Wonder–Ventures in STEM

# Mystery Animal

***The Nuts and Bolts***

**Students will learn about animal identification and classification as they figure out the identity of a garden visitor.**

## The Quick Start

Share the video with students and stop at the PAUSE BREAKS for class discussions or assessments. Don't be afraid to stop often and review sections of the video.

Discussion points (PAUSE BREAKS):

**Animal identification and Special Features: ( 1:46 video timestamp)**

Rapid-fire animal photos for identification and discussion about special features. You can do as whole class, stopping after each photograph or allow students to watch in small groups or individually and write down what they observe.

In-class model: Give two minutes of Alone Zone thinking, encourage students to write down/draw what they are thinking. Then share ideas in small groups. Finally, share ideas with whole class. Teacher accepts all ideas, does not give comment on them. If students add clarification or ask questions, allow students to defend their thinking.

Virtual model: Give two minutes of Alone Zone thinking, encourage students to write down/draw what they are thinking on paper or on a shared document (i.e. google doc, Jamboard). Then share with the whole class. Teacher encourages questioning and clarification.

**How do we know something is alive? (2:35 video timestamp)**

## *Formative Assessment*

Use the information shared by students as a formative assessment. What do the students know about makes something living at this point in time?

Use a rubric or content scoring form for individual students and to identify persisting misconceptions.

| Student name: | | Date: | |
|---|---|---|---|
| **On target (grade-level)** | **Missing some information** | **Missing most information** | **Misconceptions** |
| Student's understandings are appropriate for grade-level. | Student has some but not all of the key concepts. | Student does not yet have understandings. | Note any misconceptions uncovered. |

In-class model: Give two minutes of Alone Zone thinking, encourage students to write down/draw what they are thinking. Then share ideas in small groups. Finally, share ideas with whole class. Teacher accepts all ideas, does not give comment on them. If students add clarification or ask questions, allow students to defend their thinking.

Virtual model: Give two minutes of Alone Zone thinking, encourage students to write down/draw what they are thinking on paper or on a shared document (i.e. google doc, Jamboard). Then share with the whole class. Teacher encourages questioning and clarification.

## *Student Voice and Choice*

**Allow students to decide how they will gather information as they observe the mystery animal. (5:02 video timestamp)**

Students may want draw the animal or list features they notice.
Some may focus on behaviors such as flying, drinking nectar.

Repeat for the additional videos. Stop and start or allow students as much time needed to collect notes and draw pictures.

In-class model: Have students share their observations and methods of recording information. Allow students to add to their notes/drawings based on these sharings.

Virtual model: Same as in-class, allow students to hold up drawings or notes. Or have students add to a Jamboard or other shared collection site.

## *C-E-R*

**Students will make a Claim based on the Evidence from the videos and their life experiences. ( 5:58 video timestamp)**

At this point, students are not expected to know what the animal is yet they should be sharing their observations and comparisons to make a claim.

Students will complete the sentence starter:
I think the animal is _____. Choosing either a bird, bee, or, butterfly/moth.

Next, they will support their claim with evidence. Why do they think the animal is most like a bird/bee/butterfly? What features or structures are they using for comparison?

## *Scientific Argumentation*

**Scientific argumentation is based on the sharing and comparing of data/evidence and observations. (7:29 video timestamp )**

This is important skill needs repeated practice as students learn to support their ideas and thinking.

In-class model: Review students claims and create groups with differing ideas (for example: one student thinks a bird, another a butterfly, and a third a bee; or two students chose bird and two chose buttefly). Set up a talking/listening protocol so that all students can share their thoughts first and then students can ask for clarification or defend their thinking.

Virtual model: Similar to in-class model, students could be assigned to breakout rooms for argumentation after talking/listening protocol is firmly developed.

** The focus for whole class discussion should be to uncover how students have decided to agree or disagree with their choices. Did anyone change their mind? WHY? What made you change your mind? Focusing on evidence here!

## *Resources and Materials*

Upon the conclusion of this introductory lesson in classification, show the HUMMINGBIRD MOTH VIDEO. It is filled with great footage, and lots of information about mimicry and animal survival strategies. The content is appropriate for grades 3-5.

