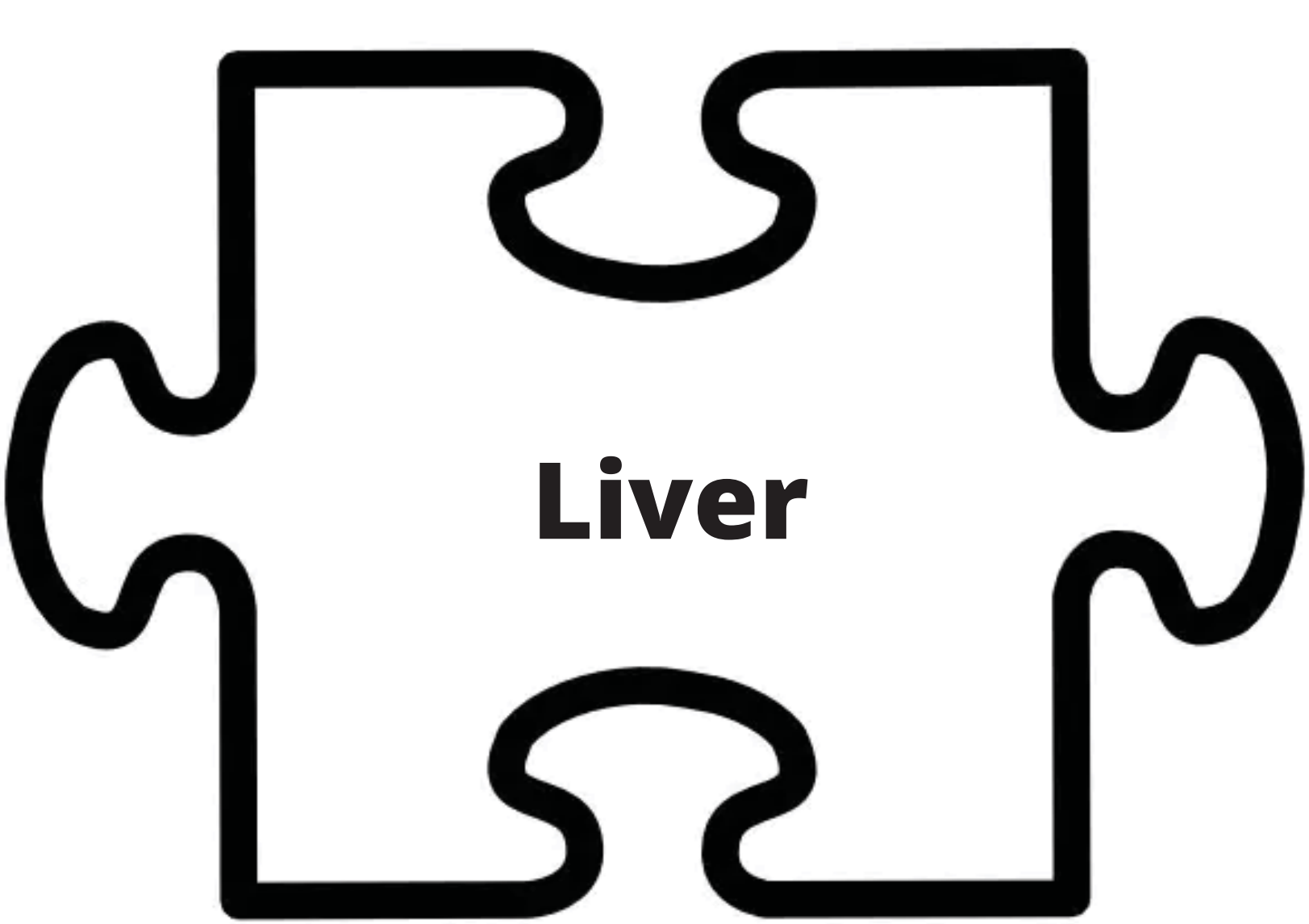

Rectum

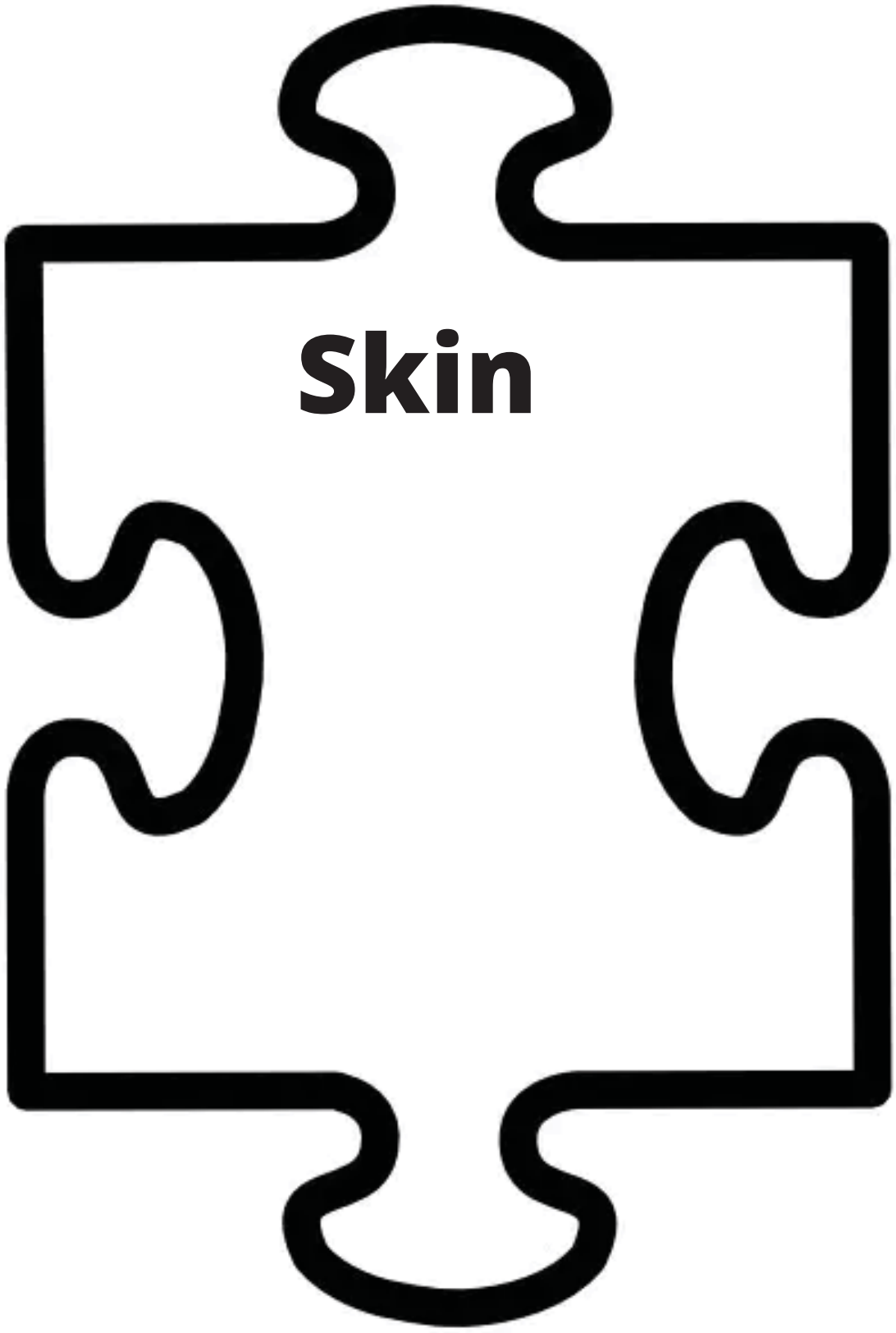

Anus


Kidney

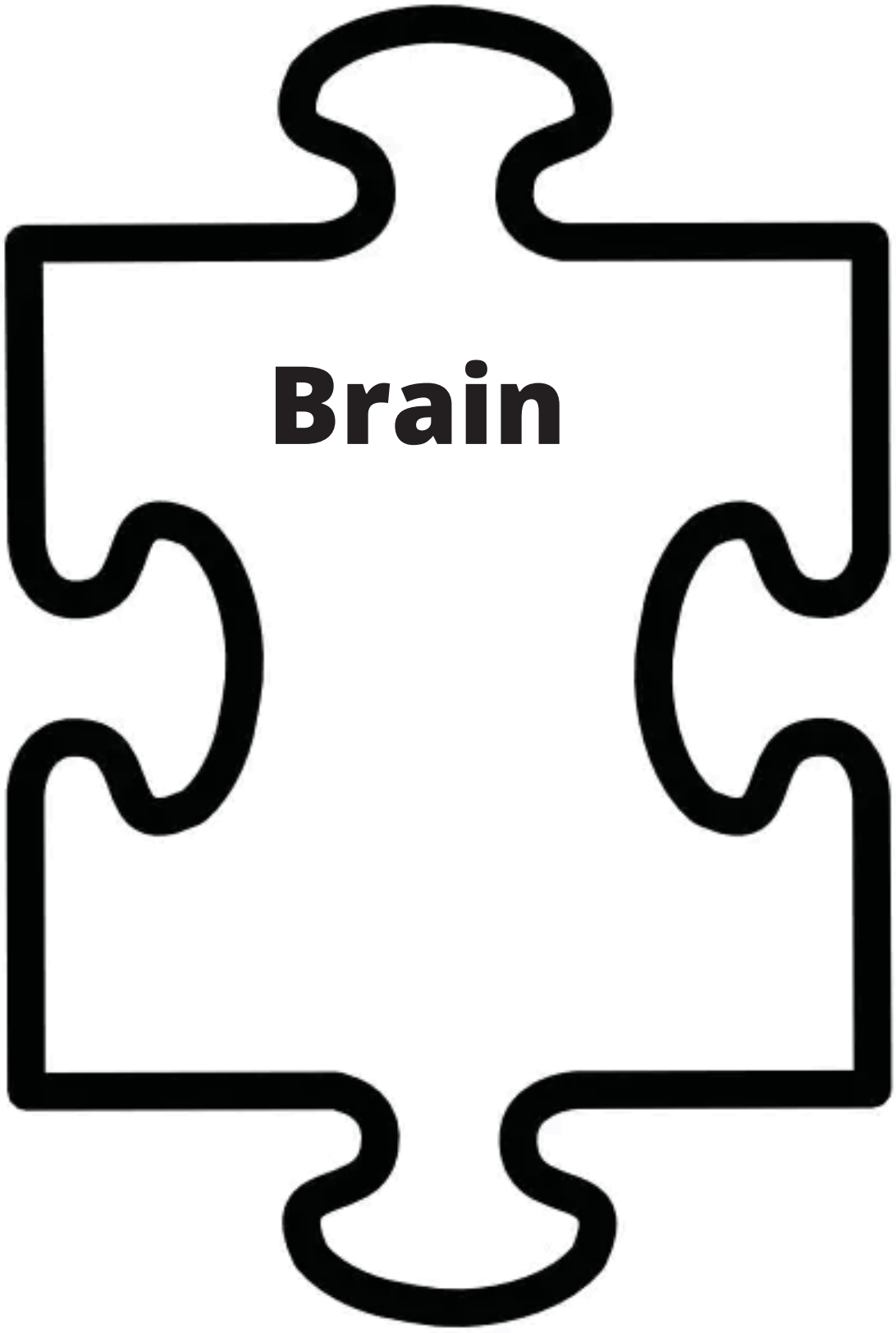

Lungs

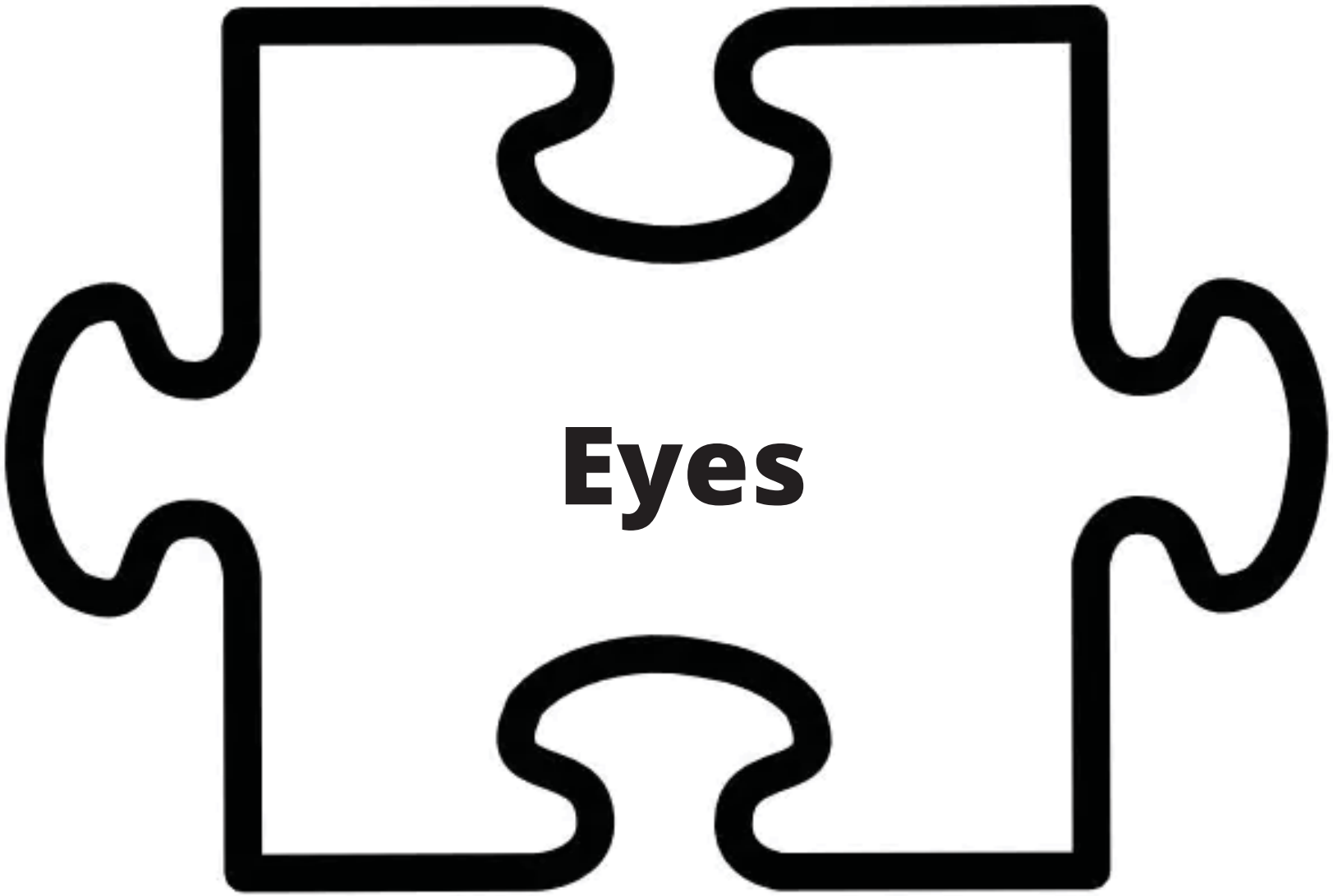

Heart

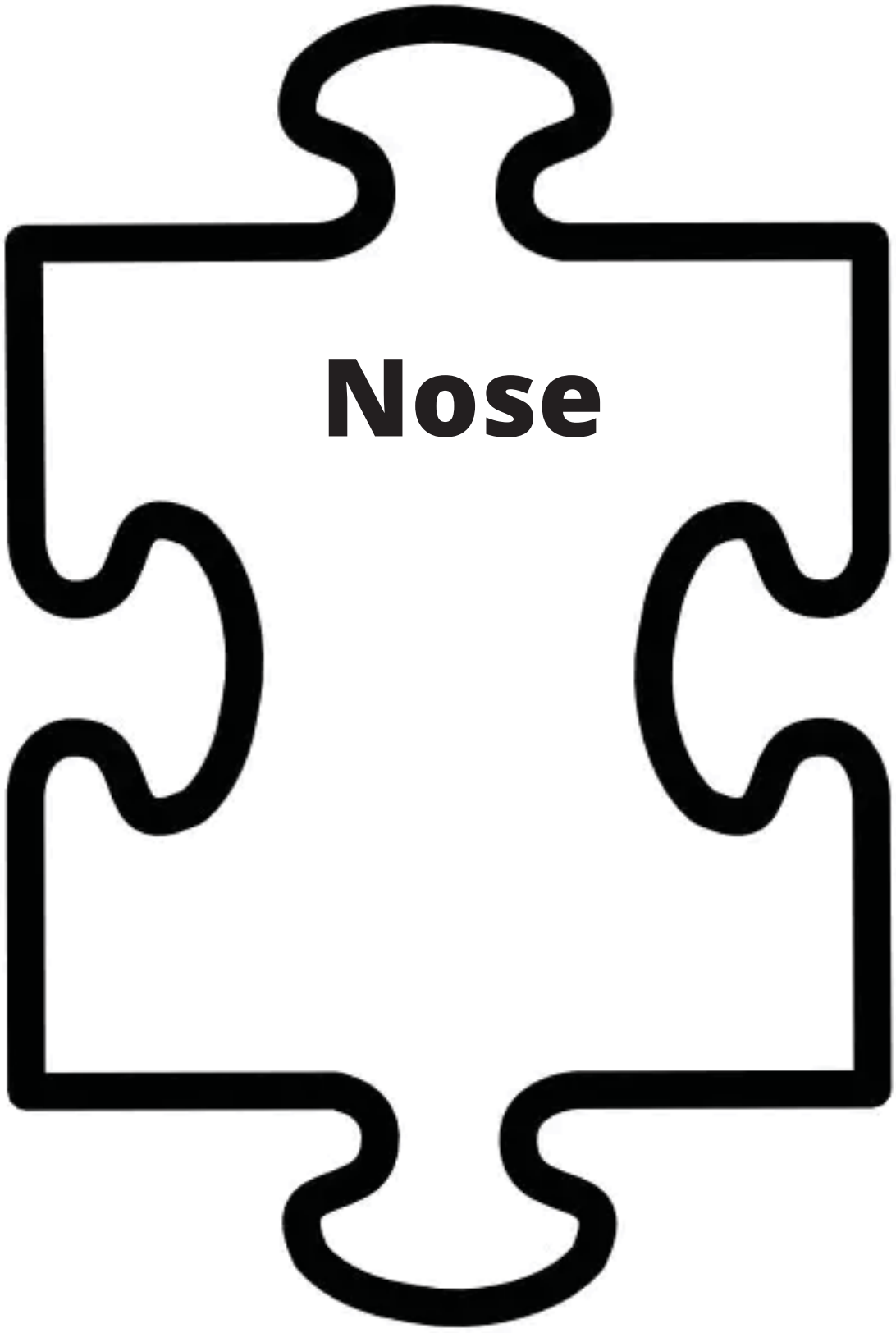

Liver

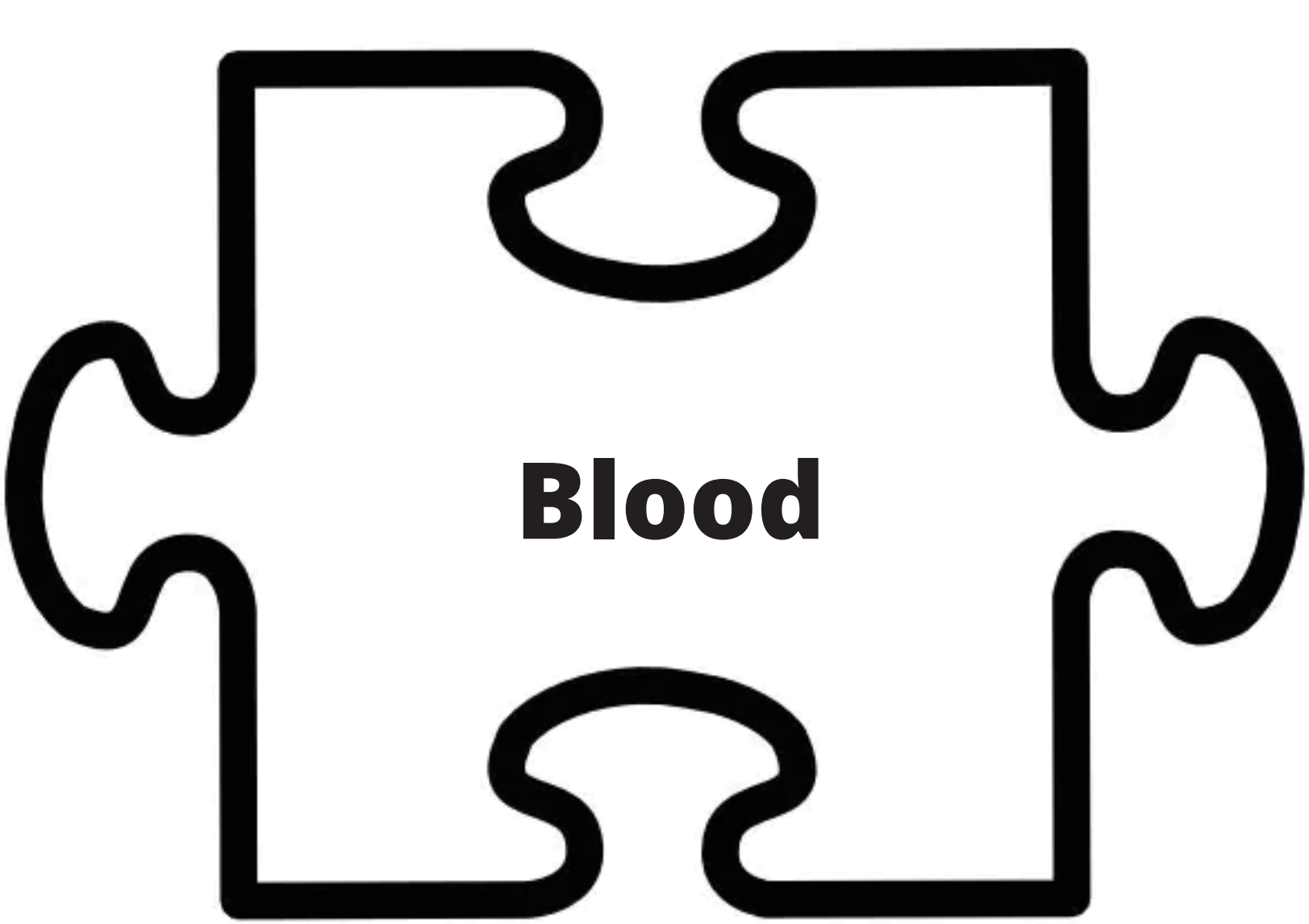

Skin

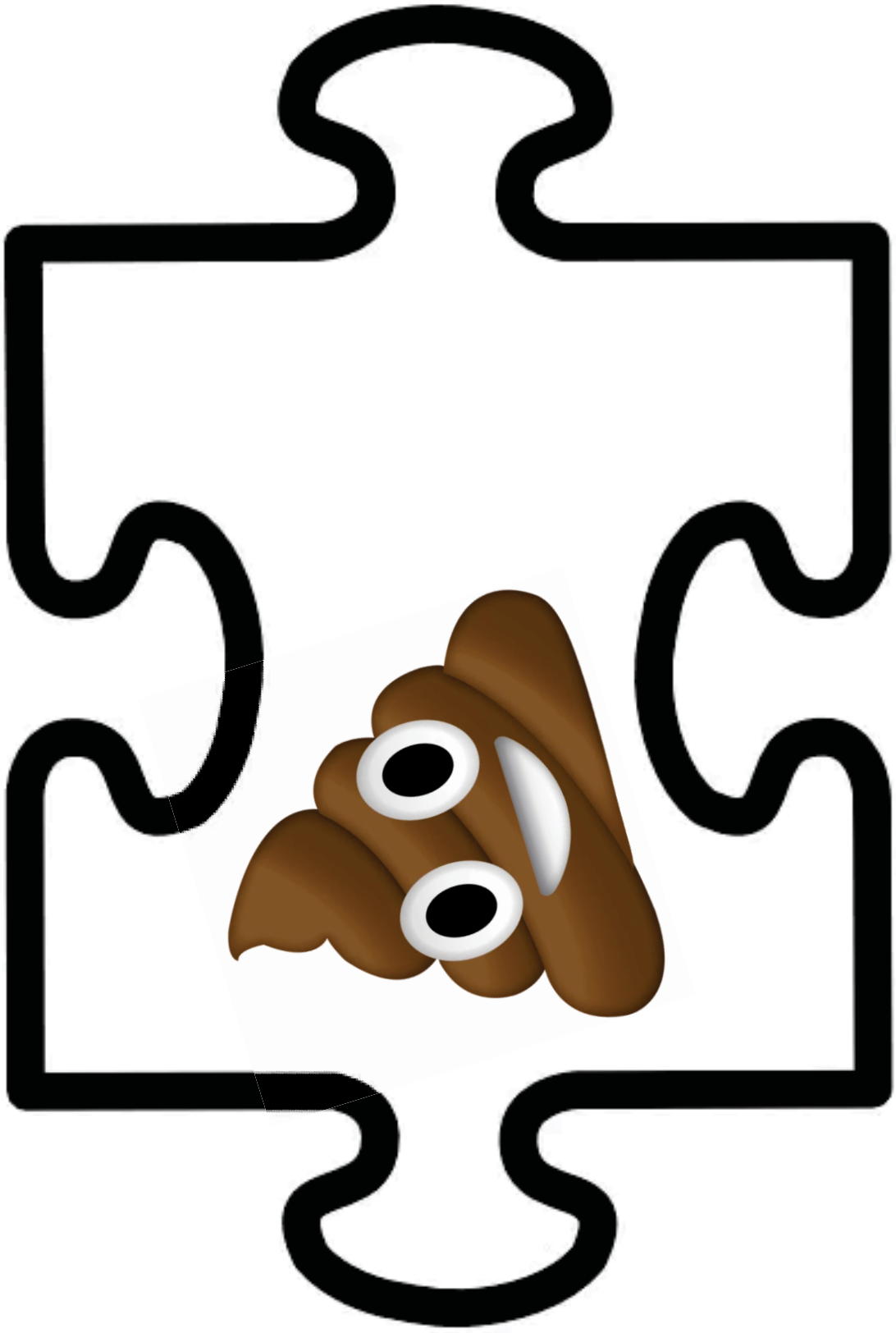

Hair


Brain


Eyes


Nose


Blood



Lesson Plan Option 1: Traditional

Name of Lesson: Mario in Morocco

Learning (TEKS) Objective:

G(1)(C): The student is expected to select tools including real objects, manipulatives, paper, pencil and technology as appropriate, and techniques including mental math, estimation, and number sense as appropriate to solve problems.

G(11)(C): Apply the formulas for the total and lateral surface area of three-dimensional figures, including cylinders, to solve problems using appropriate units of measure.

G(11)(D): Appy formulas for the volume of three-dimensional figures including cylinders, to solve problems using appropriate units of measure.

A(5)(A) Solve linear equations with one variable

(C)(6)(C) analyze physical and chemical properties of elements and compounds such as color, density, viscosity, buoyancy, boiling point, freezing point, conductivity, and reactivity;

Student Outcome: *Students will be able to…* find the volume of 3 different pipes,find ways to measure the volume of a person, and compare costs of replacing the pipes depending on the material used.

Day of the Week and Time

Week 2
Wednesday 1:30- 2:15

Total Length of Lesson: 45 minutes

Materials (per student):

- Pencil
- Paper
- Notebook

Technology

- Computer
- Jamboard:

Advanced preparation

- Jamboard.
- PowerPoint or Canva slides
- Tunnel images with key and dimensions.
- Coins with budget on the back virtual and physical.

