

LOST AND FOUND



VIRTUAL
Field Trip
to the California Science Center

FOCUS QUESTION:
WHAT PARTS OF
an organism
HELP IT
SURVIVE?

BUZZWORD:
STRUCTURE

**NGSS
STANDARDS**

**PERFORMANCE
EXPECTATIONS**

4-LS1-2, 4-LS1-1

SEP - DEVELOPING AND
USING MODELS

CCC - SYSTEMS AND
SYSTEM MODELS

OBJECTIVE:

Students will model how information is received by the senses and processed through the brain in a 3-part activity. Students will create an initial model then play a “choose-your-own adventure style” game in order to test interactions between an animal’s environment and the structures of its sensory system. They will then show their understanding in a more detailed, final model.



NOTE: All portions of the activity can be completed using either the interactive Google Slides or using paper and pencil.

MATERIALS AND MODIFICATIONS



- **The Decision Map** -Students can use either the interactive Decision Map on Google Slides or the one-page Decision Map on pg. 6 of the Teacher Guide.

-**A pencil and paper**-These are optional and will allow students to write or draw their ideas into a science notebook as an alternative to editing the student guide directly.

FACILITATING THE EXPERIMENT



1. **Before students start the experiment:** Lead a conversation to activate student's prior knowledge about the sensory system. Ask students to share their model from Page 1 of the Student Guide.
2. **Set up the experiment:** Decide if you will provide students with the [interactive Decision Map](#) on Google Slides or the [one-page Decision Map](#) on pg. 5 of this Teacher Guide.
3. **During the experiment:** Students using the interactive slides must enter presenter mode and click on the boxed clues and actions in the slides (do not scroll). If using the one-page Decision Map, instruct students to read all three clues then follow the color-coded arrow path to choose an action.
4. **Wrap up:** Discuss the “What’s Going On” steps and questions together. Allow students to revise and share their final models to show how their understanding has changed.



TROUBLESHOOTING

Students can edit the Student Guide slides directly to make their models.

- To create new arrows and shapes for their models: go to the toolbar, press the line icon and select an arrow. Click the document, and the arrow will appear.
- To resize an arrow or shape, students can click it with their mouse and drag the blue dots with their cursor.

Students can play the [Decision Map](#) as an interactive slideshow.

- Students must play in “present” mode in order to press buttons.
- Each “button” is an animation and will happen in order regardless of where the student clicks.
- Slides are linked so that students can progress through the decision map following clues. If students click outside the designated “buttons” in the slide show, it may lead them to an incorrect slide. To reset, hit escape or exit and restart the presentation.

WHAT'S GOING ON?

1. Students should circle the **structures** that make up the sensory system: the ears, eyes, nose, (external structures) and brain (internal structure). They may also choose to circle the tongue and skin.
2. **Pink arrows show information being received by sensory organs.** In the game, there were three kinds of clues received by these sensory organs: auditory (sound), visual (sight), and olfactory (smell). Information from the clues is either chemical (scent molecules) or physical (light or sound waves).
3. **Blue arrows show information being sent to the brain for processing.** Encourage students to think about how each species was able to send information from their external structures to the internal structure (brain).
4. **The green star shows the action or response to the information.** Each species uses their individual perceptions and memories to guide their actions.
5. **The red "x" shows a disruption** in the path receiving and/or the path processing information from the scent.
6. Students may reflect on how each model shows the flow of information through the sensory system and how its structures work together. While the wolf and person have similar internal and external sense structures, they respond differently to clues.



It is not important that students have one correct answer, rather that they can explain the flow of information through their model.

ADDITIONAL RESOURCES

Share your students' experience with the Decision Maps on Social Media for a chance to be featured!



@californiasciencecenter



@casciencecenter



CONNECT WITH US!



Visit the California Science Center virtually or in person to explore this standard and extend the activity with related content.

- **Watch a free video:** Join our educators to observe how our resident Venus Fly Trap, snake and Military Macaw process visual information. Plus, explore an eyeball by completing your own Science Sketch.
- **Reserve a live interactive experience:** Invite scientists from the California Science Center to visit your classroom virtually as we explore how our sensory system works through a cow eye dissection and an encounter with Tess, our 50-foot body simulator.
- **Visit us in-person:** Check out our World of Life Gallery for more examples of how body structures help organisms to survive.

Website: www.californiasciencecenter.org

Phone: 213-744-7444

EXTENSIONS

Assign students the blank template and instructions on Pages 7 and 8 to make their own Decision Map based on an environment and animal of their choice.

DECISION MAP INSTRUCTIONS

You are lost in the wilderness looking for your friends that are the same species as you. Use the clues to make decisions and reunite with your group!

