Insect - Who Lives in the Desert?

Objective:

Students will demonstrate an understanding of the characteristics of living things, their structure, function and life cycle. Students will identify some insects/spiders that exist in the local environment.

Grades: 1 - 2

Key Vocabulary:

- **Evaporation**
- **Conserve**
- **Arachnid**
- **Segment**
- **Predator**
- **Carnivores**

Related Literature:

Science Kids Insects
Barbara Taylor

Children's Guide to Insects and Spiders
Simon & Schuster

Bug Faces
Darlyne A. Murawski

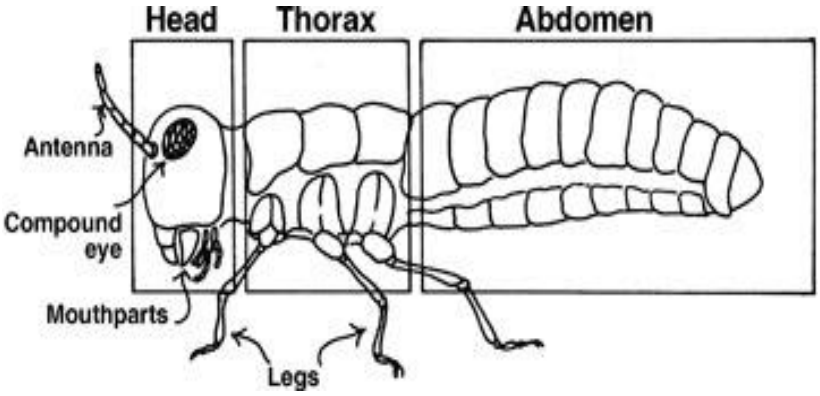
Performance Objectives:

Grade 1: Strand 4: Concept 1 PO1, 2, 3
Concept 3 PO1, 2, 3
NGSS 1-LS1. A; LS1. B; LS3. B
Grade 2: Strand 4: Concept 2 PO1
NGSS 2-LS4. D
CCSS 1.W. 2; 1.W. 3; 1.W. 5

Background Information:

Life in the desert can be a challenge for people and other living creatures. So, what is a desert? A desert can be a hot, arid place with little water. It can be a dry region covered with sand dunes and cacti. The desert of Arizona has all of those characteristics and even more. Scientists say a desert is a place where more water would be lost through **evaporation** than is gained from rain. This means that deserts are dry places, but they may not always be hot. The Arizona desert is cool in the winter months and can reach hot temperatures of over 110 degrees in the middle of the summer. Even with cool temperatures, the desert is always a dry place. Most deserts receive less than 10 inches of rain in an entire year. Arizona is one of those dry deserts with very little rain.

Creatures living in the desert have ways to **conserve** water in their bodies and to locate more as they need it. Desert animals have had to develop ways to cool themselves and find shelter from the hottest part of the day. There are many types of animals and insects that have found a way to live in the desert regions of the world. Arizona is the desert home for many insects that flourish in the dry desert. An insect is scientifically classified by specific characteristics. For example, all insects have three body parts: the head, the thorax and the abdomen.



The head contains the mouth, the eyes, the antennae and the brain. The thorax is the middle of the body and is used to help the insect move. The legs and wings (if there are wings) are attached to the thorax. The abdomen is usually the largest part of the insect and contains the internal organs. Insects have an exoskeleton, which is made of a hard substance called chitin, on the outside of their body. The hard outer skeleton helps protect and support the insect's body. Insects also have six jointed legs and a claw at the end that is used for moving, climbing and carrying food. Some of the insects found in the Arizona desert are ants, bees, grasshoppers, termites and cicadas. (See "Label the Insect" handout.)

All insects lay eggs. Some insects go through a complete **metamorphosis** during their life cycle. There are four stages to the life cycle beginning with the egg. Soon after the egg is laid, it will hatch into a larva stage. The larva grows and sheds its skin several times. After reaching a certain size, the larva then becomes a pupa inside a small cocoon. The greatest metamorphosis takes place in the cocoon, and the adult insect emerges to take its place in the insect world.