Instructional Delivery Option 1 (use if everyone is doing the same thing)	**Notes to Teacher:**
Activity 1: **Reading the Scenario** **Duration: 7 min**	

The teacher will read the scenario activity as the students follow along by sketching a picture of what was read (IN THEIR COMPOSITION NOTEBOOK)

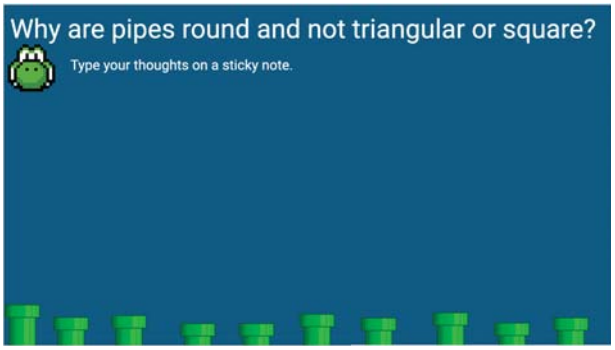
Before heading over to the Egyptian Pyramids, Mario stops in Morocco to explore the capital of Rabat and admire the breathtaking views of the Blue Village of Chefchaouen. As we know Mario travels through pipes and he quickly realizes that the pipes are not all the same. He sees the dimensions of a couple of them and wants to make sure he won't get stuck. He will use volume formulas to determine the different measurements.

https://jamboard.google.com/d/1d5bYSKboHCY-Z7OozqhY43S8hkhRCKnar74OF8621j0/edit?usp=sharing

please make a COPY

Then students will share their thoughts of the key question on sticky note and add their initials (to ensure participation).

Key question: Why are pipes round and not triangular or square?



Activity 2: Solving for Volume **Duration: 7 minutes**

During this activity split students into 3 groups. They will brainstorm ways to find the volume of the pipes. They do not just have the dimensions given so they must be creative and use estimation to find the radius or height they only have certain mario objects as measurements. They must find the volume of all 3.

What is the shape of the pipes?

What information will you need to know to solve the problem?

V of Cylinder= B*h= πr^2*h

Activity 3: Buying Material Duration: 20 minutes	Explain how as Mario's head is the biggest part of his body and as long as the circumference of his head fits through the circumference of the pipes he will fit. Remember to mention outer volume minus inner volume gives the actual volume of the pipe.
Explain that Mario will now build a pipe that he will fit through perfectly. He would like it to be 1 inch thick. Students are given 3 material options Tungsten, Copper, and Polyvinyl chloride. They will learn a little about their characteristics (periodic table). They will also be able to see the price at which it is sold in cubic meters and each has a fixed installation cost. Students will need to identify what material to use, find the actual volume of the pipe, and sketch its top view, and calculate the total cost. (done in groups).	
Activity 4: Pipes in the real world Duration: 11	
Real world examples and exit ticket.	

Back to Table of Contents

Lesson Plan Option 1: Traditional

Name of Lesson: Minecraft Mad Scientist Town Chemistry

Learning (TEKS) Objective:

112.35. Chemistry (One Credit)

Science Concepts

- **(6) The students know and understand the historical development of atomic theory. The student is expected to:**
- (D) express the arrangement of electrons in atoms of representative elements using electrons in atoms of representative elements using electron configurations and Lewis valence electron dot structures
- **(7) The student knows how atoms form ionic, covalent, and metallic bonds. The student is expected to:**
- (C) construct electron dot formulas to illustrate ionic and covalent bonds
- (E) classify molecular structure for molecules with linear, trigonal planar, and tetrahedral electron pair geometries as explained by Valence Shell Electron Pair Repulsion (VSEPR) theory.

Student Outcome: *Students will be able to…*

Understand the parts of the periodic table

Understand the structure of the atoms

Understand the Lewis structures

To create molecules

Day of the Week and Time:

2nd week, Wednesday: 9:00 am - 11:00 am, 12:30 pm - 1:30 pm

Total Length of Lesson:

3 hours total

Part 1: 2 hrs

Part 2: 1 hr

Materials (per student):

- Periodic table
- Foldables
- Color pencils
- Colored styrofoam
- Toothpicks
- Calculator
- pencil
- paper

Technology

- Phones (optional)
- Laptop
- Google slides
- google breakout room slides
- Nearpod (for student use as well)

Advanced preparation

- Open up the nearpod
- Randomize groups (The teachers who are not teaching can do this while the other teacher is teaching the lesson).
    - https://www.drawnames.com/secret-santa-generator

How to accommodate activities for students who are English Language Learners or have trouble focusing

- **Highlighting and color coding certain terms and parts of an atom**
- **Give examples of how to create molecules**
-

Instructional Delivery Option 1 (use if everyone is doing the same thing)

Notes to Teacher:

(Part 1)

Activity 1: Chemistry Time Climb **Duration:** 15 minutes

Hook: After catapulting an angry bird, it landed on a weird object that caused the world to change. You found yourself in a minecraft town that is filled with mad scientists. In order to find a way out of the minecraft world, you will need to become a mad scientist and create potions. One of the potions will lead to the way out.

Begin the Nearpod then go to the kahoor when it says on the slide.

Time Climb: On proton, neutron, electron, nucleus and atoms **to see what the students know.**

Nearpod teacher needs to use it!

Use live participation or live participation + zoom

Activity 2: Periodic Table and Atoms Foldable **Duration:** 45 minutes

The students will do the Atoms Foldable
When you get to the slides on the periodic table, the students will be marking their periodic tables.

(Lesson) Periodic Table and Structure of the molecules
Students will be highlighting the foldable and doing an example as a class
(35 minutes for the lesson)
Begin the lesson by playing the 10 minute video. **(leave it in interactive mode so we can check and see how students are understanding the concepts in the video)**.
Then go through the slide for more clarification on the parts of an atom.

Atoms

- We will analyze the structure of atoms

- Proton
- Neutron
- Election
- Nucleus
- Refer back to the periodic table
- Indicate electron pairs

Periodic Table

Give quick definitions of periods and groups
Have the students mark their periodic tables with the charges **(They will need this for the next part of the lesson)**

(10 minutes)
The potion part of the foldable that students will work <u>individually</u> on.

Activity 3: Build an Atom Simulation **Duration:** 15 minutes

<u>Individual</u>
Students will be able to create atoms using protons, neutrons, and electrons.
This will also allow for students to have a restroom/stretch break.

Activity 4: Molecules foldable **Duration:** 45 minutes

Continue with the Nearpod.
This will be the new foldable, the molecule foldable
Students will be highlighting the foldable and doing an example as a class

(30 minutes for lesson)
Continue going through the nearpod. Do the example as a class for CH_3.
(Lesson) Molecules and electrons

- Single bond
- Double bond
- Triple bond
- How many electrons molecules can hold based on their group
- Lone Pairs

(15 minutes)
The potion part of the foldable that students will work <u>individually</u> on.

(Part 2)
Activity 5: Minecraft Mad Scientist Town board game **Duration:** 1 hour

https://www.wolframalpha.com/widgets/view.jsp?id=c11e9ad0ab00998884f0733c8f62c07d

The students will do the Minecraft Mad Scientist Town board game.

For Teachers: Spend no more than 10 minutes going over the instructions with the class. *Walk around the classroom and see if the students need any help.*

[NOTE: Flippity only allows one person to work the board so roles are assigned. So have the people that are in person, in the zoom call. They can be muted since they are near each other unless they are playing a game with someone at home.]

- ➔ **Time:**
  - ◆ Each game should be 25 minutes.
  - ◆ If you do not finish within those 25 minutes, you can keep going till someone wins the current game then begin another game.

- ➔ **Groups of 3 or 4**
  - ◆ <u>The Board Master</u>
    - One student will control the board and share their screen with everyone in their group
      - You move the characters across the board, roll for the students, and draw the cards **(Make sure to give each player time to take a picture of their card)**
    - You will still be playing the game but you have to ask/listen to *the Tracker* when they say it is someone's turn
  - ◆ <u>The Tracker</u>
    - One student keeps track of everyone's turn in the game.
    - You have to let the Leader and the person with the current turn know that it is their turn.
    - Just like *the Board Master* you will also be playing the game.
  - ◆ <u>Remaining Players</u>
    - Play the game
  - ◆ **For everyone:** All of you can help each other when you are stuck on making a molecule. After each game, trade the roles such that everyone can try out the roles. *If more than one person wants the same role, raise your hand and ask a teacher to roll a die. From there, the person will be decided for that role.*

- ➔ **Game pieces**
  - ◆ The board

https://www.flippity.net/bg.php?k=1vsvXAAkHTZmFLz9ErBmS6wAf3Ia0R82REXQWurLM9gg

- One 6 sided die
- 8 minecraft scientist characters
- Potion card deck
- Challenge card deck

➔ **How to Play**

- **Before the game**
  - Step 1
    - Decide on the roles
  - Step 2
    - The Board Master will share their screen with everyone in the group.
  - Step 3
    - Roll for who goes first by using the die on the board. *If the numbers repeat, reroll after everyone is rolled for. The Highest number (Ex: 6) goes first and the Lowest number (Ex: 1) goes last.*
  - Step 4
    - Everyone will choose their character in chronological order from first to last.
- **Beginning of the game**
  - Step 1
    - Roll for the first person
  - Step 2
    - Move the first person to a tile by the number on the die
  - Step 3
    - If the student landed on:
      - A normal space, draw a card from the potion deck
      - A challenge space, draw from the challenge deck
  - Step 4
    - Allow the student to take a picture of their card

- The student who has the card must construct the molecule on the card.

- Step 5
  - Repeat steps 1 through 6 for each person
- Step 6
  - Wait until the person has constructed their molecule before rolling for their turn
  - No one will be skipped unless a challenge card says so.

◆ **To win / ending the game**

- Be the first person to reach the finish line. Once the person lands on space 45 and completes the molecule, they win. *If more than one person lands on the last space, they can compete to see who finishes the molecule correctly first.*
- Once the person wins the game, everyone still finishes their molecules then starts a new game.

Instructional Delivery Option 2 (use if students are doing different things) *If at any point students are doing the same thing, you can just copy and paste into both columns.*		**Notes to Teacher:**
Activity 1:	**Duration:**	
Students in-person:	**Students at-home:**	
(Refer back to Option 1)	(Refer back to Option 1)	
Activity 2:	**Duration:**	
Students in-person:	**Students at-home:**	

(Refer back to Option 1)	(Refer back to Option 1)	
Activity 3:	**Duration:**	
Students in-person:	**Students at-home:**	
(Refer back to Option 1)	(Refer back to Option 1)	
Activity 4:	**Duration:**	
Students in-person:	**Students at-home:**	
(Refer back to Option 1)	(Refer back to Option 1)	
Activity 5:	**Duration:**	
Students in-person:	**Students at-home:**	
(Refer back to Option 1) Have the students log into zoom and put them into breakout rooms. They will be muted for less static and *the Board Master* shares their screen with everyone else.	(Refer back to Option 1) Just put the students into the breakout rooms. *The Board Master* shares their screen with everyone else.	

Back to Table of Contents

GAME 1

Group 1

The Board Master	
The Tracker	
Player 1	
Player 2	

Group 2

The Board Master	
The Tracker	
Player 1	
Player 2	

Group 3

The Board Master	
The Tracker	
Player 1	
Player 2	

Group 4

The Board Master	
The Tracker	
Player 1	
Player 2	

Group 5

The Board Master	
The Tracker	
Player 1	
Player 2	

GAME 2

Group 1

The Board Master	
The Tracker	
Player 1	
Player 2	

Group 2

The Board Master	
The Tracker	
Player 1	
Player 2	

Group 3

The Board Master	
The Tracker	
Player 1	
Player 2	

Group 4

The Board Master	
The Tracker	
Player 1	
Player 2	

Group 5

The Board Master	
The Tracker	
Player 1	
Player 2	

KEY TERMS

- **Atoms**- smallest unit of matter
- **Protons**- they are positively charged and are inside of the atom's nucleus.
- **Neutrons**- they have a neutral charge and are inside of the atom's nucleus with the protons
- **Electrons**- they are negatively charged and are floating outside of the nucleus cloud.

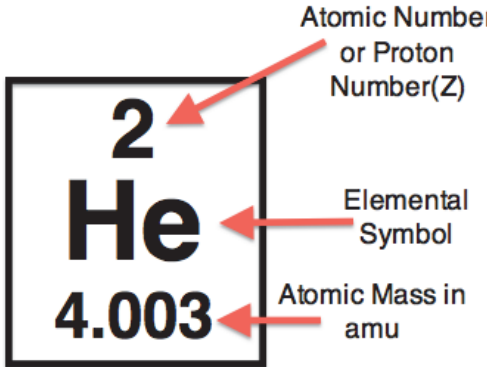
Draw a picture of an Atom and label all it's parts:

GLUE HERE

Minecraft Mad Scientist Town **(Atoms)**

PERIODIC TABLE FACTS

- The periodic table is divided into periods and groups
- The periods are horizontal, for example sodium (Na) and aluminum (Al) are in the same group.
- The groups are grouped vertically. For example, oxygen (O) and sulfur (S) are in the same group.
- The numbers across the top of the periodic table, tell us how many valance electrons the atom has. For example, the atom Magnesium (Mg) has a total of 2 valence electrons.



- You can calculate the number of protons, neutrons and electrons each atom has just by looking at the periodic table.
- The Atomic number also gives us the number of protons that element has.
- The number of protons= the number of electrons
- Number of neutrons= atomic mass – atomic number
- Take helium (He) for example it has:
  - **2 protons**
  - **2 electrons**
  - 4-2= **2 neutrons**

Choose one of the following potions from the box on the right.
For each of the elements in the potion:

DRAW AN ATOM WITH ITS MASS AND ATOMIC NUMBER AS WELL AS ITS PROPER ELEMENT SYMBOL.

Potion of Night Vision:
Potassium and **Neon**

Potion of Regeneration:
Iron and **Calcium**

Potion of Leaping:
Helium and **Zinc**

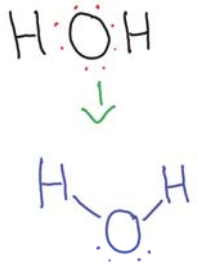
Potion of Healing:
Hydrogen and **Fluorine**

Potion of Water Breathing:
Oxygen and **Sodium**

Potion of Swiftness:
Hydrogen and **Argon**

HOW TO DRAW A LEWIS STRUCTURE

- We count the number or valance electrons each element has. Use the periodic table to help you out.
- We will be using the example of H_2O
- Hydrogen has 1 electron. Since they are two H elements it will be a total of 2 electrons
- Oxygen has 6 electrons.
- Add the number or electrons 2+6=8
- Draw out your compound, as so:



- In this case we have an excess of 4 electrons these is what we call **lone pairs.**

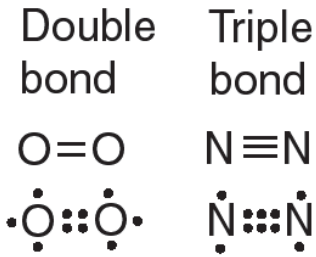
GLUE HERE

MMST cont.