1. Decide whether you are going to play as a person or a wolf. →



2. Read the first set of clues that your senses observed.

3. Decide which way to go, based on your character.



4. Follow the arrow to the next set of clues.

5. Keep playing until you find your friends!



6. Repeat steps 2-5 as the opposite species as before.

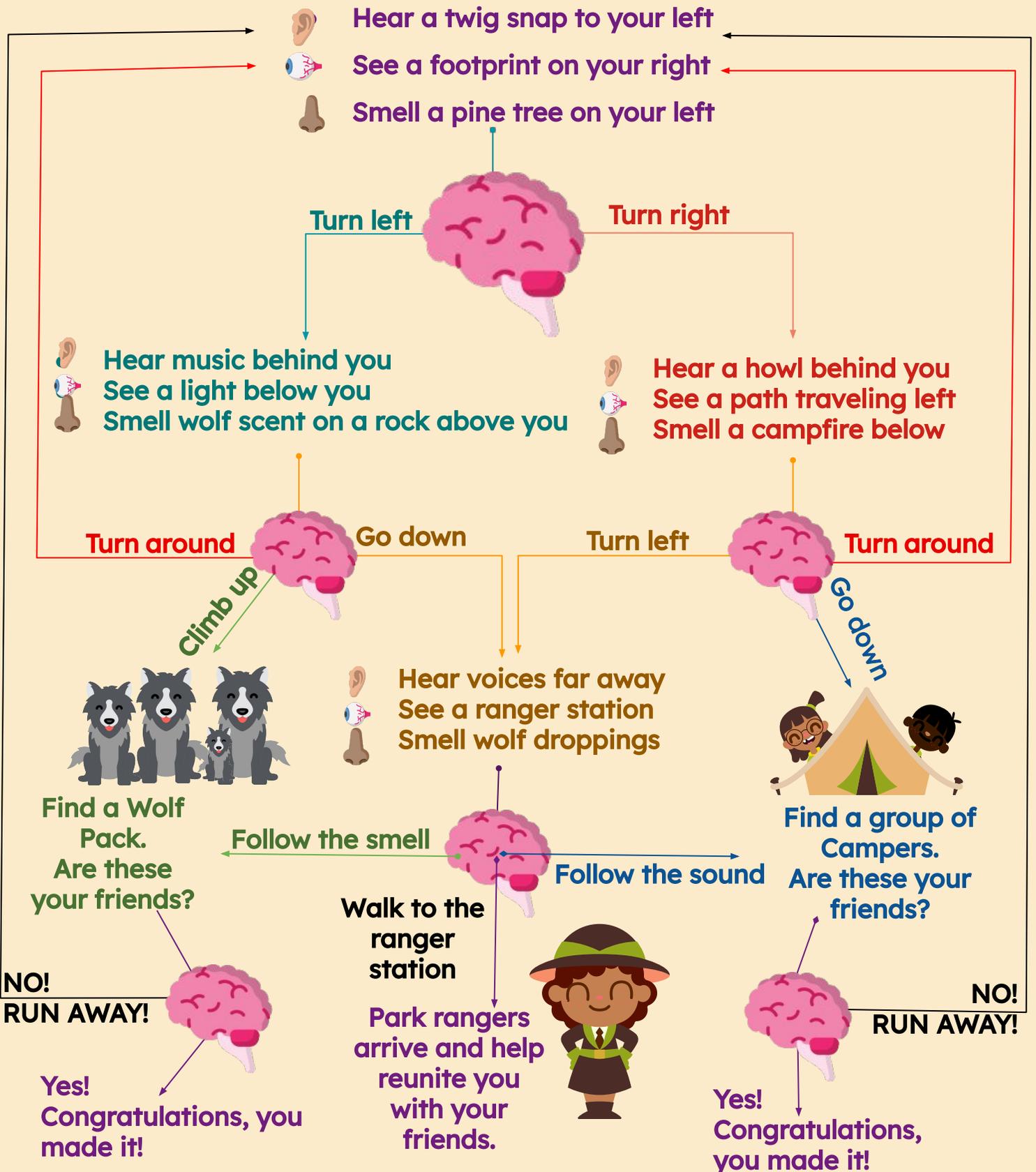
7

After playing as both the person and the wolf, repeat the game:

- Pretending it's too dark to see.
- Pretending you can't smell anything.

*You may end up at the beginning again, and need to start over!

DECISION MAP



EXTENSION: create your own decision map



- 1. Decide if your map is for a person or animal:** What types of sensory information would they receive? What structures do they use to receive it? *Draw or write about your organism below.*
- 2. Invent a situation:** Where is your organism and what is its goal? *Write your situation below:*
- 3. Develop clues for each of the scenes:** Come up with 3 clues that your organism might find in each scene. Make sure that each clue has information that will either lead your organism toward their goal or away from it. *Write 3 clues in each scene on the template.*
- 4. Write action choices at each of the decision points:** The actions can be movements like “turn left” or things the organism can do like “pick up the item”. Every action should lead the organism to a new scene. *Write these under each “Action” space on the template*
- 5. Invent 3 possible outcomes:** Outcome 1 should be the organism’s goal, it will lead to success! Outcome 2 will lead to a fail and Outcome 3 can be anything you want. *Write these in the “Outcome” boxes on the template.*

My Decision Map

