

Science 5

Weather Watch

- Predict where, within a given indoor or outdoor environment, one is likely to find the warmest and coolest temperatures.
- Describe patterns of air movement, in indoor and outdoor environments, that result when one area is warm and another area is cool.
- Describe and demonstrate methods for measuring wind speed and for finding wind direction.
- Describe evidence that air contains moisture and that dew and other forms of precipitation come from moisture in the air.
- Describe and measure different forms of precipitation, in particular, rain, hail, sleet, snow.
- Measure at least four different kinds of weather phenomena. Either student-constructed or standard instruments may be used.
- Record weather over a period of time.
- Identify some common types of clouds, and relate them to weather patterns.
- Describe the effects of the Sun's energy on daily and seasonal changes in temperature- 24-hour and yearly cycles of change.
- Recognize that weather systems are generated because different surfaces on the face of Earth retain and release heat at different rates.
- Understand that climate refers to long term weather trends in a particular region and that climate varies throughout the world.
- Recognize that human actions can affect climate, and identify human actions that have been linked to the greenhouse effect.
- Appreciate how important it is to be able to forecast weather and to have suitable clothing or shelter to endure various types of weather.
- Test fabrics and clothing designs to choose those with characteristics that most effectively meet the challenges of particular weather conditions; e.g., water resistance, wind resistance, protection from cold.

Classroom Chemistry

- Recognize and identify examples of the following kinds of mixtures:
 - two or more solids; e.g., sand and sugar
 - a solid and a liquid; e.g., sugar and water
 - two or more liquids; e.g., milk and tea
- Apply and evaluate a variety of techniques for separating different materials.
- Distinguish substances that will dissolve in a liquid from those that will not, and demonstrate a way of recovering a material from solution.
- Demonstrate a procedure for making a crystal.
- Recognize that the surface of water has distinctive properties, and describe the interaction of water with other liquids and solids.
- Produce carbon dioxide gas through the interaction of solids and liquids, and demonstrate that it is different from air.
- Distinguish reversible from irreversible changes of materials, and give examples of each.
- Recognize and describe evidence of a chemical reaction. Explain how the products of a reaction differ from the original substances.
- Use an indicator to identify a solution as being acidic or basic.

Electricity/Magnetism

- Recognize and appreciate the potential dangers involved in using sources of electrical currents:**
 - understand that household electrical currents are potentially dangerous and not a suitable source for experimentation
 - understand that small batteries are a relatively safe source of electricity, for experimentation and study, but that care should be taken to avoid short circuits
 - understand that short circuits may cause wires to heat up, as well as waste the limited amount of energy in batteries.
- Describe and demonstrate example activities that show that electricity and magnetism are related:**
 - demonstrate that electricity can be used to create magnetism
 - demonstrate that a moving magnet can be used to generate electricity.
- Demonstrate and interpret evidence of magnetic fields around magnets and around current-carrying wires, by use of iron filings or by use of one or more compasses.
- Demonstrate that a continuous loop of conducting material is needed for an uninterrupted flow of current in a circuit.
- Distinguish electrical conductors-materials that allow electricity to flow through them- from insulators-materials that do not allow electricity to flow through them.
- Recognize and demonstrate that some materials, including resistors, are partial conductors of electricity.
- Predict the effect of placing an electrical resistance in a simple circuit; e.g., in a circuit with a light bulb or electric motor.
- Recognize that the amount of electricity we use in our homes is measured in kilowatt hours.
- Interpret and explain:
 - the reading on a household electrical meter
 - efficiency labels on electrical appliances.
- Draw and interpret, with guidance, circuit diagrams that include symbols for switches, power sources, resistors, lights and motors.

Mechanisms using Electricity

- Identify example applications of electrical devices in the school and home environment, and classify the kinds of uses. Categories of electrical use may include such things as: heating, lighting, communicating, moving, computing.
- Design and construct circuits that operate lights and other electrical devices.
- Recognize the importance of switches and other control mechanisms to the design and operation of electrical devices, and identify purposes of switches in particular applications.
- Construct and use a variety of switches.
- Design and construct vehicles or other devices that use a battery-powered electric motor to produce motion; e.g., model cars, hoists, fans.
- Design and construct a burglar alarm.
- Demonstrate different ways of lighting two lights from a single power source, and compare the results. Students should recognize that wiring two bulbs in series makes both bulbs glow less brightly than if the bulbs are wired in parallel. Students may demonstrate this knowledge operationally and do not need to use the terms series and parallel
- Demonstrate different ways of using two batteries to light a bulb, and compare the results. Students should recognize that wiring the batteries in series causes the bulb to glow brighter than it would if parallel wiring were used.
- Given a design task and appropriate materials, invent and construct an electrical device that meets the task requirements.

Wetland Ecosystems

- Recognize and describe one or more examples of wetland ecosystems found in the local area, e.g., pond, slough, marsh, bog, fen.
- Understand that a wetland ecosystem involves interactions between living and nonliving things, both in and around the water.
- Identify some plants and animals found at a wetland site, both in and around the water; and describe the life cycles of these plants and animals.
- Identify and describe adaptations that make certain plants and animals suited for life in a wetland.
- Understand and appreciate that all animals and plants, not just the large ones, have an important role in a wetland community.
- Identify the roles of different organisms in the food web of a pond:
 - producers-green plants that make their own food, using sunlight
 - consumers-animals that eat living plants and/or animals
 - decomposers-organisms, such as molds, fungi, insects and worms, that reuse and recycle materials that were formerly living.
- Draw diagrams of food chains and food webs, and interpret such diagrams.
- Recognize that some aquatic animals use oxygen from air and others from water, and identify examples and adaptations of each.
- Identify human actions that can threaten the abundance or survival of living things in wetland ecosystems; e.g., adding pollutants, changing the flow of water, trapping or hunting pond wildlife.
- Identify individual and group actions that can be taken to preserve and enhance wetland habitats.
- Recognize that changes in part of an environment have effects on the whole environment.