

Spiders

Prior Knowledge

The student has

1. sorted objects into sets
2. constructed sets of up to eight members
3. ordered objects or events first through sixth
4. used ordinal number words—first, next, last—correctly
5. described objects and phenomena
6. classified objects using one variable.

Mathematics, Science and Language Objectives

Mathematics

The student will

1. depict information on a graph
2. find all possible paths in a geometric figure
3. make a figure on a geoboard; describe it verbally by finding lines of symmetry
4. estimate how many spiderlings are held in a spider's egg sac if the eggs are the size of a pea, a linking cube, lima bean, lentil
5. count or add members of sets by ones, twos, fives, tens
6. use words such as "most", "least", and "as many as" (middle) to describe how many in a group, e.g., spiders/non-spiders
7. order pictures of spiders by size, by other variables
8. use ordinal numbers up to six (first, second, last) to describe the life cycle of spiders to describe the elements in their food chain
9. construct sets of up to eight elements; tell the number in sets of up to eight elements.

Science

The student will

1. list four characteristics of spiders using numbers to describe and count body parts
2. classify pictures of animals as spiders or non-spiders
3. list two parts of the spider's food chain
4. describe at least three characteristics of a spider's habitat
5. list at least four types of spiderwebs
6. name one benefit of spiders to humans
7. name at least two natural enemies of spiders, including man
8. list two animals that are prey of spiders
9. describe a spider's life cycle
10. describe how a spider's web feels, looks and works
11. list special adaptations spiders have made to live in their environment, including how the water spider and the trap-door spider have adapted
12. describe the danger of spider bites

13. make and list predictions about what will happen if an insect is added to a vivarium
14. describe differences between live birth and hatching.

