

Animals, How Are They Similar?

TEKS: 1.6 A; 5.9C

Content Objective: The students will classify animals based on various characteristics defined by the groups of students working together in groups.

Language Objective: The students will participate in oral discussions about the characteristics that the group uses to place the animals in groups.

Five E Connection: Engagement, Exploration

Materials: (for each group)

magazines with animal pictures	posterboard	glue
scissors	figures of different sizes and colors	

Vocabulary:

classifying	organisms	characteristics
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Process:

- Place students in groups of 3 or 4.
- Explain to students that they will classify and place different objects with similar characteristics in groups (size, color, type).
- Ask:
 - How would you separate these objects into different groups?
 - Why did we separate these objects into different groups?
- Explain to students that separating objects into different groups is called *classifying*.
- Provide students with enough time to classify the objects into different groups.
- Ask students to share how they separated or classified their objects (some will be by shape, color, size, etc.).
- Ask students to draw or cut pictures of animals from magazines. They will need at least 20 pictures per group.
- Ask students to classify the pictures like they classified the objects. Ask students to divide or classify the pictures into at least 4 categories.
- Check students work before it is glued to the posterboard like a conceptual map.
- Ask each group to share their conceptual map with the rest of the class.

Do All Fruits Have Seeds?

TEKS: 1.7 D; 5.4A

Content Objective: The students will describe the life cycle of a fruit.

Language Objective: The students will write about the life cycle in their science notebooks and will report their writing to the class orally.

Five E Connection: Exploration, Explanation

Materials: (for each group)

fruits with and without seeds	pears	oranges
kiwi	bananas	tomatoes
magnifying glass	posterboard	

Vocabulary:

observe	germination	seeds
plants	classification	

Process:

- Place the fruits in a paper bag so that students cannot see them.
- Ask:
 - What is a fruit?
 - What do fruits look like?
 - Where do fruits grow?
 - Where do you find fruits?
- Provide students with enough time to discuss their answers and formulate definitions for what a fruit is.
- Ask students to write their definitions on the posterboard.
- Explain to students that a fruit is the part of the plant that contains seeds.
- Ask students to name fruits that they are familiar with and write them on the board to form a word bank.
- Show students a banana and a kiwi.
- Ask:
 - How are these two fruits alike?
 - Do they have seeds?
- Cut the fruits in half and ask the students to verify if they have seeds or not.
- Explain to students that they will use a magnifying glass to get a better look and see if the fruits have seeds or not.
- Ask:
 - Why do fruits have seeds?
- Show students the other fruits, cut them and count the number of seeds that each fruit has.
- Explain to students that fruits grow because of their seeds.
- Show students a graph of the life cycle of a fruit.
- Read a book that explains the process of the growth of a fruit tree.
- Provide students with enough time to discuss the different stages of the life cycle of a fruit.

- Ask students to draw a picture of the life cycle of a fruit in their journal and share it with the class.

The Tropical Forest

TEKS: 2.2 F; 3.8A; 5.5B; 5.3C

Content Objective: The students will create a model of a tropical forest and observe how it changes.

Language Objective: The students will orally discuss their findings and observations.

Five E Connection: Exploration

Materials: (for the class)

¼ gallon glass jar	small rocks	potting soil
small plants	scientific journal	water

Vocabulary:

plant	forest	humidity
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Process:

- Ask:
 - What can we do with these materials?
- Explain to students that they are going to plant a tropical forest.
- Add an inch of small rocks to the bottom of the large glass jar.
- Cover the rocks with two inches of potting soil.
- Add the plants to create a model of a tropical forest so that students can observe and describe its characteristics.
- Ask one student to water the plants.
- Ask another student to place the cover on the jar and place it by a window to receive the sun's rays.
- Provide students with enough time to discuss their observations and write their observations in their journals.
- After 4 days ask:
 - What did you observe?
 - How is this like a tropical forest? (the plants produce humidity, which returns to the soil just like a tropical forest)
- Ask students to orally discuss their observations and write any questions they have in their journals.

Note: This activity can be done using two jars. One jar will remain with the lid on while the other will have the lid off. The students will observe what happens in each jar for two weeks.

