Nature-Watch Activity Kit

Amazing Animals

(Nature Watch Kit # 105)

Kit Contents

Item:	Qty
Small Master Track Set (Coyote, Deer, Mountain Lion, and Rabbit included)	1 set
Books about Animal Tracks	2
Amazing Animals Track Card Decks	2
Instructor Manual	1

Additional Items Needed:
Plaster of Paris
Sand

This page includes the Next Generation Science Standards (NGSS) mapping for this kit and Science, Technology, Engineering, and Math (STEM) extensions (on back) to use in adapting and extending this activity to other subject areas.

See Back for STEM Extensions

Next Generation Science Standards Alignment

K-LS1-1. Use observations to describe patterns of what plants and animals (including humans) need to survive.

K-ESS3-1. Use a model to represent the relationship between the needs of different plants and animals (including humans) and the places they live.

2-LS4-1. Make observations of plants and animals to compare the diversity of life in different habitats.

4-LS1-1. Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

5-PS3-1. Use models to describe that energy in animals' food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun.

5-LS2-1. Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.

MS-LS2-1. Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.

MS-LS2-4. Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.

MS-LS2-2. Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.

HS-LS2-1. Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales.

This Nature Watch Activity Kit contains an Instructor Manual and materials to implement the curriculum. The kit was designed to be used with adult supervision only. Unsupervised use is not recommended.

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STEM Extensions

Science

- Compare and contrast the tracks (coyote, rabbit, mountain lion, deer) of the four animals side by side. What similarities and differences do you see? Thinking about the ways these animals move and their habitats and needs, why are their feet shaped the way they are?

- Following the pattern of "The House that Jack Built," make an illustrated children's storybook tracing a tertiary consumer's relationships down to a primary producer. Your story should read something like this: "This is the coyote who ate the X, who ate the Y, who ate the Z…"

- One more type of organism we can add to the feeding relationships is the decomposers, which break down other organisms when they die, and return the nutrients to the soil. Typical decomposers are bacteria and fungi and they are very important in all ecosystems. You can see decomposers in action with some food waste. Place some fruit pieces, vegetable pieces, and a bread slice into separate glass jars. Rub a cotton ball on the floor, then rub that same cotton ball inside the glass jars, transferring some of the microbes that were on the floor. Add a couple drops of water into each jar, since decomposers need water like all living things. Finally, close the jars and observe them over time. What do you see happening as the decomposition process unfolds?

Technology

- Use SmartArt in Microsoft Word to make trophic pyramids for one of the animals (coyote, rabbit, mountain lion, or deer). Place the animal in the correct trophic level, then add other organisms to all of the trophic levels to show what else is in the animal's food web.

- Go online to practice with food webs. There are many games available that will help you learn which organisms go where on a food web. Search for "interactive food web games" to find some.

Engineering

- Humans aren't the only engineers around! Scientists have coined the term "ecosystem engineer" for an organism that significantly changes the habitat around it in a way that affects other organisms. Beavers, zebra mussels, prairie dogs, and the kudzu vine are examples of ecosystem engineers. Find out more about an ecosystem engineer, then trade stories with a classmate to learn about another one.

- Ecological engineering combines ecology and engineering to design, monitor, and build ecosystems. It is a relatively new field that has grown important because of the many threats to the world's ecosystems. Pollution control, wetland restoration, the introduction of species to control invasive species, and addressing climate change are all examples of ecological engineering. Think of an environmental issue that affects your area. Do you know of any ecological engineering projects going on to address that issue? What kinds of ecological engineering projects do you think could be helpful?

Math

- The amount of energy moving to each trophic level decreases with each level. As little as 10% is transferred to the next level. If we start out with 10,000 kilocalories of energy at the primary producer level and assume that only 10% gets transferred to the next level, how much energy will there be in each of the subsequent levels (primary consumer, secondary consumer, tertiary consumer)? How many times less is energy is there at the top than originally?

- Assign points to the items on the Tracking Safari Hunt List, with higher point values for the more difficult things to find and low point values for the easy things to find. Set a target number of points that a team has to acquire to win. Before you go out on the Tracking Safari, come up with two different ways you could achieve the target points value. What combinations of items can you find to become the winner?