

**Water Cycle and Weather Unit**

**Driving Questions:**

* What is the water cycle and how does water move through the earth and the atmosphere?
* What is weather and how do air pressure, air temperature, moisture, wind speed and direction, and precipitation determine weather?
* How do air temperature, moisture, wind speed and direction, precipitation, and air pressure change over time and how can these changes be measured?
* How are the types of precipitation (rain, snow, sleet, and hail) similar and how are they different? How is precipitation related to the water cycle?
* How is climate different from weather?

**Massachusetts Science and Technology Learning Standards**

**Earth and Space Science**

**The Water Cycle**

1. Describe how water on earth cycles in different forms and in different locations, including underground and in the atmosphere.
2. Give examples of how the cycling of water, both in and out of the atmosphere, has an effect on climate.

**Weather**

1. Explain how air temperature, moisture, wind speed and direction, and precipitation make up the weather in a particular place and time.
2. Distinguish among the various forms of precipitation (rain, snow, sleet, and hail), making connections to the weather in a particular place and time.
3. Differentiate between weather and climate.

**Skills of Inquiry Learning Standards**

* + Ask questions and make predictions that can be tested.
  + Select and use appropriate tools and technology in order to extend observations.
  + Keep accurate records while conducting simple investigations or experiments.
  + Conduct multiple trials to test a prediction. Compare the results of an investigation or experiment with the prediction.
  + Recognize simple patterns in data and use data to create a reasonable explanation for the results of an investigation or experiment.
  + Record data and communicate findings to other using graphs, charts, maps, models, and oral and written reports.

**Technology/Engineering Learning Standards**

**Materials and Tools**

1.1 Identify materials used to accomplish a design task based on a specific property, i.e. weight, strength, hardness, and flexibility.

1.2 Identify and explain the appropriate materials and tools (e.g., hammer, screwdriver, pliers, tape measure, screws, nails, and other mechanical fasteners) to construct a given prototype safely.

**Engineering Design**

2.1 Identify a problem that reflects the need for shelter, storage, or convenience.

2.2 Describe different ways in which a problem can be represented, e.g., sketches, diagrams, graphic organizers, and lists.

2.3 Identify relevant design features (e.g., size, shape, weight) for building a prototype of a solution to a given problem.

**General Teaching Tips**

**PLEASE READ!**

* Make sure to develop a good working relationship with your classroom teacher. Communication is vital. Plan when you will meet to discuss the next lesson and how you will let each other know about schedule conflicts.
* Read the lessons well ahead of time (at least about 1 week before) so that you are prepared when you get to the classroom. Some lessons require additional materials or videos or apps (4th grade only) so you will need to make sure you are aware of these additional items in time to make arrangements or familiarize yourself in advance.
* Your feedback is very valuable to your fellow teachers in different classes and future teachers or curriculum writers. These lessons are living documents subject to change and your input is valued. Please keep your comments on GLOW up to date with your lessons.
* Asking good questions and getting students to ask good questions or make connections from different units of study or previous lessons is one of the most important parts of science education. Ask your students meaningful questions about the science activities they are doing. Encourage curiosity by giving your students the opportunity to ask their own questions. If you don’t know the answer, work together to find more information. Review questions or questions meant to have students restate the important ideas of the lessons are very valuable. Students should be encouraged to vocalize their thoughts and questions whenever possible.
* The lessons should act as guides. Your teaching experience will be more successful if you incorporate your own style to the lessons. Within the conceptual framework provided, make changes as you and your classroom teacher see fit.
* That being said, each of these lessons was carefully created to fulfill state education requirements. So while the format of the activities may be flexible and additional activities can be valuable, the activities in each lesson are necessary to cover minimum curriculum requirements. If you choose to use other interactive or visual explanations to support the basic concepts of the lessons that you teach, apply these ideas as you see fit, and please share your ideas on the GLOW thread for that lesson.
* Each lesson includes an estimated time frame. Some classes may go slower and some may go faster. As you get to know your class, pace the lessons accordingly. This may involve cutting, restructuring, or adding certain activities. Alternatively, some lessons may span 2-3 days instead of only 1 day.
* Written student work is often used to teach students good habits about following steps of the scientific method. The worksheets provided are meant to teach students what sort of information is relevant. Some students may finish written work and some may not. It is more important to focus on the main concepts of the lesson.