Make a water model experiment

Try these experiments and make simple, miniature models of the natural water cycle.

The natural water cycle is the continuous movement of water from the earth to the atmosphere and back again. During its journey water changes states through the processes of evaporation, transpiration, condensation and precipitation.

Make one or both models and discover the water cycle in action.

Purpose

Students use hands on practical investigations to explore how the natural water cycle works. Using two different experiments, water cycle in a terrarium and water cycle in a bag, students can replicate what happens in nature.

Students will learn how to:

- identify processes in the water cycle
- investigate scientifically – predict, observe and question
- conduct a fair test.

Experiment 1: Water cycle in a terrarium

Create a mini-Earth and observe the continuous movement of water through the processes of evaporation, transpiration, and precipitation.

Equipment

- 2 large glass jars with lids
- 2 small plants
- Potting mix, sand, gravel
- Water

Preparation

- Add a layer of gravel, sand, and potting mix to each glass jar.
- Plant the small plants in each jar. Add enough water to moisten the soil, but not so much as to flood it.

- Close the lid and place one jar beside a window, not too sunny or you'll bake the plant, and the other in a shady spot.
- Ask students what they think will happen to the water in each jar. Will there be a difference and why? (Form a hypothesis)
- Observe and record what happens to the water in each jar over time.

Task

1. Students form a hypothesis. For example, I think the water will stay in the potting mix in both jars.
2. Record observation through the day.
3. Students check to see if their hypothesis was correct.
4. Discuss what makes this a fair test. What was different or the same for each jar? Sunlight, shade, temperature? Did they record observations of both jars at the same time?

Experiment 2: Water cycle in a bag

Create a water cycle in a bag to watch the movement of water through the processes of evaporation, condensation and precipitation.

Equipment

- 2 clear plastic bags (zipper sandwich bag works best or use a rubber band)
- tablespoon
- blue food colouring
- markers
- masking tape

Preparation

- Pour 2 tablespoons of water into a clear plastic bag. Add a few drops of blue food colouring. Repeat for the second bag.
- Blow air into each bag and quickly seal.
- Tape one bag to a sunny window and the other on a dark cool wall.

Optional:

With the markers, draw the water cycle on each bag include a lake, tree, sun, cloud and rain and label evaporation, transpiration, condensation, precipitation.

Task

1. Students form a hypothesis. For example, I think the water will stay in the bottom of both bags.
2. Record observations through the day.
3. Students check to see if their hypothesis was correct.
4. Discuss what makes this a fair test. What was different or the same for each bag? Sunlight, shade, temperature? Did they record observations of both bags at the same time?
5. Discuss what students observed. Did they see water vapour and condensation (droplets) on the side of the of each bag?

Conclusion

End with a discussion about what these investigations demonstrated and draw conclusions about the natural water cycle processes. Did the students observe differences between the terrarium or bag placed in the sun and shade? Discuss what drives the water cycle. Heated water causes water to evaporate, changing water to water vapour (gas). The sun does this job in nature. The water vapour rises in the air and as it cools it condenses and forms a cloud. As more water condenses the droplets become heavy and forms rain, precipitation, or in this case, droplets running down the side of the terrarium or bag.

Investigation report

What happened to the water in the terrarium or bag?

Morning

What I think will happen:	What happened?

Midday

What I think will happen:	What happened?

Afternoon

What I think will happen:	What happened?