Comparing Leaves

TEKS: 2.5 B; 5.4A; 5.2B; 2.9A

Content Objective: The students will examine and describe leaves with a magnifying glass.

Language Objective: The students will orally discuss their observations and record them in their science notebooks.

Five E Connection: Engagement, Exploration

Materials: (for each group)

leaves of different sizes, shape and color	glue	a magnifying glass
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Vocabulary:

plants	leaves	veins
stem	classify	order
characteristics	patterns	

Process:

Ask students to look for leaves in their backyards, on the way to school or around their neighborhoods and bring them to school (you should also have several examples in the classroom.)

Place students in groups of 3 or 4 and ask them to examine the leaves that they brought to class.

Ask:

- What did you observe in the leaves?
- How are they different and alike?
- Provide students with enough time to discuss their observations and write their observations in their journals.

Ask students to observe the leaves again but this time they are going to use a scientific instrument, a magnifying glass, and are going to write down any other characteristics that they observe in their journal.

Ask:

- What do you see? (veins and stems that help transport water, the leaves have a shape, colors, and different sizes; some leaves are triangular in shape, others have the shape of needles, or fans, or ovals or tears; some leaves are wide, others are skinny, small, pointed like, and others are rounded; leaves have patterns)

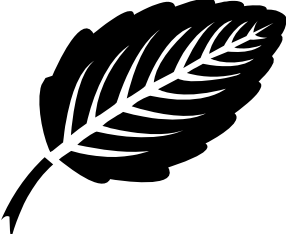


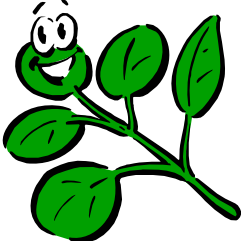

Ask students to classify and order the leaves based on one of the characteristics mentioned above.

Provide students with enough time to discuss their comparisons orally.

Ask students to make a chart where they will collect information on the characteristics of the different leaves.

Note: Use the leaves in an art project. For example, students can make a picture using the patterns of some of the leaves; they can decorate a picture frame using the leaves or make a mobil.

Comparing Leaves

<i>Leaf</i>	<i>Shape</i>	<i>Color</i>	<i>Size</i>
			
			
			
			
			

Does Wax Protect?

TEKS: 2.6 C; 2.9A; 5.9A; 5.2B; 5.3C

Content Objective: The students will compare coverings on sponges full of water to understand the unique characteristics to leaves in the desert ecosystem.

Language Objective: The students will engage in dialogue using the following vocabulary terms: retain, exterior, and interior.

Five E Connection: Engagement, Exploration, Explanation

Materials: (for each group)

2 leaves (cactus)	2 sponges, same size	a container with water
1 foot of wax paper	newspaper	scissors
Scotch tape	2 sheets of construction paper	

Vocabulary:

wax paper	retain	water
plant	exterior	interior

Process:

- Ask:
 - What types of plants exist in the desert?
 - How do plants survive in the desert?
- Place students in groups of 4 or 5 and pass out the materials.
- Ask students to cut open the leaves with the scissors and observe what is inside.
- Write the students' answers on a concept map.
- Ask:
 - How does the exterior of the leaf feel?
 - How does the interior of the leaf feel?
 - Why do you think that the leaves are so thick?
 - How does the thickness of the leaves help the plant survive in the desert?
- Explain to students that they will conduct an experiment to simulate the leaves.
- Ask students to wet the sponges and to squeeze the water out.
- Ask students to wrap one sponge with the wax paper and the other sponge with newspaper, and leave one of the sides open (students may use tape to keep the other side closed).
- Ask students to put their name on the two pieces of construction paper, and then place the sponge covered with wax paper on one and the sponge covered in newspaper on the other.
- Ask students to place the papers in an out-of-the-way place for two days.
- After 2 days ask students to check the sponges, and ask:
 - Are both sponges moist?
 - How do they compare?
 - Why do you think that the sponge wrapped in wax paper is moister?
- Explain to students that through this experiment they can know understand why the wax like texture of the leaves helps the plant survive in the desert.
- Provide students with enough time to discuss their observations and write them in their journals.

