

# *Changing Habitats Activity Bag*

## **Stimulus and Response: Teacher Guide**

This is a continuation of the Stimulus and Response activity. In the first part, students explored stimulus and response through a reaction time activity. In these lessons, students will experience how smell and sound are used in nature as stimuli to communicate information and trigger responses.

Students will participate in a hands-on activity where they use smell to identify members of their “family,” modeling how animals recognize others in their environment.

### **Materials From The Teacher Bag (for all students)**

- Plastic cups, 4 oz
- Lids for plastic cups
- Extract, peppermint
- Extract, strawberry
- Isopropyl alcohol
- Cotton balls
- Push pin
- Pippette
- Behavioral Scenario Cards

### **Other Materials**

- Ability to view the Google Slide Deck
- Stimulus and Response Student Activity Sheet

### **Preparation:**

You will prepare three different sets of smell cups: peppermint, strawberry, and alcohol

1. Put one cotton ball in a plastic cup.
2. Use a pipette to place a few drops of peppermint extract on the cotton ball.
3. Seal the cup with a lid.
4. Using a push pin, gently poke several small holes in the center of the lid.
5. Repeat until you have one cup per student, making sure students are evenly divided among the three smells.

***Safety note:* Remind students not to open the cups or touch the cotton balls.**

## **Communicating Through Smell**

### **Part 1: Find your Family**

For this activity, students will use smell cups to determine what other students share the same smell. The students with the same smell will be a “family”.

### **Procedure:**

1. Explain to the class that they will play a game involving different smells.
2. Show the class a smell cup.
3. Demonstrate how to use the smell cup:
  - Hold the cup under your nose.
  - **Gently** squeeze the sides of the cup.
  - Smell through the holes in the lid.
4. Give each student one smell cup.
5. Explain the challenge:
  - Students must walk around the room and find others with the same smell.
  - Students with the same smell are part of the same family.
6. When everyone is ready, allow students to begin searching for their family members.

7. After several minutes, students should be grouped into three smell families.

8. At the conclusion of the activity, collect the smell cups for Part 2.

Lead a discussion with your students:

- How did you find other students with the same smell?
- What was the stimulus? **The different smells.**
- What was the response? **Recognizing family members and separating from non-family members**
- In nature, why would it be important to be able to recognize family members by smell?

**Key Reasons for Recognition by Smell:**

- **Staying Healthy** - Animals can use their sense of smell to avoid mating with close relatives, such as brothers or sisters. This helps baby animals be healthier and stronger.
  - **Parents Finding Their Babies** - Many mother animals use smell to find their own babies. This is important because babies often look the same, and newborns cannot see very well yet.
  - **Working Together as a Family** - Animals use smell to know who is in their family group. This helps them protect each other, find food together, and trust one another.
  - **Sharing Food and Care** - Animals are more likely to share food and help family members. Smell helps them decide whom to care for and protect, rather than helping strangers.
  - **Family Smells Alike** - Family members often smell similar because they share the same genes. This makes it easier for animals to recognize family members quickly.
- Tell students to think about when two dogs meet. Ask, “What do dogs do when they meet other dogs?”  
**Dogs often sniff each other to gather information. Through smell, dogs can tell whether another dog is male or female, whether the dog is friendly or aggressive, and whether the dog belongs to their pack or family.**

## Part 2: Find the Food

In this part of the activity, students will walk around and smell cups to identify which of the three scents represents food. This activity is best conducted outside, where students have space to move safely and freely.

### Preparation:

1. Decide where the activity will take place and define the area as the animal’s habitat.
2. Place all or some of the smell cups around the habitat.
  - Be sure that all three smells are represented.
3. Set aside one strawberry-scented cup to use as a model so students know which smell represents food in the game.

### Procedure:

1. Explain to the class that they will play another game using their sense of smell. Tell students that, for this activity, they will pretend to be animals searching for food in their habitat.
2. Explain that animals find food by recognizing specific smells.
3. Pass around the strawberry-smelling cup and allow each student to smell it. Explain that this smell represents food.
  - When students find a cup with this smell, they have found food and should collect the cup.
4. Show students the boundaries of the habitat and explain how the hunt will work.  
**Depending on the size of the habitat, you may allow all students to hunt at once or send them out in smaller groups.**
5. Allow students to hunt until all strawberry-scented cups have been found.
6. Collect the cups and bring the class together for a discussion.

### Discussion Questions:

Lead a discussion with your students.

