Asking Questions About Animal Behavior

University of California, Davis
Animal Behavior Graduate Group
The Ethogram

UCDAVIS GEAR UP
A Program of the School of Education

CENTER FOR COMMUNITY AND CITIZEN SCIENCE

Teacher Notes

Grade level(s): 5–8

Time: ~45 min

Materials:

- Interactive google slides with links to animal videos and optional Jamboard slides
- Students need notebook/computer to record observations/questions

Preparation:

- Choose which animal behavior clips to show (tailor to student audience/location)
- If using Jamboards, make copies for your class and replace links in the slides

Teacher Notes

CONTEXT:

This lesson is designed to engage students in asking questions about animals and their behavior. The lesson also teaches students about four categories of questions that animal behavior scientists ask when they are conducting research.

The videos embedded in these slides can be substituted with other videos, especially clips featuring animals that students have experience with and/or animals that are native to your local area.

Teacher Notes

RATIONALE:

Making observations and asking questions are vital parts of the scientific process. Being able to form their own questions about animal behavior should foster curiosity and increase student engagement. In addition, learning how to categorize questions according to the four types will help students think critically about the questions they ask and set them up for the type of data they would need to answer their questions. This lesson focuses on the NGSS science practice of *Asking questions*. Formulating a good scientific question is the basis for *Planning and carrying out investigations* and *Constructing explanations*, which students will practice in later lessons.

Teacher Notes

INSTRUCTIONS:

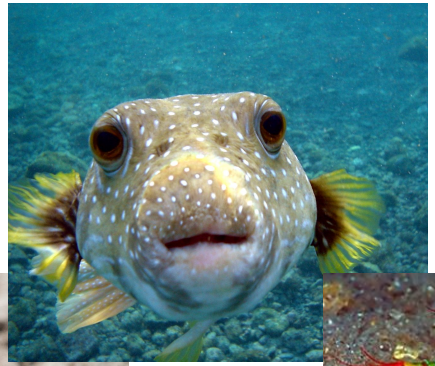
See the lesson plan for an outline of the lesson and detailed instructions.

Grey slides throughout the presentation provide additional notes to the teacher on each section.

If you use the Jamboard slides (optional), make copies for your class and replace the links in the slides.

What is animal behavior?

- Something an animal does that is *controlled from inside the animal's body* and can be *sensed from the outside*
  - Examples: swimming, running, eating, playing, singing, calling, caring for young, building a home, self-cleaning, finding food or catching prey . . . and many other examples


Why study animal behavior?

- Because it’s cool!
- Humans rely on animals to survive (for food, transportation, service animals, etc.)
- Understanding animal behavior is necessary for conservation (protecting threatened species)
- We are animals too! Studying behavior of other species helps us learn about ourselves

Learning Outcomes

1. Make observations about animal behavior
2. Distinguish between the 4 categories of animal behavior questions: *cause, development, function,* and *history*
3. Write a scientific question about an animal behavior for each of the 4 categories

Photo by Ben Lunsford [source]

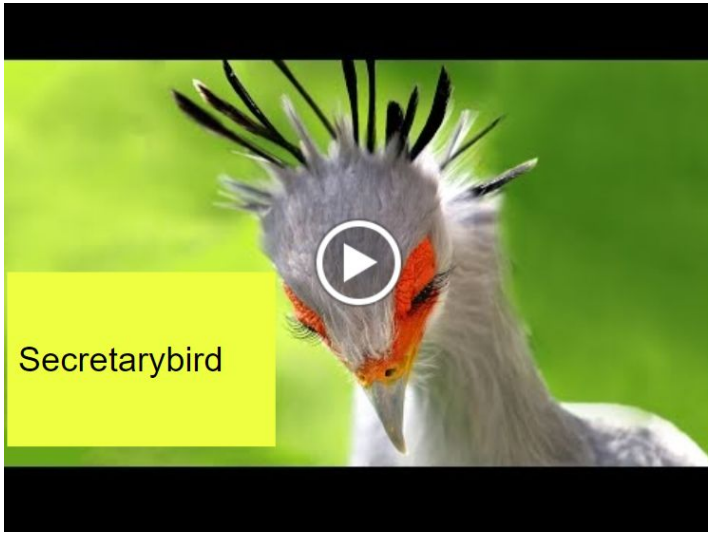
Today **you** are animal behavior scientists.

Imagine you are on a safari in South Africa and suddenly you see this giant bird with funny feathers sticking straight up from its head . . .

