

4. Desert Tortoises (Open Inquiry)

Grade Level: 6

Science Concept: Students explore the desert ecosystem and characteristics of organisms that live in that ecosystem, particularly of the desert tortoise.

Ecosystem of the desert

-What types of animals live/survive in the desert

Focus: desert tortoise

-What resources are available for desert tortoises in the ecosystem?

-How do they adapt to their habitat? (ex: hibernating/burrowing)

Relationship to CA Science Content Standards:

5. Organisms in ecosystems exchange energy and nutrients among themselves and with the environment. As a basis for understanding this concept:
 - e. *Students know* the number and types of organisms an ecosystem can support depends on the resources available and on abiotic factors, such as quantities of light and water, a range of temperatures, and soil composition.

Learning Objectives:

1. SW create a group-designed research-based project about tortoises, using resources to elaborate on main ideas.

Evaluation Ideas:

Formative: SW show evidence of planning for final project. During the first planning session, they will have main research question and project type chosen, as well as group member roles designated. During periodic planning sessions, students will show evidence of research, outlining, and progressed stages of completion. SW also record information from station activity to generate ideas for the project.

Summative: SW complete a group project on desert tortoises. Students will be evaluated on having: reliable references and resources, a focus research question and providing information from different sources (at least 2), information that is accurate and clearly stated (in own words), organization of ideas is well-executed.

Conceptual Background:

Students could include some basic information about the desert tortoise (habitat, diet, lifespan, reproduction, physical characteristics, social behavior), and about the desert ecosystem (characteristics, food web, climate, resources).

An *ecosystem* is a community of living (biotic) and non-living (abiotic) things that work together. *Ecosystems* have no particular size. There are resources and abiotic factors that contribute to the survival of animals within the desert ecosystem. This includes:

More on ecosystems:

http://www.aurumscience.com/environmental/4_ecosystems/lecture.html

More on desert tortoises: <http://www.tortoise.org/general/descare.html>

LESSON

Implementation Plan:

Engage- Introduce the SERC California desert tortoise (without saying what it is) and tell students they will have an opportunity to take a closer look to make observations about Jeremiah. *Allow for comments and/or reactions, but let students know they will be developing projects around tortoises, so questions they may have would be good to discover and incorporate as part of their group research.

Explore- Students will be doing group projects on desert tortoises. Students will have an opportunity in their group to develop a main question they would like to explore about desert tortoises. Ideas could first be elicited. Some ideas students might come up with include: survival strategies of a desert tortoise, desert tortoise and the food web, life cycle of the desert tortoise, resources available for the desert tortoise in it's habitat, interaction of the desert tortoise with other desert animals.

Stations: groups will cycle through various stations to get ideas for their projects. Stations include:

- 1) **Jeremiah, the SERC desert tortoise.** The students will be able to closely observe the tortoise, and think of questions they have about the tortoise. They should record observations/questions in a science journal.
- 2) **Desert ecosystems Brain pop video.** Students watch the video: <http://magma.nationalgeographic.com/ngexplorer/0403/quickflicks/>. They can record observations/information in their science journal.
- 3) **Desert tortoise virtual fieldtrip:** Students record information from a virtual field trip found here: <http://www.tortoise-tracks.org/dtna/tour.html>
- 4) **Desert ecosystem exploration.** Students will be presented with materials from a desert ecosystem (a box with sand, cactus plant(s), miniature desert animals figures (turtles, lizards, etc), flash light). Students explore these materials along with pictures of the desert ecosystem to determine characteristics. OR, students could

create an account on Second Life (secondlife.com) and explore virtual deserts using avatars. Free to use.

- 5) **Books and internet resources.** Students look through books (see suggested reading) or articles available, as well as different websites with information.

Reliable websites/videos include:

-Great reliable resource for students: kids.usa.gov. Click on “Teens Grade 6-8” and search “desert tortoises.” Many videos and articles available, level and age appropriate.

