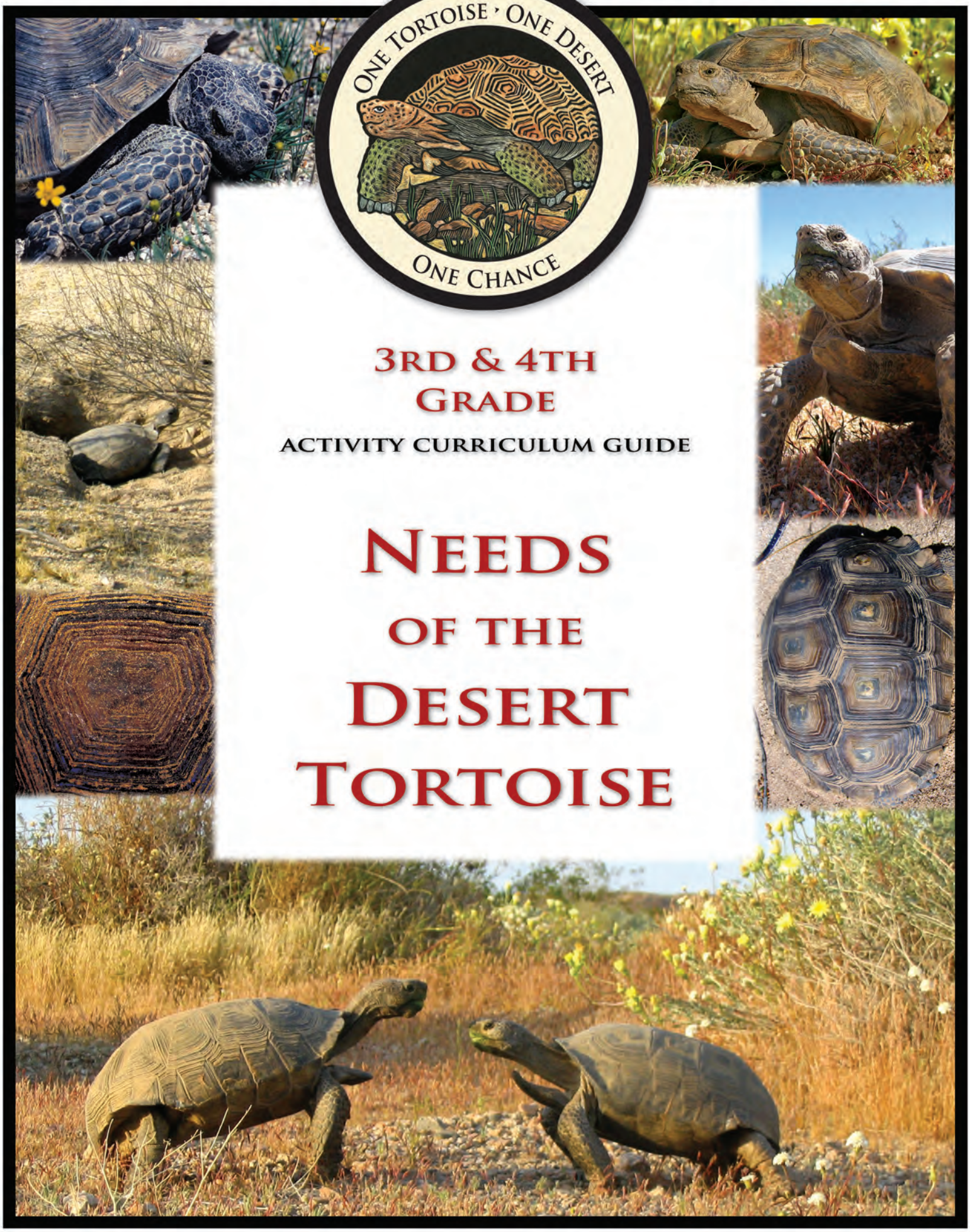

3rd & 4th Grade

Activity Curriculum Guide

Needs of the Desert Tortoise

Activity Flow for Tortoise Trunk
3rd/4th Grade Trunk

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Teacher Note

For this week, students will keep a journal in which they will record their thoughts and responses to outlined activities. Teachers can have the students create their own journals. Journals can be made by binding pieces of paper together and having the student illustrate a title/cover page.

Before students come in, take out the map of the Mojave Desert and place it over the trunk - covering it!

Desert Tortoise Round Table - *Opening Activity*

Theme/Concept: Desert tortoise background knowledge and ongoing record of knowledge gained.

Goals: To generate an understanding of student knowledge regarding tortoises by drawing out what students know about tortoises, what they want to know about tortoises, and to help assess what students have learned about tortoises.

Objectives:
- Students will be able to list what they know about tortoises.
- Students will be able to list what they want to know about the tortoises.

Third Grade Standards

Language Arts: 1.0 Listening and Speaking Strategies

Students listen critically and respond appropriately to oral communication. They speak in a manner that guides the listener to understand important ideas by using proper phrasing, pitch and modulation.

Comprehension

1.2 Connect and relate prior experiences, insights, and ideas to those of a speaker.

1.3 Respond to questions with appropriate elaboration.

Organization and Delivery of Oral Communication

1.5 Organize ideas chronologically or around major points of information.

Science:

Life Sciences

3a. Students know plants and animals have structures that serve different functions in growth, survival, and reproduction.

3b. Students know examples of diverse life forms in different environments, such as oceans, deserts, tundra, forests, grasslands, and wetlands.

3d. Students know when the environment changes, some plants and animals survive and reproduce; others die or move to new locations.

Fourth Grade Standards:

Language Arts: 1.0 Listening and Speaking Strategies

Comprehension

1.1 Ask thoughtful questions and respond to relevant questions with appropriate elaboration in oral settings.

1.2 Summarize major ideas and supporting evidence presented in spoken messages and formal presentations.

Organization and Delivery of Oral Communication

1.8 Use details, examples, anecdotes, or experiences to explain or clarify information.

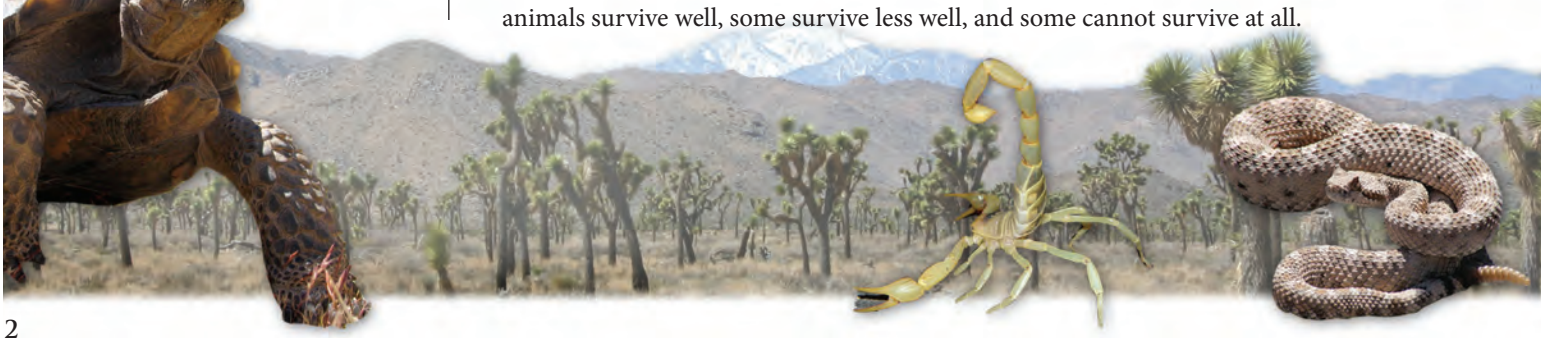
Science:

Life Sciences

2b. Students know producers and consumers (herbivores, carnivores, omnivores, and decomposers) are related in food chains and food webs and may compete with each other for resources in an ecosystem.

3a. Students know ecosystems can be characterized by their living and nonliving components.

3b. Students know that in any particular environment, some kinds of plants and animals survive well, some survive less well, and some cannot survive at all.



Teacher Materials Needed: Using poster board, make a **KWL** chart with columns labeled: What I Know, What I Want to Know, What I Learned.

K (What I Know)	W (What I Want to Know)	L (What I Learned)

Materials in kit: None

Activity:

• The class (with teacher directive) will create a KWL chart that can be added to, and referred to over the week as the students are learning about the desert tortoise. The chart can be a rubric to informally assess what students are learning. This brainstorming activity can help to determine what students know, what they want to know, and what they have learned about desert tortoises.
• Explain to students that they will be learning about the desert tortoise during the week.
• Ask students what they know about the desert tortoise.
• Write responses on the chart under column **K**. Responses can be correct or incorrect, and then be verified as correct, or proved incorrect from the knowledge/facts they gain throughout the week. The teacher may want to make a symbol next to the statements that need to be revisited and verified (or use a different color marker to designate these statements)
• Ask students what they want to know about the desert tortoise.
• Write responses on the chart under column **W**.
• Leave the third column blank for knowledge and facts the students gain about the desert tortoise throughout the week.
• Designate certain times of the day to reflect on, and record knowledge gained about the desert tortoise.

Definitions:

Turtle – an aquatic or a terrestrial reptile whose trunk is enclosed by a shell
Tortoise – a terrestrial turtle having club-like limbs and a thick rounded shell
Desert – an extremely dry region receiving very little rain (less than 10 inches per year) and vegetative growth

Extensions:

1. Students can make their own Desert Tortoise Vocabulary Book to keep and add vocabulary words to as the desert tortoise unit progresses. The book can be made using construction paper as the cover and white blank paper as the pages.

The Lorax

Theme/Concept:

Ecosystems, cause and effect relationships

• Students make connections between the story/characters, and real life situations.
• Students listen to the story, reflect upon concepts that arise in the story, and make connections with the story. Eventually, students can use these connections in the framework of how the desert tortoise habitat is impacted by human activity.

Objectives:

• Students will be able to identify a cause and effect relationship in the book.
• Students will be able to identify a cause and effect relationship in the world.
• Students will be able to relate the story's cause and effect theme to how desert tortoises are presently impacted.