You watch it in fascination for a few moments and pull out your **notebook** to jot down some notes.

Activity:

Watch the video of the secretarybird and write down observations about its behavior (What is the bird doing?)



Observation:

A description of something you see or measure with a tool


KILLER
QUEEN

What did YOU observe?

Observation:

A description of something you see or measure with a tool

Jamboard Activity!

https://jamboard.google.com/d/1s3MrJMsKKoeHOOl74uXOEzjfojW4pEe97w7NLWArrbI/edit?usp=sharing

>>Make your own copy of the Jamboard above<<
>>and insert here for students to fill out<<

Next Step: Asking Questions

- Now that you observed some behaviors, the next step is to **come up with some questions based on your observations**.

- We are going to practice asking questions using a different behavior of a species that you should all be familiar with . . .

The animal is a **human** and the behavior is **eating a sandwich**!

Teacher Notes

Cause: **What caused the behavior?**

- **Ask students:** *What caused you to eat a sandwich?* What happened that made you go and make yourself a sandwich and eat it?
- **Possible answers:** I was hungry; it sounded good (had an appetite for it); I like sandwiches; it was lunch time; it was there
- **Explain:** hunger is most often the cause for the behavior of eating. We feel hungry, and that's our cue to eat something

Teacher Notes

Development: **How did the behavior develop?**

- **Ask students:** *How did you develop the ability to eat a sandwich?* Have you always known how to eat sandwiches since you were a baby? Or did you learn over time? If so, how did you learn? (optional: you can also talk about making a sandwich as part of this behavior)
- **Possible answers:** I started by eating soft baby foods, and eventually I learned how to eat harder foods like sandwiches; I just knew how to chew and swallow (instinct/innate behavior); my parent taught me how to make and eat a sandwich
- **Explain:** There are two main ways that animals **develop** behaviors: **learned** vs. **innate** behaviors (define each and give examples).

Teacher Notes

Function: **What is the function of the behavior?**

- **Ask students:** *What is the function of eating sandwiches?* What is the purpose for your body of eating sandwiches; what is this behavior for? (If students need additional prompting, ask “What would happen to your body if you did not eat anything?”)
- **Possible answers:** to provide the body with energy/calories; to stop me from feeling hungry; to provide nutrients so the body can run/walk/grow/think; to obtain carbs/protein/fat; I eat sandwiches so that I don’t starve
- **Explain:** The **function** of a behavior is how it helps the animal survive and reproduce, so the function of eating is to provide your body energy (so that you can breathe, pump blood, walk, think, etc.). Animals do various behaviors because those behaviors help them get food, avoid predators, survive, or reproduce.

Teacher Notes

History: **Do other species have the same or similar behaviors? / Which species evolved the same or similar behaviors?**

- **Ask students:** *Do you know of other species that eat sandwiches? What do other organisms do that is similar to eating sandwiches?* (If students have already learned about photosynthesis, can ask: “What do plants do instead of eating food?”)
- **Possible answers:** yes, my dog/cat will steal people-food or sandwiches and eat them; other animals eat grains, meat or plants, but not sandwiches; other animals might mix foods together to make them taste better; all animals eat, but different types of food; plants don’t eat but they get energy from the sun instead
- **Explain:** The behavior of eating is shared with other species of animals, but eating sandwiches is probably unique to humans. Other animals eat food to get energy, like humans, but plants make their own sugar using energy from the sun. Humans are more similar to other animals than they are to plants.
- *Alternative phrasing for classes that have covered evolution already:* Are there other species that evolved the behavior of sandwich eating or similar behaviors? Animals that are closely related to humans, like primates, also eat food using their hands and eat a mixture of plant foods and meat

Teacher Notes

Question Type:			**Possible answers:**
Cause	*What caused the behavior?*	What caused you to eat a sandwich?	I felt hungry
Development	*How did the animal develop the behavior?*	Did you learn how to make or eat sandwiches from someone?	I learned how to make a sandwich from my family; I practiced chewing and eating solid food when I was a baby
Function	*What is the function of the behavior?*	What is the purpose of eating a sandwich?	To provide energy for my body
History	*Which other species evolved the same or similar behaviors?*	Do other animals eat sandwiches?	No, but other primates eat similar foods like grains, vegetables, and meat/dairy

4 Types of Questions About Animal Behavior

Question Type:
Cause
Development
Function
History

Cause

- Questions about **cause** ask:

  What caused the animal to do the behavior?