-U.S. Government research article on desert tortoises. Language may need to be scaffolded/explained:

<http://www.fs.fed.us/database/feis/animals/reptile/goag/all.html#FOOD%20HABITS>

- A list of articles on desert tortoises on the USA.gov for Science website:

<http://www.science.gov/scigov/result-list/fullRecord:desert+tortoise/>

-Video called: “The Heat is On: Desert Tortoises and Survival”. Website:

<http://pubs.usgs.gov/gip/98/>

- Hatching video: <http://gallery.usgs.gov/videos/131#.UAYQIPFxKbI/> A four minute video of a Mojave desert tortoise hatching, with some information about survival strategies and rate.

-Second life- explore a virtual desert ecosystem at secondlife.com.

*check in school or local library for additional resources/books on desert tortoises and/or desert ecosystems.

*If there is no internet access or books available, use the attached information on desert tortoises (see fact sheet).

Explain- Students will decide as a group the type of project and focus of the project as it relates to desert tortoises. Students must work in groups to research their focus area, and put together information in a project of their choosing.

Project ideas include (elicit from students):

- A. Make a brochure
- B. Make a powerpoint (if access to a computer is available)
- C. Make a picture book
- D. Make a diorama
- E. Design a comic book

Teacher will elicit what each of those projects are, and provide more information about what each project entails if students ask.

Students will need to show evidence of planning and meet with the teacher periodically to show planning and execution progress. Students will be responsible for designating

responsibilities within the group (the teacher could provide extra guidance/assistance as necessary).

Elaborate- Students will present their projects to the class. As each group presents, the other class members will write constructive feedback, as well as provide suggestions for further research the group could do (other questions to find the answers that could enhance or add to the project).

Evaluate-

- a. summative- Group project: Students will complete a group project on desert tortoises. Students will be graded on having: reliable references and resources, having a focus research question and providing information from different sources (at least 2), information is accurate and clearly stated (in own words), organization of ideas is well-executed.
- b. formative- Project planning: Students will have main research question and project type chosen, as well as group member roles designated during first planning session. During periodic planning sessions, students will show evidence of research, outlining, and progressed stages of completion.

Differentiation Plans:

Behavioral for Student A: Student A will be given incentives to complete assignments and stay on task (via pre-determined rewards system, both group and individual). One incentive could be that this student can earn more time to observe Jeramiah and/or at a station of his/her choosing if they are actively involved and recording relevant information throughout the class period.

Cognitive for Student B: The student will be working in a group, and be exposed to many different types of inquiry-based learning. This includes textiles, videos, virtual tours, books on the topic for different reading levels, and graphic organizers to document observations.

Cognitive for Student C: This student will be challenged to think of a unique project (not necessarily on the list), first approved by the teacher. The student will also be encouraged to think of a multi-faceted focus question, to instigate deeper research on a conceptual idea.

Affective for Student D: The teacher will closely monitor the student's interaction with the group during stations and group planning. The teacher will provide extra encouragement and guidance as needed, to make tasks easier to manage and delegate. The teacher should check in with the student periodically to see how the student is doing in the group, and make modifications to grouping if needed. The teacher can also give one-on-one advice and guidance if the student needs extra support for the group project.

Language Demands for Students E, F, G

Student E: This student will have optional transcription of video material, cognates provided for certain vocabulary as necessary, key vocabulary displayed and defined, and extra instruction/guidance during the stations and group work as needed. Teacher will closely monitor progress and interaction within the group, providing discussion sentence frames as

necessary. Clear and concise instructions for each station (written and oral) should be provided.

Student F: The student will have resources available which are at different reading levels and provide visuals/ other media sources. The student will be given extra guidance on research strategies as needed.

Student G: This student will have graphic organizers and group members to help organize ideas and complete tasks. Sentence frames and clear instructions will be provided.

List of Materials:

- 1) Stations worksheet (1 per student)
- 2) Project graphic organizer (1 per student)
- 3) a box with sand, cactus plant(s), miniature desert animals figures (turtles, lizards, etc), flash light
- 4) Computer lab/internet access
- 5) Books about tortoises (see suggested reading list)

Suggested Reading:

Fox, Sue. (2002). *The Desert Tortoise*. Two Mountain Press.

Lamfrom, David; Knighten, Rana. (2010). *Tortoises Through the Lens: A Visual Exploration of a Mojave Desert Icon*. El Cajon, CA: Sunbelt Publications.

Steffoff, Rebecca. (1997). *Giant Turtle*. Tarrytown, NY: Marshall Cavendish Corporation.