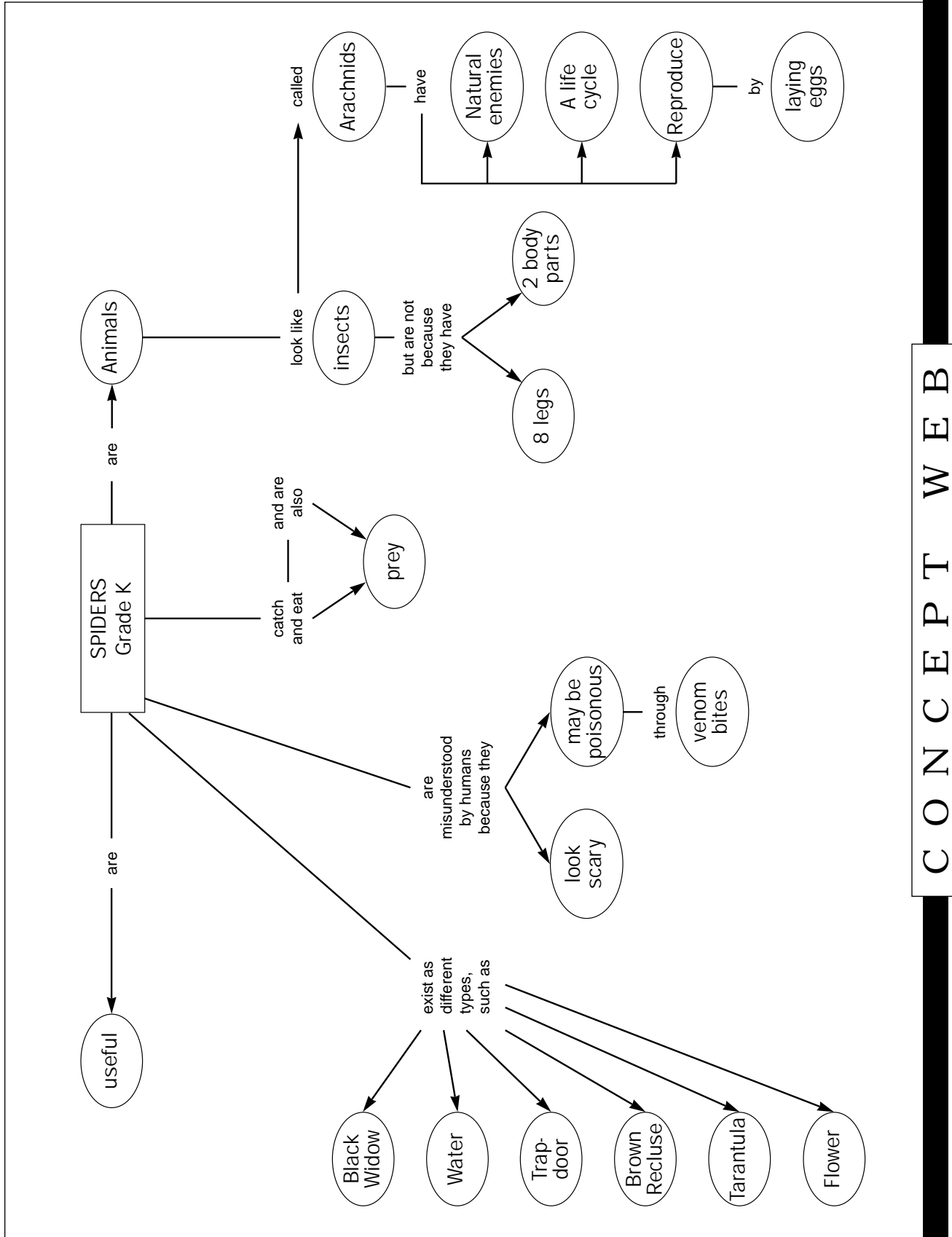
Language

The student will

1. verbalize feelings about spiders in English and/or Spanish
2. act out spider actions, such as spinning a web, ballooning, camouflage
3. write or dictate a sentence about spiders using the theme's vocabulary
4. create a minibook about his/her favorite spider
5. provide information about spiders after observing thm in the vivarium
6. cite or draw an illustration about a story and its author from the several books presented during the unit
7. examine their feelings about spiders
8. write a sentence about spiders using one or more of the day's vocabulary words.

V O C A B U L A R Y

spider araña	legs patas	body parts partes del cuerpo	insect insecto
eight ocho	silk seda	web telaraña	arachnid arácnido
spin tejer	feelings sentimientos	vivarium vivero	fangs colmillos
life cycle ciclo vital	food chain cadena nutritiva	egg sac huevera	ballooning (ballooning)
spiderlings arañuelos	prey presa	usefulness utilidad	camouflage camuflage
venum veneno			



C O N C E P T W E B

Teacher Background Information ● ● ●

This unit will help children appreciate the place spiders have in the world and will lessen the fear of spiders caused by misunderstandings. They will begin activities such as building a spider habitat, constructing a web and reading about spiders to develop the theme. There are more than 30,000 different types of spiders known to scientists! Most of them are very tiny animals that help people by eating insects. The banana spider, the trap-door spider, the purse-web spider, the garden spider, and the grass spider are just a few of the interesting animals we're going to learn about.

Spiders are not insects as many people believe. Students will learn the physical differences between insects and arachnids in this unit. Students will also study other distinct characteristics of spiders, such as spiders' contribution to other organisms in nature. Spiders' need for food will be explained as will the concepts of "prey" and "natural enemies."

Spiders belong to a class of animals called arachnids. They have four pairs of segmented legs, and can grow a new leg if they lose one. Most spiders have eight eyes, and they do not have antennae or wings. A spider's body is divided into two sections, the abdomen and the cephalothorax. The legs, eyes, and mouthparts are all in the cephalothorax. Most spiders have poison glands and fangs in their jaws, which they use to inject poison into insects. The venom paralyzes or kills their prey.

Spiders usually have six fingerlike silk glands called spinnerets located beneath their abdomen. The silk comes from inside the spider's body as a liquid, thicker than water. When a spider wants to make a web, it squeezes the silk out of the two small holes at the back of its body called spinnerets. The moment it hits the air, the silk dries into a line that looks like a long strand of hair. Many spiders use their sticky silk webs to catch food, which consists of tiny animals. Some spiders use silk as draglines, which are long lines of silk the spider hangs onto as the wind blows it through the air. The spider can always crawl back up the silk line if it is blown some place it doesn't want to be! Some spiders spin silk webs, and others line their burrows with silk. Many spiders lay their eggs in silken sacs. All young spiders, and some adult males, release long silken threads to float or ride the wind to new areas. This is called ballooning.

Although spiders can live almost anywhere in the world, some like it where it is very humid, and some like it where it is very dry. Some spiders live underground and catch their prey by jumping out at them. Others live in trees and capture their prey in their webs. Others live in our houses. Have you seen them hanging from the ceiling? Many times a spider's common name tells something about the spider. Where do you think the garden spider lives? What about the water spider? A wolf spider? A banana spider?

The **tarantula** is probably the most feared of spiders. It is very big and can stretch itself almost to the size of a one-foot ruler — 10 inches. It is furry, unlike other spiders. It is a **nocturnal** animal and comes out at night to find food. It is large enough to eat many animals that smaller spiders can't catch. It can eat big beetles, toads and frogs. It can even eat small birds, snakes and lizards. Most spiders live one or two years, but the tarantula takes eight to 10 years to become an adult, and then lives a few more years. Tarantulas can become pets in our homes

because they can be tamed.

