

## **1: Horsefields Tortoise (Russian Tortoise) –Inquiry level: Confirmation**

### **Science Concept:**

Sixth grade students have been exposed to the concept of habitat and ecosystems but may have little knowledge about the biomes of planet Earth. In this beginning lesson Ss will explore the six main biomes of the world mainly through direct teaching and confirmation of knowledge they learn. If Ss already have a firm grasp on these concepts it may be beneficial in the interest of time, to choose the next lesson which may be more suited for a guided learning inquiry and less direct teaching.

### **Relationship to California Science Content Standards:**

Ecology

5.d: Students know different kinds of organisms may play similar ecological roles in similar biomes.

### **Lesson Objectives:**

Student will demonstrate their understanding of the relationships among: individual organisms, populations, communities, ecosystems, biomes and the biosphere by labeling a hierarchy worksheet.

Student will describe the basic characteristics and note the differences of the biomes: tundra, desert, grassland, rainforest, taiga and deciduous forest.

### **Conceptual Background:**

As a descendent of the dinosaur, remaining virtually unchanged for over 250 million years, the tortoise is fascinating to humans. The Horsefields Tortoise is one of many chelonians in the reptile species, and is commonly known as the Russian tortoise. This four clawed creature has the ability to hibernate or estivate for most of the year in its natural harsh environment. It may be necessary to clear up misconceptions about the differences between turtles and tortoises at some point in the lesson. This tortoise is the only *Testudo* with four claws on each foot, resulting in one of its common names, the four-toed tortoise (Cohen, 2012). Another interesting fact about this tortoise is that its blood contains a what scientist refer to as an “anti-freeze”, which helps the tortoise endure harsh winters. (Cohen, 2012).

*Biomes* -the world's major communities, classified according to the predominant vegetation and characterized by adaptations of organisms to that particular environment (Campbell, 1996)

More on Biomes:

[http://cde.nwc.edu/SCI2108/course\\_documents/earth\\_moon/earth/earth\\_science/biosphere/biomes.htm](http://cde.nwc.edu/SCI2108/course_documents/earth_moon/earth/earth_science/biosphere/biomes.htm)

## Lesson Plan

### Engage:

1. Begin this lesson with a visualization exercise. When all students are seated, instruct them to close their eyes and imagine a tortoise or turtle.
2. First have them think about their reptile alone as an individual. What does it look like? How does it move?
3. Then imagine this animal interacting with others of its kind. Does your tortoise live alone or in a group? How does it take care of its young? How does it interact with other adults of its species?
4. Next think of other types of living things your tortoise might interact with. What does it eat? What eats it? Does it depend on grasses or trees for shelter or making a nest? Does it compete with other types of animals for food?
5. Next think of the non-living things that your animal interacts with. Where does it live? Where does it find water? What type of soil does it live on? What is the weather like where it lives?
6. Think about the tortoise or turtle in relationship to the whole Earth, imagine them from space. How does the turtle or tortoise affect the lives of the other organisms around it.
7. When Ss open their eyes have them think about how they “zoomed out” from the turtle or tortoise as one individual to how it affects everything around it, living and non-living. Explain that ecologists study organisms in the environments and they do similar things. Some ecologists study the ecosystem or the biome of organisms. Today you will be an ecologist and describe the various levels of “zoom” we just visualized.
8. Hand out the Ecosystem Organization Pyramid and explain that each tier should have a description based on the reptile we are about to meet.
9. Have students draw in pencil, the turtle, or tortoise they imagined, and label the portion of the pyramid “Individual”.

Return to the opening questions again and ask for volunteers to answer them. Write this on a KWL chart title Tortoise and Turtles, ask Ss what they know about them.

### Explore:

Arrange to have Mikhail the Russian Tortoise visit the class during the *explore* phase of the lesson. Take the class outside if possible, and have them all sit in a giant circle, which will allow all Ss to observe Mikhail at once. They should document their observations on a half sheet of paper handed out before going outside.

