

SPLASH, FLASH, CRANK, SLIDE, ALIVE!

This is a general science tour with plenty of hands-on action in the areas of life cycles, adaptation, fossils, energy, water cycle, friction, and gravity. Your class will explore Discovery Center animals, water table, shadow room, and super slide.

5th GRADE

Standards:

Science

Language Arts

Social Studies

Life Science

Standard 2. INTERDEPENDENCE:

Conceptual Strand 2: All life is interdependent and interacts with the environment.

GLE 0507.2.1. Investigate different nutritional relationships among organisms in an ecosystem.

Teacher Questions, Pre-Tour

Q: What are some things we eat for lunch? List meats and their sources (hamburger = cow, etc.), plants and their sources (vegetable soup = tomatoes, carrots, onions, etc.). If you identified the meat, what did that animal eat? (hamburger = cows, eat grass/hay/corn). So, what is the source of all of our nutrition? (Plants, which make their own food from the SUN.)

Teacher Questions, Post-Tour

Q: In a wetland ecosystem like that at the Discovery Center, can you trace some of the nutritional relationships, starting with the sun for the following species (research may be required for some of these): a cattail plant; an otter; a dragonfly; a great blue heron.

GLE 0507.2.2. Explain how organisms interact through symbiotic, commensal, and parasitic relationships.

Teacher Questions, Pre-Tour

Q: Define symbiotic, commensal, and parasitic. Give examples of each.

Teacher Questions, Post-Tour

Q: Based on wetland plants and animals and their relationships, such as those found at the Discovery Center wetlands, describe the relationships between the following species and explain why their relationship fits the description you chose:

1. Ticks and raccoons
2. Spider homes and plants
3. Bees and wildflowers

GLE 0507.2.3. Establish the connections between human activities and natural disasters and their impact on the environment.

Teacher Questions, Pre-Tour

Q: The term ‘natural’ disaster indicates that humans do not cause natural disasters. But some things that humans have done and continue to do can affect the impact of a natural disaster. For instance, if a lightning strike causes a fire, if humans have built homes too close together and out of flammable materials, a fire can spread quickly and destroy many homes, possessions, and possibly lives.

Can you give an example where human activity could make a natural disaster better or worse? (Floods, tsunamis, heavy rainfall, earthquakes, volcanic eruptions, etc.)

Teacher Questions, Post-Tour

Q: How can wetlands help prevent flooding? (Wetlands function like big sponges, slowing down and absorbing excess water during storms.) How can wetlands improve water quality for an area? (Wetlands improve water quality by filtering out pollutants, like sediment and nutrients, before they reach the river.)

Standard 3. FLOW OF MATTER AND ENERGY:

Conceptual Strand 3: Matter and energy flow through the biosphere.

GLE 0507.3.1. Demonstrate how all living things rely on the process of photosynthesis to obtain energy.

Teacher Questions, Pre-Tour

Q: Do we make our own food? (No).

Q: What organism CAN make its own food? (Only green plants)

Q: How does a green plant make its own food? Uses sunlight, carbon dioxide from the air, and water in its ‘food factory’ ---leaf cells --- to produce sugar (food) and oxygen, which it releases into the atmosphere. (<http://photosynthesisforkids.com/>)

Teacher Questions, Post-Tour

Q: Name some of the animals you saw on your Discovery Center tour. What does each one eat, and how does that animal depend on photosynthesis?

Standard 4. HEREDITY:

Conceptual Strand 4: Plants and animals reproduce and transmit hereditary information between generations.

GLE 0507.4.2. Recognize that some characteristics are inherited while others result from interactions with the environment.

Teacher Questions, Pre-Tour

Q: What characteristics might you inherit from your parents? (Skin, eye, hair color, ‘handedness,’ ability to twirl tongue, attached/nonattached earlobes, height, freckles, etc.) What characteristics might you develop due to your environment? (Physical ability, mental, spiritual, social traits). Can you list some of these? (<http://www.gurusoftware.com/GuruNet/Personal/Factors.htm>)

Teacher Questions, Post-Tour

Q: Think of an animal that you met at the Discovery Center. What characteristics did it inherit from its parents? Are there any characteristics that result from interactions with its environment? Write

down some you think of? Would these be true of this animal alone, or of all animals of its species? Why or why not?

