Down and Dirty

This module is designed to help you explore how earth science affects your life each day.

1. Choose A or B or C and complete ALL the requirements:
   A. Watch an episode or episodes (about one hour total) of a show about Earth, the weather, geology, volcanoes, or oceanography. Then do the following:
      1. Make a list of at least two questions or ideas from what you watched.
      2. Discuss two of the questions or ideas with your counselor.

> *Some examples include—but are not limited to—shows found on PBS ("NOVA"), Discovery Channel, Science Channel, National Geographic Channel, TED Talks (online videos), and the History Channel. You may choose to watch a live performance or movie at a planetarium or science museum instead of watching a media production. You may watch online productions with your counselor's approval and under your parent's or guardian's supervision.*

   B. Read (about one hour total) about Earth, the weather, geology, volcanoes, or oceanography. Then do the following:
      1. Make a list of at least two questions or ideas from what you watched.
      2. Discuss two of the questions or ideas with your counselor.

> *Books on many topics may be found at your local library. Examples of magazines include but are not limited to Odyssey, KIDS DISCOVER, National Geographic Kids, Whizz Pop Bang, Science+Nature, How it Works, Aquila, Popular Science, muse, and OWL or owlkids.com.*

   C. Do a combination of reading and watching (about one hour total) about Earth, the weather, geology, volcanoes, or oceanography. Then do the following:
      1. Make a list of at least two questions or ideas from what you read and watched.
      2. Discuss two of the questions or ideas with your counselor.

2. Complete ONE adventure from the following list for your current rank or complete option A or B. (If you choose an Adventure, choose one you have not already earned.) Discuss with your counselor what kind of science, technology, engineering, and math was used in the adventure or option.

Wolf Cub Scouts	Bear Cub Scouts	Webelos Scouts
Digging in the Past	Super Science	Earth Rocks!

Option A: Complete two of the following. (a) Explain to your den or an adult what geology means. (b) Collect samples of igneous, sedimentary, and metamorphic rocks and explain how each was formed. (c) Collect samples of three minerals. Explain to your family or den what a mineral is and show and tell about the minerals you collected. (d) With your family or den, make a mineral test kit, and test minerals according to the Mohs scale of mineral hardness. Record the results.

Option B: Complete one of the following: (a) Make a fossil cast. (b) Make a dinosaur dig. Be a paleontologist and dig through a dinosaur dig made by another member of your den. Show and explain

3. Investigate: Choose A or B or C or D and complete ALL the requirements:

A. Volcanoes erupt
   1. How are volcanoes formed?
   2. What is the difference between lava and magma?
   3. How does a volcano both build and destroy land?
   4. Build or draw a volcano model. If you build a working model, make sure you follow all safety precautions including wearing protective glasses for your volcano's eruption. If you draw a volcano, be sure to draw a cross section and explain the characteristics of different types of volcanoes.
   5. Share your model and what you have learned with your counselor.

B. Rock on
   1. What minerals are common in your state? Make a collection of three to five common minerals and explain how they are used.
   2. Are these minerals found in sedimentary, igneous, or metamorphic rocks?
   3. Explain or demonstrate the difference in formation of the three major types of rocks. Which types of rocks are common in your area?
   4. Share your collection and what you have learned with your counselor.

C. Weather changes our world
   1. Make three weather instruments out of materials around your home. (Examples include a rain gauge, weathervane, barometer, anemometer, and weather journal.) Use these and another method that is readily available (i.e., thermometer, eyes, older person's joints, etc.) for a total of four methods to monitor and predict the weather for one week. Keep a log of your findings. Which instrument provided the most accurate information?
   2. Keep a weather journal for a week. Include your predictions and the predictions of a local meteorologist. Do your predictions match those of the local meteorologist? Do your predictions match the weather that occurred? How can the predictions become more accurate?
   3. Discuss your work with your counselor.

D. Animal habitats: Choose TWO of the following animal habitats and complete the activity and questions. At least one habitat should be close to your home (within 50 miles). Visit at least one of the habitats. Once you have completed the activity and questions, discuss the habitats and the activities with your counselor:

1. Prairie

   Draw or model a food web with at least five consumers and two producers that live in the prairie habitat. What is the difference between consumers and producers? Predators and prey? What would happen if one of the animals in the food web disappeared?

2. Temperate forest

   Research the two main categories of trees in the temperate forest (coniferous and deciduous). Why are their leaves different? How are their seeds different? Put a twig from a coniferous tree (cone-bearing tree with needles) in a cup of water and tightly fasten a clear plastic bag around the needles. Put a twig from a deciduous tree (leafy tree that loses its leaves in the fall) in a cup of water and tightly fasten a clear plastic bag around the leaves. Observe what happens and draw pictures of your observations. Think of an explanation for what occurred and discuss your explanation with your counselor.

3. Aquatic ecosystem

   With a parent's permission and guidance, visit an aquatic habitat near your home. Examples include a stream, river, lake, pond, ocean, and wetland (a marsh or swamp). Draw or photograph the area. What are the most common types of plants growing there? What animals did you see? Did you see, hear, or smell any evidence of other animals? (Your evidence might include things like bird calls, splashes of fish or frogs jumping, tracks, feathers, or bones.) How do aquatic ecosystems affect your life? How have humans affected the ecosystem? (Look for signs of humans such as trash and bridges or walkways.) How do you think humans have affected the ecosystem in ways you cannot see? (Think about fertilizer and pesticides washing off your lawn and flowing into a stream. How would this affect creatures that live in the water?) What can you do to improve the quality of the ecosystem?

4. Temperate or subtropical rain forest

   Describe the three main levels of the rain forest (canopy, understory, and forest floor). Make a drawing or model showing examples of animals and plants that live at each level. Choose an animal or plant from each level and explain how it is adapted to its particular place in the rain forest.

5. Desert

   Choose a desert animal or plant. Make a model of it, draw it, or describe it. Explain how it is particularly well adapted to survive in a place where there is very little water. How would the desert be different if this plant or animal were not there?

6. Polar ice

   Research an animal that can be found in the polar ice habitat. Draw or make a model of the animal and name three characteristics that make it well adapted for life in the very cold and snowy environment.

7. Tide pools
   Explain how a tide pool is formed and describe several animals that are found in tide pools. Make a model or draw a diagram of a tide pool at a high intertidal zone and a low intertidal zone. Include animals found in tide pools and explain how they adapt to their constantly changing environment.

4. Visit. Choose A or B and complete ALL the requirements.

   A. Visit a place where earth science is being done, used, explained, or investigated, such as one of the following: cave, quarry or mine, geology museum or the gem or geology section of a museum, gem and mineral show, university geology department, TV or radio station meteorology department, weather station, volcano or volcano research station, or any other location where earth science is being done, used, explained, or investigated.

      1. During your visit, talk to someone in charge about how people at the site use or investigate a particular area of science. How could this investigation make the world better?

      2. Discuss with your counselor the science being done, used, explained, or investigated at the place you visited.

   B. Explore a career associated with earth science. Find out what subjects you would need to study as you get older. What kind of education would you need in the future to help explore Earth? What types of people other than geologists explore Earth? Discuss with your counselor what is needed to have a career in earth science.

5. Discuss with your counselor how earth science affects your everyday life.

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