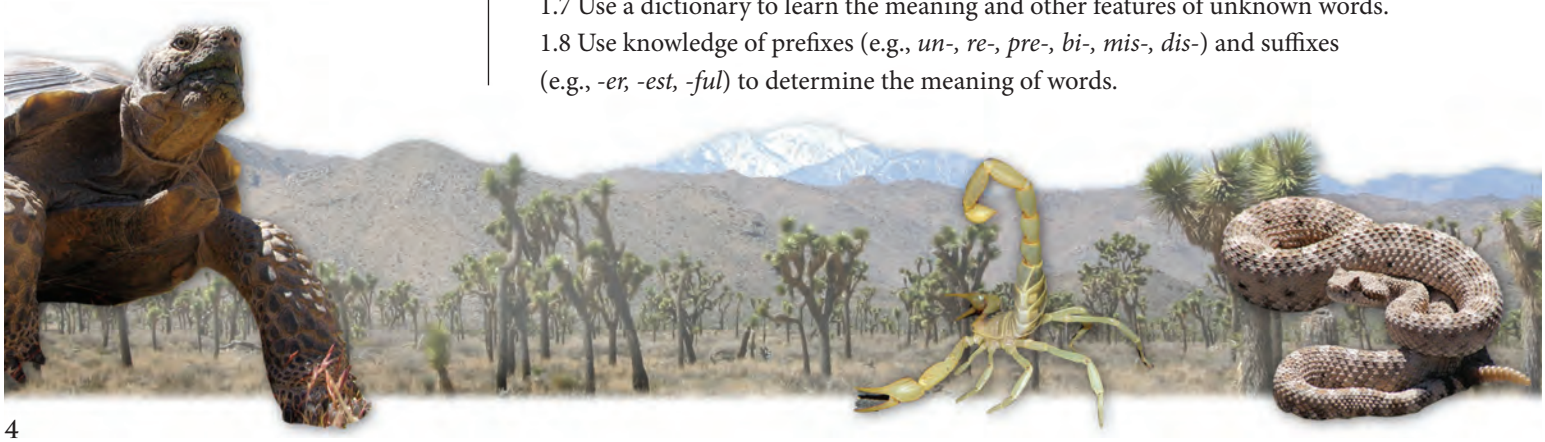
Third Grade Standards:

Science:

3. Adaptations in physical structure or behavior may improve an organism's chance for survival. As a basis for understanding this concept:
a. *Students know* plants and animals have structures that serve different functions in growth, survival, and reproduction.
b. *Students know* examples of diverse life forms in different environments, such as oceans, deserts, tundra, forests, grasslands, and wetlands.
c. *Students know* living things cause changes in the environment in which they live: some of these changes are detrimental to the organism or other organisms, and some are beneficial.
d. *Students know* when the environment changes, some plants and animals survive and reproduce; others die or move to new locations.
e. *Students know* that some kinds of organisms that once lived on Earth have completely disappeared and that some of those resembled others that are alive today.

Language Arts:
1.0 Word Analysis, Fluency, and Systematic Vocabulary Development

Students understand the basic features of reading. They select letter patterns and know how to translate them into spoken language by using phonics, syllabication, and word parts. They apply this knowledge to achieve fluent oral and silent reading.
Decoding and Word Recognition
1.1 Know and use complex word families when reading (e.g., *-ight*) to decode unfamiliar words.
1.2 Decode regular multi-syllabic words.
Vocabulary and Concept Development
1.4 Use knowledge of antonyms, synonyms, homophones, and homographs to determine the meanings of words.
1.5 Demonstrate knowledge of levels of specificity among grade-appropriate words and explain the importance of these relations (e.g., *dog/mammal/animal/living things*).
1.6 Use sentence and word context to find the meaning of unknown words.
1.7 Use a dictionary to learn the meaning and other features of unknown words.
1.8 Use knowledge of prefixes (e.g., *un-, re-, pre-, bi-, mis-, dis-*) and suffixes (e.g., *-er, -est, -ful*) to determine the meaning of words.



2.0 Reading Comprehension

Students read and understand grade-level-appropriate material. They draw upon a variety of comprehension strategies as needed (e.g., generating and responding to essential questions, making predictions, comparing information from several sources). The selections in Recommended Readings in Literature, Kindergarten Through Grade Eight illustrate the quality and complexity of the materials to be read by students. In addition to their regular school reading, by grade four, students read one-half million words annually, including a good representation of grade-level-appropriate narrative and expository text (e.g., classic and contemporary literature, magazines, newspapers, online information). In grade three, students make substantial progress toward this goal.

Comprehension and Analysis of Grade-Level-Appropriate Text

2.3 Demonstrate comprehension by identifying answers in the text.

2.4 Recall major points in the text and make and modify predictions about forthcoming information.

2.5 Distinguish the main idea and supporting details in expository text.

2.6 Extract appropriate and significant information from the text, including problems and solutions.

3.0 Literary Response and Analysis Writing

Students read and respond to a wide variety of significant works of children's literature. They distinguish between the structural features of the text and literary terms or elements (e.g., theme, plot, setting, characters). The selections in *Recommended Readings in Literature, Kindergarten Through Grade Eight* illustrate the quality and complexity of the materials to be read by students.

Structural Features of Literature

3.1 Distinguish common forms of literature (e.g., poetry, drama, fiction, nonfiction).

3.2 Comprehend basic plots of classic fairy tales, myths, folktales, legends, and fables from around the world.

3.3 Determine what characters are like by what they say or do and by how the author or illustrator portrays them.

3.4 Determine the underlying theme or author's message in fiction and nonfiction text.

3.5 Recognize the similarities of sounds in words and rhythmic patterns (e.g., alliteration, onomatopoeia) in a selection.

3.6 Identify the speaker or narrator in a selection.

Writing

1.0 Writing Strategies

Students write clear and coherent sentences and paragraphs that develop a central idea. Their writing shows they consider the audience and purpose. Students progress through the stages of the writing process (e.g., prewriting, drafting, revising, editing successive versions).

Organization and Focus

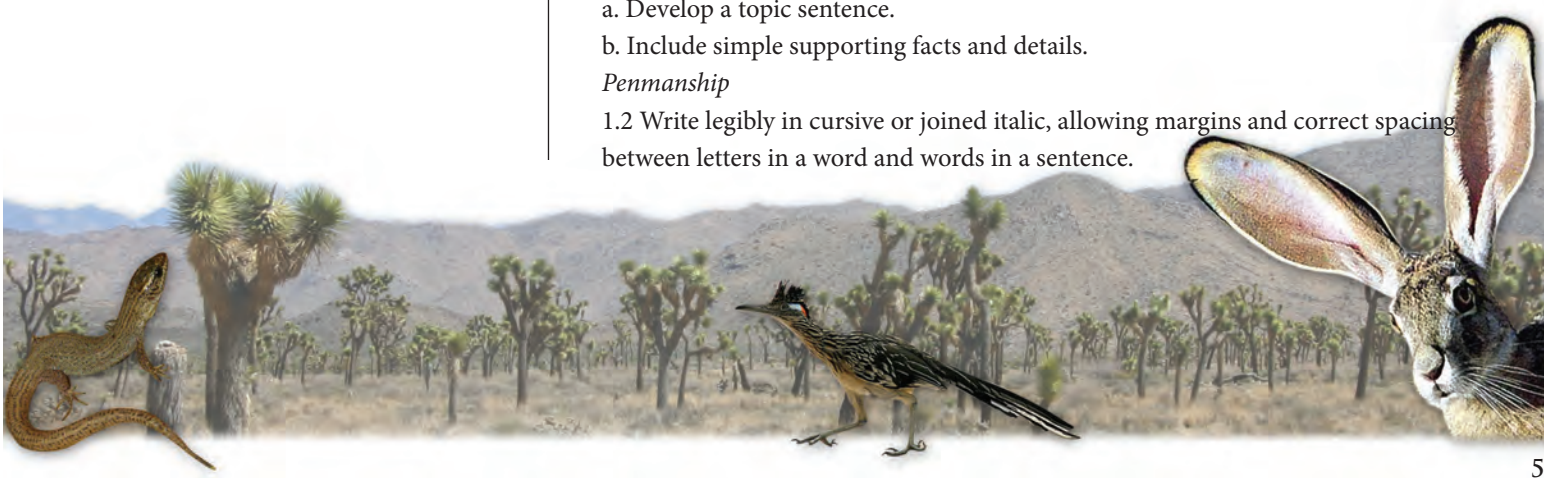
1.1 Create a single paragraph:

a. Develop a topic sentence.

b. Include simple supporting facts and details.

Penmanship

1.2 Write legibly in cursive or joined italic, allowing margins and correct spacing between letters in a word and words in a sentence.



Fourth Grade Standards:

Science:

3. Living organisms depend on one another and on their environment for survival. As a basis for understanding this concept: a. Students know ecosystems can be c haracterized by their living and nonliving components.
b. Students know that in any particular environment, some kinds of plants and animals survive well, some survive less well, and some cannot survive at all.
c. Students know many plants depend on animals for pollination and seed dispersal, and animals depend on plants for food and shelter.
d. Students know that most microorganisms do not cause disease and that many are beneficial.

Language Arts:
1.0 Word Analysis, Fluency, and Systematic Vocabulary Development

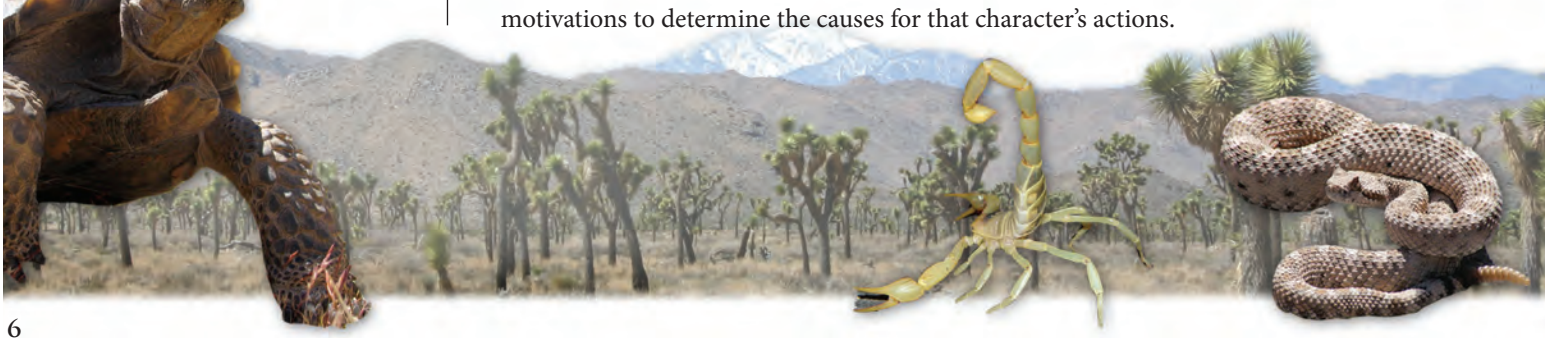
Students understand the basic features of reading. They select letter patterns and know how to translate them into spoken language by using phonics, syllabication, nd word parts. They apply this knowledge to achieve fluent oral and silent reading.
Vocabulary and Concept Development
1.2 Apply knowledge of word origins, derivations, synonyms, antonyms, and idioms to determine the meaning of words and phrases.
1.3 Use knowledge of root words to determine the meaning of unknown words within a passage.
1.5 Use a thesaurus to determine related words and concepts.

2.0 Reading Comprehension

Students read and understand grade-level-appropriate material. They draw upon a variety of comprehension strategies as needed (e.g., generating and responding to essential questions, making predictions, comparing information from several sources). The selections in *Recommended Readings in Literature, Kindergarten Through Grade Eight* illustrate the quality and complexity of the materials to be read by students. In addition to their regular school reading, students read one-half million words annually, including a good representation of grade-level-appropriate narrative and expository text (e.g., classic and contemporary literature, magazines, newspapers, online information).
Comprehension and Analysis of Grade-Level-Appropriate Text
2.3 Make and confirm predictions about text by using prior knowledge and ideas presented in the text itself, including illustrations, titles, topic sentences, important words, and foreshadowing clues.
2.6 Distinguish between cause and effect and between fact and opinion in expository text.

3.0 Literary Response and Analysis

Students read and respond to a wide variety of significant works of children's literature. They distinguish between the structural features of the text and the literary terms or elements (e.g., theme, plot, setting, characters). The selections in *Recommended Readings in Literature, Kindergarten Through Grade Eight* illustrate the quality and complexity of the materials to be read by students.
Narrative Analysis of Grade-Level-Appropriate Text
3.2 Identify the main events of the plot, their causes, and the influence of each event on future actions.
3.3 Use knowledge of the situation and setting and of a character's traits and motivations to determine the causes for that character's actions.