Standard 5. BIODIVERSITY AND CHANGE:

Conceptual Strand 5: A rich variety of complex organisms have developed in response to a continually changing environment.

GLE 0507.5.1. Investigate physical characteristics associated with different groups of animals.

Teacher Questions, Pre-Tour

Q: Define mammal, reptile, amphibian, bird. Give examples of each.

Teacher Questions, Post-Tour

Q: On your visit to the Discovery Center, you met several types of animals. Tell which family each of the following belongs to, and what physical characteristics prove it:

1. turtle
2. ferret
3. salamander
4. lizard
5. snake
6. rabbit

GLE 0507.5.2. Analyze fossils to demonstrate the connection between organisms and environments that existed in the past and those that currently exist. [Note: “Fossils” may be requested as a station for the “Animals All Around” tour.]

Teacher Questions, Pre-Tour

Q: Are fossils real? Are they living or nonliving? What would you say to someone who told you, “A fossil is just a rock”?

Teacher Questions, Post-Tour

Q: During our trip to the Discovery Center, you were able to investigate some real Tennessee fossils. Could you distinguish animals from plants? What about “Indian money” (crinoids stems)? These plant stem pieces resemble an animal’s vertebrae.) Did you see anything that reminded you of a present-day plant or animal? What conclusions could you draw from your observations?

Physical Science

Standard 9. MATTER:

Conceptual Strand: The composition and structure of matter is known, and it behaves according to principles that are generally understood.

GLE 0507.9.3. Investigate factors that affect the rate at which various materials freeze, melt, or evaporate.

Teacher Questions, Pre-Tour

Q: Experiment to find out which beverages will melt the fastest---water, orange juice, cola, and coffee with cream? Have students measure ½ cup of each beverage and pour each into a paper cup.

Freeze overnight. First thing the next morning when the class is seated, set the cups out in the room (not in the sunshine) and ask students to list each beverage on a piece of paper, and estimate a time for each to be completely melted. Check the progress of melting each hour, and have students check their predictions.

Q: Which liquid melted first? Why, do you think? What could we have done to help the liquids melt faster? Slower? [Have students write their suggestions, then share until all ideas have been posted on the board.]

Teacher Questions, Post-Tour

Q: During your trip to the Discovery Center, you experienced three states of water (solid, liquid, gas). What affected the melting of your piece of ice? (size of piece, heat of hand, temperature of the surrounding air).

Standard 10. ENERGY:

Conceptual Strand: Various forms of energy are constantly being transformed into other types without any net loss of energy from the system.

GLE 0507.10.1. Design an experiment to illustrate the difference between potential and kinetic energy.

Teacher Questions, Pre-Tour

Q: What is the difference between potential energy and kinetic energy?

Teacher Questions, Post-Tour

Q: During our visit to the Discovery Center, you went down the big slide. Make a drawing/poster of your trip down the slide. Label the parts of the picture where potential energy is being displayed, and where kinetic energy is being displayed. Can you think of any other activities you did which are examples of potential energy and kinetic energy? (you getting ready to push the handle on the water table to make bubbles in the water columns, or the bar that creates a wave.)

Language Arts

Recommended Reading:

Nonfiction:

A Drop Around the World by Barbara McKinney. (1998). Ages 5 and up. **Lexile measure: 820L.**

City Animals (Zoobooks Series) by John Bonnett Wexo.

Come to Your Senses (All Eleven of Them) by Milan Tytla. (1993).

Cool Gravity Activities: Fun Science Projects about Balance (Cool Science) by James Hopwood.

DK Eyewitness Books: Fossil by Paul Taylor (2004). Ages 8 and up.

Ducks, Geese, & Swans (Zoobook Series) by John Bonnett Wexo

Hamsters, Gerbils, Guinea Pigs, Rabbits, Ferrets, Mice, and Rats: How to Choose and Care for a Small Mammal (American Humane Pet Care Library) by Laura S. Jeffrey. (Ages 5 and up, 48 pages).