Classification of Animals

TEKS: 2.9 A

Content Objective: The students will classify vertebrate animals.

Language Objective: The students will read and write about mammals, amphibians, birds, fish, and reptiles.

Five E Connection: Explanation, Elaboration

Materials: (for each group)

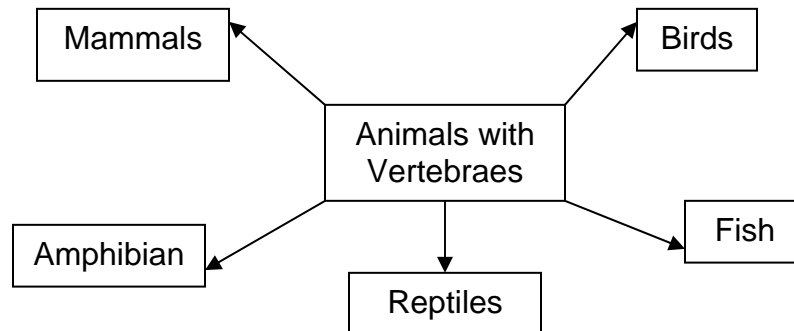
informative books about animals (mammals, birds, fish, amphibians and reptiles)	<i>Animal Characteristics</i> sheet	information cards
large paper	markers	scissors
glue		

Vocabulary:

mammals	birds	reptiles
amphibians	fish	characteristics
classify	vertebraes	

Process:

- Ask the following questions and write student responses on the board:
 - What types of animals have you read about?
 - What special characteristics do these animals have?
 - How can we classify these animals?
- Provide students with enough time to discuss their responses.
- Explain to students that scientists have classified animals with vertebrae into 5 groups based on their characteristics (mammals, birds, fish, amphibians, and reptiles).
- Write the name of each group on the board and ask:
 - Are you familiar with these terms?
 - Can you give me an example of each type of animal?
- Write student responses on the board.
- Provide students with a copy of the “*Animal Information Cards*” and review the information with the students.
- Ask students to make an animal concept map by cutting out the characteristics found in the handout “*Animal Characteristics*” and gluing them next to the correct animal group in their journal, they can also include a drawing.



Animal Information Cards



Mammals

Mammals are warm blooded animals, which means that they can maintain their body temperature even if the temperature in the environment changes. Most of these animals are land animals, but there are some that are water animals.

All mammals have hair or fur, even though some may have very little. All mammals have lungs and breathe air. Most mammals have live babies, and are the only animals that produce milk to feed their babies.

Some examples are deer, mice, monkeys, dolphins, whales, racoons and elephants. Humans are also mammals. Can you give examples of other mammals?



Reptiles

Reptiles are cold blooded animals, which means that their body temperature changes when the temperature in the environment changes. Reptiles lay eggs and the shells are hard, strong, and leather like.

Reptiles are covered in hard, dry and rough scales. They breathe through lungs. Most are land animals, even though some spend many hours in the water. Some have legs while others, like snakes, do not. Some examples are lizzards, turtles, and snakes. Can you give examples of other reptiles?

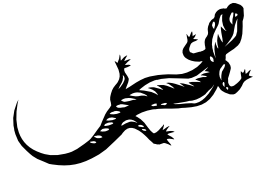




Amphibians

Amphibians are cold blooded animals, which means that their body temperature changes when the temperature in the environment changes. Amphibians lay eggs that are covered with a gel-like substance.

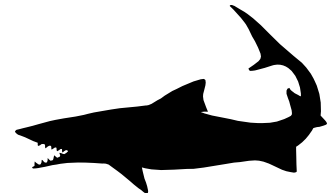
All amphibians are born in the water and breathe through gills. With time they grow lungs and can live on land. Most amphibians have soft and moist skin. Some examples are toads, frogs, and salamanders. Be careful not to confuse an amphibian with a reptile!

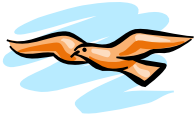


Fish

Fish have fins and live in water, and breathe through gills. Fish are cold blooded animals, which means that their body temperature changes when the temperature in the environment changes.