Writing
1.0 Writing Strategies

Students write clear, coherent sentences and paragraphs that develop a central idea. Their writing shows they consider the audience and purpose. Students progress through the stages of the writing process (e.g., prewriting, drafting, revising, editing successive versions).
Organization and Focus
1.1 Select a focus, an organizational structure, and a point of view based upon purpose, audience, length, and format requirements.

Teacher Materials Needed:

None

Materials in kit:

The Lorax by Dr Seuss
5 Kaleidoscopes

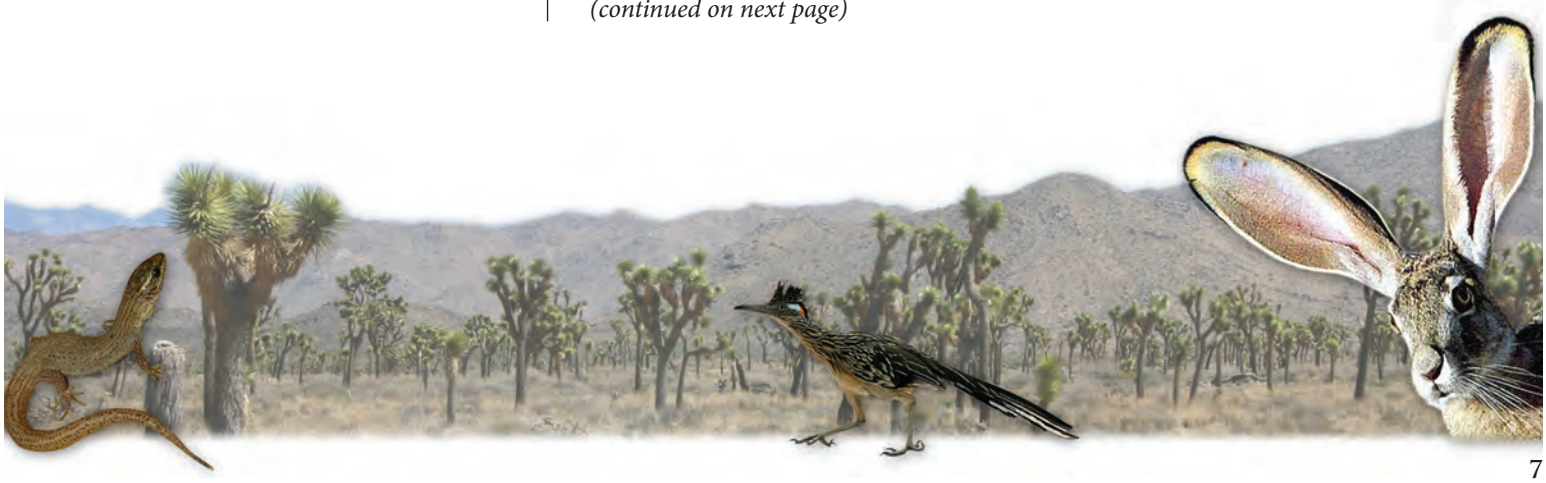
Activity:

• Explain to students that they will be reading the story *The Lorax.* What do they think a Lorax is? Have students write down their answers/predictions in their journals.
• Read *The Lorax* to the students and stop at different points to ask questions. At each spot, stop and have students write responses as to what is going on in the story. Guided questions may encourage students to write and/or draw responses. Give students a few moments at each of the suggested points.

Suggested points of interest and questions:
Pg 10, (the whisper-ma-phone). Have the students write a prediction about what the whisper-ma-phone is used for, who is using it, and what secrets will be told, etc.
Pg 23, (where the lorax comes out of the stump). Students write about how they think the Lorax feels and/or predict what happens next.
Pg 39, (the Bar-ba-loots and Swomee-Swans leave). How do you think the bar-ba-loots feel? How do you feel about what has happened? What do you think will happen next? Will the Lorax return?
Pg 45, How do you think the Humming-Fish feel? How do you feel about what has happened? What do you think will happen next? Will the Lorax return?
Pg 51, How do you think the Once-ler felt when everyone left him? Why did everyone leave?
End, Ask the students what "UNLESS" means. Ask students if the ending surprises them. Ask students what they would do if they were the Once-ler. Ask students what they would do if they were the Lorax?

Definitions:

• Introduce Vocabulary and Definitions:
Ecology - the relationship between organisms and their environment
Ecosystem - The combined habitats and communities, as well as their relationship with the air, water, soil, and energy, make up an ecosystem
(continued on next page)



Definitions: *(continued)*

Habitat – an area that provides organisms with what they need to survive—air, water, food, and space/shelter
Organism – a living thing that has the ability to act and function independently
Population – all the organisms that constitute a specific group or occur in a specified habitat
Habitat fragmentation - When native vegetation is cleared for agriculture, habitats, which were once continuous, becomes divided into separate fragments. After intensive clearing, the separate fragments tend to be very small islands, isolated from each other by crop, land and pasture. Small fragments of habitat can only support small populations of fauna and these are more vulnerable to extinction. Fragments of habitat that are separated from each other are unlikely to be re-colonized

• Relate these words back to the story of *The Lorax* and list examples.
• Show a kaleidoscope: As a kaleidoscope is turned, it shows the same objects moving and changing into different images. Have students use the kaleidoscopes as an example to show how each of us may see the same things differently - similar to how the Once-ler and Lorax had different perspectives on their environment. The Lorax saw the Truffula Trees as something that should be preserved, whereas the Once-ler saw the trees as something to use for his own personal gain.
• Discuss how each act in the book caused something else to happen. Create a cause and effect chart.

CAUSE	⇨	EFFECT

(or other cause/effect chart or graphic organizer of your choosing)

• What did we learn from the story of *The Lorax*? Tie to the idea that we must be good stewards of our environment and/or world.
• Have students either write a sequel to the story or persuasive paper on the importance of good stewardship.

Extensions:

1. Have a "desert natural resources manager" visit and talk to the class about his/her job and about how he/she manages public desert areas. Have him/her discuss the difference between allowing and not allowing OHV use. Have him/her discuss all of the different creatures that depend on "unfragmented" open desert expanses.

2. Discuss how each step of the Once-ler's developing business removed a piece of the ecosystem until the entire ecosystem ceased to function. Discuss what a healthy ecosystem needs to survive.

3. Have students discuss why the Super Axe Hacker was invented, why the Once-ler ignored the Lorax's warning, what happened to the Lorax, and why the Once-ler was called the "Once-ler."

4. Discuss what happened to the Once-ler when there were no more Truffula trees. Ask students to write a story about what the Once-ler could have done so that his factory would still function and the environment would remain healthy. Research companies that implement sustainable practices into their management plans. What kinds of practices are various companies using, and are they effective?

5. Have students write a rhyming paragraph about the Lorax's message. Base the paragraph on the meaning of the word, "UNLESS," then discuss, as a class, how all generations must care for the Earth, now and into the future. Or, have students write a new conclusion for The Lorax starting from where the word "Unless…" leaves off.

6. Discuss the idea of "thneeds" (the needs), and how advertising can sometimes make you think you need a product. Discuss what types of products the class thinks are essential (e.g. food, water, shelter, learning/educational items, etc.) and what products are luxury items (e.g. new car every year, latest fashion trend or toy, etc.). Design an ad campaign for the needs of the environment and share it with the school and community.

Tinfoil Tortoise

Themes/Concepts:

Adaptations with an emphasis on how temperature and other environmental factors (i.e. direct radiation, ambient air temperature) impact animals, especially the desert tortoise and other reptiles.

Goals:

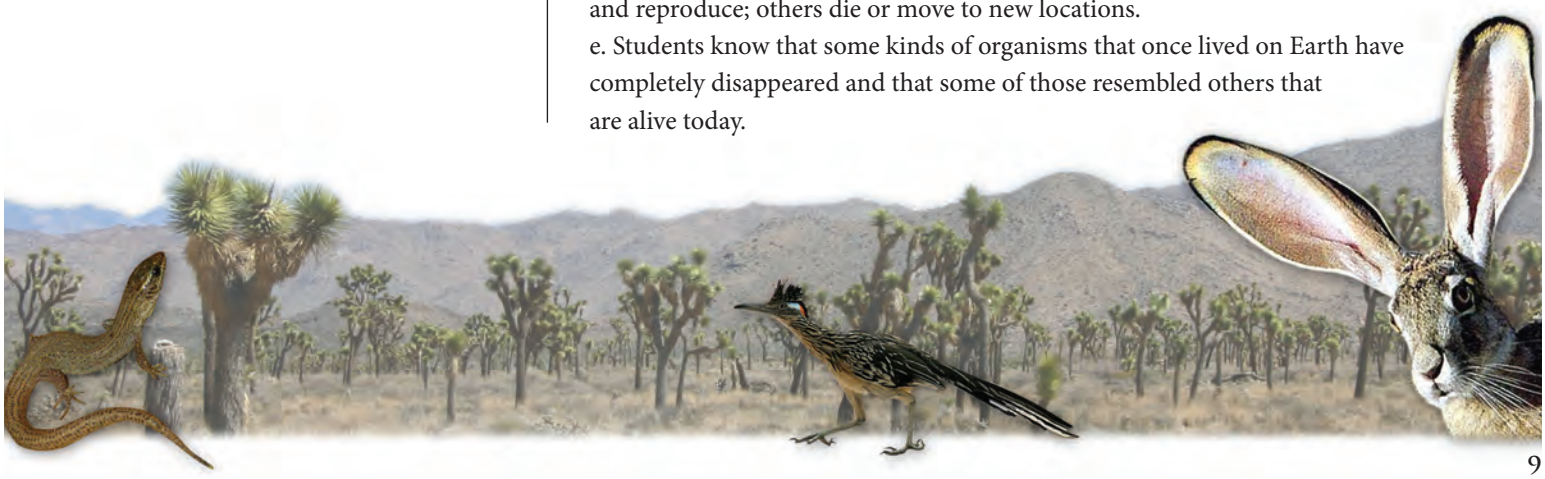
• Students will understand (and appreciate) that the desert tortoise must adapt to its environment in a timely manner (minute by minute), so not experience harm in the form of physiological stress.

Objectives:

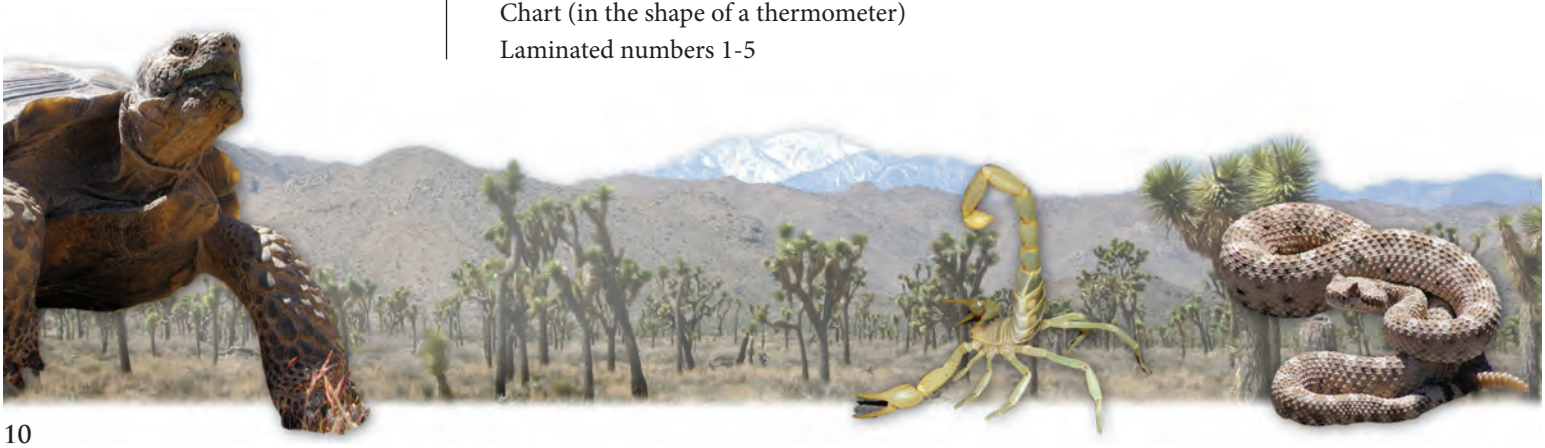
• Students will be able to identify at least one adaptation of the desert tortoise.
• Students will be able to identify how temperature affects animals.