  What made the animal start doing the behavior?

- The cause might be a particular **cue**, like hearing a noise or seeing something; or animals might do the behavior in response to a change inside their body (e.g., hormones).
- Example
  - **Behavior:** the secretarybird stomps on the ground
  - **Question about cause:**

Development

- Questions about **development** ask:

  How did the animal develop the behavior?

- Two ways that animals can develop behaviors are:
  1. Through **learning** - by observing other animals do the behavior and practicing themselves
  2. **Innate** behaviors - behaviors that an animal is born knowing how to do
- Example
  - **Behavior:** the secretarybird stomps on the ground
  - **Question about development:**

Function

- Questions about **function** ask:

  What is the function or purpose of the behavior to the animal?

  What benefit(s) does the animal receive by performing the behavior?

- The **function** of a behavior is how it helps the animal survive and reproduce.
- Example
  - **Behavior:** the secretarybird stomps on the ground
  - **Question about function:**

History

- Questions about **history** ask:

  What is the evolutionary history of this behavior?

  Which other species evolved the same or similar behaviors?

- **Evolution** - change in the characteristics (including behaviors) of organisms over generations due to genetic changes (DNA)
- Example
  - **Behavior:** the secretarybird stomps on the ground
  - **Question about history:**

Now let’s try a different animal example!

First, watch the video and jot down some observations about the lizard’s behavior

Draco lizard (*Draco* sp.)

Lizard Behavior

As you watch the video again, **write down questions** you have about the lizard's behaviors

For example, you might have questions about *where and how the lizard moves, how it moves its body*, etc.

It's <u>okay if you ask questions that you don't know the answers to!</u> Science is about figuring out the answers to questions.

Draco lizard (*Draco* sp.)

Lizard Behavior

1. **Small groups:** each person share some questions they wrote about the lizard's behavior

2. **Share with the class:** pick your favorite 3 questions and write them in the correct box on the board

Jamboard Activity!

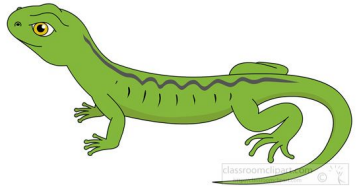
https://jamboard.google.com/d/108Rh25XjUnWIC_zr6n4IEvapz1TQpciPj51sdLDtf24/edit?usp=sharing

>>Teachers: make your own copy of the Jamboard above<<
>>and insert above for students to fill out<<

In your group, decide where your questions fit and place them in the correct box indicating which type of question

Cause	**Function**
Development	**History**

4 Types of Questions About Animal Behavior

Question Type:			
Cause	*What caused the behavior?*	What caused you to eat a sandwich?	
Development	*How did the animal develop the behavior?*	Did you learn how to make or eat sandwiches from someone?	
Function	*What is the function of the behavior?*	What is the purpose of eating a sandwich?	
History	*Which other species evolved the same or similar behaviors?*	Do other animals eat sandwiches?	

Wrap-Up

- Making observations is the first step in science. Observations lead to questions about what was observed. You can make observations any place and any time!

- Today you learned how to write four different types of questions that scientists ask about animal behavior:
  - Cause
  - Development
  - Function
  - History

In case you are curious . . . Here are some possible answers to the questions about the secretarybird

Cause

- **Animal EX:** What caused the secretarybird to begin stomping on the ground?
- **Possible answer:** Seeing a snake caused the bird to begin stomping.
- **Alternate answer:** Smelling a snake caused the bird to begin stomping.

Development

- **Animal EX:** How did the secretarybird develop the behavior of stomping?
- **Possible answer:** Young birds learn to stomp by watching their mothers stomp on the ground.
- **Alternate answer:** Stomping on the ground is an innate behavior, and young secretary birds do this without ever seeing another bird stomp.

Function

- **Animal EX:** Why do secretarybirds stomp on the ground?
- **Possible answer:** Stomping on the ground on top of snakes or lizards provides a source of food for the birds.
- **Alternate answer:** Stomping on the ground on top of snakes or lizards protects the birds from being bitten.

History

- **Animal EX:** Do other species of birds stomp on the ground, or is this behavior unique to secretarybirds?
- **Possible answer:** The behavior of stomping on the ground evolved only in secretarybirds.
- **Alternate answer:** The behavior of stomping on the ground is shared with other species of birds.

Another way to define the 4 types of animal behavior questions: