Hydrologic Water Cycle Experiments



Introduction

I have been learning about the hydrologic water cycle in science, so I decided to do two experiments on the hydrologic cycle. The first was to create a small scale cycle, and the second was to make water with the hydrologic water cycle using some green leaves from a mulberry tree. First I will explain what took place in the small scale hydrologic cycle, and then followed by the latter experiment.

Experiment One

(Creating a mini scale of the hydrologic system)



Experiment One

Aim: To recreate a mini scale of the hydrologic water cycle.

Hypothesis: My hypothesis before I do experiment number one, is that the water will evaporate building up on the cling wrap, hence forming droplets of condensation which will build up and join together. This will cause weight on the droplets which will create a sliding motion on the sloped cling wrap. The droplets will build up in the centre of the cling wrap beneath the rock which I have placed on top of the cling wrap. All the droplets will connect causing them to have unbearable weight and eventually fall as precipitation.

Equipment:

- Jug
- Cling wrap
- Warm water
- Food colouring
- Medium sized rock
- Small sized rock

Method: I began by finding a glass jug and found a medium and small sized rock in our garden. The medium sized rock imitates an island surrounded by water. I placed the medium sized rock into the jug, shortly followed by some warm water to jump-start the cycle. Once the water, rock, and splash of food colouring were in the jug, I wrapped the top of the jug with cling wrap to seal off any escaping evaporation. I then placed the small rock on top of the cling wrap above the island (medium rock) to direct the precipitation. I gave the jug half a minute to begin and immediately the results came through.



Result: Evaporation began to rise onto the cling wrap. The cling wrap began to fog up causing condensation. The condensation droplets grew larger via joining together until they became too heavy in which they began rolling to the centre of the cling wrap below the rock. As the condensation droplets built up under the rock (on top of the cling wrap), they began to fall as precipitation onto the island (medium rock). Here the precipitation soaked onto the rock and soon slid down the side of the rock, flowing back into the main body of water. The pictures, which follow this page, show dark streaks on the rock where the water flowed and soaked on the rock. This completes the first experiment of the hydrologic cycle.



Here the evaporation began and started to fog up the cling wrap.



Minute condensation droplets begin to form.



The condensation droplets begin to join and now are growing larger.



Now the condensation droplets have rolled down the cling wrap below the small rock placed on top of the cling wrap. It will soon fall as precipitation.



The precipitation drops have now fallen onto the island (medium rock) and have flowed back into the main body of water leaving behind wet streak marks.

Experiment Two

(Creating water from tree leaves)



Experiment Two

Aim: To create water using the hydrologic system with tree leaves.

Hypothesis: My hypothesis before I do my second science experiment, (making water from tree leaves). I strongly believe that the leaves may take a while to warm up before evaporation begins to take place. The evaporation will begin and condensation will start to form on the cling wrap connecting together to create larger droplets of condensation which will roll down the cling wrap to the centre below the small rock (placed above the cling wrap). The droplets will eventually fall into the cup as precipitation to create fresh water drained from the tree leaves.

Equipment:

- Cling wrap
- Jug
- Green leaves
- Small cup
- Small rock

Method: I began by placing the cup in the middle of the jug shortly followed by some vibrant green mulberry leaves surrounding the cup. I then wrapped the jug loosely with cling wrap so the rock which I placed on top of the cling wrap would help weigh down the centre above the cup. The jug was placed in direct sunlight.

Result: As I stated in my hypothesis, I believed the evaporation would take a while before it started. I was wrong. It took a total of three minutes before it started fogging up the cling wrap. Two minutes after the evaporation began, tiny condensation droplets began forming. These droplets joined with each other to the point of weighing themselves down and soon finding themselves under the rock that was placed above the cling wrap. Seven minutes after, the condensation droplets formed and precipitation began. The first drop of water fell directly into the cup. A total of a few drops were collected in the cup within forty-five minutes, however I was unable to measure how much water was collected because a crow got to it before I did



This is my setup before I placed it in direct sunlight.



Three minutes into the experiment, evaporation began and minute condensation droplets began to form.



Medium condensation droplets are beginning to form.



Large condensation droplets are sliding under the rock.



Here are the few drops I water I was able to collect.

Conclusion

I found that heat and sunlight definitely sped up the cycle and yielded more water, whereas cooler weather with cloud cover would have slowed the cycle down and yielded very little water. I enjoyed the experience of doing these experiments on the hydrologic cycle.

Comments to Jordan (the student):

What I liked about the project was that you clearly stated your aim, hypothesis, method and result. Your results were descriptive and backed up by excellent photos. Perhaps you can add a **conclusion** to your first experiment. The conclusion is essentially an answer to your hypothesis. **Hypothesis:** I think this. **Conclusion:** The experiment agrees (or doesn't).

Your results are really your observations. It's unclear (out there in the world) whether the results include a conclusion. I personally believe you should just report your observations in one section (which we can call results or observations) and draw inferences (i.e. make sense out of it and answer the hypothesis) in your conclusion.

This is not to say that you did anything wrong, Jordan! Your presentation is clear and I would not have marked you down for it, but if you follow my suggestion next time, your mum can note this in the report and show how you have made progress in your presentation :)

Another thing you can do next time is write it all up in the third person (You used the first person: "I began by placing the cup..." etc; In the third person it would be, "First, the cup was placed...") This is how science reports are usually done.

Other examples: "I was wrong," becomes, "This was not the case."

Whenever you cannot avoid being personal, like "I believe that..." you can write, "The author believes that..."

I liked the way you wrote, so this is not a criticism, but here is a good opportunity to make a visible change in your next presentation to show that your style has "improved."

It may sound like I think there is a lot wrong with it, but I don't. I think this is an excellent example.

Comments to Laura (the mother):

... your next job will be to **annotate** this. I will give some suggestions. This is an important step in submitting work samples. They will not want to see it "left alone".

Laura, if you could just make a few comments along the lines of my suggestions, but mainly put ticks and comments such as "Excellent photos!" "Well written!" "Nicely presented!" to show the HEU that you have given feedback, and of course don't forget to date it, this would be a perfect work sample.

Well done!