

Fuel Cell Car Instructions

Items included:

Quantity	Item	Item Label	Included Yes/No
1	Car Chassis	A	
1	Gas Collector Tank	B	
1	Fuel Cell	C	
4	Wheels	D	
2	17 cm Hose	E	
2	5 cm Hose	F	
2	Clear Hose Connectors	G	
2	Hose Plugs	H	
1	Battery Holder	I	
1	Metal Wheel Axle	Not Labeled	

Procedure:

Use Figure 1 for steps 1-4.

1. Attach the two front wheels onto the front axle making sure not to bend the axle.
2. Be careful that your finger is not covering the middle hole on the wheel. The axle could slip through and hurt you.
3. Slide metal axle through the holes at the back of the chassis and attach the two back wheels onto the back axle like you did in step 1.
4. Remove gas tank from the back of the chassis.

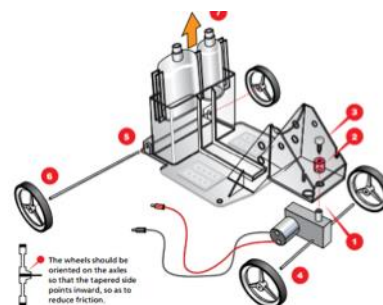


Figure 1: Car Assembly

Use Figure 2 for steps 5-8.

5. Insert the ends of the 17 cm tubes into the holes in the top of the gas collector. Push the tubes all the way through the bottom of the tanks.
6. Insert the clear hose connectors into the ends of the tubes.
7. Pull the hose up to wedge the connector into the hole in the tank to create a tight seal.
8. Insert gas collector to the back of the chassis with oxygen tank on the left and the hydrogen tank on the right.

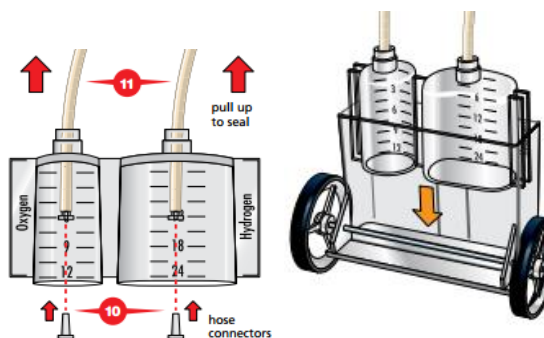


Figure 2: Gas Collector Assembly

Use Figure 3 for steps 9-12.

9. Set fuel cell into the slot in the middle of the chassis so that the side with the red ringed socket is on the left and the black ringed socket is on the right.
10. Attach the free ends of the 17 cm tubes to the bottom nozzles. (The hose coming out of the larger tank should go into the black side of the fuel cell, and the hose from the smaller tank should go into the red side of the fuel cell).
11. Attach the 5 cm tubes to the top nozzles of the fuel cell.
12. Insert the red hose plugs into the ends of both 5 cm tubes.
13. Call your instructor to help begin charge the fuel cell.
14. After instructor fills fuel cell with distilled water carefully plug cables from the battery holder into the corresponding sockets. (Red wire with the red ringed socket and the black wire with the black ringed socket).

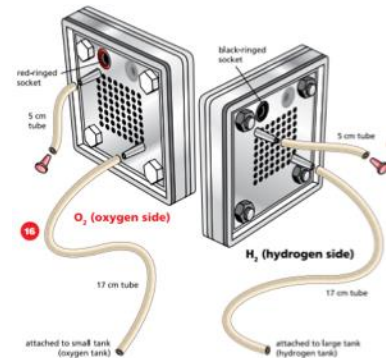


Figure 3: Fuel Cell Assembly

Formula Sheet

KINETIC ENERGY:

$$KE = \frac{1}{2} \dot{m} v^2$$

POTENTIAL ENERGY:

$$PE = \dot{m} g z$$

EFFICIENCY:

$$n = \frac{\text{Energy Output}}{\text{Energy Input}}$$

POWER:

$$P = I * V$$

$$P = A_s * P_{sun}$$

WORK:

$$W = F * d$$

FORCE:

$$F = m * a$$

ACCELERATION:

$$a = \frac{v}{t}$$

VELOCITY:

$$v = \frac{d}{t}$$

COMPONENTS

v = velocity

\dot{m} = mass flow rate

g = gravity

z = height

n = efficiency

I = current

V = voltage

A_s = solar panel area

P_{sun} = power produced by the sun

ρ = density

\dot{V} = volumetric flow rate

A_c = cross-sectional area

d = distance

a = acceleration

m = mass