(Molecules)

SINGLE, DOUBLE, & TRIPLE BONDS

- There are 3 types of bonds
- **Single bonds**- are joined when 2 electrons are shared between elements. Like in our example H and O shared 2 electrons one from H and another from O.
- **Double bonds**- are joined with 4 electrons are shared between elements. Between O_2 they share a total of 12 electrons so we have enough shared electrons to create a double bond.



- Triple bonds- are joined with 6 electrons shared in between two elements. You can see on the example of N_2, they are six electrons that we can make bonds of and still have some lone pairs.

Let's Practice Draw a Lewis Structure of the compound CH_3

Choose one of the following potions from the box on the right.
For each of the molecules in the potion:

DRAW THE LEWIS STRUCTURES THAT ARE IN YOUR CHOSEN POTION.

Potion of Night Vision:
KCl and CH_4

Potion of Regeneration:
$CaCl_2$ and **HCl**

Potion of Leaping:
$ZnCl_2$ and **H_2**

Potion of Healing:
NH_3 and **HF**

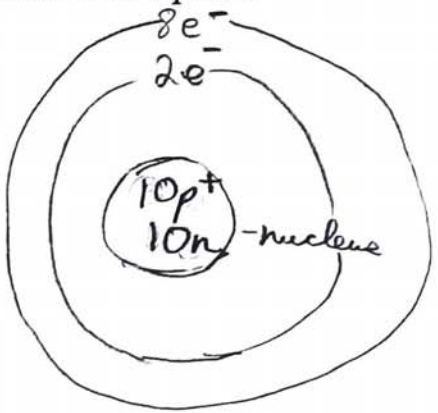
Potion of Water Breathing:
Na_2O and **NaCl**

Potion of Swiftness:
C_2H_2 and **H_2**

KEY TERMS

- **Atoms**- smallest unit of matter
- **Protons**- they are positively charged and are inside of the atom's nucleus.
- **Neutrons**- they have a neutral charge and are inside of the atom's nucleus with the protons
- **Electrons**- they are negatively charged and are floating outside of the nucleus cloud.

Draw a picture of an Atom and label all it's parts:

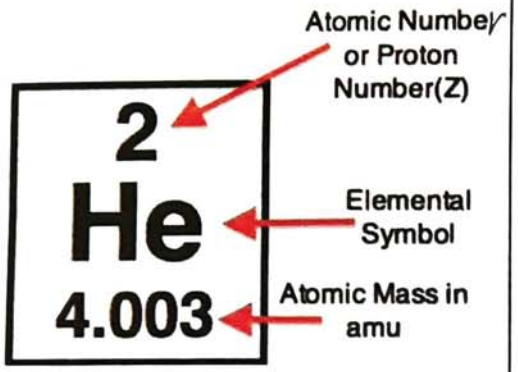


GLUE HERE

Minecraft Mad Scientist Town **(Atoms)**

PERIODIC TABLE FACTS

- The periodic table is divided into periods and groups
- The periods are horizontal, for example sodium (Na) and aluminum (Al) are in the same group.
- The groups are grouped vertically. For example, oxygen (O) and sulfur (S) are in the same group.
- The numbers across the top of the periodic table, tell us how many valance electrons the atom has. For example, the atom Magnesium (Mg) has a total of 2 valence electrons.

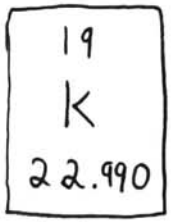


- You can calculate the number of protons, neutrons and electrons each atom has just by looking at the periodic table.
- The Atomic number also gives us the number of protons that element has.
- The number of protons= the number of electrons
- Number of neutrons= atomic mass – atomic number
- Take helium (He) for example it has:
  - **2 protons**
  - **2 electrons**
  - 4-2= **2 neutrons**

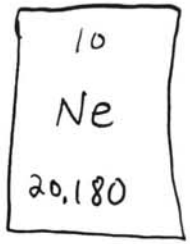
Choose one of the following potions from the box on the right.
For each of the elements in the potion:

DRAW AN ATOM WITH ITS MASS AND ATOMIC NUMBER AS WELL AS ITS PROPER ELEMENT SYMBOL.

For student but here is an example



potassium



neon

Potion of Night Vision: **Potassium** and **Neon**

Potion of Regeneration: **Iron** and **Calcium**

Potion of Leaping: **Helium** and **Zinc**

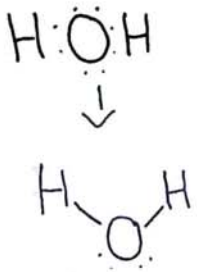
Potion of Healing: **Hydrogen** and **Fluorine**

Potion of Water Breathing: **Oxygen** and **Sodium**

Potion of Swiftness: **Hydrogen** and **Argon**

HOW TO DRAW A LEWIS STRUCTURE

- We count the number or valance electrons each element has. Use the periodic table to help you out.
- We will be using the example of H_2O
- Hydrogen has 1 electron. Since they are two H elements it will be a total of 2 electrons
- Oxygen has 6 electrons.
- Add the number or electrons 2+6=8
- Draw out your compound, as so:



- In this case we have an excess of 4 electrons these is what we call **lone pairs.**

Note that the electrons are trying to stabilize

GLUE HERE

MMST cont.

(Molecules)

SINGLE, DOUBLE, & TRIPLE BONDS

- There are 3 types of bonds
- **Single bonds**- are joined when 2 electrons are shared between elements. Like in our example H and O shared 2 electrons one from H and another from O.
- **Double bonds**- are joined with 4 electrons are shared between elements. Between O_2 they share a total of 12 electrons so we have enough shared electrons to create a double bond.

Double bond	Triple bond
O=O	N≡N

- Triple bonds- are joined with 6 electrons shared in between two elements. You can see on the example of N_2, they are six electrons that we can make bonds of and still have some lone pairs.

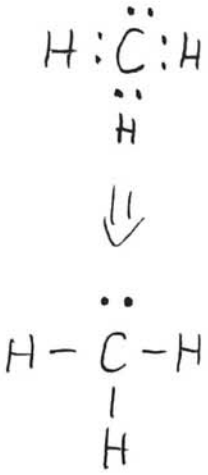
Let's Practice Draw a Lewis Structure of the compound CH_3

C has 4 electrons

H has 1 electron

$4 + 3(1) + 1 = 8$

CH_3^- (it wants to stabalize)



3 single bonds

1 lone pair

Choose one of the following potions from the box on the right.

For each of the molecules in the potion:

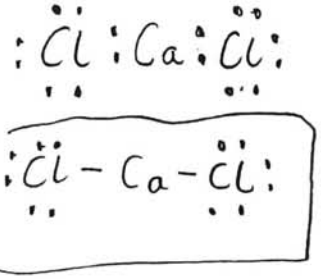
DRAW THE LEWIS STRUCTURES THAT ARE IN YOUR CHOSEN POTION.

$CaCl_2$

Ca has 2 electrons

Cl has 7 electrons

$2 + 2(7) = 16$

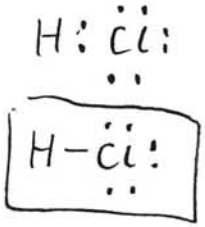


HCL

H has 1 electron

Cl has 7 electrons

$1 + 7 = 8$



Potion of Night Vision:
KCl and CH_4

Potion of Regeneration:
$CaCl_2$ and **HCl**

Potion of Leaping:
$ZnCl_2$ and **H_2**

Potion of Healing:
NH_3 and **HF**

Potion of Water Breathing:
Na_2O and **NaCl**

Potion of Swiftness:
C_2H_2 and **H_2**

Minecraft Mad Scientist Town Board Game Instructions

➔ Time:

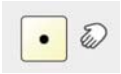
- Each game should be 25 minutes.
- If you do not finish within those 25 minutes, you can keep going till someone wins the current game then begin another game.

➔ Groups of 3 or 4

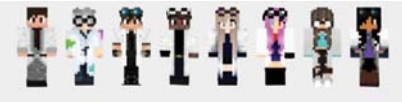
- The Board Master
  - One student will control the board and share their screen with everyone in their group
    - You move the characters across the board, roll for the students, and draw the cards **(Make sure to give each player time to take a picture of their card)**
  - You will still be playing the game but you have to ask/listen to *the Tracker* when they say it is someone's turn
- The Tracker
  - One student keeps track of everyone's turn in the game.
  - You have to let the Leader and the person with the current turn know that it is their turn.
  - Just like *the Board Master* you will also be playing the game.
- Remaining Players
  - Play the game
- **For everyone:** All of you can help each other when you are stuck on making a molecule. After each game, trade the roles such that everyone can try out the roles. *If more than one person wants the same role, raise your hand and ask a teacher to roll a die. From there, the person will be decided for that role.*

➔ Game pieces

- The board **https://www.flippity.net/bg.php?k=1vsvXAAkHTZmFLz9ErBmS6wAf3la0R82REXQWurLM9gg**
- One 6 sided die

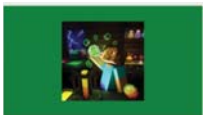


- 8 minecraft scientist characters



- Potion card deck

- Challenge card deck



➔ How to Play

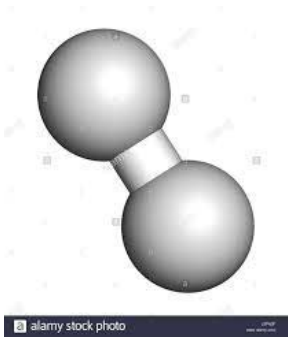
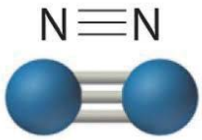
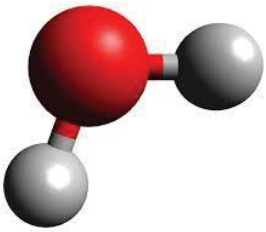
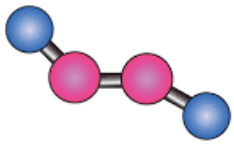
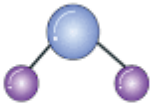
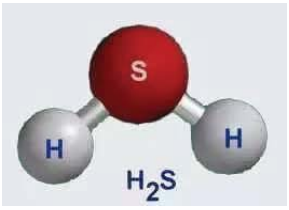
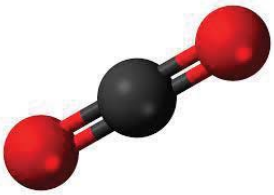
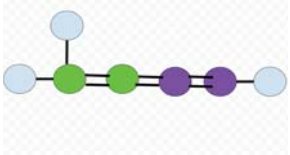
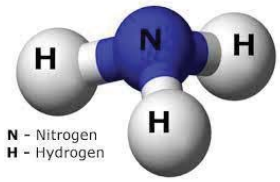
- **Before the game**
  - Step 1
    - Decide on the roles
  - Step 2
    - The Board Master will share their screen with everyone in the group.
  - Step 3
    - Roll for who goes first by using the die on the board. *If the numbers repeat, reroll after everyone is rolled for. The Highest number (Ex: 6) goes first and the Lowest number (Ex: 1) goes last.*
  - Step 4
    - Everyone will choose their character in chronological order from first to last.
- **Beginning of the game**
  - Step 1
    - Roll for the first person
  - Step 2
    - Move the first person to by the number on the die

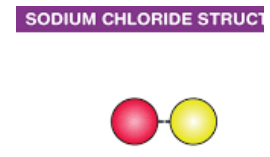
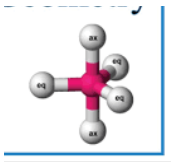
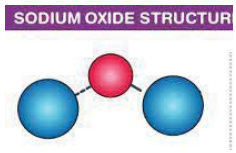
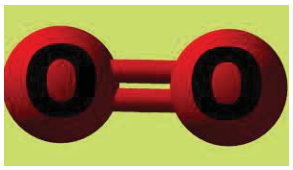
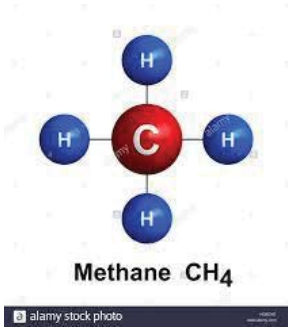
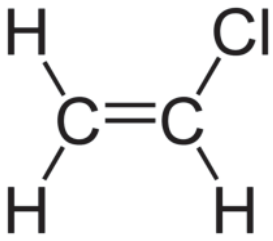
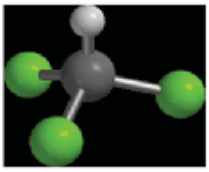
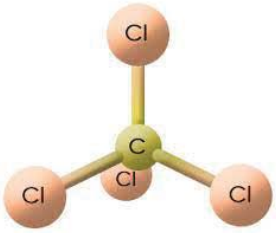
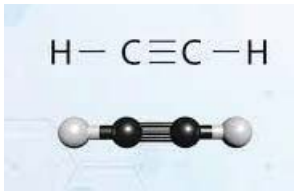
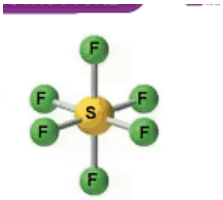
- Step 3
    - If the student landed on:
        - A normal space, draw a card from the potion deck
        - A challenge space, draw from the challenge deck
- Step 4
    - Allow the student to take a picture of their card
    - The student who has the card must construct the molecule on the card.
- Step 5
    - Repeat steps 1 through 6 for each person
- Step 6
    - Wait until the person has constructed their molecule before rolling for their turn
    - No one will be skipped unless a challenge card says so.

- **To win / ending the game**
    - Be the first person to reach the finish line. Once the person lands on space 45 and completes the molecule, they win. *If more than one person lands on the last space, they can compete to see who finishes the molecule correctly first.*
    - Once the person wins the game, everyone still finishes their molecules then starts a new game.