They have hard and strong scales all over their bodies that serve as protection. Their shape helps them move easily through water. Most lay gel-like eggs, but some have babies like mammals. Some examples are trout, barracuda, and tuna. Can you give examples of other fish?





Birds

Birds are warm blooded animals, which means that they can maintain their body temperature even if the temperature in the environment changes. They lay eggs and are the only animals that have feathers. All birds have wings and most can fly. Birds have strong and hard bones yet they are light. Many of the birds that spend a lot of time in the water have webbed feet to help them swim better and faster.

Some examples are penguins, ducks, nightingales, sparrows, and crows. Can you give examples of other birds?



Animal Characteristics

Warm blooded	Breathe through gills
Warm blooded	Breathe through lungs
Cold blooded	Lay gel-like eggs
Breathe through lungs	They first have gills, later they develop lungs
Lay leather-like shell eggs	Lay gel-like eggs
Lay hard shell eggs	Have babies
Produce milk for their young	Have feathers
Have hair or furr	Have soft and moist skin
Have strong and hard scales	Most have legs
Always live in the water	Most have legs
Most have legs	Have hard, strong, dry and rough scales
Have strong bones, but light	Have wings
Breathe through lungs	Most can fly
Cold blooded	Cold blooded
Lay eggs	Some species have webbed feet

What is Inside a Seed?

TEKS: 3.2 B; 5.2 ABCDE; 5.4A; 5.6C

Content Objective: The students will observe the growth of a seed into a plant.

Language Objective: The students will record their observations in their science notebooks.

Five E Connection: Exploration

Materials: (for each student)

beans	water	magnifying glass
clear plastic cup	scientific journal	
books about seeds and plants	markers	construction paper

Vocabulary:

seeds	coat	embryo
root	germinate	

Process:

- Explain to students that they will plant a seed and watch it grow in order to learn about the parts of a plant.
- Show students a bean, place it in a plastic cup and add water.
- Ask:
 - What do you think is inside a seed?
 - What do you think will happen to the seed now that we have added water to it?
- Provide students with enough time to discuss their responses.
- Ask students to place their seed in the cups and add water.
- After an hour ask students to use the magnifying glass to observe the changes in the seed.
- Ask:
 - What happened to the seed?
 - What can you conclude about what happened to the seed?
- Provide students with enough time to discuss their observations and write them in their journals.
- Ask:
 - What else would you like to learn about seeds?
- Write students responses on chart paper (this way the theme will be developed according to the students interest).
- Inform students that seeds have different parts that can be seen when the seed is germinating.
- Remove the seeds outer coat and identify the embryo.
- Explain to students that the part of the seed that grows from the inside is called the root.
- Ask students to make a drawing of the parts of a seed and label them in their journal.



- Ask students to observe the seed and its growth for two weeks (10 days) and record their observations in their journals.

What is an Ecosystem?

TEKS: 3.8 A

Content Objective: Students will learn about the interdependent nature of an ecosystem.

Language Objective: The students will observe animals in their ecosystem and record their findings in their science notebooks.

Five E Connection: Exploration

Materials: (for each student)

scientific journal	pencil	
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Vocabulary:

ecosystems	organisms	habitat
interact	interdependence	

Process:

- Explain to students that in this activity they will observe and describe the habitat of organism within an ecosystem.
- Write the words ecosystem and habitat on the board.
- Explain to students that an ecosystem is where beings and things live together under one environment.
- Ask students to write the word ecosystem on a page in their journal and the word habitat on another page in their journal.
- Ask:
 - Are you familiar with an ecosystem? (a forest, a beach, a desert)
- Write the names of the ecosystems that the students mention on the board.
- Explain to students that in a habitat all the animals and plants live together.
- Ask:
 - Have you ever seen a habitat? (such as the students backyard, or a puddle of water)
- Ask students to think of the school yard and football field as examples of ecosystems.
- Ask:
 - Do you think that the school yard and football field can be an ecosystem for different animals and plants?
 - What organisms live in this area? (spiders, butterflies, birds)
- Ask students to make two columns in the under the word ecosystem in their journals and label them school yard and football field.
- Explain to students that half of the class is going to investigate the ecosystem of a school yard and the other half will investigate the ecosystem of a football field.
- Ask students to go outside and research data about their ecosystem.
- Explain to students that when they find an organism in their ecosystem, they should write its name and make a drawing in their journal.
- Explain to students that when they are finished collecting scientific data, they are to return to class and choose one of the organisms that they found in their ecosystem.
- Give students an example (a spider, which has its habitat in a tree or a swing, can survive in this ecosystem).