**Background for teachers**
Paul Anderson
Structure and Function
https://www.youtube.com/watch?v=jHCwYpt5CDw
Engaging in Argumentation (C-E-R)
https://www.youtube.com/watch?v=L96LiRDWgmI

**Books for Read Aloud**

- What Do you do With a Tail Like This? By Steve Jenkins
  Video read-aloud (length 8:38)
  https://www.youtube.com/watch?v=kRVA9NlHyss
- What if you had animal eyes? bySandra Markle
  Video read-aloud (length 13:16)
  https://www.youtube.com/watch?v=AuiVqN2tDdM
- My Camel Wants to be a Unicorn by Julia Inserro
  Video read-aloud (length 3:03)
  https://www.youtube.com/watch?v=4scNcK6gsU4
- Stuck by Oliver Jeffers (this is good for out of the box connections to structures and functions! Read by author.)
  Video read-aloud (length 2:27)
  https://www.youtube.com/watch?v=hipx6HJs4XQ
- Stella Luna by Janell Cannon
  Video read-aloud (length 11:08)
  https://www.youtube.com/watch?v=VLRIvyWUzxs
- Animal Adaptations by NSTA KIDS

**Video Resources**

SciShow Kids:
Moth vs Butterfly
https://www.youtube.com/watch?v=iblveeTDkXQ
Mimicry
https://www.youtube.com/watch?v=cV0kkFMK2CI
Animal Groups
https://www.youtube.com/watch?v=gwH8xGmqGmo

## *NGSS Connections*

There are multiple entry points for connecting with NGSS. Connections are listed for DCI, SEP, and CCC.

| NGSS | Classroom Connections |
|---|---|
| **Disciplinary Core Ideas** | |
| **1-LS3 Heredity: Inheritance and Variation of Traits**<br>Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents. | Students will be examining similarities and differences in animal groups to determine identity of the mystery animal. Understanding that even though animal groups may have differences, it's the similarities of traits that help scientists classify. |
| **3-LS3 Heredity: Inheritance and Variation of Traits**<br>Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms. | Students examine similar behaving animals to be able to determine the identity the mystery animal based on structures and features. |
| **4-LS1-1 From Molecules to Organisms: Structures and Processes**<br>Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction. | Students will observe external structures to determine where the mystery animal fits: bird, bee, butterfly/moth.<br>Students will support their identification claims using evidence as they engage in scientific argumentation. |

| Science and Engineering Practices | |
|---|---|
| Analyzing and Interpreting Data | K-2<br>Record information (observations, thoughts, and ideas).<br>Use and share pictures, drawings, and/or writings of observations.<br>Use observations (firsthand or from media) to describe patterns and/or relationships in the natural and designed world(s) in order to answer scientific questions and solve problems.<br>3-5<br>Compare and contrast data collected by different groups in order to discuss similarities and differences in their findings. |
| Engaging in Argument from Evidence | K-2<br>Identify arguments that are supported by evidence.<br>Listen actively to arguments to indicate agreement or disagreement based on evidence, and/or to retell the main points of the argument.<br>Construct an argument with evidence to support a claim.<br>3-5<br>Compare and refine arguments based on an evaluation of the evidence presented.<br>Construct and/or support an argument with evidence, data, and/or a model. |
| **Crosscutting Concepts** | |
| Patterns | K-2<br>Patterns in the natural and human designed world can be observed, used to describe phenomena, and used as evidence.<br>3-5<br>Similarities and differences in patterns can be used to sort, classify, communicate and analyze simple rates of change for natural phenomena and designed products. |
| Structure and Function | K-2<br>The shape and stability of structures of natural and designed objects are related to their function(s).<br>3-5<br>Same as K-2 |

## *Final Thoughts For Planning*

Give time and space for students to share what they already know about animals, animal groupings, and classification. Allow for students to share their ideas and experiences (prior knowledge). Create shared experiences through read alouds, shared digital resources, as well as student-generated investigations, observations, and research.

Use the time, to develop students' scientific thinking by focusing on the Crosscutting Concepts of "Patterns" and "Structure and Function."

Be explicit about directing student attention to how claims are supported with evidence. Have students engage in scientific arguments by listening to each other, as they share their observations and evidence.

**EXTENSION IDEA**: Have students bring in or share virtually "unknown" items. It could be a cooking tools, an electronic item, or other job-specific item. Students can try to figure out what these mystery items are using some of the same steps.