Spiders are considered humankind's friend because they help keep the insect population in check. Humans use spiders' silk to make threadlike lines for microscopes, telescopes and other scientific instruments.

All animals have natural enemies. Birds, insects such as wasps, snakes, lizards, frogs and fish eat spiders. Sometimes spiders eat each other. Humans try to destroy them because we do not understand how useful they are. Spiders try to protect and defend themselves from their enemies. Ask students to consider if they were spiders what they would do to protect and defend themselves. All of us know how to protect ourselves using methods that are very similar to those of the spider.

1. **Escape!** How? (Use the dragline to drop into space and wait; move along the web to a safe place; use powerful jaws on smaller animals; use venom.) Usually spiders are frightened of people and try to escape from us because we appear like giants to them. Humans also try to escape from things that we think are dangerous.
2. **Hide!** A spider can hide by using its colors and patterns for **camouflage** to blend in with colors and patterns. What colors do spiders have? What are the colors of dirt, trees, leaves and grass? Humans will also hide if they sense a danger.
3. **Frighten the enemy!** Many people think that all spiders are poisonous, but in general, very few spider bites will be harmful to humans. **Tarantulas** look frightening, but they are not poisonous. They just scare their enemies and people silly!
4. Use a weapon — venom! Most spiders are not poisonous, but some are: the **black widow** and the **brown recluse** are poisonous and make people very ill with their bites. Many people do not understand that spiders very rarely attack their enemies. If a spider sees an enemy, it will usually try to get away. But all spiders use their poison in self defense, when escape is impossible.

At times, spiders will not attack their prey unless it is moving. Many insects have learned that if they do not move, the spider will not detect their motion vibrations. Spiders that ensnare their prey in their webs do not use their poison. The spiders that hunt for their prey, or hide on flowers and capture insects by grasping them with their fangs when the insects come close by, kill their victims with poison.

L E S S O N F O C U S**■ LESSON 1*****Spiders ! Scary or Nice?******BIG IDEAS***

Humans often do not understand spiders because spiders look scary. Counting and graphs help us show information.

■ LESSON 2***Spiders Have Special Characteristics******BIG IDEAS***

Spiders are animals that look like insects but are not, because spiders have 8 legs and 2 body parts. We can order numbers by using the idea of “one more than.”

■ LESSON 3***Spiders Catch Prey******BIG IDEAS***

Spiders catch and eat their prey and are also caught and eaten by their enemies.

■ LESSON 4***Spiders Are Special******BIG IDEAS***

Spiders have a life cycle, and reproduce by laying many eggs. We can count by 1s, 2s, 5s or as many as we want.

■ LESSON 5***Spiders Have Natural Enemies******BIG IDEAS***

Spiders protect themselves from their natural enemies. A spider’s web makes many paths.

■ LESSON 6***Spiders Live Everywhere******BIG IDEAS***

We can find spiders everywhere in the world because they have adapted themselves to living in different environments.

■ LESSON 7***Now We Know Spiders!******BIG IDEAS***

Knowing about spiders helps us appreciate them. Information helps us make guesses.

O B J E C T I V E G R I D

Lessons	1	2	3	4	5	6	7
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Mathematics Objectives

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|--|---|---|---|---|---|---|---|
| 1. depict information on a graph | • | | | | | | • |
| 2. find all the possible paths in a geometric figure | | | | | • | • | |
| 3. make a figure on a geoboard; describe it verbally by finding lines of symmetry | | | • | | | | |
| 4. estimate how many spiderlings are held in a spider's egg sac if the eggs are the size of a pea, a linking cube, lima bean, lentil | | | | • | | | |
| 5. count (or add) members of sets by 1s, 2s, 5s, 10s | • | • | | • | • | • | • |
| 6. use words such as "most", "least", and "as many as" (middle) to describe how many in a group, e.g., spiders/non-spiders | • | | | • | | | |
| 7. order pictures of spiders by size, by other variables | • | | | • | | | |
| 8. use ordinal numbers up to 6 (first, second, last) to describe the life cycle of spiders, to describe their food chain, other | • | | | | | | |
| 9. construct sets of up to 8 elements; tell the number in sets of up to 8 elements | • | • | • | • | • | • | |
| 10. order numbers | | • | • | | • | • | • |
| 11. makes a guess based on information given. | | | | | | | • |

Science Objectives

- | | | | | | | | |
|---|---|---|---|---|---|---|--|
| 1. list 4 characteristics of spiders using numbers to describe and count body parts | | • | | | | | |
| 2. classify pictures of animals as spiders or non-spiders; other | • | • | • | | | | |
| 3. list 2 parts of the spider's food chain | | | • | | • | • | |
| 4. describe at least 3 characteristics of a spider's habitat | | | | • | • | • | |
| 5. list and describe at least 4 types of spiderwebs | | | • | | • | | |
| 6. name one benefit of spiders to humans | • | | | | | | |