Guide Ss comments and questions toward the questions they visualized earlier. Next, have them pair, share about the ecosystem Mikhail the Russian tortoise might be originally from, making connections between what they observed and what they infer. Explain that this type of tortoise is exported from its native home in Uzbekistan and other parts of northern Asia in pet trade. Give them some time to think about what that might be like. Direct the comments toward the ecosystem and the biome of the tortoise.

Ask if there is any difference between turtles and tortoises. What are they? Does one swim and the other stay on land? How would that change your opinion on their ecosystem?

Ask other guiding questions about the ecosystem such as;

“What other organisms might live with or near this tortoise?”

“How does the climate in the biome affect the eating, mating and hibernation habits of the tortoise?”

**Explain:**

Provide direct instruction to students about the six biomes of the world using the website:

[http://www.tclauset.org/20\\_ESbk/ch16.pdf](http://www.tclauset.org/20_ESbk/ch16.pdf) or a textbook with similar information.

Begin by asking if they know each biome then ask what they know about the biome.

Chart their answers on a separate piece of chart paper. Through a guided discussion, elicit the information that corresponds to the text regarding the biomes. When all six biomes have been discussed and charted, ask Ss if they know which biomes they think that their visitor might live in and which ones they cannot. Accept all answers without judgment. Return to the KWL chart and ask what they would like to know about this tortoise, list their answers under “W”.

Students now know some basics about biomes and should be able to answer some questions about them. Explain that Mikhail is a tortoise from the reptile class and one of many different types of testudinidae or chelonians. Read the fact sheet for Mikhail and distribute other resources for Ss to find information. See resource guide.

Perform the 6 biome formal assessment to determine if Ss need more direct instruction.

Prepare a mini-lesson on the areas Ss are having the most difficulty with.

Mini-lesson for Ss who have misconceptions about biomes could be:

a) have Ss draw the features of a particular biome they are struggling with, and have a class discussion about how the features compare to another biome which they are familiar.

b) play “rally coach”- Pairs of students try to answer the posed question. One partner draws a portion of the biome or labels it and the other person verifies the work, or makes corrections until the entire biome is represented. Then there is a class share out.

**Elaborate:** After the discussion, have Ss return to the original questions that are posted on a document camera or overhead. Ss will answer the following questions about the tortoise in the wild. Ss should write the information in the science journals.

1. Does the tortoise live alone or in a group?
2. How does it take care of its young?
3. How does it interact with other adults of its species?
4. What does it eat? What eats it?
5. How does it find shelter? What is it?
6. What is the weather like where it lives?
7. Where does the tortoise find water?
8. What other animals or organisms inhabit the same ecosystem as the tortoise?

Hand out the short assessment and have Ss individually answer the questions. If it helps them to draw pictures, allow them to do so. Have Ss self correct the assessment, then have them return to the pyramid worksheet and label and describe all tiers of the Russian tortoises biome, ecosystem. Return to the KWL chart and ask Ss to reflect on what they learned then ask them to pair-share about the most interesting fact they learned and share out with the rest of the class.

### **Evaluate, Assessments:**

**Formative:** Put up 6 posters with all of the names of the biomes. They can be 8 ½” x 11” paper with the individual names posted up on the walls around the room. Describe a biome and ask the Ss to go to the area of the room that names that biome. Observe Ss participation and which Ss may be following others, indicating they are not sure.

### **Summative:**

Students will match the correct word to the example using the appropriate letter to fill in the blank for the pre-assessment.

Students will be able to draw and label a hierarchy worksheet focusing on turtles and tortoises as the individual organism. They will label correctly, and then draw the corresponding information based on what they learned about the tortoise Mikhail and his ecosystem and the larger biome.