- Ask:
 - Who will eat the spider? (the students need to understand that a spider interacts with its habitat and eats small insects)
 - How do spiders help us?
- Explain to students that a spider lives in an ecosystem and is connected to the insects it eats, and with us humans.
- Explain to students that spiders help us in that they eat the mosquitoes that bite us when we are outside.
- Review the interdependent cycle of the organisms in an ecosystem.
- Provide students with enough time to think and make notes about the organisms in their ecosystem.
- Ask students to present their findings to the class.

What is an Ecosystem?



Name _____

Name of ecosystem _____

What kind of animals live in your ecosystem, herbivores or carnivores? _____

Describe the plants in your ecosystem _____

Name 3 animals that live in your ecosystem:

1. _____

2. _____

3. _____

Draw your ecosystem.

The Food Chain

TEKS: 3.8 B; 5.3C

Content Objective: The students will create a model of a food chain.

Language Objective: The students will record their understanding of the food chain in their science notebooks and will engage in oral discussion about the food chain.

Five E Connection: Exploration, Explanation

Materials: (for each group)

white paper	safety pins	yarn or string
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Vocabulary:

carnivores	herbivores	ecosystem
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Process:

- Cut the yarn in pieces that are 2 to 3 feet long for each group.
- Explain to students that each group will form a food chain.
- Explain to students that the plants and animals need food to survive. When they eat each other they begin to form a food chain.
- Draw an example of a food chain on the board.
- Ask students to choose different names of animals or names of plants of an ecosystem and write them in their journals.
- Explain to students that they are going to begin to design the food chain for their ecosystem.
- Ask one student to represent the sun while the other students represent the animals and plants.
- Give each student a piece of white paper and ask them to draw their animal or plant.
- Use the safety pins to secure the pictures on the students.
- Give each student one piece of yarn, and give three pieces to the student that will represent the sun.
- Explain to students that the students that represent plants need to take hold of the yarn from the sun. The students that represent the herbivores need to take hold of the yarn from the students that represent the plants, and the students that represent the carnivores should take hold of the yarn from the students that represent the animal that they would eat.
- Ask:
 - What is the most important part of this food chain? (the sun, because it is the source of energy)
- Provide students with enough time to explain their food chain (how it works, what it has, and what happens).
- Ask students to draw their food chain in their journal.
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What an Instinct!

TEKS: 3.8 C

Content Objective: The students will learn how salmon travel up streams to spawn and die in order to better understand how environmental changes can cause them to thrive, become ill, or perish.

Language Objective: The students will write a summary of their salmon experience in their science notebooks.

Five E Connection: Exploration, Explanation

Materials: (for each group)

a card with the word salmon	two disposable cups	a different smell for each group (vanilla, mint, orange, lemon, anis, cinnamon)
paper towels	cards with numbers (to eliminate the salmon card)	scientific journal
adhesive tape	index cards (3X5)	

Vocabulario:

instincts	salmon	sense of smell
survive	difficulties	stream

Process:

- Explain to students that in this activity they will learn to describe the environmental changes in which some organisms will thrive, become ill, or perish.
- Prepare the material that will represent the streams ahead of time. Soak a paper towel with one of the smells. Place the paper towel in one of the cups and place the other cup inverted on top, and tape the two cups together.
- Consult a map to locate where salmon can be found, and write the names of several local streams on the index cards. Place each card under a cup. Each cup will represent a stream.
- Explain to students that they will begin this activity by studying the habits of salmon (how it is born, how it migrates and goes back to the place where it was born to die).
- Ask:
 - How do you think that the salmon can return to the same stream where it was born?
 - What dangers does he face in his journey?
- Explain to students that for their investigation they will use their sense of smell to help the salmon return to the stream where it was born.
- Explain to students that they will imitate the life of a salmon.
- Place students in groups of 3 and explain that each member of the group will represent one part of a salmon's journey, from when it is born until it dies.
- Distribute the materials to each group.
- Explain to students that each group should have one student that will represent the salmon, one student that will represent the dangers of the salmon's journey, and a third student that will help the salmon find its' stream using his sense of smell.