Lessons**1 2 3 4 5 6 7**

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- | | | | | | | | |
|---|--|--|---|---|---|---|--|
| 7. name at least 2 natural enemies of spiders, including man | | | • | | • | | |
| 8. list 2 animals that are prey of spiders | | | • | | • | | |
| 9. describe a spider's life cycle | | | | • | • | | |
| 10. describe how a spider's web feels, looks and works | | | • | | | | |
| 11. list special adaptations spiders have made to live in their environment, including how the water spider and trap-door spider have adapted | | | • | • | • | • | |
| 12. describe the danger of spider bites | | | • | | • | | |
| 13. make and list predictions about what will happen if an insect is added to a vivarium | | | • | | | | |
| 14. describe differences between live birth and hatching. | | | | • | | | |

Language Objectives

- | | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. verbalize feelings and give information about spiders in English | • | • | • | • | • | • | • |
| 2. act out spider actions, such as spinning a web, ballooning, camouflage | | • | | | • | | |
| 3. write or dictate a sentence about spiders using the theme's vocabulary | | • | • | • | • | | • |
| 4. create a minibook about the student's favorite spider | | | • | • | | | • |
| 5. provide information about spiders after observing them in the vivarium | • | | • | • | • | | • |
| 6. cite or draw an illustration about a spider story and its author | | | • | • | | | • |
| 7. state justifications for a claim about spiders. | • | • | • | • | • | • | • |

LESSON

1

Spiders ! Scary or Nice?

BIG IDEAS Humans often do not understand spiders because spiders look scary. Counting and graphs help us show information.

Whole Group Activities**Materials**

Books: **Spiders** by J. Dallinger or **El Gato Araña** by N. Bayley

Collection of pictures of different kinds of spiders and different insects such as bees, grasshoppers, snails, snakes, etc.

Collection of pictures of different-size spiders

Magnifying glasses to observe spiders in the vivarium

Word tags: life cycle, egg sac, ballooning, spiderlings, food chain, vivarium, others, as they are needed

Encountering the Idea

Read a book on spiders to the students; example: **Spiders** or **El Gato Araña**.

Have a short discussion with students about their experiences with spiders. Include where **spiders** are found; what they look like; what they do; and why students are or are not afraid of them.

Construct two graphs to depict students' feelings toward spiders **before and at the end of** the lesson and at the end of the unit. Do **Activity** — Like or Not Like. The second graph shows the new vocabulary and information about spiders.

Exploring the Idea

At the **Science Center**, students place spiders they have collected into their class **vivarium**. Do **Activity** — Spider Vivarium. Students collect insects such as flies, grasshoppers, etc. to feed the spiders. They find out what foods to bring to the vivarium. Students observe the spiders using magnifying glasses when necessary and write or dictate observations about the live spiders. Students describe what they see. (These descriptions can serve as a part of the lesson assessment.)

At the **Music** and **Drama Centers**, sing and act out songs and nursery rhymes. Introduce songs and rhymes to the whole group in the first lesson and keep them in the centers for rest of the unit. Using nursery rhymes, students role play “**Little Miss Muffet**” and “**Eensy, Weensy Spider**.”

At the **Mathematics Center**, the students do **Activity** — Like or Not Like.

At the **Art Center**, the students make a wall spider. Students draw or paint individual spiders to place on the bulletin board.

Students can also make flannel board spider body parts by cutting the body parts out of flannel and putting them together with glue or sewing them. The dif-

ferent parts can be made from different-colored flannel. (The teacher can prepare flannel spiders to use in the **Game Center** as puzzles.)

At the **Art** and **Drama Centers**, act out rhymes. Students also make paper puppets related to **Spiders** and **El Gato Araña** and role play an original story.

At the **Writing Center**, students work on a **vocabulary list** by locating new word tags in alphabetical order on the wall spider as they learn them, e.g., life cycle, egg sac, ballooning, spiderlings, food chain.

Getting the Idea

Students verbalize any decisions to qualify their spider preferences after the lesson and write their comments over or under their names on the graph.

Place graph chart in **Mathematics Center** to add to as students work on the unit.

Organizing the Idea

Students construct one set representing the students that like spiders, and another set representing the students that do not like spiders. (Students suggest ways to make these sets.)

Next, name the number of students that **do**, and then the number that **do not** like spiders. Talk about these two sets showing different groups of people.