### **Differentiated Plans:**

**Behavioral for Ss A-** To assist Ss A who may have difficulties focusing their attention on too many sensory inputs at once, restate directions and steps as well as project them on the document camera. Direct Ss A to find the information themselves, before asking the teacher. This may lead to increased ability to self-monitor.

**Cognitive for Ss B:** A Ss who does not grasp concepts quickly may need extra time to complete the assessment and worksheet. Allow them more time as needed.

**Cognitive for Ss C:** A Ss who grasps concepts quickly and is easily bored, may use the computer (if available in class) to research the Russian tortoise. Ss C will be encouraged to make a brochure for the tortoise and include threats to the animal.

**Affective for Ss D:** Ss D, who may not like to work in pairs or groups should be encouraged to be in a leadership position or role within the group. Allow Ss D to choose a position that will encourage them to communicate more with group members.

### **EL Adaptations:**

**Ss E: Beginning ELL:** Biome and ecosystem may be complex concepts for second language learners. In order to provide them equal access to the lesson, provide flash cards for students who are having difficulty with the concepts about biomes and the ecosystem of tortoises. During group activity time, include this as a station and encourage EL Ss to visit and use the cards. Try to make connections to the cognate of the vocabulary if possible.

**Ss F: Intermediate ELL:** Pair EL Ss with another Ss who speaks the same language and have them quiz each other during free work time, allow them to communicate about the flash cards using the language they feel most comfortable using.

**Ss G: Advanced ELL:** This Ss may have nearly mastered the verbal communication necessary to understand and be understood in groups. During group or pair's have this Ss document findings for the group. This way, Ss G will hear the words and practice writing them. Display their work on the word wall or have them fill out the cards for the accommodation below.

General Notes:

During direct instruction it is easy to go too fast and fail to explain new terms well. Write any new academic language on a 4x6 card and place on a word wall for the unit or a science wall. Include a brief description of the word and a picture if possible. Include Ss in making these cards and drawing pictures. Use repetition and connect to real life situations to help Ss make meaning and use new vocabulary in context.

Biome Website

[http://www.blueplanetbiomes.org/world\\_biomes.htm](http://www.blueplanetbiomes.org/world_biomes.htm)

Flashcard Machine creator:

<http://www.flashcardmachine.com/biomes-flashcards.html>

Biome Extension Activities:

Biome Expedition:

Ss are given a biome to investigate and research, then they are individually expected to pack their "suitcase" with the 5 essential items they will need to survive in that biome.

Found at : [http://www.tclauset.org/20\\_ESbk/ch16.pdf](http://www.tclauset.org/20_ESbk/ch16.pdf)

Resources

Campbell, N.A. 1996. *Biology*, 4th Edition. The Benjamin/Cummings Publishing Company, Inc., Menlo Park, California.

Cohen, M. A. *Russian tortoise, testudo horsfieldii*. Retrieved from <http://tortoise.org/archives/russ.html> July 23, 2012.

## Biome and Ecosystem Organization

Match the example to the correct word by writing the letter that corresponds to the example.

Mikhail the Tortoise\_\_\_\_\_

Turtles, other tortoises,

The entire planet Earth\_\_\_\_\_

The community, the water, the air the rocks, the soil and the sand \_\_\_\_\_

A desert\_\_\_\_\_

All the turtles and tortoises in the area\_\_\_\_\_

- a) ecosystem
- b)community
- c) biome
- d) individual
- e) population
- f) biosphere

## Biome and Ecosystem Organization Answer Sheet

Match the example to the correct word by writing the letter that corresponds to the example.

Mikhail the Tortoise \_\_\_d

Turtles, other tortoises, \_\_\_b\_\_\_

The entire planet Earth \_\_\_f\_

The community, the water, the air the rocks, the soil and the sand \_\_\_a\_\_\_

A desert \_\_\_c\_\_\_

All the turtles and tortoises in the area \_\_\_e\_\_\_

- a) ecosystem
- b) community
- c) biome
- d) individual
- e) population
- f) biosphere