



Classroom Teacher Preparation

Earth Science 16: Weather Basics - Rising Air & Falling Rain

Please use the following to prepare for the next SfS lesson.

Description:

Using a series of demonstrations and activities, students will learn about how clouds form and the role that air temperature and moisture have in this phenomenon. They will also see how these factors allow clouds to ultimately produce rain or other forms of precipitation.

Lesson Objectives – SWBAT (“Students Will Be Able To...”):

3rd-5th

- Identify factors that play a role in determining cloud formation and precipitation, especially temperature and moisture levels

Disciplinary Core Idea (DCI)

ESS2 Earth's Systems – ESS2.A Earth's Materials and Systems

- (3rd-5th) Four major Earth systems interact. Rainfall helps to shape the land and affects the types of living things found in a region. Water, ice, wind, organisms, and gravity break rocks, soils, and sediments into smaller pieces and move them around.

Science & Engineering Practice (SEP)

Constructing Explanations

- (3rd-5th) Use evidence (e.g., measurements, observations, patterns) to construct or support an explanation

Crosscutting Concept (CCC)

Systems and System Models

- (3rd-5th) A system can be described in terms of its components and their interactions

Preparation:

This lesson can be an introduction to the concept of cloud formation but students should have an understanding of the **water cycle** prior to this lesson.

Room Set Up for Activities:

This lesson can be done in a classroom on tables or benches. This lesson uses significant volumes of water, so access to water and sinks will make this lesson much easier to perform, though outside water can be carted in if necessary. Teachers will need a sink or other way to dispose of used water at the end of the lesson.

Instructors will need access to an outlet for boiling water using an electric kettle.



Safety:

Students will work with very hot water (sometimes boiling) for this activity and should be monitored.

Related Modules:

This lesson may be taught as part of a sequence or group of related modules on **Water** and **Weather**. Modules include:

Earth Science 12: Water Cycle – This module presents a game (where students act as water molecules) that explains how water cycles through different forms and storage types on Earth and in Earth's atmosphere.

Earth Science 17: Meteorology & Weather Mapping – Students will learn about weather patterns, weather symbols, and how to interpret a weather map. They will then use the skills they have learned to highlight the weather on a national weather map and identify pressure systems and weather fronts.

Chemistry 11: States of Matter – The concepts of evaporation and condensation (and other changes of state) are introduced in this lesson, while observing dry ice.

For other module sequences and groups, look here: www.sciencefromscientists.org/sequences

Standards Covered:

Please click the following link to our website to review the standards covered by this lesson, listed by state:

www.sciencefromscientists.org/standards/

Lessons are matched to both national NGSS and local state standards.

After Our Visit:

Extend this lesson by trying activities to highlight how warm air rises and cold air sinks.

Access this Extension activity by visiting the Classroom Post found on our website at sciencefromscientists.org/cohorts. Use the name of your school/cohort and password to log in.

To help Evaluate, check out our Open Response questions online at sciencefromscientists.org/open-response-questions. They are freely available for all of our lessons for current teachers. Use the password supplied by your instructor to log in.

Additional Resources:

- WeatherKids: Information, games and online activities: <http://www.weatherwizkids.com>
- National Ocean Service: information on how the oceans contribute to weather: https://oceanservice.noaa.gov/education/pd/oceans_weather_climate/welcome.html
- Cold Fronts and Warm fronts video (2:25m): <https://www.youtube.com/watch?v=huKYKyjcm0>
- Weather and the Water Cycle: <http://www.learner.org/interactives/weather/watercycle.html>