Example: By using beans, represent the students belonging to the set who like spiders, and make the other set of linking cubes represent students who do not like them. Obtain the number for each set from the graphs at **Mathematics Center**. This can be done for the “after” set also.

Closure and Assessment

The sets constructed in the **Mathematics Center** under **Organizing the Idea** can be part of the lesson assessment.

Oral Assessment

1. What do the markers inside the set represent? How many students like spiders? How do you know? How many do not like spiders? How do you know? Show this in two different ways. (Using sets and using numbers.)
2. Why didn't you put all of the markers inside only one set? (You have to show two different sets because there were two different groups.)
3. Which set has more/less?
4. In which set do you belong?
5. Were the sets different after the lesson? Why?
6. What did we learn about spiders?

Performance Assessment

1. Students will make drawings of sets constructed at **Mathematics Center**.
2. Assess individual graphs constructed by students for student understanding.

List of Activities for this Lesson

- ▲ Like or Not Like
- ▲ Spider Vivarium

▲ ACTIVITY *Like or Not Like*

Objective

Students collect information and depict it on a graph; count; compare numbers.

Materials

At the **Mathematics Center**

Chart paper

Glue or tape

Post-it notes or pieces of paper with each student's name or initials to glue on chart

Procedures

1. Before the lesson, take a survey of class members to see whether they like or do not like spiders.
2. Each student places note on the column marked "yes" or "no".
3. Students count notes in each category.
4. Compare the numbers. How many more like (or dislike) spiders than not like (or like)? What do we do to compare two numbers to see which is greater? (We can count; match the squares to see which ones are left over; subtract.)
5. Repeat the survey **after** the lesson. Again, compare the numbers.

Chart:

	Before Lesson		After Lesson
Yes	□ □ □ □ □	Yes	_____
No	□ □ □	No	_____

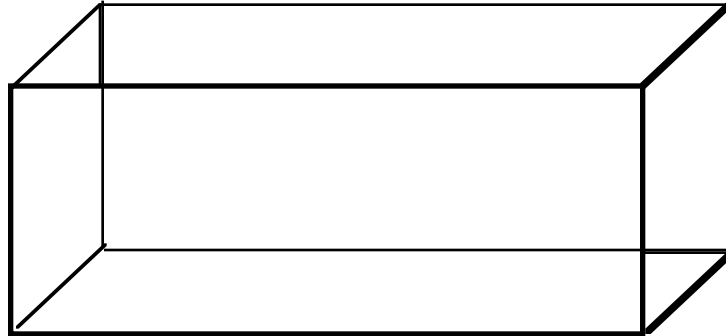
▲ **ACTIVITY**

Spider Vivarium

Objective

Students study spiders by observing them in a “close to natural” state; they describe the spiders’ physical features and their eating, mating, and reproducing behavior, if possible from observations.

**SPIDER
VIVARIUM**



Materials

Soil; aquarium tank or very large jar (one gallon); small wet sponge; leaves, rocks, branch; cheesecloth and tape; flashlight; plastic container or net (for catching spiders and insects)

Procedures

1. Place soil in the bottom of an aquarium tank and cover it with a few leaves, rocks and a large branch. Place a small wet sponge in the tank for moisture.
2. Go on a spider hunt. Be sure to capture your spiders (five or six) with a net or plastic container so that you do not hurt them.
3. Place the spiders in your tank. Cover the tank with cheesecloth. Tape the cover in place. Place water on the sponge periodically.
4. Have children observe the spiders over several days. Do they move around much? Do they eat leaves? If you are lucky, the spiders will spin a web on a branch.
5. Add a live insect to the tank and watch what happens.
6. Students begin and maintain a list of substances and animals that spiders eat.
7. Do spiders sense light (darken room and then use a flashlight). Do they like light?
8. Do spiders sense noise?
9. List other ways students have tried to stimulate the spiders to get a response.

LESSON
2

Spiders Have Special Characteristics

BIG IDEAS Spiders are animals that look like insects but are not, because spiders have eight legs, two body parts and spinnerets. We can order numbers by using the idea of “one more than.”

Whole Group Work

Materials

Live or dead insects, or large pictures of insects (bees, ants, flies)

Live or dead spiders, or pictures of various types of spiders

Magnifying glasses

Copies of **National Geographic** featuring spiders

Books: **Spiders are Animals** by J. Holloway & C. Harper, **A Look at Spiders** by C. & B. Moon and **La Araña Despistada** by J. Wordman

Encountering the Idea

Read about spiders in **Spiders Are Animals** and **A Look at Spiders**; discuss the readings and brainstorm facts about spiders found in the reading. Ask: How are spiders special? What can we say about them? Let’s observe them and see.

