The Water Cycle/Precipitation

TIME FRAME: About 45-60 minutes **Grade Level:** 4-5

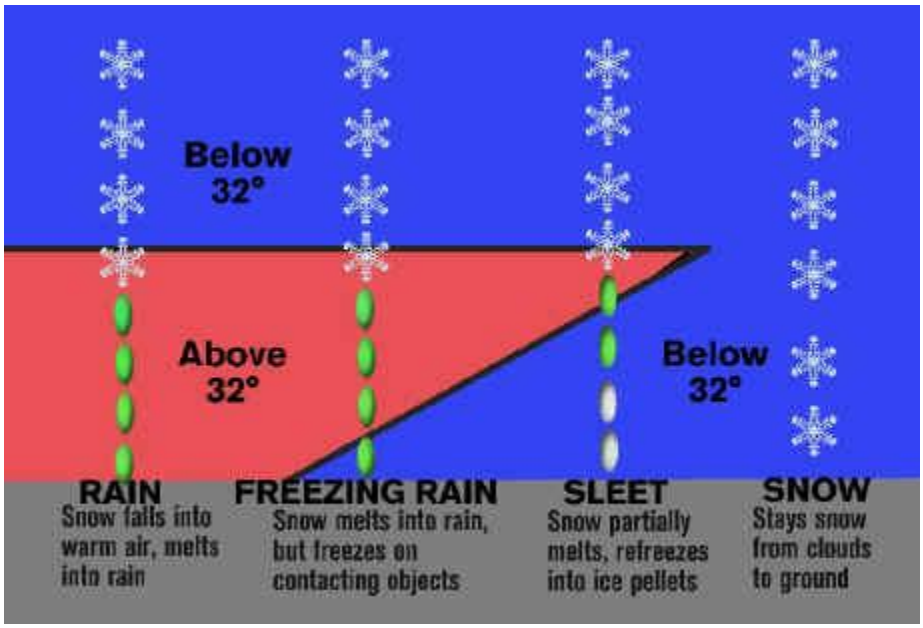
LESSON OBJECTIVES: Each student will demonstrate an understanding of the water cycle and precipitation by knowing the differences between rain, freezing rain, sleet, and snow. Students will model their understanding by creating their own water cycle. They will utilize technology to learn more about precipitation and the water cycle.

ILLINOIS LEARNING STANDARDS FOR SCIENCE: 11.B.2c, 11.B.2e, 11.B.2f, 12.C.2b, 12.E.2a.

MATERIALS FOR EACH STUDENT:

- Pixie cup
- Baggy
- Tape
- Water

BACKGROUND INFORMATION: In cold air way up in the sky, rain clouds will often form. Rising warm air carries water vapor high into the sky where it cools, forming water droplets around tiny bits of dust in the air. Some vapor freezes into tiny ice crystals which attract cooled water drops. The drops freeze to the ice crystals, forming larger crystals we call ***snowflakes***. When the snowflakes become heavy, they fall. When the snowflakes meet warmer air on the way down, they melt into ***raindrops***. In tropical climates, cloud droplets combine together around dust or sea salt particles. They bang together and grow in size until they're heavy enough to fall.



Look at the figure above. Sometimes there is a layer of air in the clouds that is above freezing, or 32 degrees F or 0 degrees C. Then closer to the ground the air temperature is once again below freezing. Snowflakes partially melt in the layer of warmer air, but then freeze again in the cold air near the ground. This kind of precipitation is called ***sleet***. It bounces when it hits the ground. If snowflakes

completely melt in the warmer air, but temperatures are below freezing near the ground, rain may freeze on contact with the ground or the streets. This is called ***freezing rain***, and a significant freezing rain is called an ice storm. Ice storms are extremely dangerous because the layer of ice on the streets can cause traffic accidents. Ice can also build up on tree branches and power lines, causing them to break and our lights to go out. There is another kind of precipitation that comes from thunderstorms called ***hail***.

PROCEDURE FOR 'HANDS-ON' ACTIVITY:

1. Put a small amount of water in the pixie cup.

2. Put the pixie cup in a baggy and close the baggy.

3. Tape the baggy with the cup of water inside of it to a window that the sun comes in.

What happens? With the heat of the sun, the water evaporates from the cup which you cannot see and condenses on the inside of the bag into little water droplets. These droplets eventually drip down to the bottom of the bag.

EXPLANATION:

This is what happens to the water in our creeks, streams, rivers, lakes and oceans. The water evaporates into the air and rise with the heat of the sun. It condenses into small droplets into what we see as clouds. When the droplets become too heavy, they fall to the ground as rain or snow.

LESSON ASSESSMENT: Each student will be evaluated on the completion of student pages.

SAFETY: Instruct students to observe the following safety practices:

- Listen carefully to the teacher's instructions.
- Use the equipment carefully.
- Do not drink the water used in this activity.
- Never put anything near your eyes or in your mouth.

ADAPTATIONS: Students with learning disabilities will be included in all activities. Pupils identified as ADD should be given special attention, repeating directions with demonstration of the necessary steps.

An interpreter will be present for ELL (English Language Learners) and ESL (English as a Second Language) students, to be used as needed.