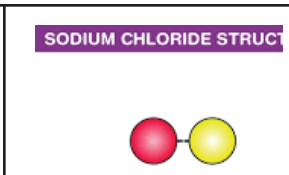
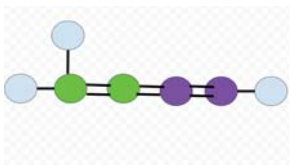
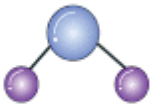
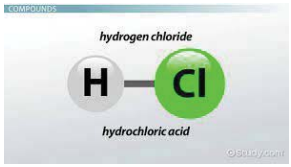
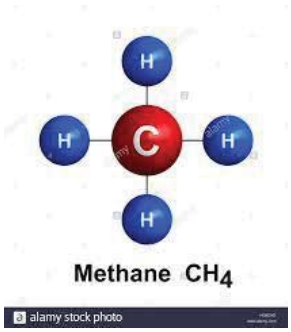
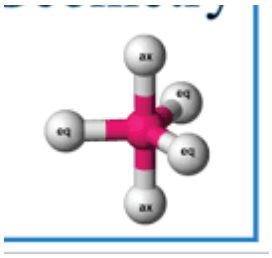
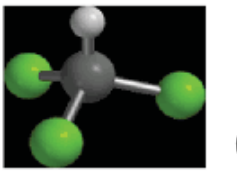
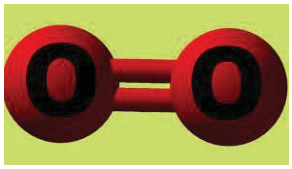
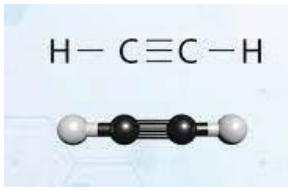
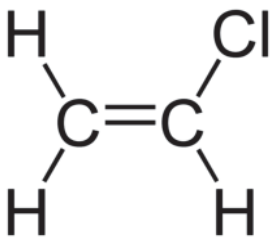

Minecraft Mad
Scientist Town

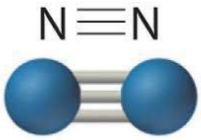
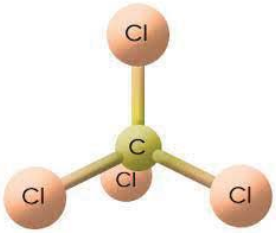
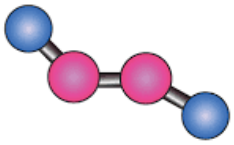
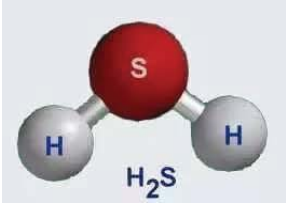
Potion Cards

H_2		N_2	
H_2O		H_2O_2	
$CaCl_2$		H_2S	
CO_2		CH_2COOH-	
NH_3		HCl	

NaCl		PCl_5	
Na_2O		O_2	
CH_4		C_2H_3Cl	
$CHCl_3$		CCl_4	
C_2H_2		SF_6	

Challenge Cards

NaCl		CH_2COOH^-	
$CaCl_2$		HCl	
CH_4		PCl_5	
$CHCl_3$		O_2	
C_2H_2		C_2H_3Cl	

N_2		CCl_4	
H_2O_2		SF_6	
H_2S			

Periodic Table of the Elements

1 H Hydrogen 1.008																	2 He Helium 4.003
3 Li Lithium 6.941	4 Be Beryllium 9.012											5 B Boron 10.811	6 C Carbon 12.011	7 N Nitrogen 14.007	8 O Oxygen 15.999	9 F Fluorine 18.998	10 Ne Neon 20.180
11 Na Sodium 22.990	12 Mg Magnesium 24.305											13 Al Aluminum 26.982	14 Si Silicon 28.086	15 P Phosphorus 30.974	16 S Sulfur 32.066	17 Cl Chlorine 35.453	18 Ar Argon 39.948
19 K Potassium 39.098	20 Ca Calcium 40.078	21 Sc Scandium 44.956	22 Ti Titanium 47.88	23 V Vanadium 50.942	24 Cr Chromium 51.996	25 Mn Manganese 54.938	26 Fe Iron 55.933	27 Co Cobalt 58.933	28 Ni Nickel 58.693	29 Cu Copper 63.546	30 Zn Zinc 65.39	31 Ga Gallium 69.732	32 Ge Germanium 72.61	33 As Arsenic 74.922	34 Se Selenium 78.09	35 Br Bromine 79.904	36 Kr Krypton 84.80
37 Rb Rubidium 84.468	38 Sr Strontium 87.62	39 Y Yttrium 88.906	40 Zr Zirconium 91.224	41 Nb Niobium 92.906	42 Mo Molibdenum 95.94	43 Tc Technetium 98.907	44 Ru Ruthenium 101.07	45 Rh Rhodium 102.906	46 Pd Palladium 106.42	47 Ag Silver 107.868	48 Cd Cadmium 112.411	49 In Indium 114.818	50 Sn Tin 118.71	51 Sb Antimony 121.760	52 Te Tellurium 127.6	53 I Iodine 126.904	54 Xe Xenon 131.29
55 Cs Cesium 132.905	56 Ba Barium 137.327	57-71 Lanthanides	72 Hf Hafnium 178.49	73 Ta Tantalum 180.948	74 W Tungsten 183.85	75 Re Rhenium 186.207	76 Os Osmium 190.23	77 Ir Iridium 192.22	78 Pt Platinum 195.08	79 Au Gold 196.967	80 Hg Mercury 200.59	81 Tl Thallium 204.383	82 Pb Lead 207.2	83 Bi Bismuth 208.980	84 Po Polonium [208.982]	85 At Astatine 209.987	86 Rn Radon 222.018
87 Fr Francium 223.020	88 Ra Radium 226.025	89-103 Actinides	104 Rf Rutherfordium [261]	105 Db Dubnium [262]	106 Sg Seaborgium [266]	107 Bh Bohrium [264]	108 Hs Hassium [269]	109 Mt Meitnerium [268]	110 Ds Darmstadtium [269]	111 Rg Roentgenium [272]	112 Cn Copernicium [277]	113 Uut Ununtrium unknown	114 Fl Flerovium [289]	115 Uup Ununpentium unknown	116 Lv Livermorium [298]	117 Uus Ununseptium unknown	118 Uuo Ununoctium unknown

57 La Lanthanum 138.906	58 Ce Cerium 140.115	59 Pr Praseodymium 140.908	60 Nd Neodymium 144.24	61 Pm Promethium 144.913	62 Sm Samarium 150.36	63 Eu Europium 151.966	64 Gd Gadolinium 157.25	65 Tb Terbium 158.925	66 Dy Dysprosium 162.50	67 Ho Holmium 164.930	68 Er Erbium 167.26	69 Tm Thulium 168.934	70 Yb Ytterbium 173.04	71 Lu Lutetium 174.967
89 Ac Actinium 227.028	90 Th Thorium 232.038	91 Pa Protactinium 231.036	92 U Uranium 238.029	93 Np Neptunium 237.048	94 Pu Plutonium 244.064	95 Am Americium 243.061	96 Cm Curium 247.070	97 Bk Berkelium 247.070	98 Cf Californium 251.080	99 Es Einsteinium [254]	100 Fm Fermium 257.095	101 Md Mendelevium 258.1	102 No Nobelium 259.101	103 Lr Lawrencium [262]

Lesson Plan Option 1: Traditional

Name of Lesson: Super Mario Hospital

Learning (TEKS) Objective:
B.10(A) describe the interactions that occur among systems that perform the functions of regulation, nutrient absorption, reproduction, and defense from injury or illness in animal (Readiness)

B.10(C) analyze the levels of organization in biological systems and relate the levels to each other and to the whole system

Student Outcome: *Students will be able to… analyze human anatomy, learn about different body systems, and apply what they learned to a real case study.*

Day of the Week and Time
Week 2 Thursday 8:30-10:00 am

Total Length of Lesson:
1 hour 30 minutes

Materials (per student):

- **Paper**
- **Pencil**
- **Lollipops**

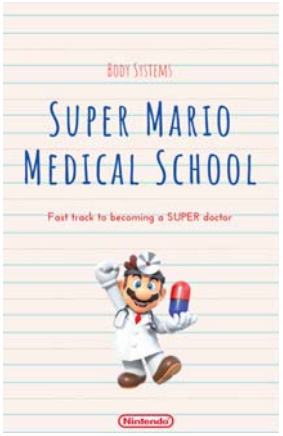
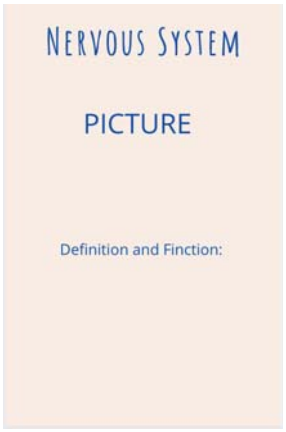
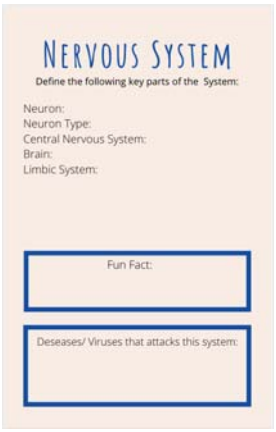
Technology

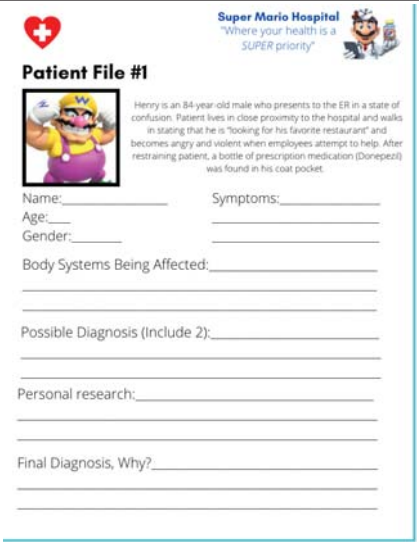
- **Canva Worksheets**
- **Canva Group Assignment**

Advanced preparation

- **Body Systems Group Assignment**
- **10 Patient Case Files**
- **Kahhot answer Key**

Instructional Delivery Option 1 (use if everyone is doing the same thing)	**Notes to Teacher:**
Activity 1: Body Systems Group Activity Duration: 20 https://www.canva.com/design/DAEcldRghzg/share/preview?token=n1lJoP6uC44-iiuwP70Sag&role=EDITOR&utm_content=DAEcldRghzg&utm_campaign=designshare&utm_medium=link&utm_source=sharebutton **Teacher: Share screen and show students the canva assignment they will be working on. Go over the completed example to guide them a little more.** **Teacher: Assign 8 different teams and give each a body system.**	**Go in and out of breakout rooms to make sure students don't have any questions.** **Make Sure to tell students they will only have 4 minutes to present.**

Students: split off into breakout rooms and assign each other tasks. **Students**: Work on assigned body system. Enter all information into the presentation above. For each system students must find: Picture, definition and function **Students**: Prepare to present to the class. Between themselves they must decide who will be presenting what    	
Activity 2: Presentations **Duration: 35** **Teacher**: share screen with completed assignment . Go in chronological order and allow students to present what they prepared on their individual body systems. **Students:** Groups will be given 4 minutes per body system.	**Give students time to present their body system.**
Activity 3: **Duration: 30** https://www.canva.com/design/DAEcj-Q6zT0/share/preview?token=OMshCz_UJkdBtACaoNysIw&role=EDITOR&utm_content=DAEcj-Q6zT0&utm_campaign=designshare&utm_medium=link&utm_source=sharebutton **In the same groups from the previous activity students will be given all 12 patient files with different diseases/ viruses.** **Teacher: Present second activity. Go over directions and one sample case study for more guidance.** **Students: Using what they learned from the previous activity students must fill out a patient journal. Here they will identify which body systems are being affected and patients symptoms.** **Students will be given a word bank with possible diagnosis and must do personal research to correctly diagnose their patients. Personal research can be done anywhere. Example: google**	**Go in and out of breakout rooms to make sure students don't have any questions or need any further assistance.** **Try not to give students the answers. Let them figure it out on their own. Maybe narrow down the diagnosis for them if they're stuck.** **It is okay if they don't finish all case studies! This is just for fun and to see how many they can get correct!**



Super Mario Hospital
"Where your health is a SUPER priority"

Patient File #1

Henry is an 84-year-old male who presents to the ER in a state of confusion. Patient lives in close proximity to the hospital and walks in stating that he is "looking for his favorite restaurant" and becomes angry and violent when employees attempt to help. After restraining patient, a bottle of prescription medication (Donepezil) was found in his coat pocket.

Name:_____ Symptoms:_____
Age:___ _____
Gender:_____ _____

Body Systems Being Affected:_____
_____
_____

Possible Diagnosis (Include 2):_____
_____
_____

Personal research:_____
_____
_____

Final Diagnosis, Why?_____
_____
_____

Diagnosis Word Bank

Alzheimer Disease: (Hint) Nervous System
Anemia (Hint) Circulatory System
Asthma (Hint) Respiratory System
concussion (Hint) Nervous System
COVID-19 (Hint) Respiratory System
Dislocation of the glenohumeral joint (shoulder) - (Hint)
(Hint) Skeletal Sysytem
Ectopic Pregnancy - (Hint) Reproductive System
Food Poisoning - (Hint) Digestive System
Hemorrhoids - (Hint) Circulatory System
IBS -Digestive System
Spontaneous abortion (miscarriage) - (Hint)
Reproductive System
Scabies - (Hint) Integumentary System

Activity 4: Answer Key Kahoot **Duration: 5 minutes**	
https://create.kahoot.it/details/ac8f0054-a823-47af-95e4-1b36c691d0a0 **Teacher: Share kahoot code on the screen. Then split teams off into their breakout rooms.** **In this kahoot students will answer what they diagnosed their patients with and will get to see whether they gave them the correct diagnosis. Let's see which group of SUPER doctors were the best!!** **Students: Pick one team member to represent your group in a kahoot. THIS WILL BE THE ONLY STUDENT IN THE KAHOOT. The rest of the members will be looking at their patient files to help the team member in the kahoot pick the right diagnosis.** **Teacher: Once kahoot is over, bring everyone together to see the winning team and close off the lesson by giving a short description in your own words on how this relates to the real world and medical field.**	**Start Kahoot Lesson**

Back to Table of Contents

Super Mario Hospital
"Where your health is a *SUPER* priority"

Patient File #1

Wario is an 84-year-old male who presents to the ER in a state of confusion. Patient lives in close proximity to the hospital and walks in stating that he is “looking for his favorite restaurant” and becomes angry and violent when employees attempt to help. After restraining patient, a bottle of prescription medication (Donepezil) was found in his coat pocket.

