



**PREVISIT ACTIVITY**  
for "Body Systems Pathway"

**GRADE LEVEL**

Grades 4–12

**CDE STANDARDS**

Science: 3.3

**PREPARATION**

Estimated Preparation Time: 30 minutes

Estimated Activity Time: 2–3 class  
periods of 45 minutes

**MATERIALS**

Play-Doh in a variety of colors

Straws

Wiki Stix

Pipe cleaners

Popsicle sticks

Paper clips

Miscellaneous art supplies

Copies of student activity sheets

Copy of *Museum Secrets* for teacher

## Bringing Life to the Elves

### Learning Goals/Objectives

Students will design elf body systems based on knowledge of human body systems.

### Advanced Preparation

1. Make copies of student activity sheets for each student or group of students.
2. Take students on a scavenger hunt through the Museum's dioramas to search for the elves within the exhibits. Use the *Museum Secrets* document as a guide.

### Classroom Activity

1. Give students a copy of the story of the elves. Explain to them that they will be designing artificial body systems for an elfin colony based on the criteria in the story. Give students very little instruction as the beauty of this activity is problem solving and application of knowledge.
2. Provide students with an assortment of materials for creating their body systems.
3. Students must sketch and label their systems, as well as be able to describe the function of each. Urge students to be creative in their design and naming of the components of each system.

### Evaluation

1. Students must draw and label each system they design for the elves. They must be able to demonstrate how the systems will work together.
2. Allow students to share their body system designs and functions with the rest of the class. Have students vote on the best designs and descriptions. Award this group with a small prize if desired.

## Story of the Elves

The year is 2555 and you are a biologist and medical doctor working as a curator of health sciences for the Denver Museum of Nature & Science. Your latest project at the Museum has led to a number of scientific breakthroughs in the study of the human body.

Your team has recently asserted that the elves hidden within the Museum's dioramas are creatures that could add to the excitement of the exhibit halls. They believe that they can bring these creatures to life by providing them artificial body systems similar to those found in your own human body.

After searching for a short time you locate all of the elves hidden within the exhibit hall dioramas. Your team is excited to begin its scientific exploration to see if they can actually bring life to these creatures. Your team has determined that the elves will need the following systems in order to successfully survive within the dioramas and function as tour guides for the exhibits:

- Nervous system
- Circulatory system
- Skeletal system
- Muscular system
- Respiratory system
- Digestive system

Your team has decided that the elves will not need a reproductive system at this time. You wish to see how this small group of elves will function with your newly developed systems before providing them an opportunity to reproduce.

## Assignment

The task of your team is to create a model of each body system necessary for an elf to function. Use human body systems as a model for your work, realizing that the elf systems must be unique and befitting of a gnome. Make sketches of each system before creating your models.

Use Play-Doh and other materials to make a model of each system in the elf's anatomy. Your systems must be engineered and designed so they will work cooperatively and be compatible within one elf body. Each system must be labeled with appropriate anatomical structures as you see fit for the elf.

**Draw and label your Elfin body system.**

## Museum Secrets

There are many hidden images in the Museum. Kent Pendelton, who painted many of the diorama backgrounds for the Museum, often hid tiny elves in his work. The elves are well camouflaged, but using this guide and a Museum map, you can seek out the elves as well as some other surprises.

Begin your elf hunt on Level 2 in the *North American Wildlife Hall*. Look at the Great Smokey Mountains daytime diorama. Stand at the center of the diorama and look at the background painting. Find the little stream to your left. Toward the middle of the stream is a dark-colored tree on the left and a light-colored tree on the right. Between these two trees is a short sapling. Look at the small branch coming out of the right side of the sapling. The elf is sitting about two inches below on the edge of the rock. He's waving and is wearing green, but it's easy to see his big white beard.

The next elf is easier to find. You are in the *North American Wildlife Hall* so turn around to find the Olympic Rainforest diorama. Look toward the background painting to find a large tree covered in moss. It's in front of a fallen dead tree that is also covered in moss. Beginning with the moss-covered tree count five trees to the right. The elf is sitting against the fifth tree on top of the log. His hat blends in with the scenery, so you mostly see his face.

Still in the *North American Wildlife Hall*, find the Montague Island diorama. Stand about five feet to the right of the buck. Look left at the tallest tree in the middle, the one where the top curves to the right. Look at the second tallest tree to your left, the one without a pointy top. Follow it down until you see a smaller tree to the left that's sort of "C" shaped. Look at the light-colored shrub that goes to the left. Follow it until it dips down and evens out. The elf is right at the top of the dip. You will see only a face and small green hat. He's very tiny, only about the size of a nickel, and very difficult to see.

There are two elves in the *Edge of the Wild Hall* on Level 2. Find the pronghorn diorama. On the right-hand side there is a running pronghorn. Move to the far right end of the diorama and kneel or sit on the ledge. Look under and to the far right side of the bush. Peeking out is the only ceramic elf in the dioramas. The figure is standing and waving. He is a red-bearded elf wearing a green suit.

There is another surprise in the pronghorn diorama. Move to the far left of the diorama and find the butterfly that is orange with black markings, the *Coronis fritillary*. Keep your eye on it because the butterfly's wings move every 12 seconds.

Still in the *Edge of the Wild*, turn around and go over to the white-tailed deer display. Go to the diorama's right window and stand in front of the buck that is rubbing its antlers on a small tree. Look slightly to the left and right in the middle of the background at the smallest of the trees with multiple trunks. Look at the trunk farthest to the right on this tree, toward the bottom. There is a thin little branch with leaves on it extending to the right. Look below this branch at the branch with no leaves. Look out on the branch about two inches. The elf, dressed in brown, looks like he is swinging from the branch but he is really sitting on a wild plum bush with red fruit.

There is another butterfly moving its wings in the *Edge of the Wild*. Find the summer mule deer diorama. Move just to the left of the middle of the diorama. Peek around the middle barrier and look in the foreground to find a small yellow butterfly, *Phoebus parnissia*, sitting on a broken piece of a tree trunk. Keep an eye on the butterfly to see its wings move. The butterflies in the *Edge of the Wild* provide the only motion in the Museum's dioramas.

Continue to the *Explore Colorado* exhibit on Level 3. Find the Lowland River diorama. Find the large Great Blue Heron nest on the left and follow the large front branch down to the painted foreground on the floor. The elf is painted just to the right of where the branch meets the tree trunk. He is lying on the branch sleeping. This white-bearded fellow is wearing a green suit. You might want to lean over the ledge a little to see over the leaves in the front.

The tradition of painting elves into the dioramas continued with *Prehistoric Journey* on Level 3. From the balcony overlooking the dinosaur gallery, go down the stairs into the Cretaceous Creekbed diorama where the two dinosaurs are fighting. Take about five steps straight ahead and look on the wall to your left. There is a dinosaur, *Ornithomimus velox*, walking through the trees. The elf is riding on his back waving.