

<p><b>Grade:</b> 7</p>	<p><b>Lesson: Asking Questions</b> Snails from FOSS Diversity of Life Investigation 8, Part 1</p>	
<p><b>Standards:</b> <b>Middle School – Physical Science:</b></p> <ul style="list-style-type: none"> <li>◆ 6.MS-LS1-3. Construct an argument supported by evidence that the body systems interact to carry out essential functions of life.</li> <li>◆ 7.MS-LS1-4. Construct an explanation based on evidence for how characteristic animal behaviors and specialized plant structures increase the probability of successful reproduction of animals and plants.</li> <li>◆ 7.MS-LS2-5. Evaluate competing design solutions for protecting an ecosystem. Discuss benefits and limitations of each design</li> </ul>	<p><b>SWBAT:</b></p> <ul style="list-style-type: none"> <li>● Ask questions and make observations about land snails to familiarize themselves with some internal and external structures of snails and how they move.</li> <li>● Identify what they know about snails and create questions that they would like know more about snails to research.</li> <li>● Record and express questions in developmentally appropriate ways.</li> <li>● Use observations to generate, answer and illustrate inquiry questions in their notebooks.</li> </ul>	
<p><b>Inquiry Questions:</b></p> <ul style="list-style-type: none"> <li>● How can we demonstrate that air has mass using these materials?</li> <li>● How does your investigation demonstrate that air has mass?</li> </ul>	<p><b>Materials:</b></p> <ul style="list-style-type: none"> <li>● Land snails</li> <li>● ½ liter container with lid</li> <li>● hand lenses</li> <li>● flashlights</li> <li>● FOSS Diversity of Life lab notebook <i>Snails</i> p.49</li> <li>● paper towels</li> <li>● chalk (for snail)</li> <li>● plastic cup</li> <li>● vegetable scraps</li> <li>● spray mister with water</li> <li>● basin with lid</li> <li>● poster paper and pens</li> </ul>	
<p><b>Lesson/Intro:</b></p> <ul style="list-style-type: none"> <li>● Tell students they will begin a study of animals during this investigation. Ask them to name some animals that they have experience with. Ask, “Are insects, clams and spiders animals?” Wait time!</li> <li>● Explain every organism is a member of one of three domains. Archaea (ancient microbes), and the eubacteria are microscopic prokaryotic organisms, invisible to the eye and without specialized organelles in their unicellular bodies. The third domain, Eukarya, includes all the protists, fungi, green plants and animals. We have observed many unicellular and multicellular plants and animals so far this unit. Now we are going to study the animal kingdom. The animal kingdom includes many different kinds of creatures. “Insects, worms, clams, snails, birds, squids, crabs, snakes, frogs, and spiders! Human beings are animals, too.”</li> <li>● Tell students that their study of animals will start with land snails. Review the rules of conduct for safe and humane investigations with living organisms.</li> <li>● As students to think about what they know about snails. Talk in their groups for a few minutes.</li> </ul>		

Ask students to turn to the page in their lab notebook (p. 49) *Snails*, and record a number of statements in the column “What I know about snails”

- After a few moments, ask students to think about what they might like to find out about snails. Write a few questions in the “What I’d like to find out about snails” column. Provide starter questions, if needed (note: sentence frames and word banks are also helpful prompts):
  - *What do snails eat?*
  - *Where do snails live?*
  - *How do they move?*
  - *How do they get shells?*

[Students each write using their own graphic organizer (some students may use iPad/camera/etc.). Drawings should include labels. Make word bank/stickers/sentence frames etc. available.]

- After 5 minutes of writing, review as a group what students know and what they would like to find out. Each group should contribute one idea for each column. Write the ideas down and keep the list for future reference (alternatively, these can be written on stickie notes and put on poster sheets or a wall in the room with the titles)
- After students have been shown how to pick up the snails by sliding along the surface of the plastic container until it releases from the surface, teachers can distribute snails in cups and students can begin to examine the snail.

**Work Time:**

- Students observe snails in their container first and then carefully remove them and continue observing. Distribute hand lenses and continue observing, looking closely at all parts of the snail.
- Distribute flashlights. After a few minutes ask, “Did the snail respond in any way to the light? Were you able to see any structures using the light that you couldn’t see without it? Can you see inside the shell with the light?” Dim the lights in the room so that students can shine the light through the shell and look for internal structures. Help students locate the pulsing beat of the snail’s heart.
- Students add new information to the snails sheet and discuss findings, including structures observed, how it moves and what was seen when the flashlight was used. [develop vocabulary to describe the snail’s structures and behavior, including foot, tentacles, shell, heart, slime trail]

**Interventions:**

- Even though snails have protective shells, some shells may be very thin. Handle them gently and don’t drop them. Keep track of your snails, make sure they don’t creep off the edge of your table!
- For students who need assistance with paper and pencil recording, make an iPad or video camera available
- Guidance on how to stop and record data
- Model recording data for students
- Word bank for materials/ address labels or stickers

**Extensions:**

- Students can be challenged to make a detailed drawing of their snail with labels.
- Students can be challenged to compare and contrast their snail with their partner’s snail.
- Students record the investigation and observations in their science notebooks (including illustrations and photographs)
- Students can research snails on line.

<p><b>Discussion/Closing:</b></p> <ul style="list-style-type: none"> <li>● Have students review their questions in the “What I’d like to find out about snails” column on the Snails sheet. Record observations shared out with a video camera or tablet. Ask:             <ul style="list-style-type: none"> <li>○ <i>What questions were you able to answer?</i></li> <li>○ <i>Do you still have unanswered questions?</i></li> <li>○ <i>What new questions do you have?</i></li> <li>○ <i>How could you find the answers to some of these questions?</i></li> </ul> </li> </ul> <p>Tell students that they will be able to investigate how snails interact with objects and with each other tomorrow.</p>	
<p><b>Assessment:</b></p> <ul style="list-style-type: none"> <li>○ Did students record what they knew before the investigation began? Are students recording what they know after they investigated the snails?</li> <li>○ Did students generate questions before they investigated the snails? Did they generate relevant (possibly higher order) questions after they began their observations?</li> <li>○ Did students discover some answers to some of the questions they had initially?</li> <li>○ Are students being methodical about recording and labeling their work?</li> <li>○ Are students able to make careful observations?</li> <li>○ Can students locate the snail’s heart?</li> <li>○ Can students describe how they found answers to some of their questions?</li> <li>○ Did students use tools appropriately and use appropriate care with their animal?</li> </ul>	
<p><b>Vocabulary:</b></p> <ul style="list-style-type: none"> <li>● foot</li> <li>● tentacle</li> <li>● shell</li> <li>● heart</li> <li>● internal structures</li> <li>● domain</li> <li>● kingdom</li> <li>● unicellular/multicellular</li> <li>● slime trail</li> </ul>	<p><b>Technology (optional but provides UDL and ELL support in every classroom):</b></p> <p>iPad stickies address labels (for vocabulary) camera or video camera</p>
<p><b>Homework:</b></p> <p>In your science journal, answer this question: If we wanted to provide a good habitat for our snail, what would it look like?</p>	<p><b>Notes:</b></p>