- What was the **stimulus** in this activity? **The strawberry smell**

- What was the **response**? **Searching for and collecting the food cup**
- How did smell help you survive in your habitat? **It made them able to find food.**

### Content Connection

Say, “In this activity, you experienced how animals use smells to gather information, communicate, and find food in their environment. Smell is an important survival tool for many living things.” Give a specific example of how smells are used in nature.

## Communicating Through Sound

### Preparation:

1. Cut out the behavior scenario cards

### Part 1: Student-Choice Charades

#### Procedure

2. Ask students:
  - a. How do animals communicate without words?
  - b. How does a baby animal find its parent?
  - c. How do animals warn each other about danger?

Explain that animals use sounds and movements to survive, just like we use signals in games.

3. Explain that students will play a charades-style game, acting out animal behaviors using only sounds - no talking.
4. Divide students into small groups of 3-4, and explain that they will act as a family.
5. Project the scenario cards and have each group choose a scenario they would like to act out.
6. Give groups time to plan and practice their performance.
7. Groups will perform their scenario for the class.
8. After each performance, the class will guess which scenario was acted out.
9. Hold a class discussion using the following questions:
  - a. What animal behavior was shown?
  - b. What was the stimulus?
  - c. What was the response?
  - d. How does this help the animal survive?

Students should record these answers on their student activity sheet

### Part 2: Random-Choice Charades

#### Procedure

1. Repeat the procedure from Part 1, but have each group draw one behavior scenario card and act it out.
2. After every group has gone, hold a class discussion using the following questions:
  - a. Would these behaviors work in every habitat?
  - b. How might animals in the ocean use signals differently from animals in the forest?
  - c. How do humans use sounds and movements to communicate?

### Content Connection

1. Have the students draw an organism’s behavior showing stimulus and response, and write 2–3 sentences explaining how the organism uses this to survive.

Here are the behavior scenarios and some examples.

### **Behavior Scenarios (Examples)**

**1. Finding Offspring:** A parent animal hears a baby's call and must find it.

#### **Expected Actions:**

- Soft calling sounds
- Searching movements
- Responding to repeated sounds

**2. Warning of Danger:** An animal spots a predator nearby and warns others.

#### **Expected Actions:**

- Loud or sharp warning sounds
- Sudden movements (freezing, running, pointing)
- Other "animals" reacting by hiding or fleeing

**3. Claiming Territory:** An animal warns others to stay out of its territory.

#### **Expected Actions:**

- Loud or deep calls
- Big, strong body movements
- Responding animal stops calling or calls back briefly

**4. Group Hunting:** Animals work together using signals to catch food.

#### **Expected Actions:**

- Quiet signals or short sounds
- Pointing or coordinated movement
- Sudden group action

**5. Finding A Mate:** An animal uses sound or movement to attract a mate.

#### **Expected Actions:**

- Repeated calls or songs
- Bright or exaggerated movements (dancing, puffing up)
- Another animal responds by moving closer

**6. Plants Protecting Themselves:** A plant detects the sound vibrations of a nearby insect chewing on its leaves.

#### **Expected Actions:**

##### **Stimulus Sound (Insect):**

- Soft "chomp chomp" sounds
- Light tapping or clicking noises (to represent chewing vibrations)
- Gentle repeated scratching sounds

##### **Response Sound (Plant):**

- A sudden sharp "shhh!" sound to signal chemical release
- A rising "whooo" or "psss" sound to represent sending warning signals
- A change in sound (quiet → louder) to show a response to the vibration

Even though plants do not hear like animals, they can sense **vibrations**, which act as sound signals in their environment. This makes a great comparison to animal sound communication while reinforcing stimulus and response.

## *Behavioral Scenario Cards*

|                                                                                                |                                                                                                                                    |
|------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| <h3><b>Finding Offspring</b></h3> <p>A parent animal hears a baby's call and must find it.</p> | <h3><b>Warning of Danger</b></h3> <p>An animal spots a predator nearby and warns others.</p>                                       |
| <h3><b>Claiming Territory</b></h3> <p>An animal warns others to stay out of its territory.</p> | <h3><b>Group Hunting</b></h3> <p>Animals work together using signals to catch food.</p>                                            |
| <h3><b>Finding A Mate</b></h3> <p>An animal uses sound or movement to attract a mate.</p>      | <h3><b>Plants Protecting Themselves</b></h3> <p>A plant detects the sound vibrations of a nearby insect chewing on its leaves.</p> |