Exploring the Idea

At the **Science Center**, students use a magnifying glass to observe a spider’s legs, eyes, and other body parts. They make a drawing of the spider’s body parts that they observed.

Students specify characteristics: A Spider has _____ (suggest characteristics such as legs, eggs, body parts) They also write: A Spider does not have _____ .

Students classify pictures or plastic toys as spider or not spiders.

Students complete **Activity** — Who Am I? and **Activity** — Edible Spiders.

Getting the Idea

After the students have had an opportunity to explore the idea, discuss the following:

Many people believe that spiders are insects — they are not — they look like insects. There are two main features that distinguish spiders from insects — spiders have only two body parts and eight legs, whereas insects have three body parts and six legs. During this discussion, show pictures or show live spiders and insects to demonstrate the differences.

Students report on their observations of the spiders. They illustrate their report with drawings in their journals.

Organizing the Idea

At the **Art Center**:

Students make paper-plate spiders with:

- large plate for abdomen
- small plate for cephalothorax
- strips of construction paper folded accordion style for legs.

At the **Mathematics Center**:

1. Play **Water Spider Race** game (a spinner game with a die and a checkerboard). Students count the number of spaces that the spider can move, depending on the number that comes up on the die.
2. Students predict the number that will come up on the die.
3. Construct a set of “eight” spiders. Make thumbprint for abdomen, other fingerprints for cephalothorax and make legs with marker or crayons.



4. Students complete **Activity** — Ordering Sets and Numbers and **Activity** — Spiders Have Eight Legs. Place at the **Manipulative Center** — spider puzzles; board games related to spiders.

At the **Music** and **Art Centers** — songs on tapes or records of **Little Miss Muffet** and the **Eensy Weensy Spider**. Students draw, color, cut and paste four pictures depicting the sequence of each song while listening to the songs.

Assessment and Closure

1. Students state reasons why spiders are grouped in specific categories, including what distinguishes a spider from an insect. These comments can be written on chart tablet and reviewed later by the whole group.
2. Art Activity — paper-plate spider (shows two body parts and eight legs).
3. Mathematics activity with sets of eight spiders.

Oral Assessment

1. Why did you group the pictures/animals in this manner?
2. Can you put the frog with the spiders? Why/Why not?
3. How many fingers will you use to make a spider's body?
4. How many legs will you draw on your spider?
5. Tell me how a spider is different from an insect.

Performance Assessment

1. Assess paper-plate spiders for student understanding.
2. Assess completed sets of eight thumbprint spiders showing two body parts, eight legs—four on either side of the cephalothorax.
3. Assess for accuracy drawing of spiders observed in the **Science Center**.
4. Assess for understanding categories of spiders and non-spiders.

List of Activities for this Lesson

- ▲ Edible Spiders
- ▲ Spiders Have Eight Legs
- ▲ Who Am I?
- ▲ Ordering Sets and Numbers

**ACTIVITY***Edible Spiders****Objective***

Students learn the parts of a spider by making cookies in the shape of a spider; they label the parts.

Materials

3 cups peanut butter
3 cups honey
4 cups powdered milk
3 cups powdered sugar
Box of raisins

Procedures

1. Mix the ingredients (except raisins) together in a large bowl.
2. Shape the dough into two shapes for the head (smaller oval shape) and the abdomen (the larger, longer shape).
3. Use raisins for the eyes (spiders can have many eyes).
4. Use pipe cleaners cut into eight lengths that are proportional to the body of the spider to represent the legs.
7. The students label or point to the various parts of the spider's body.
6. There is no cooking necessary!! The spiders are ready to eat.

▲ ACTIVITY *Spiders Have Eight Legs*

Objective

Students identify spiders by counting eight legs (four on each side) on animal pictures.

Materials

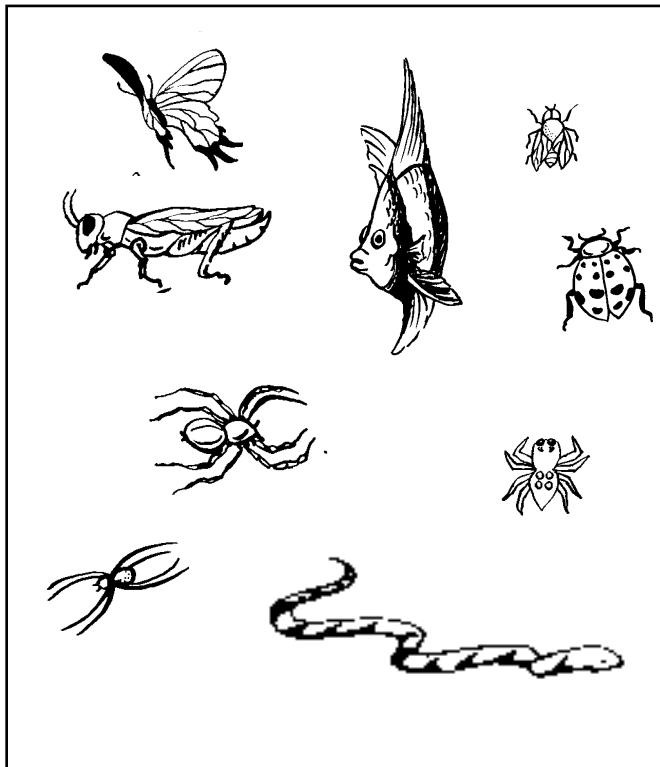
Each student has a copy of a picture of different animals, as below.

