spark
UCAR science education

Topic: Clouds

Level: Upper elementary

How to use this resource:
Each tab correlates with a part of the scope and sequence for this topic and includes links to hands-on activities, background content, and multimedia resources. Select resources within each tab that are best suited for your students to meet the learning goals. (There are often more resources linked within each section than you will need.)

Spark Teaching Boxes are themed collections of classroom-ready educational resources to build student understanding of science, technology, engineering, and math (STEM). Resources highlighted within teaching boxes are from various science education programs and all have been vetted by the Spark education team.

This page provides an overview of the Teaching Box contents and associated standards.

Explore this Teaching Box and its educational resources at:
spark.ucar.edu/clouds-teaching-box

Clouds, A Teaching Box

Observing clouds
- Goal: Students learn how to observe and describe clouds.
- Activity: Students use a guide to identify cloud types outside. There are several cloud identification guides available, and additional resources online to help students learn about cloud types. An activity back in the classroom helps solidify and assess student learning about cloud types.
- Performance Expectation: Students who demonstrate understanding can make observations and describe patterns of clouds, using a guide to identify different cloud types.
- Standards:
    - NGSS Science and Engineering Practices: Make observations, describe patterns
    - NGSS DCI: ESS2.D
    - NGSS Crosscutting themes: Patterns
    - National Geography Standards: 4 Physical Characteristics of Places

Learning How Clouds Form
- Goal: Students learn about the ingredients needed to make a cloud, and the role that air pressure and temperature play in cloud formation.
- Activity: Students experiment with a simple model to learn about the ingredients needed to make a cloud, and the role that air pressure and temperature play in cloud formation. Student learning is assessed through a writing assignment in which students describe a plan for how they would fill their classroom with clouds.
- Performance Expectation: Students who demonstrate understanding can use a model to describe the effect of air pressure, water vapor, and tiny particles in the air on cloud formation.
- Standards:
    - NGSS Science and Engineering Practices: use a model to explore and describe phenomena, obtaining, evaluating and communicating information
    - NGSS DCI: ESS2.D
    - NGSS Crosscutting themes: Cause and Effect
    - Common Core ELA: Literacy.SL.3.5 Presentation of knowledge and ideas – reporting on a topic, telling a story

Learning How Clouds Change
- Goal: Students learn that clouds change over time.
- Activity: Students use the skills they developed in observing and identifying clouds (part 1) and what they learned about how and why clouds form (part 2) to build understanding of how and why clouds change over time. Students develop scientific questions and, with teacher facilitation, design a hypothesis and research project to investigate how clouds change over time.
- Performance Expectation: Students who demonstrate understanding can collect and represent data in a graphical display (pictograph or bar chart) to investigate a question about patterns of cloud over time.
- Standards:
    - NGSS Science and Engineering Practices: Design and carry out an investigation, collect data, analyze data, represent data in a graphical display
    - NGSS DCI: ESS2.D
    - NGSS Crosscutting themes: Patterns
    - Common Core ELA: W.3.8 Recall information from experiences, take notes, sort evidence
    - Common Core Math: 3.MD.A.2 Measure and estimate, 3.MD.B.3 draw a bar graph to represent data
    - National Geography Standards: 4 Physical Characteristics of Places