Janice VanCleave's Energy for Every Kid: Easy Activities That Make Learning Science Fun by Janice VanCleave (2005). Ages 9 and up.

Learning to Care for Small Mammals (Beginning Pet Care with American Humane) by Felicia Lowenstein Niven. (Grades 3 and up)

Nocturnal Animals (Zoobooks Series) by John Bonnett Wexo. (Grades 4 and up)

Owls (Zoobooks Series) by Timothy L. Biel. (Grades 4 and up)
Salamander Rain: A Lake & Pond Journal by Kristin Joy Pratt-Serafini. (Grades 3 and 4).
Skunks and Their Relatives (Zoobooks) by John Bonnett Wexo. (Grades 4 and up)
Turtles (Zoobooks Series) by Timothy L. Biel. (Grades 4 and up)
Understanding Your Senses by Rebecca Treayes (1997) Upper elementary.
Snakes! (Zoobook Series) by John Bonnett Wexo. (2001).
Snakes! Strange and Wonderful by Laurence Pringle. (2009). Elementary.

Fiction:

(Hybrid: fiction and nonfiction) Near One Cattail: Turtles, Logs And Leaping Frogs by Anthony D. Fredericks. (Ages 4 and up)
The Magic School Bus Explores the Senses by Joanna Cole. (2001). Grades 1-4.
The Magic School Bus Gets Eaten: A Book About Food Chains by Pat Relf. (ages 4 and up, 32 pages)
The Magic School Bus Inside the Human Body by Joanna Cole. (2011). Grades 2-5
The Magic School Bus Wet All Over: A Book About the Water Cycle by Pat Relf (1996). Grades 3-5.

For teachers:

Ranger Rick's NatureScope series titles:

Amazing Mammals, Part I (1998, National Wildlife Federation, McGraw-Hill)
Amazing Mammals, Part II (1998, National Wildlife Federation, McGraw-Hill)
Endangered Animals: Wild and Rare (1997, National Wildlife Federation, McGraw-Hill)
Let's Hear It for Herps (1997, National Wildlife Federation, McGraw-Hill)
Wading Into Wetlands (1997, National Wildlife Federation, McGraw-Hill)

Social Studies

Standard 3. GEOGRAPHY:

Content Standard 3.0: Geography enables the students to see, understand and appreciate the web of relationships between people, places, and environments. Students will use the knowledge, skills, and understanding of concepts within the six essential elements of geography: world in spatial form, places and regions, physical systems, human systems, environment and society, and the issues of geography.

GLE 5.3.02 Recognize the interaction between human and physical systems around the world.

Teacher Questions, Pre-Tour

Q: How do we heat our homes? (Electric heat pump, electric heater, wood fire place, etc.)

Q: Where does the energy come from to heat our homes? If electric, how is it generated and carried to our homes?

Teacher Questions, Post-Tour

Q: How are we—as a community, city, county, state, country—able to provide 'heat and light' on demand for our citizens?

Q: Is this true for all people in all countries?

Q: How might our (as a country) use of resources affect other people around the world? Is there anything we can do to use less energy? (turn lights off when you leave a room, don't let water run, etc.)

Standard 6. INDIVIDUALS, GROUPS, and INTERACTIONS:

Content Standard 6.0: Personal development and identity are shaped by factors including culture, groups, and institutions. Central to this development are exploration, identification, and analysis of how individuals and groups work independently and cooperatively.

GLE 5.6.01. Recognize the impact of individual and group decisions on citizens and communities.

Teacher Questions, Pre-Tour

Q: Whether you live in the city or the county, you need services that can be provided to a group of citizens. Can you name some of these services? (light/electricity, water, heat, fire protection, crime prevention and protection, waster removal services, etc.)

Teacher Questions, Post-Tour

Q: Does each family buy its electric power individually from the source? (No, we usually buy it as a group, sometimes call a "coop" or cooperative, which helps save money for the individual family or consumer.) This is an example of citizens working as a group (cooperating) to provide something all of them need and use.