Third Grade Standards:
Science:

3. Adaptations in physical structure or behavior may improve an organism's chance for survival. As a basis for understanding this concept:
a. Students know plants and animals have structures that serve different functions in growth, survival, and reproduction.
b. Students know examples of diverse life forms in different environments, such as oceans, deserts, tundra, forests, grasslands, and wetlands.
c. Students know living things cause changes in the environment in which they live: some of these changes are detrimental to the organism or other organisms, and some are beneficial.
d. Students know when the environment changes, some plants and animals survive and reproduce; others die or move to new locations.
e. Students know that some kinds of organisms that once lived on Earth have completely disappeared and that some of those resembled others that are alive today.



Language Arts: 1.0 Written and Oral English Language Conventions	Students write and speak with a command of standard English conventions appropriate to this grade level. *Sentence Structure* 1.1 Understand and be able to use complete and correct declarative, interrogative, imperative, and exclamatory sentences in writing and speaking.
Math: 1.0 Students understand the place value of whole numbers:	1.1 Count, read, and write whole numbers to 10,000. 1.2 Compare and order whole numbers to 10,000. 1.4 Round off numbers to 10,000 to the nearest ten, hundred, and thousand.
Fourth Grade Standards:	
Science:	3. Living organisms depend on one another and on their environment for survival. As a basis for understanding this concept: a. Students know ecosystems can be characterized by their living and nonliving components. b. Students know that in any particular environment, some kinds of plants and animals survive well, some survive less well, and some cannot survive at all. c. Students know many plants depend on animals for pollination and seed dispersal, and animals depend on plants for food and shelter. d. Students know that most microorganisms do not cause disease and that many are beneficial.
Language Arts: 1.0 Written and Oral English Language Conventions	Students write and speak with a command of standard English conventions appropriate to this grade level. *Sentence Structure* 1.1 Use simple and compound sentences in writing and speaking.
Math:	1.0 Students understand the place value of whole numbers and decimals to two decimal places and how whole numbers and decimals relate to simple fractions. Students use the concepts of negative numbers: 1.1 Read and write whole numbers in the millions. 1.2 Order and compare whole numbers and decimals to two decimal places. 1.3 Round whole numbers through the millions to the nearest ten, hundred, thousand, ten thousand, or hundred thousand. 1.4 Decide when a rounded solution is called for and explain why such a solution may be appropriate
Teacher Materials Needed:	Tape
Materials in kit:	4 Aluminum Pie Plates with thermometers *(A 5th thermometer shaded inside of Styrofoam coffee cup (to measure air temperature) to be used as a control).* Chart (in the shape of a thermometer) Laminated numbers 1-5



Activity

This activity needs to be completed outdoors in an area with varied sections: blacktop, grass, shade, mulched area, water, etc.

• Divide the class into four groups.

• Give each group a pie plate. Explain that each plate represents a tortoise and that they are going to look at how location affects the temperature of tortoises.

• Give students time to place their pie plate in a pre-selected area. For example: *Pie Pan #1- Blacktop, Pie Pan #2- Grass Area, Pie Pan #3- Shaded Area, Pie Pan #4 - Close to a Bush/Shrub*

• Gather students back up and have students predict which area will be the coolest and which will be the hottest. Students write down their predictions. Explain to students that you will collect the pie plate tortoises in 20 minutes.

(Scute activity can be done while temperature activity is going on, then return to temperature activity – see lesson entitled "Scutes to Boot").

• Have the students retrieve their pie plates.

• Have students record the location and temperature of each pie plate.

• Explain that tortoises function best between 68°F and the upper 90's. Use a chart (in the shape of a thermometer) to show the temperatures for the tortoise as well as the temperatures of other animals and/or other items.

• Mark the temperatures of the five pie plates. Which location worked best for the tortoise, today? What if it was a hot day? What if it was a cold day? Discuss the varying behavior of the tortoise in regard to temperature.

• Discuss how tortoises use burrows and why they need them to stay cool or warm. Discuss the concept that tortoises are exothermic. Discuss adaptations of the tortoise: water usage, and how they obtain water. Discuss that tortoises "lose" their water if they get frightened.

Definitions:

Exothermic – generally refers to cold-blooded animals or animals that rely on external forces to heat or cool their bodies

Adaptation – to adjust to different conditions, environment or circumstances

Temperature – a measure of warmth or coldness of an object in reference to a standard value

Cold Blooded – animals (fishes and reptiles) whose body temperature depends on the surrounding temperature

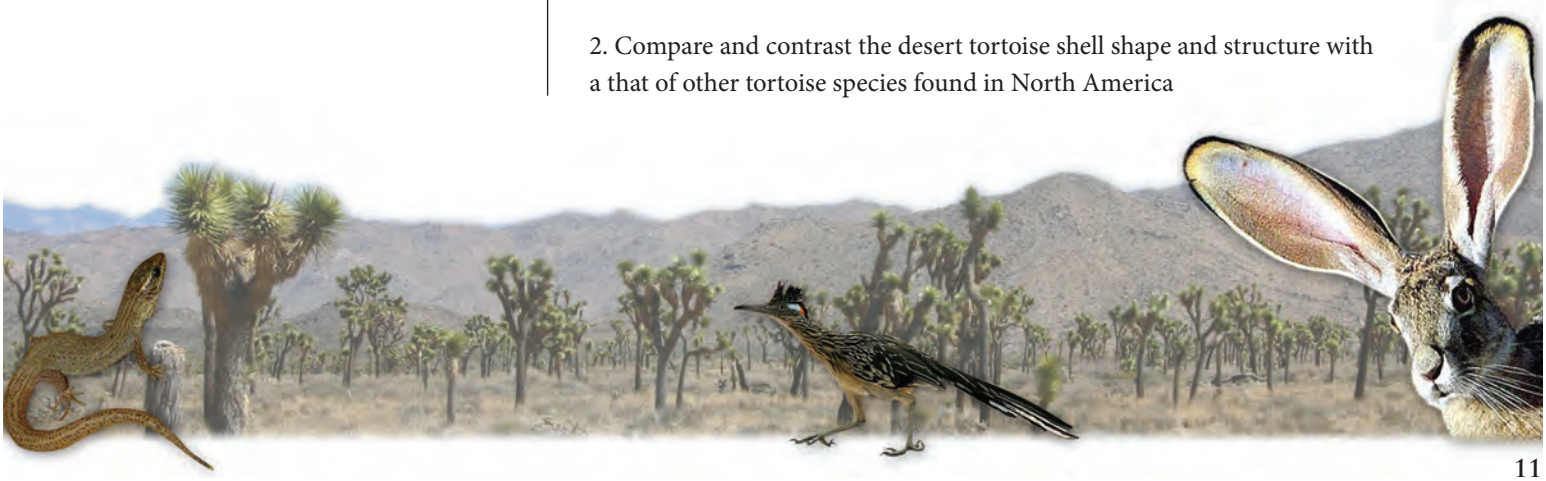
Radiation – energy emitted as particles or waves

Ambient Air Temperature – the surrounding air temperature

Extensions:

1. Use colored pans (spray painted with flat or gloss primer paint) in silver, black, medium brown, and green to see the difference color makes.

2. Compare and contrast the desert tortoise shell shape and structure with a that of other tortoise species found in North America



Scutes to Boot

Theme/Concept: How to identify a desert tortoise

Goals:

- Students will learn that all desert tortoises have 13 scutes no matter its age or size.

Objectives:

- Students will be able to identify a desert tortoise by the number of scutes it has and know that scutes do not determine the age of a desert tortoise.
- Students will be able to find evidence of how tortoise shell plates grow using a magnifying glass.

Third Grade Standards:
Math: 1.0

Students understand the place value of whole numbers:
1.1 Count, read, and write whole numbers to 10,000.
1.2 Compare and order whole numbers to 10,000.
1.4 Round off numbers to 10,000 to the nearest ten, hundred, and thousand.

Fourth Grade Standards:
Math:

1.0 Students understand the place value of whole numbers and decimals to two decimal places and how whole numbers and decimals relate to simple fractions.
Students use the concepts of negative numbers:
1.1 Read and write whole numbers in the millions.
1.2 Order and compare whole numbers and decimals to two decimal places.
1.3 Round whole numbers through the millions to the nearest ten, hundred, thousand, ten thousand, or hundred thousand.
1.4 Decide when a rounded solution is called for and explain why such a solution may be appropriate.

Teacher Reference:

How old is my tortoise?
Unfortunately, unless the tortoise was very small when acquired, or has a known date of birth, it is almost impossible to tell its age accurately. Counting "growth rings" around the scutes (scute rings or annuli number) may be useful in small tortoises. These rings are formed because the scutes (or shields) are a modified form of skin that is continually renewed. The new scute material grows under the old, and being larger shows at the edges of the scute as a "ring". Unlike trees, however, tortoises (especially well nourished captives) don't get a new "growth ring" every year. On the contrary, several "growth rings" may appear in a single season! In bad years, some wild tortoises may not show any growth at all. When a tortoise reaches adult size (at 10-20 years) growth continues, although new scute rings are almost imperceptible. In fact, in a recent attempted study of the age range of wild tortoises at the Desert Tortoise Natural Area, one biologist resorted to using an electron microscope to count the minuscule scute layers found in mature animals!

Once a tortoise reaches adulthood its appearance continues to slowly change. The often beautiful scute-sculpturing of the youngster becomes progressively less distinct. The scutes become flattened, take on a dull sheen and eventually become a more uniform gray color. In extreme old age the scutes may appear sunken in, as calcium becomes depleted from the bony shell that lies underneath them.

Adapted from: http://www.tortoise.org/archives/agasques.html

For a picture of a typical Desert Tortoise shell, go to:
- *http://www.enchantedlearning.com/subjects/turtle/Destortprintout.shtml*
- *http://myweb.tiscali.co.uk/cheloniauk/agassia.gif*
- *http://www.tortoise.org/archives/gophdiff.html*
- *http://www.infovisual.info/02/019_en.html*
- *http://www.tortoiselife.co.uk/html/common/Ant.htm*

Concerning fish scale growth:
- *http://www.newton.dep.anl.gov/askasci/bio99/bio99228.htm*
- *http://www.wildeducation.org/programs/fish_ways/activity/scales.asp*
- *http://wdfw.wa.gov/fish/chum/chum-3e.htm*

Teacher Materials Needed:

Materials in kit:

Picture of a desert tortoise
3 different size tortoise shells
Magnifying glasses
Rulers calibrated in mm

Activity:

- Set up four stations with one tortoise shell or the poster at each station.
- Group students into four groups and have them gather at stations.
- Ask students, "How do you think we tell how old a tortoise is?" "What are the parts of the shell?"
- Explain to students that they will be moving from station to station, counting scutes on the different tortoise shells. Go over the parts of a tortoise shell with students: carapace, plastron, scutes, gular horn, and shell edge.
- Have students make a chart label at the first station, and then record the number of scutes they count on the paper.
- Students move from one station to another counting the scutes on each tortoise shell or picture and record the results on their chart. Students need to take their charts from station to station. Have students inspect scute plates with a magnifying glass, looking for evidence of growth patterns to suggest a hypothesis for how scutes form?
- Discuss findings – 13 scutes on each plate.
- Explain that a desert tortoise always has 13 scutes, as do several other tortoise species (different type of tortoises). Some may have more or less scutes, indicating it is not a desert tortoise. *(FYI: the sum of vertebral and costal scutes = 13 on most turtles and tortoises, while other scute patterns on the margin and plasteron vary between species and genera. If more or less scutes, then it is not a desert tortoise. This is not true for the scutes being counted in this lesson.)*

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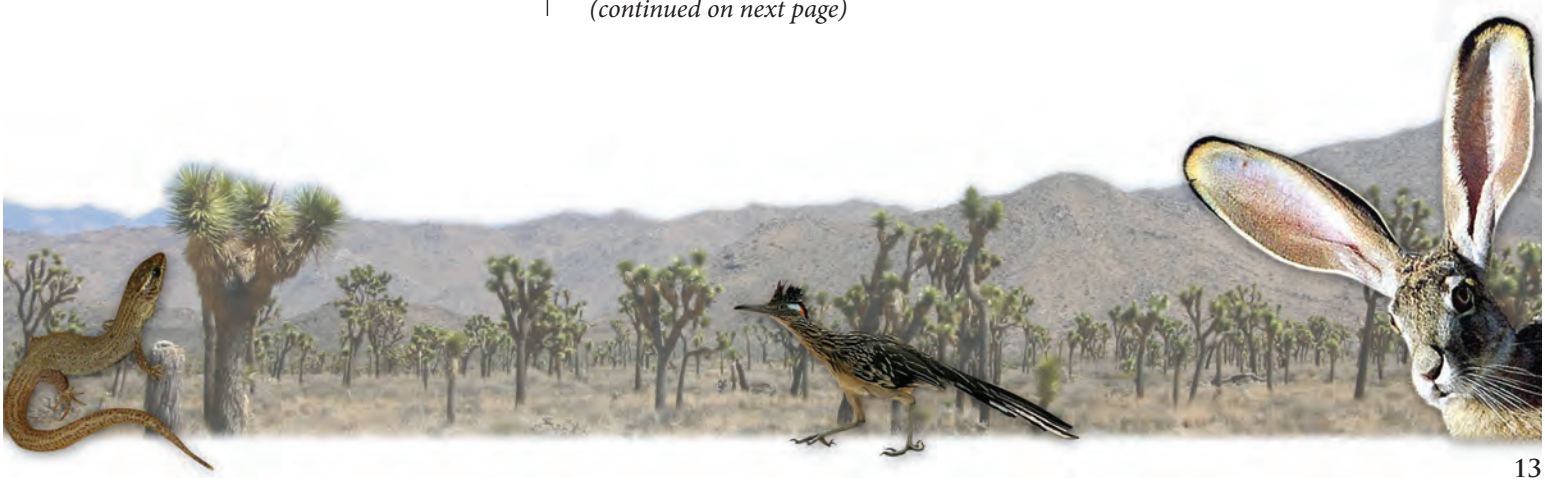


Acitvity: *(continued)*

• How can we tell the age of a tortoise? Only by size. *(Note: captive raised desert tortoises can be aged from date of hatch).* Explain the age and size of tortoises using the shells: the large one is over 15 years, the medium size is 7-15 years, and the little one is under 7. The only way we know how old a tortoise is, is by observing the tortoise over time. Counting scute rings only provides a relative age within about the first 10-14 years after hatching. After that, the newborn rings at the apex or center of each scute can wear off. How can we tell the age of a non-captived raised desert tortoise? What evidence did the students find that might show growth patterns.

Extensions:

1. Compare and contrast the desert tortoise shell shape and structure with that of other tortoise or turtle species found in North America.
2. Have students use a magnifying glass to closely examine scute rings.

Tortoise Mobile of Needs

Theme/Concept: The needs of the desert tortoise

Goals: To help students understand what animals need in order to survive in their natural surroundings and/or native habitat.

Objectives:

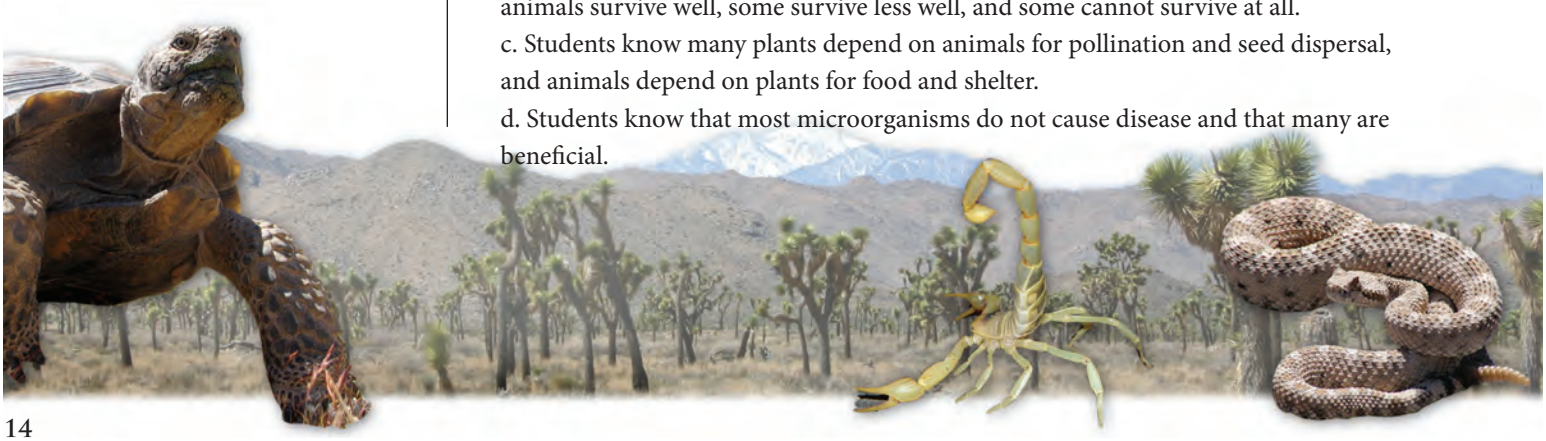
• Students will be able to identify the difference between a need and a want.
• Students will be able to list some of the needs of the desert tortoise.

Third Grade Standards:
Science:

3. Adaptations in physical structure or behavior may improve an organism's chance for survival. As a basis for understanding this concept:
a. Students know plants and animals have structures that serve different functions in growth, survival, and reproduction.
b. Students know examples of diverse life forms in different environments, such as oceans, deserts, tundra, forests, grasslands, and wetlands.
c. Students know living things cause changes in the environment in which they live: some of these changes are detrimental to the organism or other organisms, and some are beneficial.
d. Students know when the environment changes, some plants and animals survive and reproduce; others die or move to new locations.
e. Students know that some kinds of organisms that once lived on Earth have completely disappeared and that some of those resembled others that are alive today.

Fourth Grade Standards:
Science:

3. Living organisms depend on one another and on their environment for survival. As a basis for understanding this concept:
a. Students know ecosystems can be characterized by their living and nonliving components.
b. Students know that in any particular environment, some kinds of plants and animals survive well, some survive less well, and some cannot survive at all.
c. Students know many plants depend on animals for pollination and seed dispersal, and animals depend on plants for food and shelter.
d. Students know that most microorganisms do not cause disease and that many are beneficial.



Teacher References: Reading: *http://bss.sfsu.edu/geog/bholzman/courses/Fall00Projects/tortoise.htm*

Teacher Materials Needed:

Metal clothes hanger
Construction Paper
Plain Paper
String
Scissors
Tape
Single hole punch
Pliers
Wire cutters

Materials in kit: None

Activity:

- Explain the difference between a need and a want.
- Have students brainstorm the needs of a desert tortoise. Taking the concept further, have students brainstorm the needs of a Desert Tortoise as an individual and as a species.
- Divide the needs into the following categories: food, water, shelter, space, social interaction. (Access to a community of nearby desert tortoises is vital to the survival of the species -- remembering no desert tortoise is an island. Tortoises indicate the health of an ecosystem. If the desert tortoise disappears, then this will affect the survival of other species within that ecosystem.)
- Ask students how they can find out if their ideas are correct or not. What research do they need to do?
- Use different color paper to separate food, water, and shelter.
- Create a tortoise out of construction paper to serve as the top of the mobile.
- Use metal coat hangers and yarn to create the mobile.

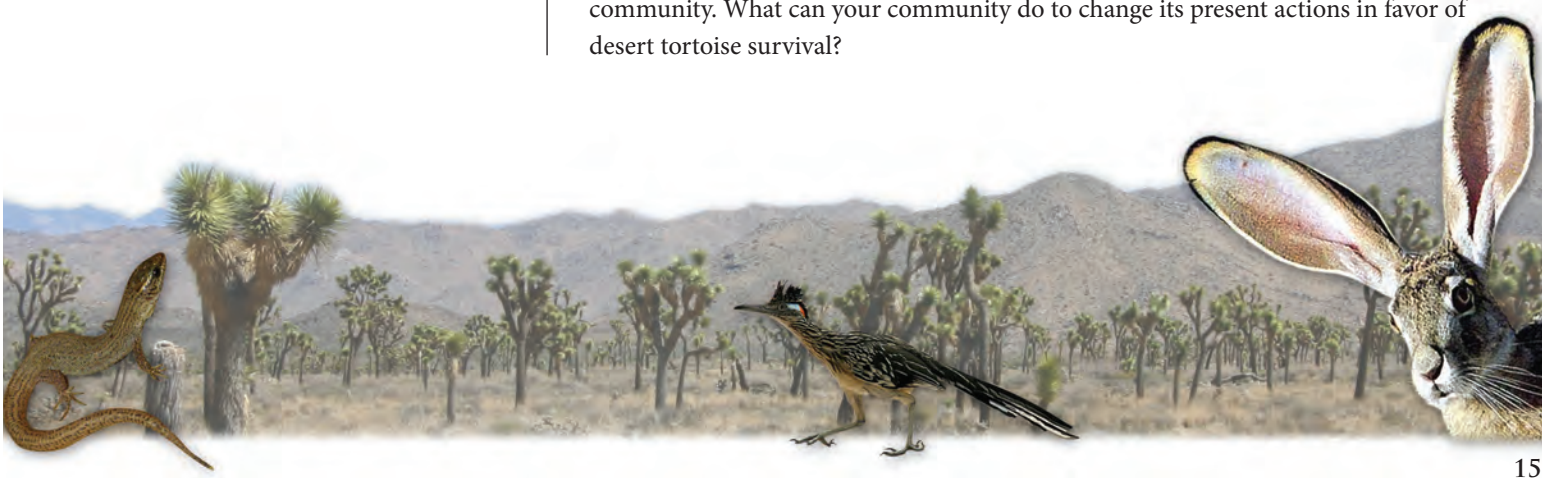
Example:

Food	Water	Shelter	Space	Community
flowers	puddles, rain	burrows	territory	mating
cacti	plants	shell	safe travel	diversity (gene pool)

Exensions:

1. Hypothesize the cause and effect relationship between reducing the availability of, or "taking away a need resource," to the health and well-being of an individual desert tortoise or that of a community of desert tortoises in a given area.