Name: Wario

Age: 84

Gender: Male

Symptoms:
- Confusion
- Temper
- Disorientation

Body Systems Being Affected:
- Nervous System
- Immune System
- Endocrine System

Possible Diagnoses (Include 2):
- Alzheimer's Disease
- Concussion

Personal research:
- Alzheimer's disease is the most common cause of dementia, a continuous decline of thinking, behavioral, and social skills that affects a persons ability to function independently.
- Concussion is a traumatic brain injury that affects your brain function. Effects are usually temporary but can include headaches and problems with concentration, memory, balance, and coordination.

Final Diagnosis, Why? Both Alzheimer's disease and concussions cause confusion. However, because of his age and temper the final diagnosis is **Alzheimer's disease.**

Super Mario Hospital
"Where your health is a *SUPER* priority"

Patient File #2

Peach is an 18-year-old female who presents to the ER following an injury in a soccer game she experienced the night before. The patient reports “going for a header” and having her head strike the head of an opponent’s. Initially, she only felt localized pain in the location of the injury, however she began developing other symptoms as the game progressed. She states that she is experiencing some dizziness, blurred vision and sensitivity to light. Her mother reports that the patient seems “confused” and “sluggish”, has difficulty concentrating and has been complaining of headaches. A computed tomography (CT) scan was performed and reports were all normal.

Name:_____

Age:____

Gender:_____

Symptoms:_____

_____

_____

Body Systems Being Affected:_____

_____

_____

Possible Diagnoses (Include 2):_____

_____

_____

Personal research:_____

_____

_____

Final Diagnosis, Why?_____

_____

_____

Super Mario Hospital
"Where your health is a *SUPER* priority"

Patient File #3

Daisy is a 20-year-old female who presents to the ER complaining of a cough, runny nose, body aches and extreme fatigue. Daisy states she thought it was “just a cold” but has gotten progressively worse over the past 12 hours. Oral temperature is recorded at 103.4°F. Patient also states that the cough has become more severe and she is beginning to lose the ability to taste and smell.

Name:_____

Age:____

Gender:_____

Symptoms:_____

_____

_____

Body Systems Being Affected:_____

_____

_____

Possible Diagnoses (Include 2):_____

_____

_____

Personal research:_____

_____

_____

Final Diagnosis, Why?_____

_____

_____

Super Mario Hospital
"Where your health is a *SUPER* priority"

Patient File #4

Birdo is a 23-year-old female who presents to the ER complaining of intense suprapubic pain with vaginal bleeding. The patient also reports shoulder pain. A pregnancy test was determined to be positive and an Ultrasound revealed no gestational sac.

Name:_____

Age:____

Gender:_____

Symptoms:_____

_____

_____

Body Systems Being Affected:_____

_____

_____

Possible Diagnoses (Include 2):_____

_____

_____

Personal research:_____

_____

_____

Final Diagnosis, Why?_____

_____

_____

Super Mario Hospital
"Where your health is a *SUPER* priority"

Patient File #5

Waluigi is an 81-year-old male who presents to the ER with complaints of feeling “weak and terrible.” He states that he has “no energy whatsoever and I’m always cranky.” Vital signs are taken and results show an elevated heart rate and respiratory rate. Patient shows signs of having the inability to concentrate while answering questions. Skin pallor is prominent. Blood tests revealed low hemoglobin and hematocrit levels.

Name:_____

Age:____

Gender:_____

Symptoms:_____

_____

_____

Body Systems Being Affected:_____

_____

_____

Possible Diagnoses (Include 2):_____

_____

_____

Personal research:_____

_____

_____

Final Diagnosis, Why?_____

_____

_____

Super Mario Hospital
"Where your health is a *SUPER* priority"

Patient File #6

Pauline is a 24-year-old female who presents to the ER with abdominal cramping and heavy vaginal bleeding and clots. Patient states she is 11 weeks pregnant. Over the past two days, she had experienced light spotting, which had increased in severity that morning. Patient reports no fever, chills, burning on urination, nausea, or vomiting. Bloodwork reveals a Beta human chorionic gonadotropin (b-hCG) level of 9400.0 mIU/mL, which suggests a gestational age of three to four weeks. An ultrasound shows an absence of fetal heart rate (FHR).

Name:_____

Age:____

Gender:_____

Symptoms:_____

_____

_____

Body Systems Being Affected:_____

_____

_____

Possible Diagnoses (Include 2):_____

_____

_____

Personal research:_____

_____

_____

Final Diagnosis, Why?_____

_____

_____

Super Mario Hospital
"Where your health is a *SUPER* priority"

Patient File #7

Rosalina is a 17-year-old female who presents to the emergency room (ER) after receiving an injury at school. She reports that she was in the busy hallway at school when she put her arm up to give a “high-five” to a friend and a student barreled into her arm causing it to twist backward forcefully. She is experiencing severe localized glenohumeral pain, muscle spasm, numbness, and weakness in her arm. She states that it feels “out of place.”

Name:_____

Age:____

Gender:_____

Symptoms:_____

_____

_____

Body Systems Being Affected:_____

_____

_____

Possible Diagnoses (Include 2):_____

_____

_____

Personal research:_____

_____

_____

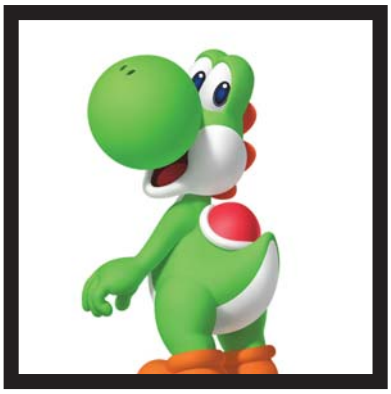
Final Diagnosis, Why?_____

_____

_____

Super Mario Hospital
"Where your health is a *SUPER* priority"

Patient File #8



Yoshi, a 24-year-old male presents to the ER with complaints of wheezing, difficulty breathing and fatigue. He is not a smoker and is in generally good shape. He is speaking in short phrases due to breathlessness. His blood pressure is 142/80 mmHg, heart rate at 115 beats per minute(BPM), respiratory rate of 24 bmp and an Oxygen SAT of 92% on room air. After performing a spirometry test, his forced expiratory volume (FEV)1 results were low. After receiving an albuterol treatment, his FEV1 improved by 25%.

Name:_____

Age:____

Gender:_____

Symptoms:_____

_____

_____

Body Systems Being Affected:_____

_____

_____

Possible Diagnoses (Include 2):_____

_____

_____

Personal research:_____

_____

_____

Final Diagnosis, Why?_____

_____

_____

Super Mario Hospital
"Where your health is a *SUPER* priority"

Patient File #9

Toadette is a 32-year-old female who presents to the ER complaining of nausea and vomiting. She reports having painful stomach cramps, watery diarrhea, and the inability to hold down any food or liquids. Patient states she attended a birthday party at a local seafood restaurant and was woken from sleep about 4 hours later by her symptoms. Vital signs were all within normal range.

Name:_____

Age:____

Gender:_____

Symptoms:_____

_____

_____

Body Systems Being Affected:_____

_____

_____

Possible Diagnoses (Include 2):_____

_____

_____

Personal research:_____

_____

_____

Final Diagnosis, Why?_____

_____

_____

Super Mario Hospital
"Where your health is a *SUPER* priority"

Patient File #10

Toad is an 11-year-old boy who is brought to the ER by his mother who is concerned with a rash on the patient's body that has been visible for over a week and has not gone away. Upon physical examination, a "pimple-like" skin rash is found clustered in the wrists, armpits, around the waist, groin and inner elbow regions. The patient states that the rash is "very itchy" and tends to worsen at night. A scraping of the area under a microscope revealed scybala.

Name:_____

Age:____

Gender:_____

Symptoms:_____

_____

_____

Body Systems Being Affected:_____

_____

_____

Possible Diagnoses (Include 2):_____

_____

_____

Personal research:_____

_____

_____

Final Diagnosis, Why?_____

_____

_____

Super Mario Hospital
"Where your health is a *SUPER* priority"

Patient File #11

Luigi is a 39-year-old male who presents to the ER due to finding blood in his bowel movement over the past several days. Luigi noted that he had been constipated for the past month and reports straining most of the time, often taking up to 20 minutes at minimum to initiate a bowel movement. The patient did report feeling some swollen masses when he wiped after a bowel movement as well as the area feeling "itchy."

Name:_____

Age:____

Gender:_____

Symptoms:_____

_____

_____

Body Systems Being Affected:_____

_____

_____

Possible Diagnoses (Include 2):_____

_____

_____

Personal research:_____

_____

_____

Final Diagnosis, Why?_____

_____

_____

Super Mario Hospital
"Where your health is a *SUPER* priority"

Patient File #12

Wendy O. Koopa is a 23-year-old female who presents to the ER with painful stomach cramping. Patient reports that she notices the episodes come shortly after eating, especially coffee, sodas, and some dairy products. She states that she has bloating and gas as well as mucus in her stool. She also notes that the pain is often relieved once she has had a bowel movement. A colonoscopy performed days later shows no signs of disease or abnormalities.

Name:_____

Age:____

Gender:_____

Symptoms:_____

_____

_____

Body Systems Being Affected:_____

_____

_____

Possible Diagnosis (Include 2):_____

_____

_____

Personal research:_____

_____

_____

Final Diagnosis, Why?_____

_____

_____

Diagnosis Word Bank

Alzheimer Disease: (Hint) Nervous System

Anemia (Hint) Circulatory System

Asthma (Hint) Respiratory System

Concussion (Hint) Nervous System

COVID-19 (Hint) Respiratory System

Dislocation of the glenohumeral joint (shoulder) - (Hint) Skeletal System

Ectopic Pregnancy - (Hint) Reproductive System

Food Poisoning - (Hint) Digestive System

Hemorrhoids - (Hint) Circulatory System

IBS -Digestive System

Spontaneous abortion (miscarriage) - (Hint) Reproductive System

Scabies - (Hint) Integumentary System

Lesson Plan Option 1: Traditional

Name of Lesson: Po-key-mon & Who's that Pokemon?

Learning (TEKS) Objective:
B.8(B) Categorize organisms using a hierarchical classification system based on similarities and differences shared among groups.

Student Outcome: *Students will be able to… classify Pokemons according to their shared characteristics by practicing using a dichotomous key.*

Day of the Week and Time
Week 2: Thursday, 10:00 AM-11:15 AM

Total Length of Lesson:
1.25 Hours

Materials (per student):

- Laptops
- Candy Sorting Practice Template
- Po-key-mon Template
-

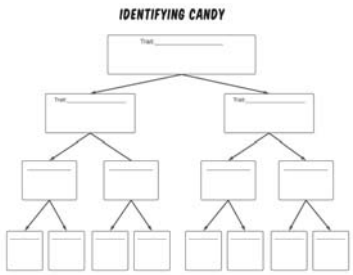
Technology

- Desmos Polygraph - Who's that Pokemon? (can use any electronic device)
-
-

Advanced preparation

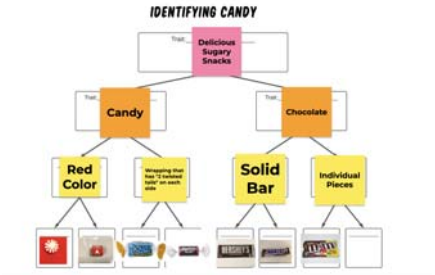
- Make sure students have access to laptops
-
-

Instructional Delivery Option 1 (use if everyone is doing the same thing)	**Notes to Teacher:**
Activity 1: Introduction to Candy Sorting Practice (Individual) **Duration: 10 mins** Dichotomous Key (2:40 min): **Click me →** **Dichotomous Key Video** Explain to students that a dichotomous key is a scientific tool scientists use to identify organisms based on observable traits. They consist of a series of statements with two choices that will lead the user to the proper identification of the organism. Then, have students practice sorting and identifying candy. **Practice Classification:** Use this document below, it contains the script/instructions for this activity! **Click me →** **Candy Sorting Instructions** **Click me →** **Candy Sorting Practice Template**	**IMPORTANT:** Remind students to download the file before editing!



They can group items by size, wrapping, color, hard/soft, candy/chocolate, or any other observation made!

Example of Candy Sorting Activity:



This will be sorted physically and **will not be done on Jamboard (it is just an example of how it can look since I did not have the candy on hand), they will get to have a physical bag full of 7 different types of treats and they will sort them accordingly and include name and a brief description of the item in each square.**

Then, go over answers as a class:
There is not a specific right or wrong answer, just make sure students are able to justify why they grouped the items the way they did and have them describe shared characteristics within the groups.

Activity 2: Po-key-mon (Dichotomous Key) **Duration: 30 mins**

Now that students know how a dichotomous key works, they get to practice filling one out by observing differences and similarities between the provided Monsters & Pokemons.

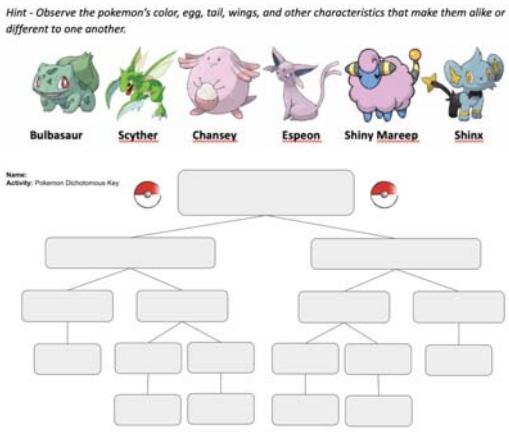
Click me → **Mysterious Creatures Practice**
Answer key:

IMPORTANT:
Remind students to download the file before editing!