MULTIDISCIPLINARY CONNECTIONS:
Art & Writing: Draw a picture of yourself dressed for a rainy day. Write a sentence about your picture.

TECHNOLOGY:
Extend the lesson by having students use a technological tool.
Option 1: Use a computer to explore information about precipitation by using a search engine.
Option 2: Have the students explore the many videos on the water cycle.
http://video.search.yahoo.com/search/video?p=video+on+water+cycle

Water Cycle Assessment Name:

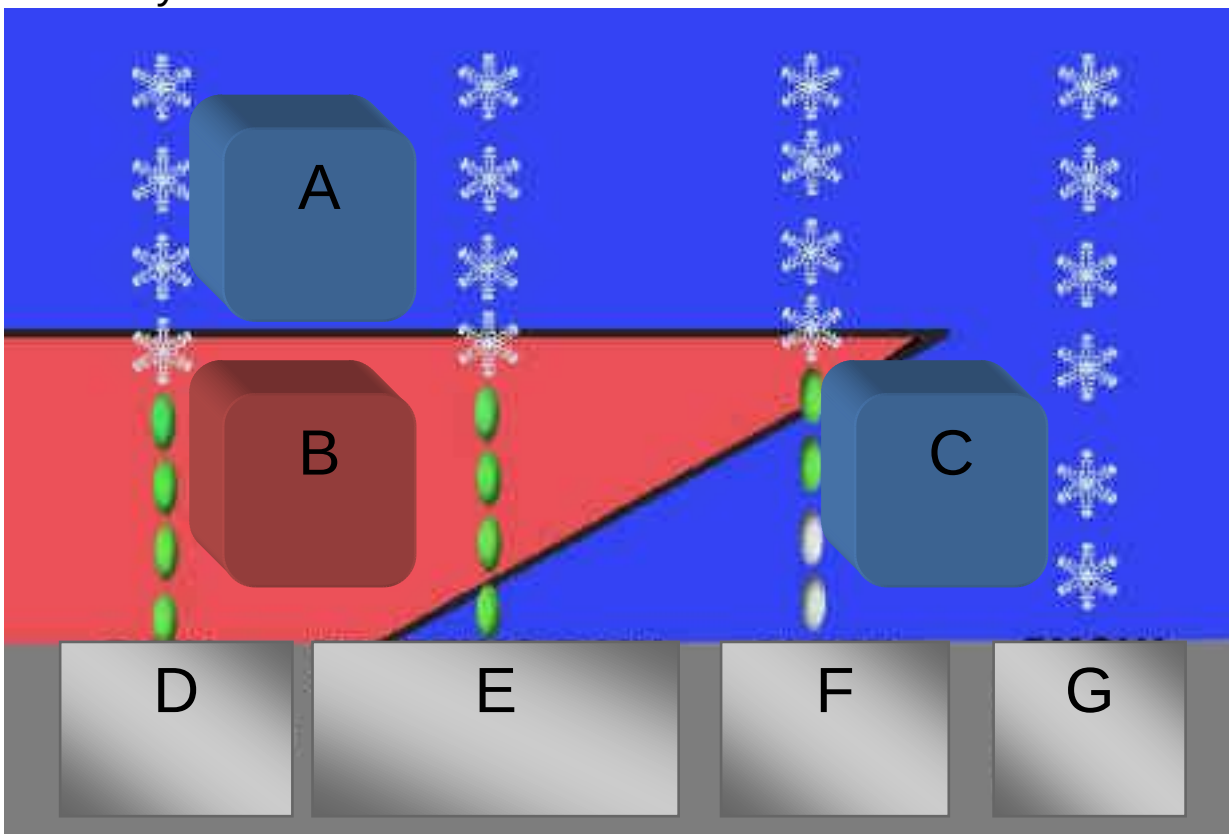


Figure Z

Look at figure Z above. Remembering our discussion on rain, freezing rain, sleet, and snow; circle 'Above' or 'Below' the correct temperature in the clouds represented by the letters A, B, and C: (2 pts each)

A Above / Below 0 degrees (circle one)

B Above / Below 0 degrees (circle one)

C Above / Below 0 degrees (circle one)

Using the figure above, match the letter with the correct form of precipitation by drawing a line connecting them: (2 pts each)

D	Snow
E	Rain
F	Sleet
G	Freezing Rain

Circle the correct answer: (2 pts each)

1. Snow melts into rain, but freezes on contacting objects:

a. Rain

b. Freezing Rain

c. Sleet

d. Snow

2. Stays snow from clouds to ground:

a. Rain

b. Freezing Rain

c. Sleet

d. Snow

3. Snow falls into warm air, melts into rain:

a. Rain

b. Freezing Rain

c. Sleet

d. Snow

4. Snow partially melts, refreezes into ice pellets:

a. Rain

b. Freezing Rain

c. Sleet

d. Snow

Short Answer (3 pts):
Write or reconstruct and explain the weather cycle. You may refer to the websites/videos and write three details or reconstruct and explain our activity.

Extra Credit (3 pts):
Draw a picture of the weather cycle.