2. Identify places in your desert community where is human activity is reducing or removing components necessary for maintaining a healthy desert tortoise community. What can your community do to change its present actions in favor of desert tortoise survival?



Breaking up the Desert - Map History of the Mojave Desert and Fragmentation

Theme/Concept: Human activities directly and indirectly impact (desert) animals and their habitats.

Goals:

- Help students understand how development and other human activities impact the habitats of native desert inhabitants and the environment.

Objectives:

- Students will be able to identify at least one way a habitat could be fragmented.
- Students will be able to identify at least one way fragmentation affects animals.

Third Grade Standards:

Social Science: 3.1 Students describe the physical and human geography and use maps, tables, graphs, photographs, and charts to organize information about people, places, and environments in a spatial context by: 1. identifying geographical features found in their local region (e.g., deserts, mountains, valleys, hills, coastal areas, oceans, lakes) 2. Tracing the ways in which people have used the resources of the local region and modified the physical environment (e.g., a dam constructed upstream changed a river or coastline).

Science: 3. Adaptations in physical structure or behavior may improve an organism's chance for survival. As a basis for understanding this concept: a. Students know plants and animals have structures that serve different functions in growth, survival, and reproduction. b. Students know examples of diverse life forms in different environments, such as oceans, deserts, tundra, forests, grasslands, and wetlands. c. Students know living things cause changes in the environment in which they live: some of these changes are detrimental to the organism or other organisms, and some are beneficial. d. Students know when the environment changes, some plants and animals survive and reproduce; others die or move to new locations. e. Students know that some kinds of organisms that once lived on Earth have completely disappeared and that some of those resembled others that are alive today.

Language Arts: 1.0 Listening and Speaking Strategies

Students listen critically and respond appropriately to oral communication. They speak in a manner that guides the listener to understand important ideas by using proper phrasing, pitch, and modulation.

Comprehension

1.1 Retell, paraphrase, and explain what has been said by a speaker.
1.2 Connect and relate prior experiences, insights, and ideas to those of a speaker.
1.3 Respond to questions with appropriate elaboration.

Fourth Grade Standards:

Social Science: 4.1 Students demonstrate an understanding of the physical and human geographic features that define places and regions in California by:

1. Explain and use the coordinate grid system of latitude and longitude to determine the absolute locations of places in California and on Earth.
2. Distinguish between the North and South Poles; the equator and the prime meridian; the tropics; and the hemispheres, using coordinates to plot locations.
3. Identify the state capital and describe the various regions of California, including how their characteristics and physical environments (e.g., water, landforms, vegetation, climate) affect human activity.

Teacher References:

4. Identify the locations of the Pacific Ocean, rivers, valleys, and mountain passes and explain their effects on the growth of towns.
5. Use maps, charts, and pictures to describe how communities in California vary in land use, vegetation, wildlife, climate, population density, architecture, services, and transportation.

Science:

3. Living organisms depend on one another and on their environment for survival. As a basis for understanding this concept: a. Students know ecosystems can be characterized by their living and nonliving components.
b. Students know that in any particular environment, some kinds of plants and animals survive well, some survive less well, and some cannot survive at all.
c. Students know many plants depend on animals for pollination and seed dispersal, and animals depend on plants for food and shelter.
d. Students know that most microorganisms do not cause disease and that many are beneficial.

Language Arts: Written and Oral English Language Conventions 1.0

Students write and speak with a command of standard English conventions appropriate to this grade level.
Sentence Structure
1.1 Use simple and compound sentences in writing and speaking.

Listening and Speaking Strategies 1.0

Students listen critically and respond appropriately to oral communication. They speak in a manner that guides the listener to understand important ideas by using proper phrasing, pitch, and modulation.
Comprehension
1.1 Ask thoughtful questions and respond to relevant questions with appropriate elaboration in oral settings.

Teacher Materials Needed:

None

Materials in kit:

Laminated: Habitat Map, Houses, Roads, Shopping Centers

Activity:

• Explain fragmentation to students.
Fragmentation: (in the sense of habitat) is dividing an area into sections.

You can use one or more of the following example(s) to introduce the concept of fragmentation:

Concept/Attainment Technique #1
Create a T-chart on the blackboard or on a piece of chart paper. On one side you will write "Yes - Fragments Habitat". On the other, "No - Does not Fragment Habitat."
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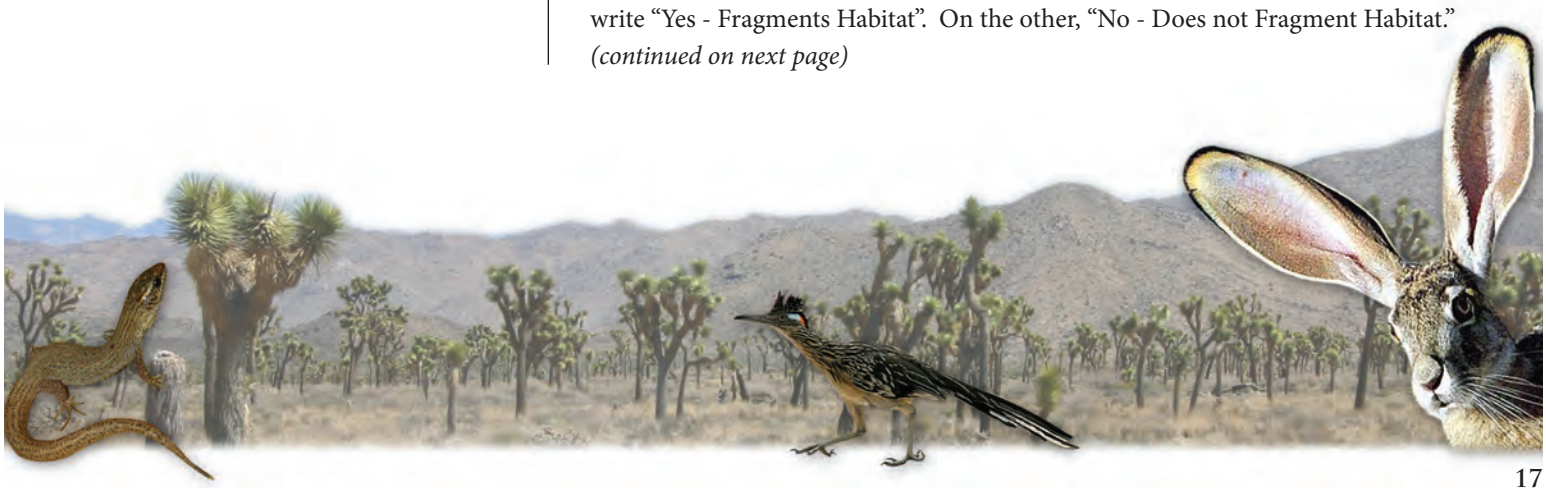


Activity: *(continued)*

Gather pictures or words that show what is not habitat fragmentation – pictures of native or natural, undisturbed Mojave Desert habitat. Gather pictures or words that are examples of direct habitat fragmentation (homes, roads, aqueducts, power lines) and indirect habitat fragmentation (ravens, pets, invasive plants).

Place the pictures below the "Yes" or "No" column, each time saying "This is an example of habitat fragmentation." or "This is not an example of habitat fragmentation." Eventually, the students should attain the concept and be able to place the words and pictures in the correct columns.

Once the students have an understanding of the concept of habitat fragmentation they should brainstorm a definition. You may want to limit the definition to direct habitat fragmentation by human activity, as few students will note that human activity invites the entrance of natural desert tortoise predation (ravens). This may confuse some students.
(This concept/attainment technique may be used for various lessons included in the "Tortoise Trunk" to build student's vocabulary prior to a lesson).

Concept/Attainment Technique #2
Have a large, laminated habitat map attached to the board at the front of the room.

Ask students to identify some of the things that might fragment a habitat. When a student lists something, the teacher or the student will place the pre-drawn, laminated object on the map.

Cause/Effect Technique
Discuss how fragmentation affects the desert tortoise as well as other wildlife (cause: what "needs" of the desert tortoise is reduced, removed/taken away as their habitat is fragmented; effect: how is the desert tortoise affected by this change in "resources" availability").

Extensions:

1. Brainstorm how the fragmentation of existing habitat can be reduced, and create posters that communicate these strategies and suggestions. Hang these posters around school, in school and (having received prior permission) in public places.

2. Provide the class/school community with an opportunity to reverse the effects of habitat fragmentation on public lands. Contact desert managers with the BLM. NPS, SPS for available opportunities (Some fleshing out of potential contact information would be needed here).

Tortoise Trials

Theme/Concept: Survival of a species depends on how safely it can move around within its environment over time.

Goals: To help students become aware of the limiting factors affecting survival of desert tortoises.

Objectives:

- Students will be able to name something that can cause Desert Tortoises to die.
- Students will be able to name something that can cause an accumulation of stressors that could lead to the death of a desert tortoise.

Third Grade Standards:
Science:

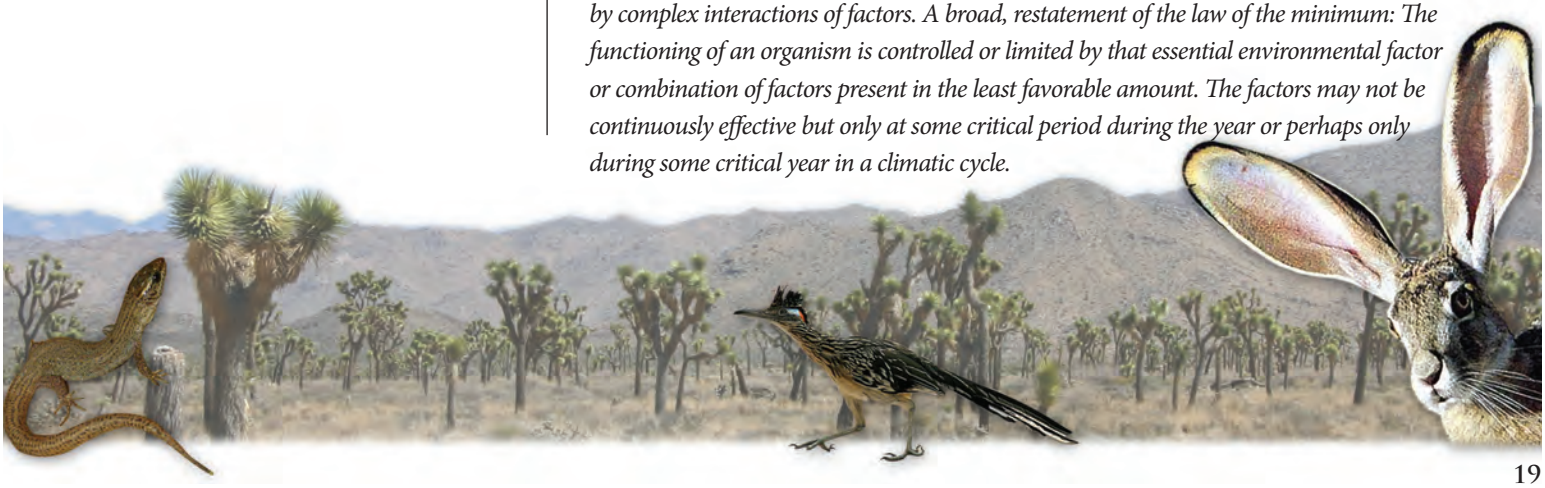
3. Adaptations in physical structure or behavior may improve an organism's chance for survival. As a basis for understanding this concept:
a. Students know plants and animals have structures that serve different functions in growth, survival, and reproduction.
b. Students know examples of diverse life forms in different environments, such as oceans, deserts, tundra, forests, grasslands, and wetlands.
c. Students know living things cause changes in the environment in which they live: some of these changes are detrimental to the organism or other organisms, and some are beneficial.
d. Students know when the environment changes, some plants and animals survive and reproduce; others die or move to new locations.
e. Students know that some kinds of organisms that once lived on Earth have completely disappeared and that some of those resembled others that are alive today.

