



## TEXAS MEMORIAL MUSEUM

### Mammals in our Midst: Modeling Scat

#### Concepts:

Because most mammals are nocturnal, we can use clues other than sightings to learn about the mammals living in our area. These clues (called “sign”) include tracks, scat, nests, burrows, and trails. Scat (fecal droppings) left by mammals can tell us about the general type, size and diet of a mammal. Actual scat should not be handled, just observed. Modeling scat is a safe and fun way to explore the diversity of local mammals.

#### Objective:

Model mammal scat to learn how to recognize the presence of local mammals based on the size, shape and texture of scat.

#### Materials:

1. A field guide of North American mammals or a set of mammal fact sheets that include diet and body size information for local mammals. Two great sources for information to create your own mammal fact sheets are the online edition of The Mammals of Texas (<https://www.depts.ttu.edu/nsrl/mammals-of-texas-online-edition/>) and Texas Parks and Wildlife Department (TPWD) Fact sheets for mammals (<https://tpwd.texas.gov/huntwild/wild/species/#mammals>).
2. Brown play-doh (mix colored versions to create brown); or prepared dough (see 2 recipe options below).
3. Add-ins for dough:
  - a. **Bones:** Elongate white sprinkles, dried clay pieces
  - b. **Fur:** Actual fur from your shedding pets, fake fur from craft store
  - c. **Feathers:** Craft store feathers
  - d. **Grass:** Actual dried grass
  - e. **Fruit:** Fruit snack pieces, Red Hots candies
  - f. **Seeds:** Birdseed, mustard seed, sesame seed
  - g. **Insects:** Small metallic sequins, shredded bits of shiny paper
4. Paper plates (1 for each team of 2 or more learners).
5. Rulers (optional, 1 for each team).

## Instructions:

Each team receives a different fact sheet about a local mammal, a ruler, and some dough (make sure there is enough for scat produced by the largest mammal in your field guide) on a paper plate. Make available on a separate table the containers of the add-ins (representing bones, hair, berries, insects, etc.). Each team reads their fact sheet and then creates a scat model using the dough and add-ins. Teams should pay careful attention to *size* of the scat as well as any other shape features. Instead of labeling the scat, teams should try to identify what type of mammal scat the other team has modeled.

## Notes about mammal scat:

### Dimensions:

Length & width measurements in field guides are generally helpful

Size may vary within a species depending on the mammal's age, diet and health

### Shape:

Herbivores typically produce round or oval pellets

Carnivores typically produce cylindrical scat with tapered ends

    Cords – bears, raccoons, foxes, coyote

    Segmented (or broken) – bobcats

    Looped – weasels, mink

### Texture / Contents:

Texture can vary depending on the moisture content of the diet, weather conditions and freshness of the scat

Look for undigested seeds, berries, insects, bones and hair

## Materials for Creating Scat Models:

### Easy Stove-top Dough Recipe

**Source:** Fisk, Katie. 2013. Cold Scat Creamery. *Science Scope*, 36(8): 68-71.

### **Materials**

~0.5 oz. brown food coloring (can be made by mixing red, yellow and blue food coloring until the desired hue is achieved)

3 cups water

3 cups flour

1.5 cups salt (use table salt – small grains work best)

6 tsp cream of tartar

3 Tbsp cooking oil

### **Procedure**

1. Add the food coloring to the water before combining it with the remaining ingredients in a large pot. Add as much food coloring as you need to achieve desired shade of brown.
2. Pour all ingredients into a large pot on stove.
3. Stir constantly over low-medium heat until the dough starts to pull away from the sides as you stir (about 10 minutes).

4. Remove dough from the pot and knead it until texture matches that of playdough (1-2 minutes).
5. Store in airtight food container.

This recipe makes enough for approximately 20 learners. The dough lasts for months if kept in food storage containers at room temperature or in the refrigerator. Some salt crystals may form on the surface of the dough after a few weeks, but the crystals can be mixed back in by hand.

### **Alum Dough Recipe**

**Source:** Marks, Diana F. 1996. *Glues, Brews, and Goos: Recipes and Formulas for Almost Any Classroom Project*. Teacher Ideas Press, Englewood, CO. 296 pp.

#### **Materials**

3 teaspoons alum  
1½ cups flour  
1 cup salt  
1 cup boiling water  
2 teaspoons vegetable oil  
Powdered tempera paints

#### **Procedure**

1. Combine the dry ingredients in a mixing bowl.
2. Add the boiling water and the oil. Mix thoroughly.
3. Divide the dough into several portions, place in mixing containers, and add tempera paints to achieve desired colors.
4. Model and let dry.
5. Store unused dough in airtight containers.

Makes 2½ cups. Divide dough into three portions. Leave one white, color one with brown powdered tempera paint (or cocoa), and color one with brown + black powdered tempera paint. Provide more black powdered tempera paint to mix in as needed for each sculpture.

