

**ACTIVITY DESCRIPTION:**

To show students the interactions between water, the water cycle and our weather and to teach an appreciation for the interconnectedness of all water on earth and the importance of avoiding contamination.

MATERIALS

Water model
Kettle
Lamp
Ice
Cooler
Small plastic bag
Water Cycle Poster
Metal tray

Make sure you have all items before the students arrive!

BEGIN THE ACTIVITY

What will I be doing?

This activity connects the water cycle to weather and climate through an interactive model and discussion.

The model shows the interconnectedness of all water on earth and how each process relies on the one before it. Students will learn that water is continuously recycled through the environment, that weather is dependent on the processes in the water cycle and that we can waste water by making it permanently contaminated so that it can no longer be used for drinking or washing.

Set up the model at least a half an hour before the children arrive in the morning and have it constantly running. The model is designed so that the processes of evaporation and condensation of water are confined within a closed plastic box. The source of heat (light bulb) and cold (ice cubes) are applied to the outside of the box. The elements of the model are: a plastic box that holds the moisture-laden air, a pool of water (about one cup) representing the Earth's oceans and lakes, a land form depicting mountains and rivers, a small lamp representing the sun, and a bag of ice cubes to represent the cooling of the upper atmosphere. The model is designed on a slant so that water is confined to one end (about one-third of the bottom area). The warm air, heated by the lamp and carrying moisture from the "ocean," will rise to the upper end of the chamber, where it will be chilled by the ice. As the air is chilled by the ice, the moisture in the air will condense and form droplets on the area of the lid that is underneath the ice. When these droplets fall, it will "rain." The model will operate most effectively if the bag of ice is covered with the ice 'over-cap' which will confine the cold and keep the ice from melting. Place a sheet of white paper under the "ocean" and the lamp will reflect heat in that area. Again, this will reduce the time it takes for the model to work. To encourage the condensation to drop (rain) from the area of the ice trough you may need to tap the clouds.

Boil the water in the kettle provided as you begin the lesson.

Introduce the activity by pointing to the kettle of boiling water and asking:

When we boil water it all goes away after awhile. Where does it go? That's right, it evaporates! Can you think of some examples of evaporation in our everyday lives? Puddles drying up, wet clothes drying, hair drying, lawns drying out, and plants withering etc.

What happens to water in the air after it has evaporated? It remains in the air until it is cooled, which is condensation, and then falls back down to earth in different forms which is precipitation. When water falls back down to earth out of the clouds, what are some of the different forms it can take? After such things as rain or snow or hail reach the ground, and after the snow and hail melt, where do they go? Precipitation can be absorbed by the ground and be "recharged" or it can travel along the ground and "runoff" until it either reaches a body of water or flows into a storm drain.

Go through the water cycle poster with the students to reinforce these points.

So, what do we see happening in the model right now? Point to the condensation forming and the precipitation about to begin. It's going to rain (or is raining) isn't it? And where will the drops of rain go? They will flow into our storm drains (runoff) or be absorbed by the ground (recharge). How was the water in our model heated? By the lamp. What heats water in the real oceans and lakes? The sun. What happens to the temperature as you go up mountains or as the altitude increases? The temperature drops. And, what effect does that have on the weather in the mountains? Is it warm up there? No, it's freezing cold and there is snow on mountain peaks all year round. So, when water evaporates, it goes into the air and makes clouds. The clouds rise to the cold upper air, where they form rain or snow which is the process of condensation. The precipitation or rain or snow falls back to the earth and runs into our rivers, oceans and lakes. What would happen if one area of the water supply got contaminated? It can spread to other areas of the environment as all of our water is reused.

When water is heated by the sun from lakes and rivers and streams it does what? Evaporates! The water stays in the air until it is cooled in the clouds, which is what? Condensation. And, condensation leads to.....? Precipitation! Our weather every day is part of the water cycle as is all the water you see everywhere!

WHAT HAVE WE LEARNED?

Not to take water for granted and not to waste water! It can be used for more important things!

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SCIENCE AND TECHNOLOGY: LET IT RAIN