Fourth Grade Standards:
Science:

3. Living organisms depend on one another and on their environment for survival. As a basis for understanding this concept: a. Students know ecosystems can be characterized by their living and nonliving components.
b. Students know that in any particular environment, some kinds of plants and animals survive well, some survive less well, and some cannot survive at all.
c. Students know many plants depend on animals for pollination and seed dispersal, and animals depend on plants for food and shelter.
d. Students know that most microorganisms do not cause disease and that many are beneficial.

Teacher Reference: *http://www.deserttortoise.org/answeringquestions/chapter1.html*

Liebig's Law of Minimum: *Put forth by German geochemist, Justus von Liebig, in 1840. It can be easy to conceive how a limiting resource (ie. food) controls a process (ie. growth) by running low or running out. However, some biological and ecological processes are controlled by too much of a factor (such as heat) rather than too little. Or, processes may be controlled by complex interactions of factors. A broad, restatement of the law of the minimum: The functioning of an organism is controlled or limited by that essential environmental factor or combination of factors present in the least favorable amount. The factors may not be continuously effective but only at some critical period during the year or perhaps only during some critical year in a climatic cycle.*



Definition:

Limiting Factor

- A factor whose ***absence*** exerts influence upon a population and may be responsible for no growth, limited growth (decline), or rapid growth.
- A factor present in an environment in such ***short supply*** that it limits growth or some other life process.
- A ***requirement*** such a food, cover or territory within a community of related species that is in shortest supply with respect to all resources necessary to sustain life and thus "limits" the size or retards production of a organisms population.
- One factor that ***controls*** a process, such as organism growth or species population size or distribution

Desert tortoise limiting factors include:

(I- intrinsic, E- extrinsic)

Intrinsic – inherent or belonging to **Extrinsic** – not inherent or belonging to

- E - Availability of and to suitable habitat (Space)
  10 to 40 acres territories is common
- E - Availability of suitable food (Food)
- E - Suitable air temperature (spring-fall) limits activity
  10 C (50 F) and 32 C (90 F)
- E - Suitable soil temperature (spring-fall) limits activity
  18 C (64 F) to 48 C (118 F)
- E- Presence of soil suitable for digging burrows (Shelter)
  Under bushes (summer shelters)
  Banks of washes (winter shelters)
- E- Suitable wintering sites (Space & Shelter)
  Low recruitment rate
- I – Health
  Desert tortoises are sensual organisms (physical contact, face to face is common) within their populations; diseases spread quickly
- I -Clutch size
  Low clutch size
- I -Time to maturity
  Take 15-40 years to reach sexual maturity in the wild
- E - Predation (by burrowing and non burrowing species)
- E – Predation (High mortality of eggs and hatchlings up until the age of 5 years)

Teacher Materials Needed:

4 Cones
2 Hula-hoops

Materials in kit:

Identity Cards for Limiting Factors
Clothespins
Ping Pong Balls
Jump Rope
Poker Chips

Activity:

(see map of area to set up the game)

• Review the term habitat, and what the desert tortoise needs in order to survive in a healthy habitat. Use the student-created Tortoise Mobile of Needs.

• Divide the class in half - one group will receive bags with 10 ping pong balls each, the other group will receive a limiting factor card (groups switch after first round).

• Explain the rules

Tortoise Rules:

1. Tortoises (students) must "hatch" and go between the year zones on the hatching side 5 times, collecting one poker chip in each year zone.
2. Then, tortoises (students) may cross over to the 5-year zone.
3. Tortoises (students) spend 5 years in the open desert by running between the year zones on each side, collecting one poker chip in each year zone.
4. Burrow areas are safety zones where limiting factors cannot touch a tortoise, but tortoises (students) can not stay in the burrow more than 2 minutes.
5. If a tortoise (student) is tagged by a limiting factor, he/she must give up 1 ping pong ball.
6. Any tortoise (student) that that loses all 10 balls is dead and becomes part of the housing development.
7. If a tortoise (student) becomes part of the housing development, then he/she must find a place in the playing area and stay there.
8. After 10 years (10 chips) tortoises (students) return to the nesting area to get 5 ping pong balls and one chip.
9. After getting 3 chips, the tortoise (student) has reached maturity and does not return to the nesting area.
10. The game ends when all tortoises are either dead or reach maturity at 40 years.

Limiting Factor Rules:

11. Limiting Factor students cannot tag the same tortoise twice in a row.
12. Limiting Factor students cannot tag tortoises handing a ping pong ball to another Limiting Factor student – students must stay at least 4 steps away from one another

Limiting Factors

Human Factors	**Natural Factors**
Vehicles on Roadways (2)	Ravens (2)
Dogs (1)	Coyotes (2)
Disease (2)	Birds of Prey (1)
Off-road vehicles (1)	Red Harvester Ants (1)
Making Pets of Wild Tortoise (1)	Poachers (1)
Raven from landfill (1)	
Trash/Balloons (1)	

Have students switch roles after one round

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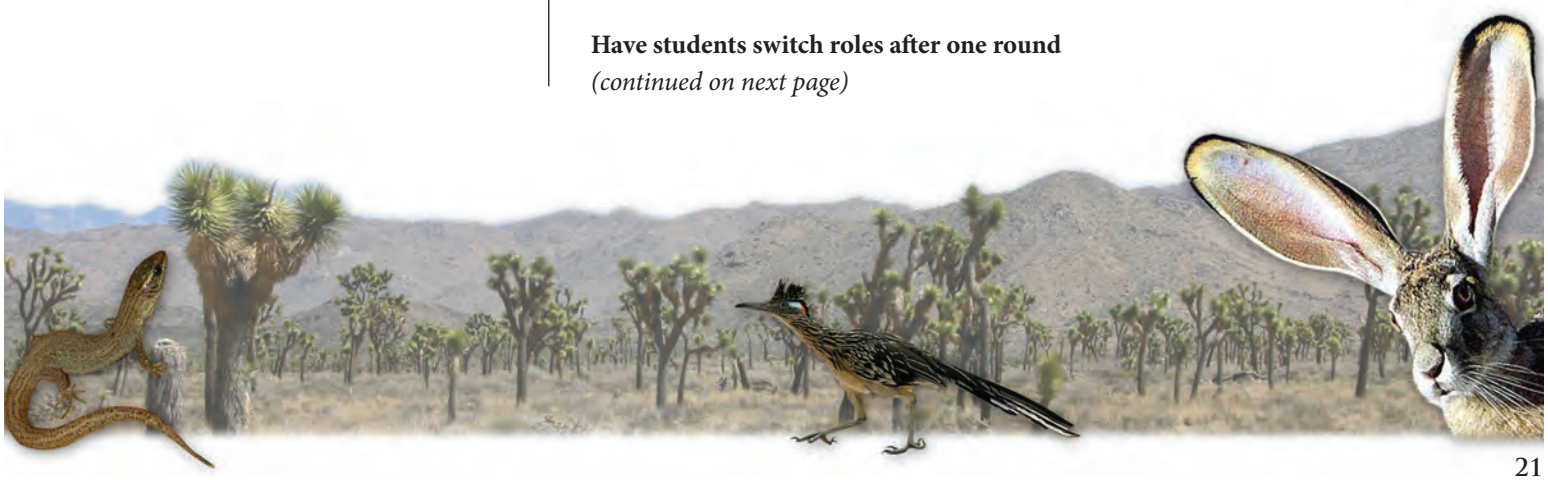
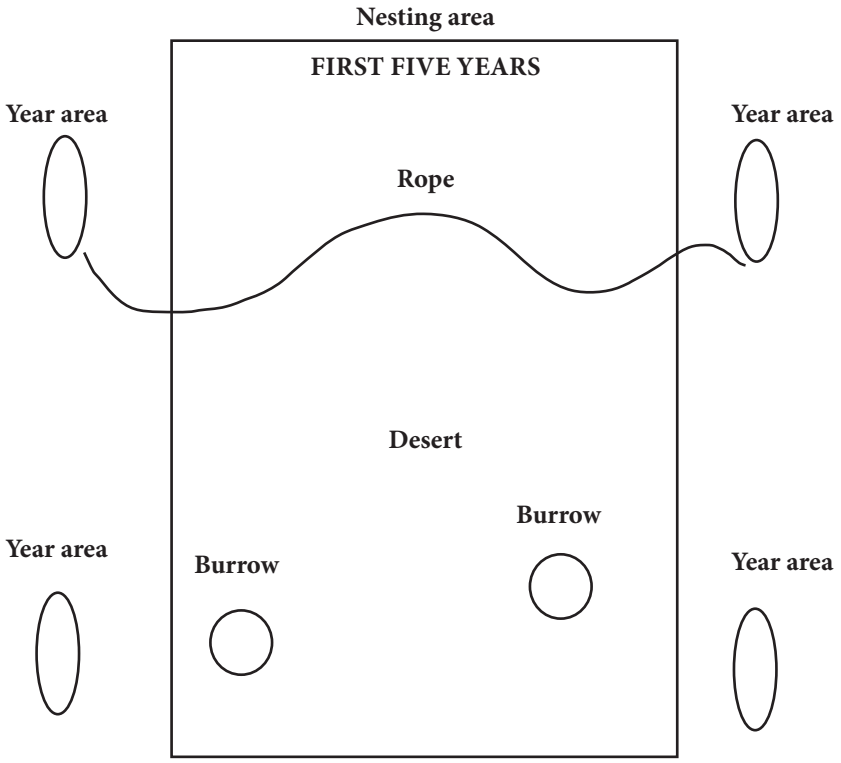


Discussion

1. What did students notice was happening?
2. What would happen if all the tortoises survived? (overpopulation and loss of habitat)
3. Why do tortoises lay so many eggs? (increases odds of species survival)
4. What is the difference between human factors and natural factors?
5. Why do we want to reduce some factors? (to help the species survive)

MAP OF ACTIVITY



Extensions:

Have students research more information on-line about tortoise and other animals.
Have students create a shoebox habitat of a desert animal.

Learn more about Deserts and Desert Animals @:

- *http://www.nps.gov/jotr/nature/animals/reptiles/tortoise/tortoise.html*
- *http://www.girlsfirst.org/members/tortoise.pdf*
- *http://www.joshuatreevillage.com/229/kidst.htm*
- *http://creec.edgateway.net/cs/creec7p/view/creec_res/1095*
- *http://www.sdcoe.k12.ca.us/score/desert/deserttg.html*
- *http://www.lewiscenter.org/users/mhuffine/subprojects/tortoise_terrace/trackingkey.pdf*
- *http://www.uen.org/Lessonplan/preview.cgi?LPid=618*
- *http://www.fws.gov/nevada/desert_tortoise/dt_help.html*
- *http://library.thinkquest.org/26634/desert/introf.htm*
- *http://arthur.k12.il.us/arthurgs/desanim.htm*
- *http://teachers.net/lessons/posts/277.html*
- *http://www.ed.uiuc.edu/YLP/Units/Curriculum_Units/95-96/Desert_SPerri/table_contents.html*

Eco-Blocks - Understanding The Importance Of A Healthy, Cohesive Ecosystem

Theme/Concept: For everything taken out of an ecosystem there is an effect on the system as a whole.

