Animal Tracks Can Illuminate Many Things: A Detective Exercise

Driving Question:

- What can we learn from animal tracks?

Word Bank	
Track	the imprint left on the ground by a single foot.
Track length	equal to foot length or shoe size.
Stride length	the distance from a point of one foot to the corresponding point of the next track of the same foot.
Speed	the rate of travel in units of distance over time
Correlation	the relationship or connection between two or more variables.

Activity 1: Inferring from Evidence

Often times in science, we don't have all the pieces to the puzzle for the question we are trying to answer. Use the information that is available to fill in the rest of the picture below.
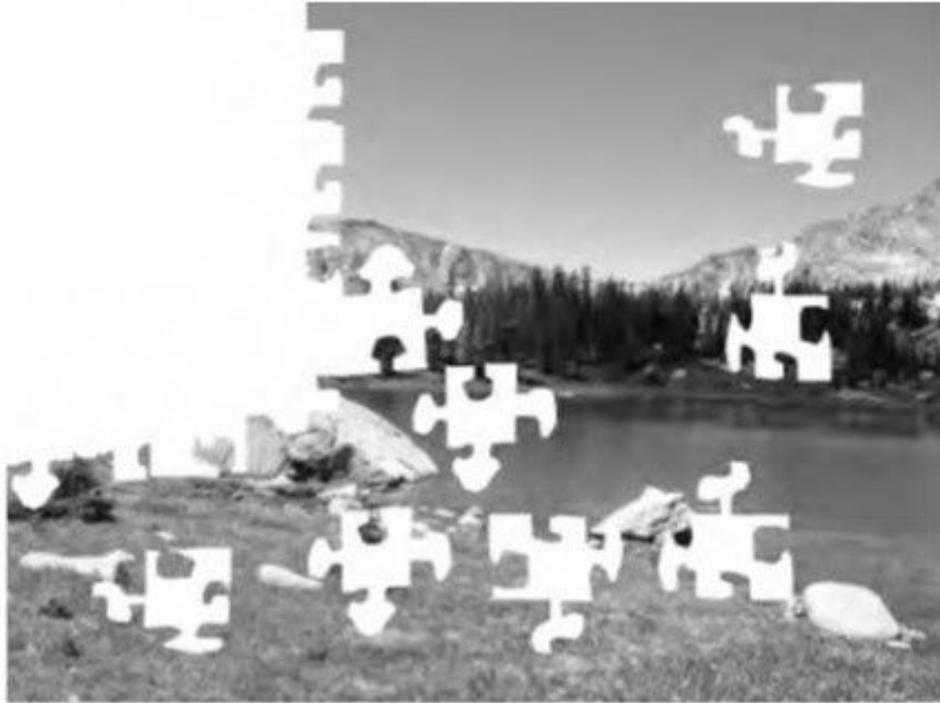
1. In what areas are you most confident about what you are drawing?

2. What areas are you least confident about what you are drawing?

In science, we often need to decide what information we know and what information we don't know.

3. If we were to find a set of dog tracks what information would we know or could we discover through observation and measurement?

4. What do we not know or can't find out?

Activity 2 Unraveling the Mysteries Found in Tracks

Activity 2

We will be using data from your movements to see if the relationships between animal tracks and animal movement are the same for both animals and humans.

Data Table:

Who? Walking, running, or trotting?	Column 1: # of steps in 20 meters	Column 2: # of strides (Column 1 divided by 2)	Column 3: Stride length (20 m divided by Column 2)	Column 4: Time (seconds)	Column 5: Speed (m/sec)

To help solve the mystery in a set of tracks as to whether or not the animal was walking, trotting or running, work through this calculation to determine a ratio related to the speed at which the animal was moving.

> Track length x 4 = hip height
> Stride length / Hip height = ratio
>
> If the ratio is less than 2.0, the animal was walking.
> If the ratio is between 2.0 and 2.9 the animal was trotting
> If the ratio is greater than 2.9, the animal was running.

Now, let's graph the class data.

Activity 3 Graphs as Models

Activity 3
The two graphs you created in the previous step using class data are scatter plots. Draw trendlines through the data and write the equations for the relationships in each graph.

Next, apply the same procedure to the animal tracks in the photos we looked at in Activity 1.

Activity 4 From Observations to Inferences

Activity 4
First, follow animal tracks outside (dog or squirrel will do) and try to determine what the animal is doing and what measurements could be useful in describing the animal's activities or comparing across a larger population of that species.

Second, in your small group, act out a human or an animal story leaving only tracks behind. Then have each group analyze each other group's tracks and try to decipher the story using the evidence that is available.

List the evidence as well as measurements that may be important in supporting their ideas about what occurred and see how well it matches the story here.

Activity 5 What do Animal, Fossil, and Car Tracks all have in Common?

Activity 5

5. Imagine you are in the woods and find a fresh set of animal tracks in some fresh snow. Write a list of characteristics you know about the animal that made the tracks. After following the tracks for a short distance you notice that the stride length of the animal triples. What does this tell you about the approximate speed of the animal and what may be going on?

6. Application: How could you use the skills you learned in this lab in analyzing other events, such as a car sliding on the snow? Or the interpretation of fossil tracks?