- Ask the students that represent the streams to take the cup (the stream) and place it close to the nose of the student that represents the salmon, so that he can smell his stream and recognize it in the future.

- Ask the students that represent the salmons to leave the classroom for 3 minutes while the students that represent the streams place the cups in different places. Place some of the streams at different heights to represent the difficulties that the salmon encounters in their journey.
- Give each student a card with the number 1, 2 or 3 written on it, to represent the danger.
- Ask the salmons to return to class.
- Explain to students that they will begin the migration of the salmon.
- Explain to students that the student that represents the salmon cannot touch the stream, they can only smell it. The salmon need to go to different parts of the classroom to find their stream.
- After 3 minutes, ask the students with the danger index cards to take out the number of salmon that their cards indicate (1, 2 or 3). These salmon are now eliminated and return to their desk.
- Ask:
 - What kind of danger can salmon encounter?
- Provide students with enough time to answer.
- Explain to students that the salmon that are left will continue on their quest to find their stream. If the stream is out of their reach (placed to high), the salmon is then eliminated.
- Continue with the activity until the surviving salmons have found their streams.
- Ask:
 - Was it easy or hard for the salmon to find their streams?
 - Why don't all salmon reach their destination?
 - Would it be difficult for you to find your house using only your sense of smell? Why?
- Ask students to write a summary of the activity in their journals.

Froggy, Froggy

TEKS: 4.6A

Content Objective: The students will learn about the life cycle of a frog.

Language Objective: The students will record their understanding of each stage of the frog's life cycle in their flip books.

Five E Connection: Exploration, Explanation

Materials: (for each student)

informative books about frogs	a pencil	3 sheets of construction paper
markers	crayons	stapler

Vocabulary:

metamorphosis	frog	tadpole
back legs	eggs	gills
life cycle		

Process:

- Explain to students that in this activity they will describe how living organisms modify their physical environment to satisfy their needs.
- Ask:
 - How is a frog born?
 - Where are frogs born?
- Review the life cycle of a frog (use illustrations from books, the internet).
- Write the stages of the life cycle of the frog on chart paper so that students can copy them in their journals.
- Give each student 3 sheets of construction paper for them to make a flip book about a frog's metamorphosis.
- Remind students to include all 4 stages. Students will use one layer of the flip book to write information about each stage. Students will be able to use books as well as the internet to gather data about the stages of the life cycle of a frog.
- Encourage students to include illustrations in their flip book.
- Provide students with opportunities to share their book with the class.

<i>Life Cycle of a Frog</i>
<i>Egg</i>
<i>Tadpole</i>

The Desert

TEKS: 3.9 A

Content Objective: The students will conduct an investigation to find the factors that affect desert animals.

Language Objective: The students will orally discuss the factors in group discussions.

Five E Connection: Exploration, Explanation

Materials: (for the class)

a sunny place	a rope	a ruler
paper towel	2 thermometers	sticks
a watch		

Vocabulary:

thermometer	desert	adaptation
haunt		

Process:

- Explain to students that they will conduct an investigation to find the factors that affect desert animals.
- Pick two sunny places around the school where students can dig. Using a rope, have each student mark off two 2x2 foot squares.
- Ask students to write in their journals the temperatures of the two squares before they start the experiment.
- Ask students to dig a 4 or 5 inch hole in the middle of the square. Place a thermometer in the center of the hole and cover it completely with dirt. Mark the place with a stick (write the #1 on the stick).
- Place the other thermometer on the surface of the dirt, next to the hole with the other thermometer and mark that spot with another stick (write the #2 on the stick).
- Leave the thermometers there for an hour.
- Ask students to return after an hour and read and write down the new temperatures on both thermometers.
- Ask students to return a second time after another hour and read and write down the new temperatures on both thermometers.
- Ask students to return a third time after another hour and read and write down the new temperatures on both thermometers.
- Ask students to touch the dirt and compare the temperature of the surface with the temperature inside the hole.
- Explain to students that in the next few days they will repeat this investigation in different surfaces such as boxes of sands or mound of humus.
- Ask students to make a graph with the data they accumulated and include their thoughts about what they found.
- Help students see what it means for animals to live in the desert. Take students to the library to read and gather information about desert animals and how they survive living there.

