

Fuel Cell Demonstration

Set Up & Take Down Procedures

This set-up should be performed 10-15 minutes prior to the demonstration in order to have produced enough energy in the the fuel cell to power the fan immediately when connected

Set Up Procedures

What you'll need:

- Distilled water
- Pourable measuring cup
- Pipette
- Alcohol spray bottle
- Towel
- Fuel cell model

Steps for set up

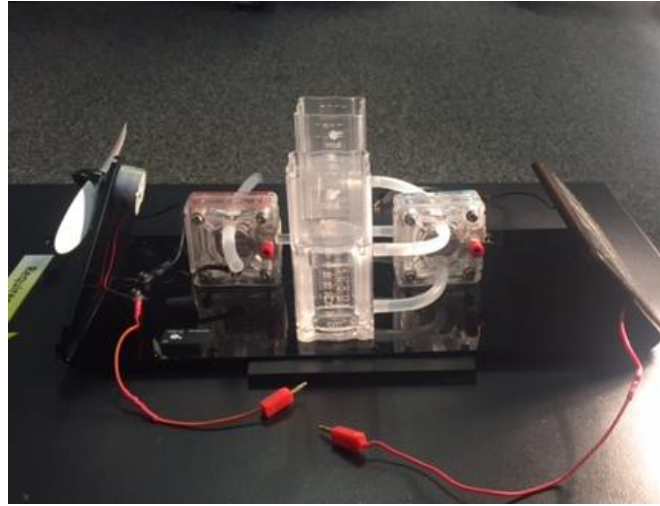
If water is present in either of the storage tanks, remove the model from the platform and empty the water out of both tanks into the sink.

Shake to ensure all the water is out of the bottom of the tanks.

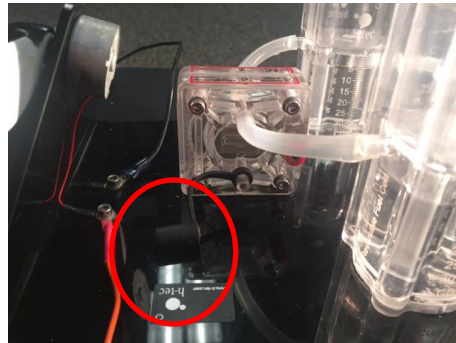
Use a towel to dry off the rest of the model if needed.



Disconnect all red and black cables except where they are screwed into the model.

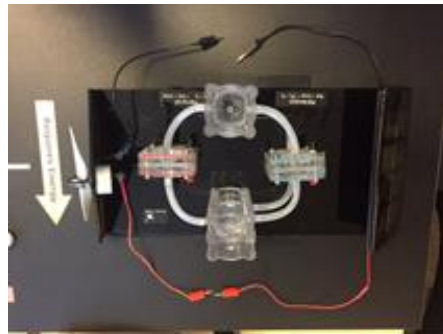


Make sure the black caps are **covering** the vents on the fuel cell. They should be **ON**.



Attach all tubing as seen.

Note: the electrolyzer has light blue trim. The fuel cell (FC) has red trim.



Pour distilled water from the jug into the measuring cup. (**never use tap water or any other water**)

From the measuring cup, fill both storage tanks to the lower line.



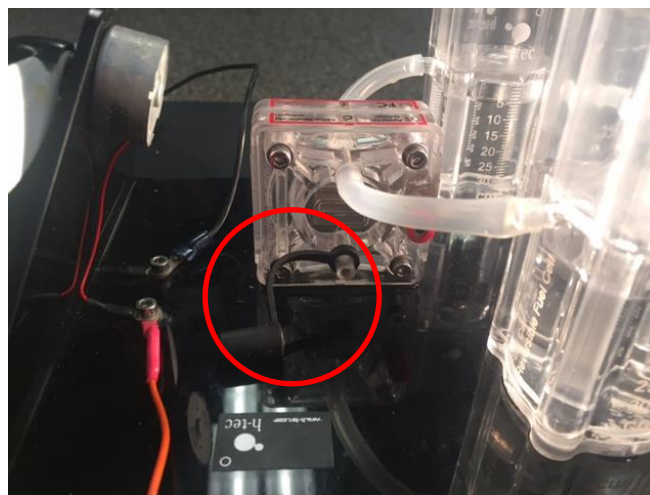
Use the pipette to adjust the water level as needed.



Disconnect the black caps on the FC, circled here in red.

Observe that the water now flows from the upper storage tanks to the lower storage tanks.

The level should come up to the 5 ml mark in the lower part of the storage tanks.



Use the pipette to adjust the water level as needed; making sure the water level is below the tubes to the fuel cell.

Note the rubber tubes that connect the storage tanks to the fuel cell.

Disconnect these tubes from where they attach to the storage tanks on both the hydrogen and oxygen sides.

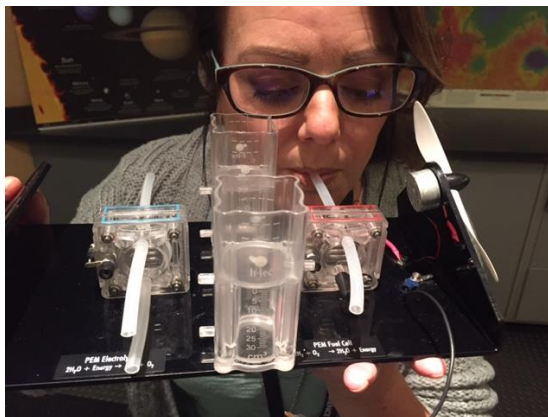
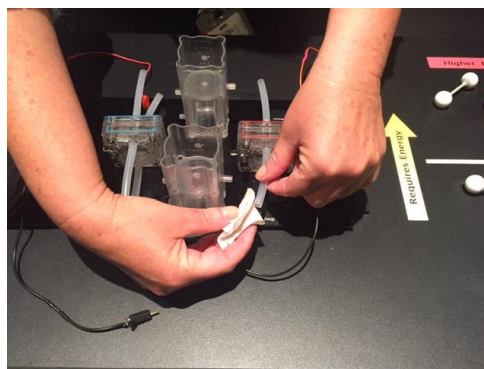


Put alcohol on a piece of paper towel and use it to wipe the ends of the tubes.