Deserts are also the home for different types of **arachnids**, commonly known as spiders. Spiders have two body parts and eight legs. The first **segment** of the spider is called the **Cephalothorax**. This part is like the head of the spider and has two short feelers called "palps." The palps help the spider eat and sense the environment. The eyes, mouth fangs, brain, stomach and glands to make poison are

in the first segment of the spider. The second segment is the abdomen of the spider. The back end of this segment is where the spider produces the silk to spin a web.

The Arizona desert is home to many types of arachnids. One of the largest of those arachnids is the tarantula. Tarantulas like to live in warm areas and have a very long life span. Some tarantulas live in underground burrows and others live on the ground. When a tarantula finds a suitable place for a home, it will use its silk to line the opening and walls of the burrow. This behavior may help protect them and their eggs from **predators**. Desert tarantulas have an exoskeleton that sheds at times when the tarantula grows. The hairy legs of the tarantula make it look large and fierce. Most tarantulas eat insects, beetles, grasshoppers and other small creatures on the desert floor. They are called **carnivores**.

The life cycle of the tarantula begins with the female laying her eggs. She may lay up to 1,000 eggs in an egg sac and guard them over the six weeks until they hatch. Once the eggs hatch, the young spiders live in the nest for a few days. The young tarantulas that survive emerge from the nest and enter the desert world.

(photo by Adriane Grimaldi)

Another common arachnid in the Arizona desert is the scorpion. Scorpions are related to spiders and are not insects. Scientists believe that scorpions have been on earth for millions of years. There are many different species of scorpions, and they can live in deserts, rain forests, mountains, grasslands and even by the seashore. Scorpions adapt to their environment and are able to climb up surfaces, crawl under rocks and move around very quickly.

Scorpions have a pair of claws at the front of their body and a stinger at the end of their tail. Scorpions have a paralyzing sting when injected into its prey. Scorpions have eight legs and a tiny claw at the end of each leg. They have an exoskeleton that protects their body. Most of the scorpions living in the Arizona desert are light tan in color and are called “bark scorpions.”

Scorpions give birth to live young who are carried on the mother's back until they are large enough to be on their own. Scorpions are carnivores, which mean that they are "meat eaters" with a diet mainly of small insects. Scorpions can go a long period of time without eating and can live as long as 25 years.

Scorpions are different from tarantulas though they belong to the same scientific class, arachnids. A scorpion's body has three segments, the head (cephalothorax), the abdomen and the tail. The head includes the mouth, eyes, and the front claws. These claws are used to help catch and hold its prey. The abdomen segment contains all eight legs and other internal organs. The five-segmented tail of the scorpion has the stinger at the end. Scorpions are durable, adaptable and well-suited for desert life.

(Public domain photo)

Sources: University of Arizona; University of Missouri; University of Michigan; New Mexico State University; KidZone; About.comInects; National Parks Traveler. Stock photos in public domain.

Procedures and Pre-Activities:

1. State the learning objectives to the students.
2. Read and discuss one or more books about the desert, insects and arachnids.
3. Ask open-ended questions to evaluate students' prior knowledge related to the topic. Ask students to give examples of desert creatures.
4. Review the vocabulary.
5. Present the background information, pausing at times, and discuss details.
6. Explain that Butterfly Wonderland is located in the desert and has an exhibit with a few desert creatures.
7. After discussing the parts of the insect, hand out the picture and ask students to label the parts of the insect.
8. Review the differences between insects and arachnids.
9. Give students the "Comparing Creatures" page and the Compare and Contrast diagram. Ask students to study the picture of the insect and the arachnid. They are to follow the directions on the page and use the diagram for their responses.

Reflection and Assessment:

After visiting Butterfly Wonderland, discuss the experience related to the insects and other desert creatures.