Procedures

1. Working in pairs, each student uses his/her picture to identify the spiders by counting eight legs and putting an "x" on the animal that is a spider.
2. If the student does not put an "x" by a picture he/she explains to his/her partner why it is not a spider.

Alternative

Students classify picture cards of animals into two groups — spiders or those that are not spiders.



ACTIVITY *Who Am I?*

Objective

The student learns that a spider has eight legs (four on each side of the body), cannot fly, can spin a web, has eight eyes usually but cannot see very well, and is not an insect.

Materials

Cut-out pictures of various types of spiders
Drawings of a spider hanging from a dragline
Pictures or drawings of a spiderweb
Pictures or drawings of a spider's eyes
Word cards — arachnid, spinnerets, silk, dragline
Pieces of silk thread

Procedures

1. The teacher tells a riddle: I am an animal; I have eight legs, I cannot fly because I have no wings; I can spin a web. **Who am I?**
2. The teacher holds up the pictures and tells the students that a spider is not an insect; it is an **arachnid** (a-rak-nid). One special thing about a spider is that it can spin a silk web. The silk comes from inside the spider's body through small holes at the back of the body called **spinnerets**. The silk comes out as a liquid but quickly dries in the air. It is very strong and looks like a long strand of hair.
3. The teacher shows a thin, long piece of silk thread. Spiders also make draglines out of the same sticky, liquid silk. A dragline is a very long strand of silk that allows spiders to hang in the air. They use the draglines to capture prey, the same way as with a web.
4. Spiders have many eyes but cannot see very well.
5. There are over 30,000 different types of spiders that scientists have been able to study. Most of them are very small and not dangerous. They help us by eating insects that we may not want to have around.

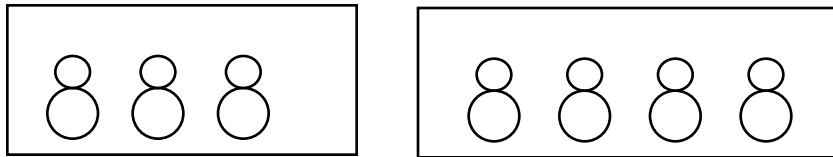
▲ ACTIVITY *Ordering Sets and Numbers*

Objective

The student constructs a set with one more (one less) member than a given set and assigns each set its corresponding cardinal number.

Materials

counters, toy spiders or objects representing spiders
numeral cards 0 through 10



Procedures

Students work in pairs.

1. One student constructs a set of spiders.
2. The second student:
 - constructs a set with one more spider on the right of the smaller set
 - places the appropriate numeral card under each set
 - makes a statement such as: four spiders are more than three spiders; four is one more than three.
3. The two students change roles and continue constructing sets of “one more.”
4. Change the task to construct a set that has “one less” spider than the given set.
5. Students continue as in Procedure 2.

LESSON

3

Spiders Catch Prey

BIG IDEAS Spiders catch and eat their prey and are also caught and eaten by their enemies.

Whole Group Work**Materials**

Books: **The Very Busy Spider** by E. Carle and **The Spider Makes a Web** by J. Lexau

Pictures of spiderwebs, or observe the webs constructed in the vivarium

Pictures of spiders that do and do not catch prey with a web

A chain about 12 inches long, or a picture of a chain

Word tags: prey; camouflage; enemy; food chain; frog; bird; snake; ballooning; spiderlings

Encountering the Idea

You have been observing spiders for a while in our class vivarium. One reason we observe the spiders is to learn some important things about them. For example: What do spiders eat? Where do spiders get food? How do they get food? We also want to know if other animals eat spiders. Are spiders themselves food? If you were a spider, what would you do to hide from your enemies and not get eaten? Look at the spiders in the vivarium. What color are they? Are all spiders brown? Are there green spiders? Red? During the time we spend in the centers, we will try to discover some of the answers to these questions.