- Ask:
 - What did you learn with this experiment?
 - Why is the temperature in the hole lower than the temperature on the surface?
 - How does this relate to life in the desert?
 - How do you think the temperature affects the animals in the desert?
- Provide students with enough time to discuss their responses.
- Explain to students that many insects, reptiles and mammals that live in the desert, like a species of squirrel, scorpions, foxes, and rattle snakes. These animals burrow in their underground haunts during the hottest time of the day. There they remain cool and come back out when the temperature goes down, early in the morning or at night.

Getting Dressed to Go to...

TEKS: 3.9 B

Content Objective: The students will identify household items that they would take with them if they were to visit the desert in order to better understand how animals must also adapt to the environment in which they live.

Language Objective: The students will engage in oral discussions regarding the need for particular items from home in order to survive and/or be comfortable in the desert.

Five E Connection: Engagement

Materials: (for the class)

boots	umbrella	jacket
hat	water	cell phone
sun glasses	sunscreen	

Vocabulary: The vocabulary will vary depending on the ecosystem that is being studied.

Process:

- Review with students the concept of an ecosystem.
- Before starting this activity choose an ecosystem and find things that are related to that ecosystem. The following is associated with the desert.
- Ask students to try to find things around their homes that could be used to survive in the desert such as clothes, equipment, water flasks, plants that secrete liquid, construction material, paper, poster board, and digging tools.
- Explain to students that they will be asking questions to the students who bring objects from home.
- Explain to students that they are going on a trip to the desert to begin an investigation.
- Ask students to think about the reasons they chose the objects they brought to class.
- Explain to students that they will be able to ask questions to the person that brought the objects. Ask:
 - Why do you use boots to go to the desert? (to protect myself from animals and plants)
 - Why do you carry an umbrella? (because of sudden showers)
 - Why do you carry water? (because the desert is extremely dry)
 - Why do you wear a hat and sun glasses? (to protect myself from the sun)
- Provide students with enough time to ask questions as long as they are discovering the characteristics of the desert and the adaptations that are required to live in this ecosystem.
- Ask students to write their thoughts about the questions and answers that they found most interesting.

Hot-Cold

TEKS: 5.9A

Content Objective: The students will describe with how the body responds/adapts to change in the environment.

Language Objective: The students will record their observations in their science notebook.

Five E Connection: Engagement, Exploration

Materials: (for each student)

3 containers	water	ice
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Vocabulary:

structure	system	process
sense of touch	nervous system	

Process:

- Place hot water in one of the containers, cold water in another, and water at room temperature in the last container.
- Show students the containers with hot water and cold water.
- Ask:
 - Can you tell which container has the cold water and which one has the hot water just by looking at it? (you cannot tell just by looking at it)
 - How could you find the difference in temperature in the two containers? (by touching them)
- Provide students with enough time to respond.
- Ask students to touch the hot water with one finger and the cold water with another.
- Ask:
 - How did your brain help you distinguish the temperatures? (the hand sent a message to the brain through our nervous system)
- Provide students with enough time to respond.
- Show students the container with the water at room temperature (do not tell them the temperature of the water) and tell them that the temperature in the container is between hot and cold.
- Ask students to place their hand in the container with cold water and the right hand in the container with hot water for 3 minutes.
- Ask students to take their hands out of the hot and cold containers and place them in the container with the warm water.
- Ask:
 - Does the third container have cold or hot water? (the hand that was in the hot water will feel that the water is cold, but the hand that was in the cold water will feel that the water is hot)
 - Why did the brain receive erroneous information? (because the nerves in the hands that were in the cold and hot water were more sensitive)
 - Have you ever had a similar experience?
- Ask students to write their observations regarding this experiment in their journals.