Goals: Students will understand that for an ecosystem to be healthy and cohesive, the organisms within the ecosystem must be present and healthy.

Objectives:

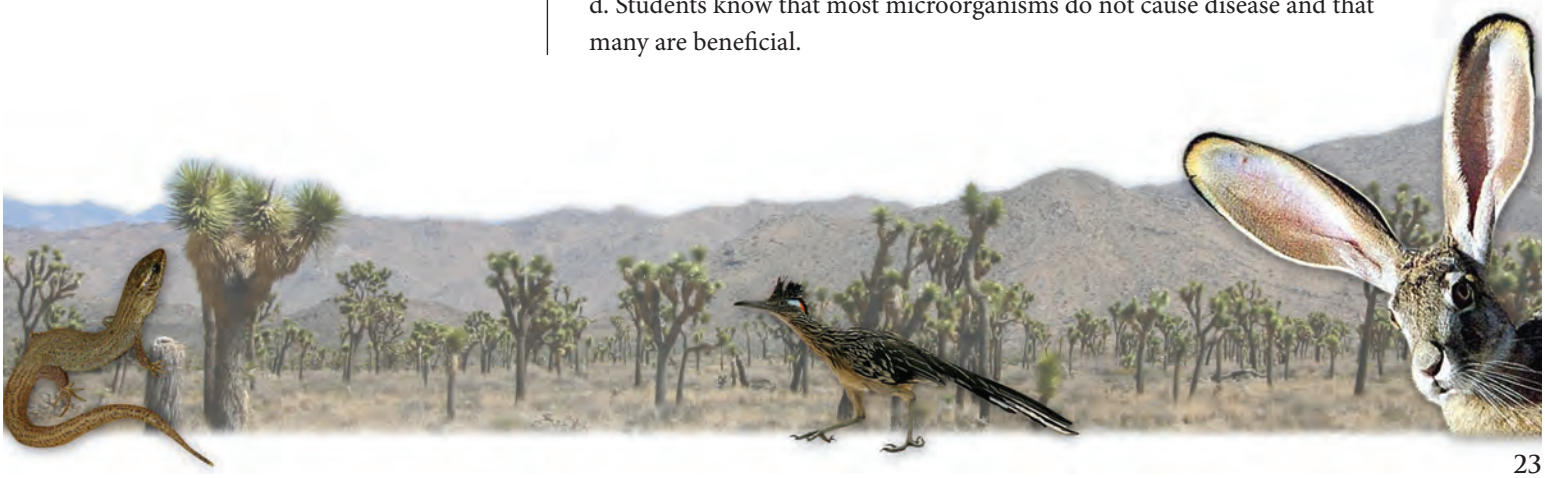
- Students will be able to understand that everything has a place in an ecosystem.
- Students will be able to see that when we remove an organism from an ecosystem, it causes the system to try and balance out until it can no longer do it, eventually causing the ecosystem to collapse or fail in some way.

3rd Grade Science Standards
Life Sciences

3. Adaptations in physical structure or behavior may improve an organism's chance for survival. As a basis for understanding this concept:
a. Students know plants and animals have structures that serve different functions in growth, survival, and reproduction.
b. Students know examples of diverse life forms in different environments, such as oceans, deserts, tundra, forests, grasslands, and wetlands.
c. Students know living things cause changes in the environment in which they live: some of these changes are detrimental to the organism or other organisms, and some are beneficial.
d. Students know when the environment changes, some plants and animals survive and reproduce; others die or move to new locations.
e. Students know that some kinds of organisms that once lived on Earth have completely disappeared and that some of those resembled others that are alive today.

4th Grade Science Standards
Life Sciences

2. All organisms need energy and matter to live and grow. As a basis for understanding this concept: a. Students know plants are the primary source of matter and energy entering most food chains.
b. Students know producers and consumers (herbivores, carnivores, omnivores, and decomposers) are related in food chains and food webs and may compete with each other for resources in an ecosystem.
c. Students know decomposers, including many fungi, insects, and microorganisms, recycle matter from dead plants and animals.
3. Living organisms depend on one another and on their environment for survival. As a basis for understanding this concept:
a. Students know ecosystems can be characterized by their living and nonliving components.
b. Students know that in any particular environment, some kinds of plants and animals survive well, some survive less well, and some cannot survive at all.
c. Students know many plants depend on animals for pollination and seed dispersal, and animals depend on plants for food and shelter.
d. Students know that most microorganisms do not cause disease and that many are beneficial.



Teacher Materials Needed: none

Materials in kit: Blocks set up in a tower, 3 by 3 going opposite ways
Eco Cards

Activity Definitions:

• Explain to students that they will be playing a game called Eco-Blocks, similar to the more popular game, *Jenga.* Set up the block tower. Place the lid on top of tower.
• Pass out one card to each student. Explain to students that they will be come up one at a time to pull a block from the tower, and place it above the lid (no one can take a block from above the lid). When removing a block, each student reads his/her individual card. This card represents something that is being removed from the desert ecosystem. *(Tortoise = animals Rock = non plants/animals, Leaf = plants).*
• Play the game until the tower falls. If all the students have not had a turn, ask them read their cards out loud for the class.
• Ask students for reasons as to why the tower fell. Ask students how important each of the things were to the ecosystem. Did removing just one block cause the tower to fall, or was it caused by removing all the blocks? What did the remaining blocks have to do each time another block was removed? The blocks represent the ecosystem. Everything is connected. If we remove one component from an ecosystem, it impacts other pieces within the ecosystem. The ecosystem attempts to balance every time a piece is removed until it can no longer do so. Eventually the ecosystem becomes unhealthy, fails or collapses in some way.

Definitions:

ecosystem - The combined habitats and communities, as well as their relationship with the air, water, soil, and energy, make up an ecosystem
organism - a living thing that has the ability to act and function independently

Extensions:

Learn more about Ecosystems @
http://www.teachersdomain.org/sci/life/eco/ecosystems/index.html
http://www.blm.gov/education/LearningLandscapes/teachers/ecosystems_desert.html

Pet Tortoise Rock

Theme/Concept: A captive tortoise needs certain things to survive that are different than a wild tortoise.

Goals: Students will reflect on the knowledge they gained while studying the desert tortoise

Objectives:

• Students will be able to list what a wild desert tortoise needs in its habitat.
• Students will be able to list what a captive desert tortoise needs in its habitat.
• Students will compare and contrast the lists of needs developed for the wild desert tortoise and the captive desert tortoise.

3rd Grade Standards
Science:
Life Sciences

3 Adaptations in physical structure or behavior may improve an organism's chance for survival. As a basis for understanding this concept: a. Students know plants and animals have structures that serve different functions in growth, survival, and reproduction.
b. Students know examples of diverse life forms in different environments, such as oceans, deserts, tundra, forests, grasslands, and wetlands.
c. Students know living things cause changes in the environment in which they live: some of these changes are detrimental to the organism or other organisms, and some are beneficial.
d. Students know when the environment changes, some plants and animals survive and reproduce; others die or move to new locations.
e. Students know that some kinds of organisms that once lived on Earth have completely disappeared and that some of those resembled others that are alive today.

Language Arts:
1.0 Listening and Speaking Strategies

Students listen critically and respond appropriately to oral communication. They speak in a manner that guides the listener to understand important ideas by using proper phrasing, pitch, and modulation.
Comprehension
1.1 Retell, paraphrase, and explain what has been said by a speaker.
1.2 Connect and relate prior experiences, insights, and ideas to those of a speaker.
1.3 Respond to questions with appropriate elaboration.
Organization and Delivery of Oral Communication
1.5 Organize ideas chronologically or around major points of information.

4th Grade Science Standards
Science:
Life Sciences

2. All organisms need energy and matter to live and grow. As a basis for understanding this concept:
a.Students knows plants are the primary source of matter and energy entering most food chains.
b. Students know producers and consumers (herbivores, carnivores, omnivores, and decomposers) are related in food chains and food webs and may compete with each other for resources in an ecosystem.
3. Living organisms depend on one another and on their environment for survival. As a basis for understanding this concept:
a. Students know ecosystems can be characterized by their living and nonliving components.
b. Students know that in any particular environment, some kinds of plants and animals survive well, some survive less well, and some cannot survive at all.

Language Arts: Written and Oral English Language Conventions

Students write and speak with a command of standard English conventions appropriate to this grade level.
Sentence Structure
1.1 Use simple and compound sentences in writing and speaking.

1.0 Listening and Speaking Strategies

Students listen critically and respond appropriately to oral communication. They speak in a manner that guides the listener to understand important ideas by using proper phrasing, pitch, and modulation.
Comprehension
1.1 Ask thoughtful questions and respond to relevant questions with appropriate elaboration in oral settings.
1.2 Summarize major ideas and supporting evidence presented in spoken messages and formal presentations.

Teacher Reference materials:

- *http://www.tortoise.org/general/permit.html*
- *http://www.desertmuseum.org/programs/tap_tortcare.html*
- *http://welcome.to/hatchlinghaven*
- *http://www.tortoisegroup.org/howworks.html*
- *http://www.tortoise.org/general/descare.html*
- *http://www.azgfd.gov/w_c/captive_tortoise_care.shtml*
- *http://www.azgfd.gov/pdfs/w_c/tortoise/DTPacket%20Complete.pdf*

Teacher Materials Needed:

Rocks (palm-sized)
Paint (needs to be thick, watercolors will not work)
Brushes
Cups of Water
Paper Towels

Materials in kit:

None

Activity:

- Each student should select a palm sized rock to work with.
- Students will paint the rock to resemble a tortoise.
- Hand out the Adopt-A-Tortoise information.
- Discuss with students what they would need to take care of their captive desert tortoise if the tortoises were real.
- Discuss the difference between pet and wild tortoises.
- Pets need us to take care of them; they need us to provide their food, water, and shelter. We take pets to the veterinarian when they get sick. Pets are used to being handled by humans.

Activity: *(continued)*

• Wild animals can take care of themselves. They find their own food, water, and shelter. We can harm them by trying to help them. We have germs on our hands that don't harm us, but can harm them. They don't go to the veterinarian when they get sick. Handling or getting near a wild animal can scare it and cause it stress that might make it weak or ill.
• Pulling out the chart you created about what students know, what they want to know, and what they learned. Add to the final column – What I Learned. Ask students how each feels about tortoises from what they have learned. This can be a writing/sharing/reflection activity continued in students' journals.

Extensions:

1. To further assess students understanding on the desert tortoise, each can name their pet tortoise rock and write up Brief Facts on a large index card describing his/her tortoises' life in the desert prior to becoming a pet. For example: Weight, Length, Gender, Favorite Food, What desert region he or she lived, Likes/Dislikes of desert life, etc…

OR –

Instead students can write up brief facts describing their pet tortoises' life in captivity. For example: Weight, Length, Gender, Favorite Food, Location, Likes/Dislikes of captive life, Favorite activities to do with owner, etc…)

The teacher can laminate index cards as a keepsake for students to take home with their pet rock tortoise.