

**Tortoise Observation
(Level 4 Inquiry – Open)**

Grade Level

Grade 4

Science Concept

This lesson is designed to reinforce the concept that research begins by asking meaningful questions based on observations.

Relationship to California Science Content Standards

6. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:

- a. Differentiate observation from inference (interpretation) and know scientists' explanations come partly from what they observe and partly from how they interpret their observations.

Objective

Students will present a question based on observing a live tortoise, research the question, and report the findings to the class in small groups.

Evaluation Ideas

- (a) Formative: Observe students at all stages of the lesson. Look at students' Inquiry Worksheet. Listen to groups as they structure their questions and scaffold or guide as needed.
- (b) Summative: The rubric that has been included can be used to assess the quality of the question generated, research done, and presentation of findings.

Conceptual Background

Students know that science is based on questioning the world around them. Using a live tortoise as the focus, students will develop their own questions and research their answers.

Materials

1. Paper and pencil for note taking
2. Access to Internet or a variety of books relating to tortoises

Engage

Do tortoise crossword with the class. This will help review necessary terms and concepts. Bring in a live Russian Tortoise. This can either be done as a surprise or by building up anticipation by telling the class that it will get to view a live animal later in the week. Provide students with a pencil and a copy of the Inquiry Worksheet and tell them to write down any questions or observations about the tortoise. The front of the sheet has three prompts, but students should be encouraged to form any question they can think of and write it on the back.

Explore:

Have students form groups of three or four. Each group will select one question about the tortoise that they must research. Internet and/or library time should be given so that students may research their questions. If a group's question is one that the provided references cannot answer, students should be encouraged to devise a theoretical experiment that could find the answer, and/or suggest where else to look.

Explain:

Have the groups present their questions and their findings to the class.

Elaborate:

During the group presentation the teacher should focus more on asking about any difficulties the students ran into while researching and what other questions came up while trying to answer the first one, rather than on emphasizing if the group found the correct answer. Encourage students to formulate a new question based off of the first and research it as optional homework to be discussed in class at a later date.

Evaluate:

Use the included Inquiry Worksheets for formative assessment of individual students. The following rubric may be used for summative assessments. The rubric should be shared with the groups before they begin researching.

	1	2	3
Question	Question asked is very basic and can be answered with a one or two word response.	Question asked is moderated complex and would involve careful research to answer.	Question asked shows sophisticated thinking and relevance to topics previously covered in class.
Research	Only one source is looked at. If using the internet the credibility of the source is not questioned.	Multiple sources are consulted to see if they agree. Internet sources are assessed for credibility.	Multiple sources are consulted. Internet sources are assessed for credibility. A student generated theoretical experiment is created to answer the question.
Presentation	Oral presentation is inaccurate or confusing.	Oral presentation is clear but lacking detail. Groups members do not respond to teacher's follow up questions.	Oral presentation is clear and detailed. Group members respond adequately to teacher's follow up questions.

Differentiation Plans

Behavioral for Student A – Have the student be involved heavily during the safety talk. Have the student be the person to write the safety issues on the board while the class is discussing them or empower that student to be the one to make sure all other students are staying the right distance away from the tortoise.

Cognitive for Student B – Give more question prompts to the student that is having trouble making observations in order to help develop questions. Scaffold the questioning process. “Why do you think he has a shell?” “How do you think that works?”

Cognitive for Student C – A student with a learning disability related to reading should be encouraged to use online resources to do research. Some potential online resources include the San Diego Zoo’s web page and National Geographic for Kids.

<http://www.sandiegozoo.org/animalbytes/t-turtle.html>

<http://kids.nationalgeographic.com/kids/>

Affective for Student D – Do not allow students to pick their own groups. Make sure the groups are heterogeneous to allow for differentiating ideas and opinions. Great care should be taken in placing student so that he will be empowered, listened too, and supported.

Language Demands for Student E – Having students research and present as groups as opposed to individuals was done, in part, to facilitate learning for EL students. If at all possible, EL students should be grouped with a corresponding bilingual student. Where this is not possible it group the EL students with at least one student who he/she is friends with, or is generally outgoing in nature.

Language Demands for Student F – Cloze Sentences should be written on the board to help students come up with their questions. Go over the rubric in detail. Make sure all process vocabulary is understood.

Language Demands for Student G – Allow student the option of including a poster, diagram, or other visual representation when giving the oral presentation.

Suggested Reading:

How the Turtle Got Its Shell, by Justine and Ron Fontes. This book tells three folk tales from around the world answering the very important question of how the turtle got its shell. After researching their own inquiries students will enjoy this literary connection.

Directions or Special Instructions; Safety Concerns, etc.

- The students should be able to view the tortoise sufficiently but may not handle it or get too close. An extensive review of what is and is not allowed during the Engage stage should be covered.