The Spotted Moth

TEKS: 5.9 B

Content Objective: The students will create moths that cannot be detected in an environment.

Language: The students will read about the Spotted Moth and discuss its means for survival in its environment through adaptations.

Five E Connection: Explanation; Elaboration, Evaluation

Materials: (for each student)

drawing of a moth	color pencils	markers
crayons	scissors	chronometer
scientific journal		

Vocabulary:

adaptation	survive	organism
predators	prey	

Process:

- Ask:
- How do animals survive in the environment environment? (using their sense of smell, hearing, touch, sight, and taste)
- How do animals move? (they run, crawl, slide, climb)
- How do animals defend themselves? (they have claws, venom, quills)
- How do animals hide from their enemies? (they camouflaged themselves, they stay still like they were frozen, they burrow)
- Explain to students that an adaptation is the change that a species makes to better survive in its environment.
- Show students a photo of an animal, and ask them to observe how this animal defends itself, eats, and hides.
- Show students a second photograph and ask them to make the same observations.
- Place students in groups of 3 or 4.
- Give each group two pictures of 2 different animals.
- Ask students to answer the following questions about their animals in their journals:
- How do your animals adapt to eat?
- How does it defend itself from its enemies?
- How does it hide?
- Do your two animals have something in common? What is it?
- What are some differences?
- Provide students with enough time to share their answers with the class.
- Read the story “The Spotted Moth.”
- Ask:
- Why did the moth change so many times?
- How did she start changing to adapt?
- Did the changes help her?
- Ask students to write the main idea of the story in their journals.
- Ask:

- Why do you think that we read this story in science class?
- Provide students with enough time to respond.
- Give each group a copy of the sheet with the drawings of the moth.
- Explain to students that they will hide the moth in the classroom for the rest of the students to find. If they find it, that means that the moth did not survive. If no one finds it that means that it survived. This activity represents the life cycle of a moth and the way an organism adapts to survive.
- Explain to students that they need to make sure that the other groups cannot see their moth (ask each group to work in a different corner).
- Take students outside while one student from each groups take turns going back to the classroom to hide their moth.
- Once all the moths have been hidden, take the students back to the classroom and start searching for the moths.
- Give students 2 minutes to find the moths. After 2 minutes stop the search and declare the moths taht have not been found as the survivors. Keep track of the time it took for students to find the moths, as well as the number of moths that survived and the number that died (the ones that were found).
- Ask:
 - As students, who did you represent?
 - What was the moth?
 - Who were the ones that survived?
- Provide students with enough time to respond.
- Remind students that an adaptation is a change that a species makes to better survive in its environment.

The Spotted Moth

This story of the spotted moth began a long time ago in Manchester, England. Two types of moths lived there. One was light gray with dark spots. The other was black all over. Until 1850, there were more gray moths than black ones.

They loved to rest on the bark of the birch trees. The color of the gray moth was almost the same color as the bark of the birch trees. This made it difficult for the hungry birds to find them. But the birds would eat the black moths because they were easier to find because of the contrast that they made with the tree bark.

Between 1850 and 1900, England began to change. They began to build factories that contaminated the air with dark smoke (soot). The leaves and the trees bark were covered in soot. During this time, scientist realized that the gray moths had disappeared. The black moths became the most common moths in England. What caused this change?

Scientist realized that the gray moths easily disappeared in the tree bark. Now the trees were black covered in soot. It was easier for the hungry birds to notice them resting on the trees because of the contrast in colors. On the other hand, the black moths were almost the same color as the tree bark.

Less and less gray moths lived long enough to have babies of the same color. But at the same time more black moths were having babies. In less than 50 years, the number of black moths increased and it was larger than the number of gray moths.

But the story of the spotted moth did not end there. After many years laws were passed to clean the contamination that existed in England. The factories were not able to pollute the air. Gradually, the rain cleaned the soot on the trees. What do you think happened to the number of gray and black moths?

Just like you probably guessed, the spotted moth adapted to its new environment. The gray moths began to survive because the birds could not detect them so easily. Now, once again, the gray moth is more numerous than the black moths.