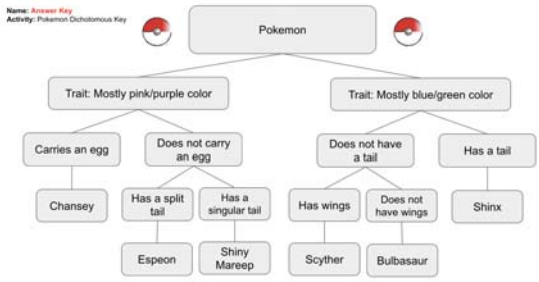
Remind students that their options are “go to #” or include the name of the pokemon on the right column (refer to answer key).

Po-key-mon Template:

Click me → **Po-key-mon Chart Dichotomous Key**



Answer Key:



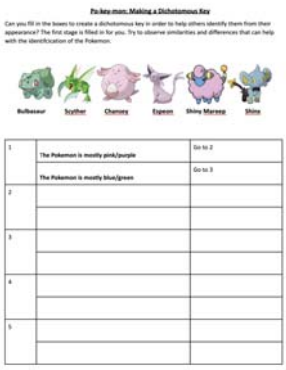
Then, have students practice the same key in a table format.

Click me → **Po-key-mon Table Dichotomous Key**

Characteristics to consider for key:

-Color
-Eggs
-Tails
-Wings
-etc.

Answer Key - Po-key-mon



UPDATE: I provided an extra page with instructions on how to create a dichotomous key with steps under the blank Pokemon table key (page 2).

If students need further guidance, refer to this answer key.

Example of Dichotomous Key Activity:

1	The Pokémon is mostly pink/purple	Go to 2
	The Pokémon is mostly blue/green	Go to 3
2	Carries an egg	Chansey
	Does not carry an egg	Go to 4
3	Has tail	Shinx
	No tail	Go to 5
4	Has a split tail	Espeon
	Has a singular tail	Shiny Mareep
5	Has wings	Scyther
	No wings	Bulbasaur

*Their dichotomous key does not have to match the table answer key provided. It is more for guidance if students are struggling.

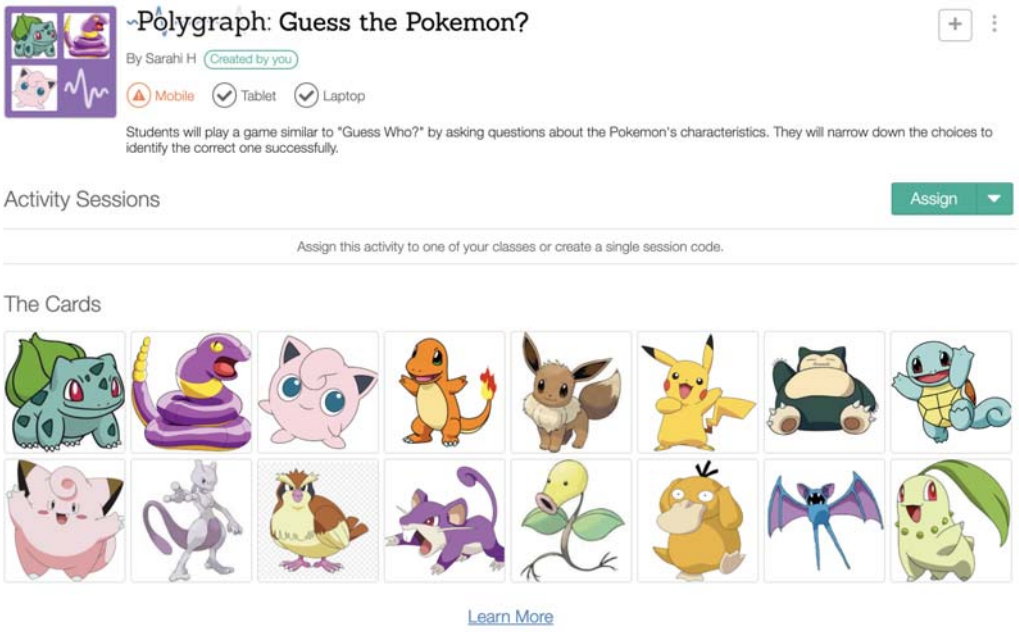
Characteristics to consider for key:

-Color
-Eggs
-Tails
-Wings
-etc.

Activity 3: Who's that Pokemon? (Desmos Polygraph) **Duration: 30 mins**

For this activity, students will play a game similar to “Guess Who?”
Students will choose a pokemon from the 16 available.

Desmos Activity Builder - Polygraph:



Students will play a game similar to "Guess Who?" by asking questions about the Pokemon's characteristics. They will narrow down the choices to identify the correct one successfully. They can replay as many times as they wish.

- ★ Class code will be created and shared with students.
- ★ Students will then visit **student.desmos.com** and type the 6-digit code.
- ★ Students can type their name and continue without signing in.

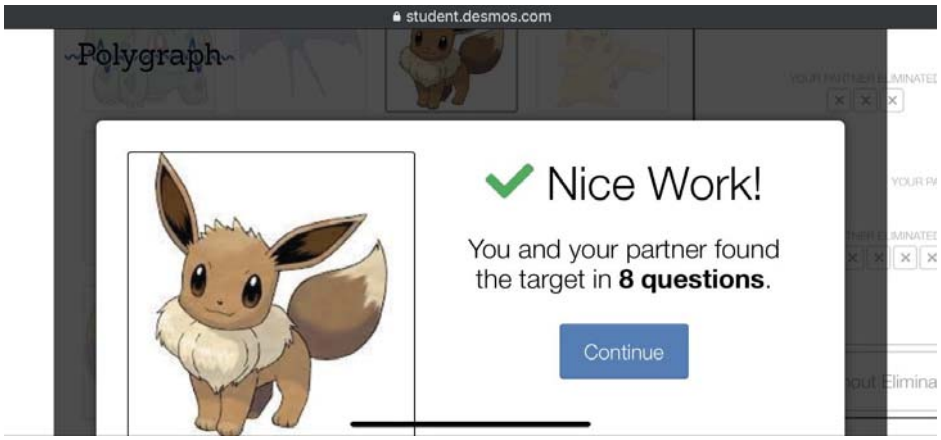
- ★ There is a general practice round of “guess who,” so students get more familiar with the game before the actual round. It is not recommended for students to

Ask students if they are familiar with the “Guess Who?” game.

*If students use their cellphones, there is a small window warning displayed. All they have to do is

skip this round as they will get to practice and familiarize themselves with the game.

- ★ They are paired randomly as students start joining the session.
- ★ One partner will get to choose the card while another has to ask the questions.
- ★ Communication is through a chat box on the side.
- ★ The questions being asked have to be **yes or no questions** about the card.
- ★ After the other partner answers either “yes, no, or not sure” it gives the option to eliminate cards to narrow down the selection.
- ★ At the end, it gives you a congratulations window and how long it took to arrive at the correct answer. Their goal is to try to identify the pokemon with the LEAST questions possible!
- ★ Tell students to keep track how long or how many questions it took them before they guessed the correct pokemon.



At the end, ask students who were able to guess the pokemon with the LEAST number of questions. Allow a few minutes for students to share their lowest value and see who did it the fastest. Ask students what they learned about dichotomous keys.

To wrap up the activity, explain to them that they were subconsciously making their own dichotomous key as they were asking their partners a question. They were grouping

accept and scroll between the cards and the chat on the screen.

If a student does not have a partner, it will get paired with a robot.

*If students are done with the first round, they can continue playing, choosing different pokemons every round and playing with other students.

individuals based on characteristics and eliminating those who were not it until they arrived at the correct pokemon. Emphasize that dichotomous keys will not always show evolutionary relationships. So even if 2 animals are close to each other on the key, it does not mean they will be close evolutionarily.	

Back to Table of Contents

DO NOT EAT! 	DO NOT EAT! 	DO NOT EAT! 
DO NOT EAT! 	DO NOT EAT! 	DO NOT EAT! 

Materials:

1 Ziploc bag with 1 piece of each candy per student:

Chewable Mint/ Butterscotch, regular mint, tootsie roll, jolly rancher, life saver, lollipop?

1 dichotomous key handout

Instructions to Tell Students:

1. Pick the peppermint candy (because it probably does not have the name of it on the wrapper) from your bag and ask students “what is the name of this candy?”

2. Some students might know. Ask them how they know what it is called.

3. Ask students “if you didn’t know what this candy is called how would you find out?”

4. Students might respond to “Google it” or “Ask someone”. And that’s okay, ask them “what would you type into Google?”

5. Their responses might be based off the traits, like typing in “hard white candy that is a circle with red stripes”. Tell students that this is how we identify things in nature too, based on their traits that we can observe!

    - Some students might mention to type in that its “minty”. That is a good time to point out that, while true, you might not know that if you wanted to find out what the candy is before opening and eating it. Sometimes we only have limited information about what we are trying to identify, usually just what we can see.

6. Tell students that we are going to explore how we identify things in nature, like plants and animals… and even Pokémon! They might already know what a dichotomous key is, allow students to share their prior knowledge.

7. Tell students that we are going to use the bag of candy as our first try in building the guide. Instruct them to use the Handout to guide them.

- Tell students that this first part is individual, so focus on their own process. Give students no more than 5 minutes for this part of the activity.

-As students create their groups, they write the defining trait at the top of the box and the names of the candies in that group below it in the box.

-They may not use all of the boxes and that’s okay.

- Fill in the top box with the students, what is one trait that they all have in common?

8. As students create their groups, you can walk around and notice their groups, remind them to write on the handout, or ask & answer questions.

9. When students are done, ask volunteers to share what their first 2 groups were.

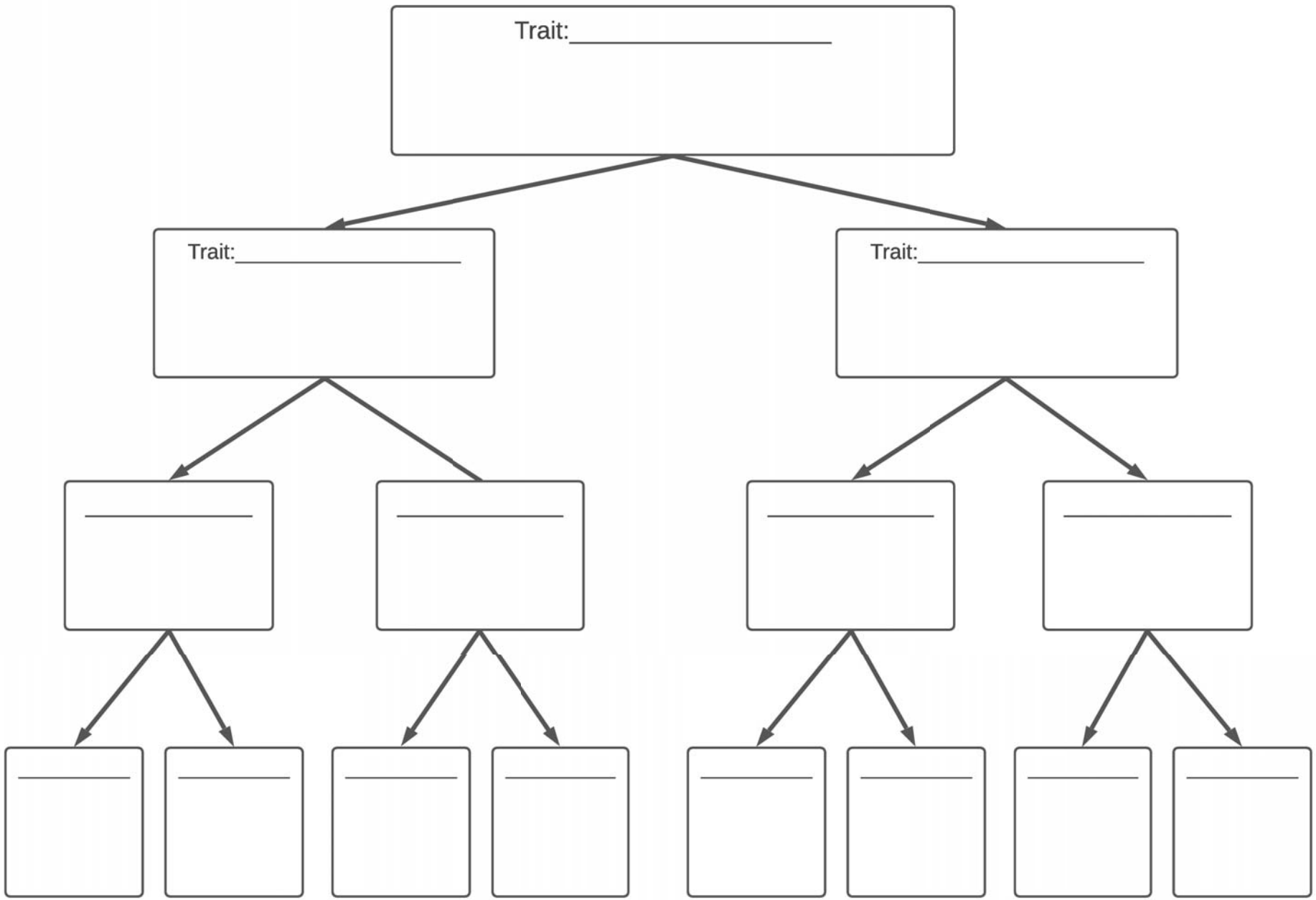
- Responses may vary and that’s okay! It allows you to address the fact that dichotomous keys don’t always follow the same process because they only address observable traits, not evolutionary relationships or anything.

- Some students may have disagreements with classifications. Like whether a Tootsie Roll is considered chocolate or not. This is okay too, and allows you to mention that dichotomous keys need to use language that is clear and not vague! Or, if they can't do that, to use a different trait to categorize groups.