Blow into the tubes connected to the FC to purge any water.

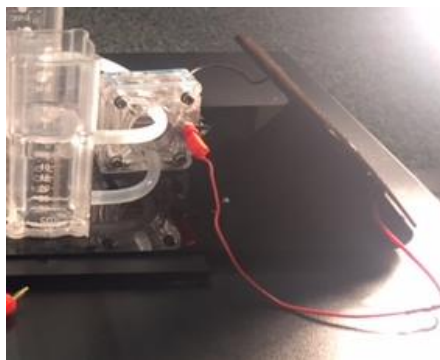
Clean the tubes with the alcohol and paper towel again and reconnect the tubes to the storage tanks.

Replace the black caps on the FC.



Connect both the red and black cables from the solar cell to the electrolyzer.

Turn on the lamp to its highest setting by clicking the switch twice.



Wait about five minutes for hydrogen and oxygen to build up.

Oxygen and hydrogen will build up in the storage tanks displacing the water which will flow back up to the upper part of the storage tanks.

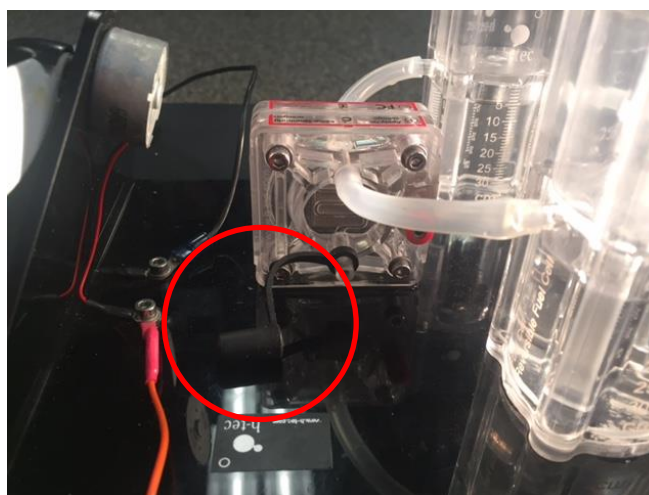


Remove the black caps briefly to allow hydrogen and oxygen to flow through the fuel cell.

Notice that the water level in the bottom of the storage tanks will increase to 5ml again.

Replace the black caps.

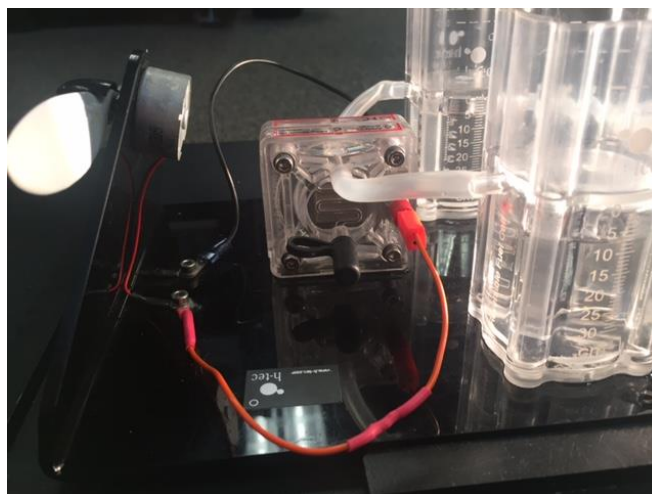
Wait another 5 min. and repeat.



Connect the red and black cables from the FC to the fan.

You should have built up enough energy to get the fan to move from the FC.

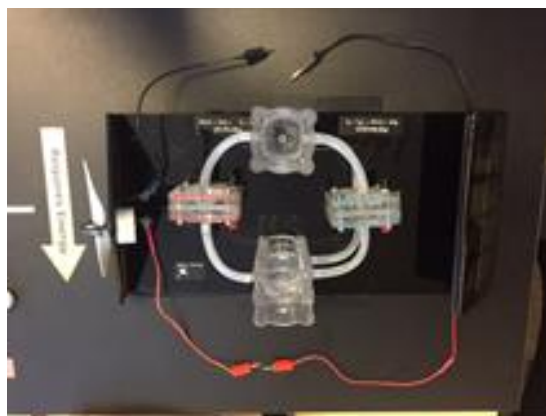
If not, detach the red and black cables and repeat the previous step until you can run the fan off the FC.



Once you have built up enough energy to run the fan with the FC you are ready to begin the demonstration.

Disconnect all cables and turn off the lamp.

This is the ready position for the demonstration.



During the demonstration please turn the lamp to its lowest level or turn it off when not in use to reduce heat build up on the solar cell.

Take Down

- Unplug all cables except where they are screwed down to the model
- Turn off the lamp
- Detach tubes from the storage tank to the FC (keeping them attached to the FC but free from the storage tanks)
- Remove the model from the platform and empty the water from the storage tanks into the sink
- Remove the black caps from the FC
- Dry the model off with a towel
- Return the model to the platform
- Store in the Experiment Bar cabinet