This recipe is a good option if cooking method is not feasible. It stores without refrigeration for a couple of months and dries overnight.

## **Additional Resources and Information**

### **Books and Field Guides:**

Elbroch, M. 2003. *Mammal Tracks & Sign: A Guide to North American Species*. Stackpole Books, Mechanicsville, Pennsylvania.

Kays, R. W. and Wilson, D. E. 2009. *Mammals of North America*. 2<sup>nd</sup> Edition. Princeton Field Guides, Princeton University Press, Princeton and Oxford.

- Murie, O. J., M. Elbroch and R. T. Peterson. 2005. *Peterson Field Guide to Animal Tracks*. Third Edition. The Peterson Field Guide Series, Houghton Mifflin Harcourt, Boston and New York.
- Reid, F. 2006. *Peterson Field Guide to Mammals of North America*. Fourth Edition. The Peterson Field Guide Series, Houghton Mifflin Harcourt, Boston and New York.
- Rezendes, P. 1999. *Tracking and the art of seeing. How to read animals tracks and sign*. 2<sup>nd</sup> Edition. HarperCollins Publishers, New York.

## Scat Rap

It starts with an "S" and it ends with "T"  
It comes out of you and it comes out of me.  
I know what you're thinking, but, don't say that.  
The scientific word for that is scat.

You're walking through the woods and your nose goes "ewww!"  
You know some animal's laid scat near you.  
It may seem gross, well that's O.K.  
They don't have toilets to flush it away.  
Now don't go screamin' and lose your lunch  
If you picked it apart you could learn a bunch about - SCAT

If you wanna find out what animals eat.  
Take a good look at what they excrete.  
Inside of their scat are all kinds of clues,  
Parts of food their bodies can't use and that's - SCAT

If you park your car in a woods or a field  
You might find scat on your windshield.  
Some of it's purple and the rest of it's white  
You just got bombed by a bird in flight and that's - SCAT

It tells us what they eat and it tells us who they are  
That's what we know about scat so far.  
If you wanna find out what animals are around,  
The place to start looking is the scat on the ground.

*"Scat Rap" written by Rodd Pemble, Mary Keebler and Andy Bennett, Great Smoky Mountain Institute, 1988.*

# Alignment with Elementary Science TEKS (Texas Essential Knowledge and Skills)

## Kindergarten

9) *Organisms and environments.* The student knows that plants and animals have basic needs and depend on the living and nonliving things around them for survival. The student is expected to: (B) examine evidence that living organisms have basic needs such as food, water, and shelter for animals and air, water, nutrients, sunlight, and space for plants.

10) *Organisms and environments.* The student knows that organisms resemble their parents and have structures and processes that help them survive within their environments. The student is expected to: (A) sort plants and animals into groups based on physical characteristics such as color, size, body covering, or leaf shape.

## First Grade

10) *Organisms and environments.* The student knows that organisms resemble their parents and have structures and processes that help them survive within their environments. The student is expected to: (A) investigate how the external characteristics of an animal are related to where it lives, how it moves, and what it eats.

## Second Grade

10) *Organisms and environments.* The student knows that organisms resemble their parents and have structures and processes that help them survive within their environments. The student is expected to: (A) observe, record, and compare how the physical characteristics and behaviors of animals help them meet their basic needs.

## Third Grade

10) *Organisms and environments.* The student knows that organisms undergo similar life processes and have structures that help them survive within their environments. The student is expected to: (A) explore how structures and functions of plants and animals allow them to survive in a particular environment.

## Fourth Grade

9) *Organisms and environments.* The student knows and understands that living organisms within an ecosystem interact with one another and with their environment. The student is expected to: (A) investigate that most producers need sunlight, water, and carbon dioxide to make their own food, while consumers are dependent on other organisms for food.

## Fifth Grade

9) *Organisms and environments.* The student knows that there are relationships, systems, and cycles within environments. The student is expected to: (A) observe the way organisms live and survive in their ecosystem by interacting with the living and non-living elements.

## Alignment with the Next Generation Science Standards

### *From Molecules to Organisms: Structures and Processes*

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

*How the lesson meets this standard:* The contents of mammal scat indicate the diet and food sources of mammals. By creating and observing scat models, students learn to identify herbivores, carnivores and omnivores within mammal communities.

### *Interdependent Relationships in Ecosystems*

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.

*How the lesson meets this standard:* Mammals eat other animals and/or plants in order to survive. The model depicted here explores the relationships among a species, its dietary needs and where it lives. Students can determine habitat preference and geographical range of a mammal species from a field guide and identify the food sources within.

### *Interdependent Relationships in Ecosystems*

2-LS2-2. Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants

*How the lesson meets this standard:* Mammals that eat fruit and/or seeds do not digest the actual seeds, but pass them out of the body in feces. Using the information presented in the field guides, students can model which of the species disperses seeds in scat and predict that larger mammals are able to disperse seeds more widely than smaller mammals.