1. Students create their own insect collection.

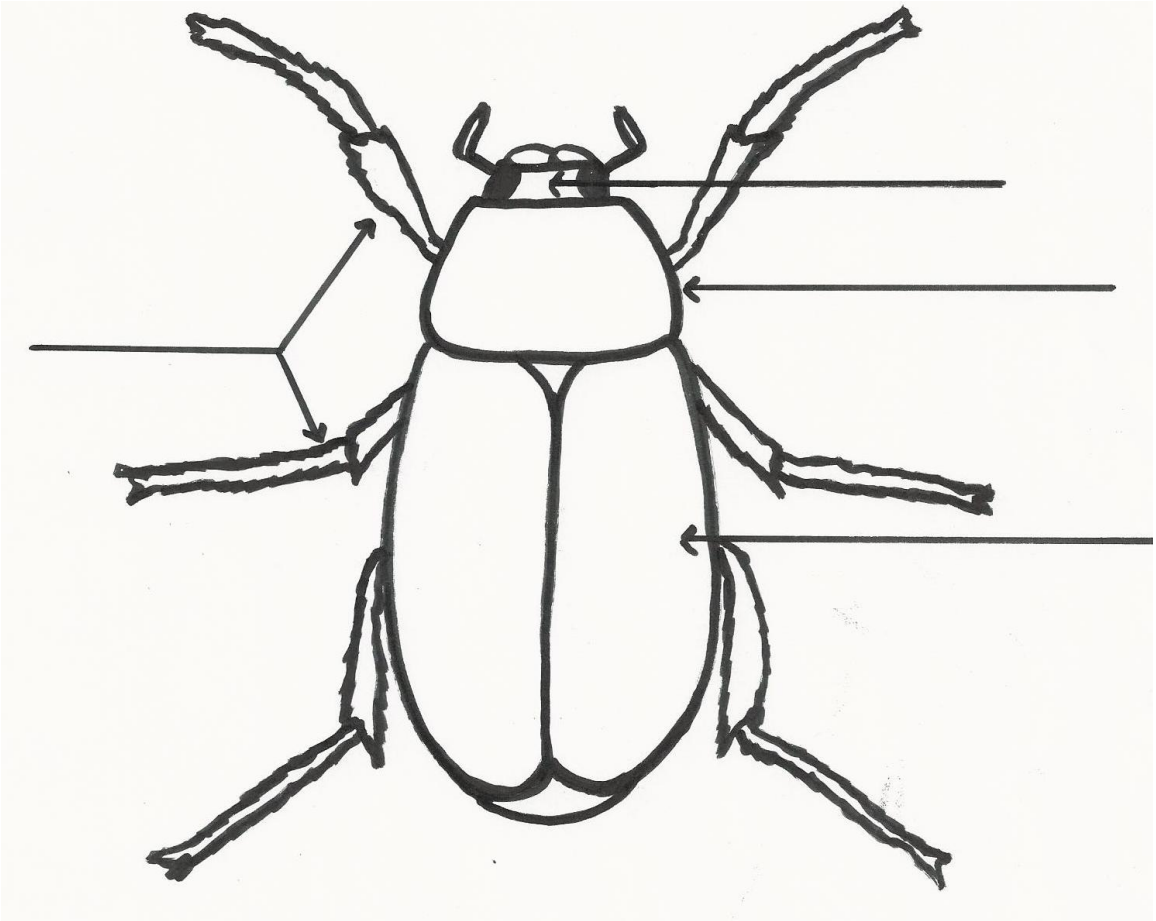
Materials: shoe box lid or poster board
colored construction paper (to line the box lid or poster board)
scissors to cut out bug pictures
crayons or colored pencils
glue sticks
pictures of insects/arachnids (plastic insects if available)

Directions: Students select 6-10 insects/arachnids and assemble them on the covered box lid or poster board. Each insect is to be colored, named and identified as an insect or arachnid. Glue the insects/arachnids and the labels to the display (box lid or poster board). Students can present their collections to the class.

