Form a Cloud

Using Dry Ice

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Introduction:

Clouds are water. They are either small liquid rain drops or tiny particles of ice. The droplets are so small that they float in air. Clouds form when the air rises. As a blob of air rises it expands and gets colder, the colder air cannot hold as much water as warmer air. As the temperature and air pressure continue to drop, tiny water droplets group together into clumps called cloud droplets. At this point, the blob of air becomes a visible cloud. Different types of clouds are formed at different altitudes.
Lesson Plan: Cloud Formation

Grade Level: 7

I. A. Learning Objectives: Students will learn about...
   a. How clouds will form in the atmosphere
   b. The different types of clouds
   c. Where the clouds form in the atmosphere

   B. Learning Skills: Students will be able to....

   a. Identify the certain types of clouds

   b. Extend their knowledge of where clouds are formed

   c. Identify new types of clouds

II. Materials: A small amount of dry ice, a glass container, some warm water, and some tongs.
III. **Procedures:**

A. **Introduction/Motivation:** Teams will work together and create a cloud and answer questions about what is happening.

B. **Exploration:** The students will be given time in class to discuss how and why clouds form.

C. **Cooperative Involvement:** Students will work together to evaluate and answer questions and make predictions. Students will predict the outcome of a variety of scenarios. Each group will present their prediction to the class.

D. **Closure:** The instructor will facilitate in a review of results and discussion of concepts.

E. **Follow through:** The class will determine further questions, make predictions on new questions, and test hypotheses.

III. **Standards:**

ESS.8.2.7 Describe characteristics of *cumulus*, *stratus*, and *cirrus* clouds

ESS.8.2.8 Predict weather based on cloud type

II. **Evaluation:** Students will have a quiz over content at the end of the activity. Students will be asked to write a short report of their experience. The report will include:

a. Answers to the questions
b. The reasoning for their initial responses
c. Analysis of the outcome of testing
d. Resulting ideas and response questions
Activity #1

Grade Level:

Time:

I. Learning Objectives and Expected Outcomes: What will the students gain from this experience?

- The students will visually observe how clouds are formed in the atmosphere by using dry ice and hot water to create their own cloud.

II. Materials:

- Dry ice
- Container filled with hot water
- Tongs
- Chamber to do demonstration in

III. Methods:

- Put hot water in the container (fill it about half way)
- Place the container inside the chamber
- Use tongs to pick up a piece of dry ice
- Place dry ice inside the container
- Close the chamber door
- Watch as the dry ice begins to bubble and form a cloud
- Repeat the process using different sizes of dry ice
Activity

Making Your Own Cloud

Instructor’s copy:

I. Small Group discussions: **Student Led**

   In small groups, observe the video. Discuss what will happen when the dry ice is dropped into the warm water.

   A. Water will from bubbles and evaporation will occur
   
   B. Nothing will happen
   
   C. The container will explode

   Discuss all three possibilities

II. If you chose (A), discuss how this might happen.

   If you chose (B or C), will the ice...

   A. Melt
   
   B. Expand
   
   C. Split into many pieces

   Explain

   Discuss

III. Class Discussion: **Teacher facilitates.** Each group shares their predictions and reasoning. The class combines to form one or more expected results

IV. Make a Cloud: Teacher facilitates, **Student performs**

   What happened?

   Try it again.

   Discuss

   Test the different scenarios above:

   A. add a larger piece of ice
B. use cold water

What happened?

Discuss

V. Discussion of how clouds form in the atmosphere. **Teacher facilitates**

Students will now brainstorm about new ways to test cloud formation, and tornadoes.

Students will conduct further tests.

VI. Small group discussions and write-up: **Student performs**

Each student should provide a one to two page write up on the group’s observations, predictions, and explanations. Included in this should be a discussion of how clouds form in the atmosphere.