Source:

https://www.generationgenius.com/wp-content/uploads/diy-activities/candy-classification-diy.pdf

IDENTIFYING CANDY

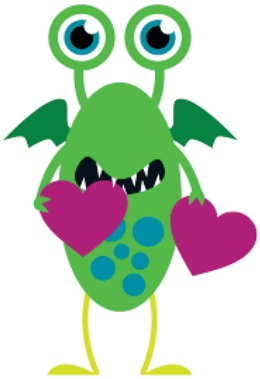


P R A C T I C E !

Mysterious Creatures -- Dichotomous Key

Name:

Name:



Name:

Name:

Name:

Name:

1A. Horns or antennae… Go to step 2
1B. No horns or antennae… Go to step 3

2A. Arms… Go to step 3
2B. No arms… **Eros**

3A. Holding a heart… Go to step 4
3B. Not holding a heart… **Gerwyn**

4A. More than one heart (including hearts not being held)… Go to step 5
4B. Only one heart… **Cradoe**

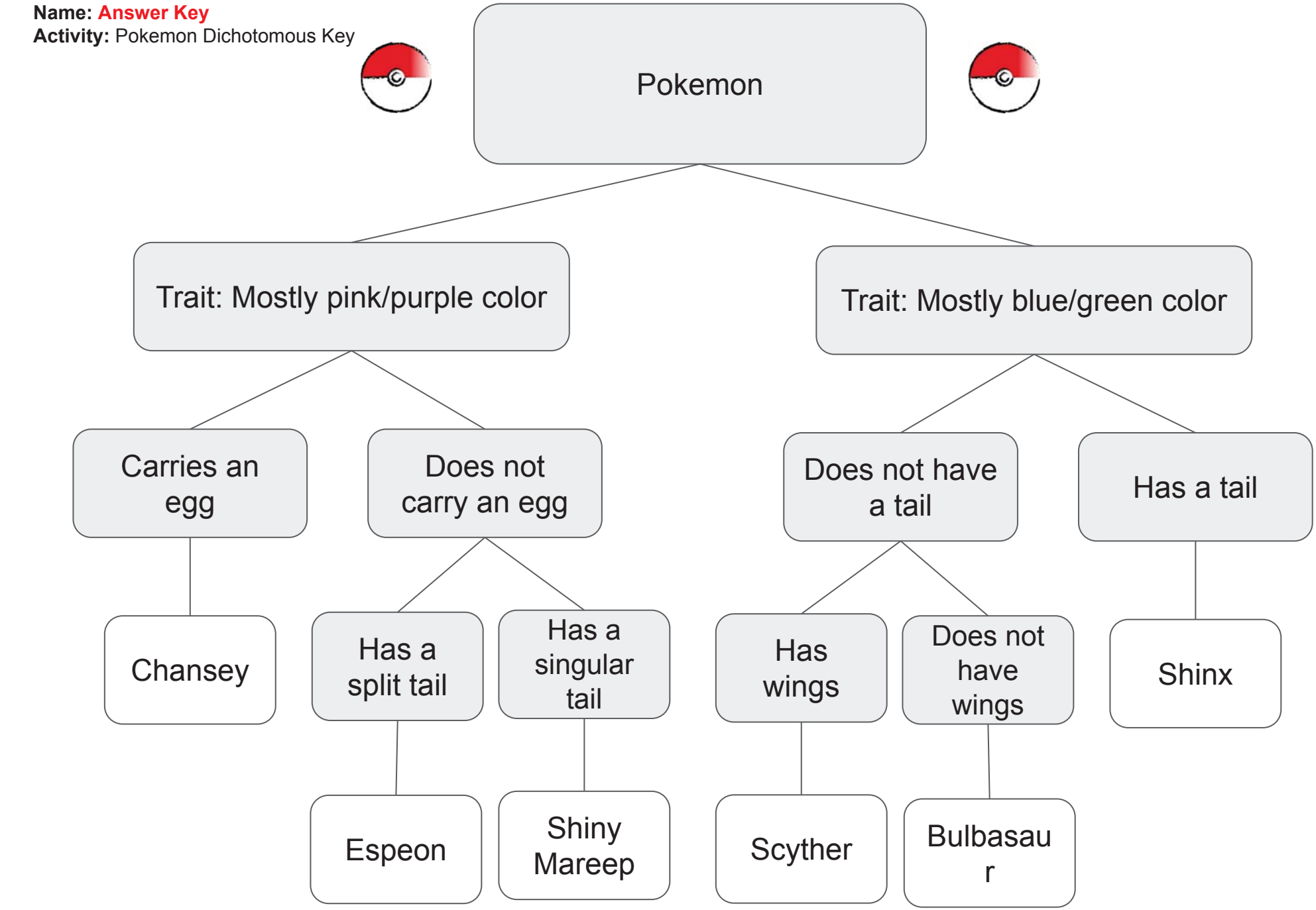
5A. Tail… **Amadeus**
5B. No tail… Go to step 6

6A. Wings… **Jedi**
6B. No wings… Go to step 7

7A. Bow and eyelashes… **Mina**

Name:
Activity: Pokemon Dichotomous Key

Name: Answer Key
Activity: Pokemon Dichotomous Key



Po-key-mon: Making a Dichotomous Key

Can you fill in the boxes to create a dichotomous key in order to help others identify them from their appearance? The first stage is filled in for you. Try to observe similarities and differences that can help with the identification of the Pokemon. *(Each number is a new characteristic/ category)

Hint - Observe the pokemon's color, egg, tail, wings, and other characteristics that make them alike or different to one another.

Bulbasaur **Scyther** **Chansey** **Espeon** **Shiny Mareep** **Shinx**

#	Description of distinctive trait	Go to this # or Insert Name of Pokemon
1	**The Pokemon is mostly pink/purple**	Go to 2
	The Pokemon is mostly blue/green	Go to 3
2	**Carries an egg**	Chansey
3		
4		
5		

How to Make a Dichotomous Key

Step 1: List down the characteristics. Pay attention to the specimens you are trying to identify with your dichotomous key. List down the characteristics that you can notice. For example, say you are trying to classify a group of animals. You may notice that some have feathers whereas others have legs, or some have long tails and others don't.

Step 2: Organize the characteristics in order. When creating your dichotomous key, you need to start with the **most** general characteristics first, before moving to the more specific ones. So it helps to have identified the more obvious and less obvious contrasting characteristics among the specimen before creating your dichotomous key.

Step 3: Divide the specimens. You can use statements (i.e. has feathers and no feathers) or questions (does it have feathers?) to divide your specimens into two groups. The first differentiation should be made on the most general characteristic.

Step 4: Divide the specimen even further. Based on the next contrasting characteristic, divide the specimen further. For example, first, you may have grouped your animals as *have feathers* and *have no feathers*, in which case the ones with feathers can be categorized as *birds* while you can further subdivide the ones that have no feathers as *having fur* and *having no fur*. Continue to subdivide your specimen by asking enough questions until you have identified and named all of them.

Step 5: Draw a dichotomous key diagram. You can either create a text-based dichotomous key or a graphical one of the specimens you are trying to identify. For this activity, you will fill out a table dichotomous key.

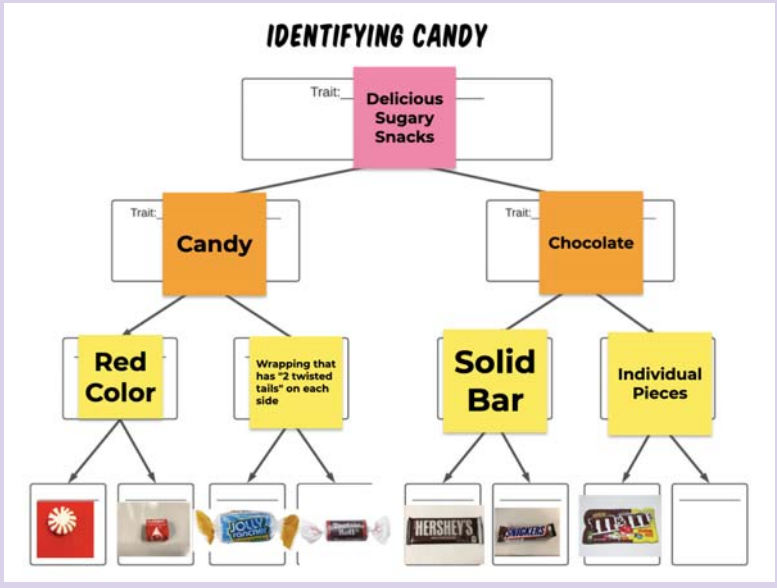
Step 6: Test it out. Once you have completed your dichotomous key, test it out to see if it works. Focus on the specimen you are trying to identify and go through the questions in your dichotomous tree to see if you get it identified at the end. If you think the questions in your dichotomous key need to be rearranged, make the necessary adjustments.

****** TIPS:*** *Consider only one characteristic at a time, use observable characteristics, use major characteristics when dividing the organisms in the beginning and use lesser or less obvious characteristics to divide them into smaller groups, when writing contrasting statements, rely on similar word formats (i.e. have feathers and don't have feathers), avoid repeating the same characteristics, use questions that lead to yes or no answers rather than statements.*

Po-key-mon & Who's that pokemon? - Answer Key & Examples

Activity 1: candy sorting practice Template

My Example:



This will be sorted physically and **will not be done on Jamboard. This is just an example of how it can look since I did not have the candy on hand. They will get to have a physical bag full of 7 different types of treats and they will sort them accordingly and include name and a brief description of the item in each square.**

answers:

There is not a specific right or wrong answer, just make sure students are able to justify why they grouped the items the way they did and have them describe shared characteristics within the groups. They can group items by size, wrapping, color, hard/soft, candy/chocolate, or any other observation made!

Next page ↓

Po-key-mon & Who's that pokemon? - Answer Key & Examples

Activity 2: po-key-mon (dichotomous key)

answer key:

Mysterious Creatures Practice

Answer Key:

Gerwyn

Mina

Jedi

Amadeus

Cradoe

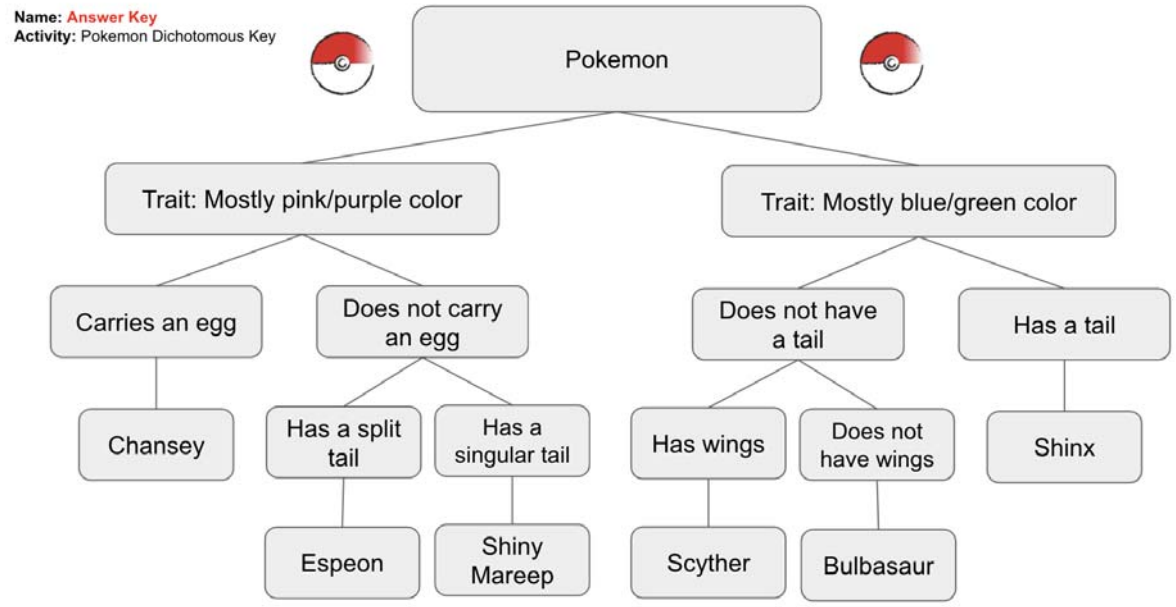
Eros

Next page ↓

Po-key-mon & Who's that pokemon? - Answer Key & Examples

Answer Key:

Po-key-mon Chart Dichotomous Key



Next page ↓

Po-key-mon & Who's that pokemon? - Answer Key & Examples

Answer Key:

Po-key-mon Table Dichotomous Key

Bulbasaur **Scyther** **Chansey** **Espeon** **Shiny Mareep** **Shinx**

1	The Pokémon is mostly pink/purple	Go to 2
	The Pokémon is mostly blue/green	Go to 3
2	Carries an egg	Chansey
	Does not carry an egg	Go to 4
3	Has tail	Shinx
	No tail	Go to 5
4	Has a split tail	Espeon
	Has a singular tail	Shiny Mareep
5	Has wings	Scyther
	No wings	Bulbasaur

Activity 3: Who's that pokemon? (Desmos Polygraph)

N/A

Using Desmos Polygraph intro video: **Click me →** [Example: Preview of Desmos]

Contact information for Level Up! Summer Camp:

Ellen Esposito
Director, Secondary Education
ADP MaST (Math and Science Teachers) Academy
The University of Texas at El Paso (UTEP)
El Paso, TX 79902
915.747.8468
edesposito@utep.edu

Sue Huffman
MaST Outreach Manager
The University of Texas at El Paso
El Paso, TX 79902
915.747.8469
sehuffman@utep.edu

All materials were developed by ADP MaST Academy Scholars and guest scholars at The University of Texas at El Paso:

Rain Azcarate
Daniel Valles
Ruby Ryan
Michelle Ramirez
Elisabet Lopez
Kayla Foster
Eduardo Moreno
Sarahi Hardy
Adrian Rosales
Hillary Quiroz

and ADP MaST Mentor Teachers:

Roger Winter
Sarah Garcia
Jesus Loya

ADP Math and Science Teachers Academy
THE UNIVERSITY OF TEXAS AT EL PASO

Level Up! Resource Guide was edited in December 2021 by:

Ruby Ryan
Scholar, ADP MaST Academy

ADP MaST Academy is supported by a grant from Automatic Data Processing, Inc.