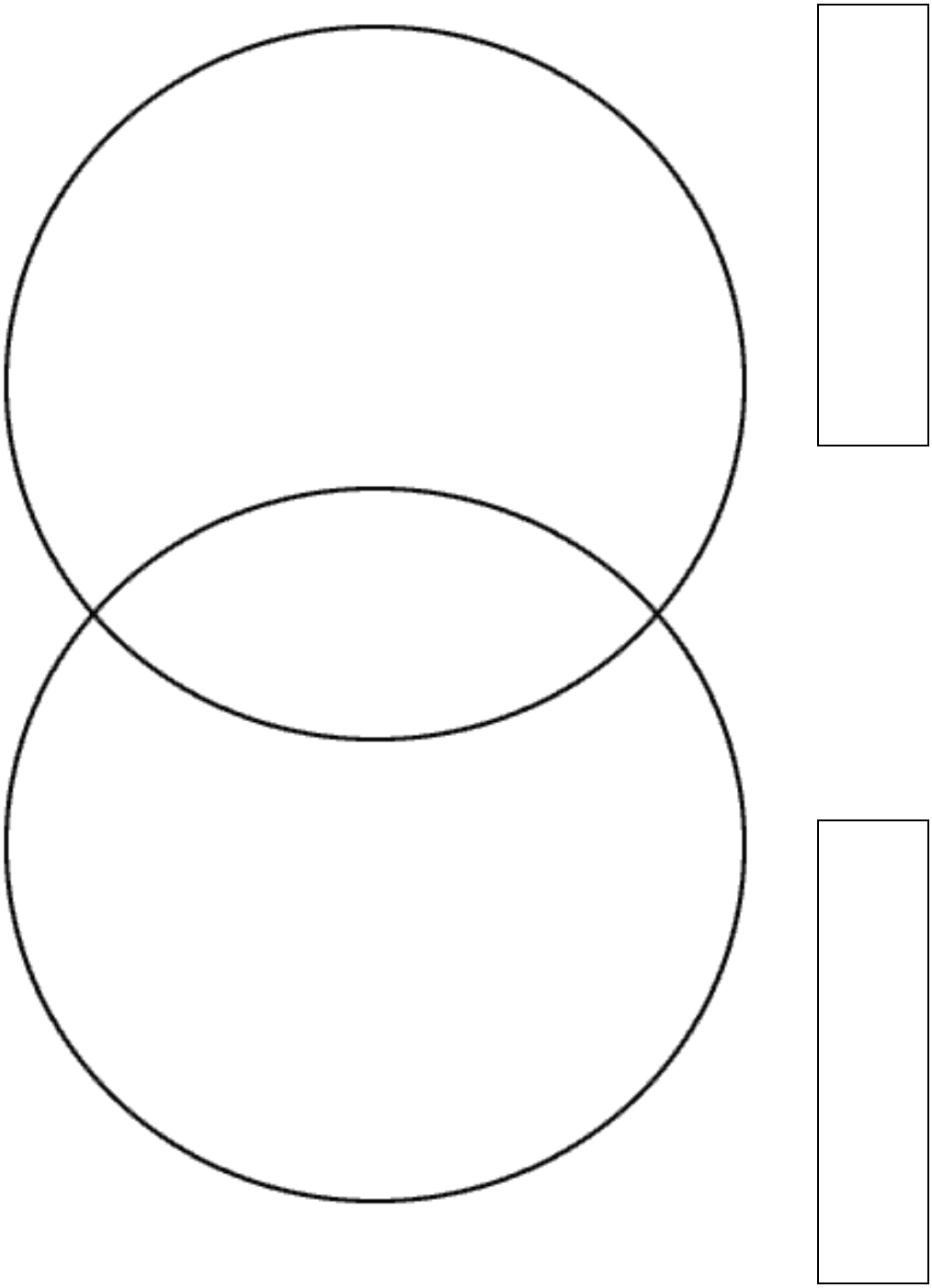
2. The final assessment is a short story writing assignment. Use the story map to help students gather their ideas about the topic: an insect or arachnid living in the desert (or any topic related to the lesson).

LABEL THE INSECT

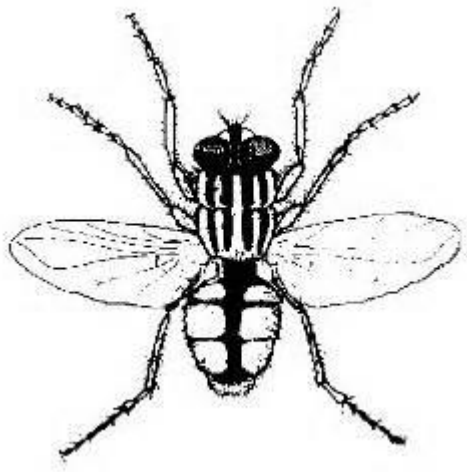
Look at the insect below and label the body parts.



What characteristics make this creature an insect?



Comparing Creatures



1. Insect

2. Arachnid

What are the characteristics for each of these creatures? Use the left circle on the chart to list the traits of the insect. Use the right circle to list the traits of the arachnid. In the center of the circle chart, list what these creatures have in common.

Main Idea

Problem of the story

A story event

A story event

How the problem is solved

The ending

Using the story map outline, write your original story about an insect living in the desert.