Exploring the Idea

First, we will read a story that will give us some ideas about spiders' food and how it is caught. Read: **The Very Busy Spider** or **The Spider Makes A Web**. After reading the book, ask the students: Do you think that other animals eat spiders? Do birds eat spiders? What else eats spiders?

Let's discuss this: If you were a spider, what would you do to hide from your enemies and not get eaten? (Hide, use camouflage.) Look at the spiders in the vivarium. Can you see their camouflage? What is their camouflage? We will be exploring these new ideas in the center activities.

At the **Science Center**, the students

1. sort pictures of safe and unsafe insects and other animals.
2. sort pictures into those that are spider's prey and those that are not.
3. complete **Activity** — Spider Venom.
4. complete **Activity** — A Spider's Breakfast.

Materials

Collection of pictures of various kinds of spiders

Collection of pictures of various kinds of insects and other small animals

(lady beetle, fly, bee, wasp, snake, snail, caterpillar, ant, roach, water beetle, grasshopper)

Procedures

1. Students sort the pictures into animals that spiders eat, those they do not eat, and those that are spiders.
2. The students report to the teacher or to the group why they sorted them as they did, including reporting on spiders' characteristic of having eight legs. They count the legs to see if there are eight, and also say that four plus four is eight.
3. The students also count the eyes: spiders usually have eight eyes; other animals usually have only two (ant, grasshopper, caterpillar).

At the Mathematics Center:

1. **Activity** — Spider gets the Fly — a spinner game.
 - One student is the spider and the other is the fly. The spider and the fly move on a board the number of times shown on a die or a pair of dice, depending on the students' ability to find sums of 12 and less. The spider catches the fly when the spider lands on the same square as the fly.
2. Students design a web on paper and then follow the design to draw or make their web on the floor or rug with yarn.
3. Complete **Activity** — Catch a Fly.

At the Art Center:

1. Students construct webs with yarn glued to construction paper or with cooled spaghetti. They put knots on the yarn to represent the sticky parts that hold the prey.
2. Complete **Activity** — Spider Fun.
3. Make paper-bag spider costumes **and stress camouflage**.
4. Make Black Widow spider with an hourglass design.
5. Make a chain, with at least three to five links with one word written on each link: grasshopper, spider, frog, plant, bird, snake, fish. The link with the word "plant" is first and the second word is "grasshopper" because grasshoppers eat plants; grasshopper is followed by "spider", followed by "frog", etc. Frogs are eaten by birds, snakes and fish, so place those links after the frog link. The students use the words "first", "second", "next" and "last" to describe the links of the chains they make.

At the Music Center:

Students sing along and read words written on a chart, and tape the song: "One Elephant" (also found in Spanish).

*One elephant went out to play
out on a spider web one day
He had such an enormous day
that he called for another elephant
to come to play.*

At the Writing Center:

Students examine a spiderweb in the vivarium. They write an illustrated description about how the web looks, feels and works.

For **Physical Education**, students play freeze tag game — getting “stung” by the Black Widow.

Getting the Idea

Discuss how the spider uses a web to catch prey. Show different types of webs and how different spiders catch their prey. Show word cards during the discussion. Discuss how camouflage helps spiders catch their prey and also helps them hide from their enemies.

Discuss the notion of a food chain with the students. Spiders consume many different kinds of insects, but they themselves are prey to other animals. At the bottom of the chain are the plants because they make their own food. At the top of the chain are humans. Humans consume plants, but humans eat meat also. Since frogs are prey to many different animals, several different links are placed within the frog link.

How does a spider use its venom? Are all spiders harmful to humans? Do all spiders bite? Which kinds of spiders have been known to kill humans with their bite? If not all spider bites cause death, in what other way can spider bites be harmful?

Use the “**Trap-door Spider**” as a choral reading. Expand the reading by comparing one spider and the web it spins to another type of spider and the web it makes.

*Trap-door Spider hiding underground
In his tunnel where he can't be found.
He digs it deep and lines it with silk
And works very hard until it is built.
Patiently he waits and doesn't make a sound,
So he can feel the vibrations on the ground.
He crawls to the top to get a good view.
If you are an insect he might catch you!!*

Unknown Source

Discussion

How does the trap-door spider catch its prey? Does it build a web? How do the leaves, sticks and grass help the spider? (The spider senses the vibrations of the leaves and sticks and knows there is prey outside the trap.)

Compare this method to the method the purse-web spider uses to catch its prey.

A spiderling can use its spinnerets as soon as it is born. The spiderling puts out a silk line called a **dragline**. What do you suppose the spiderling uses this line for? (To catch food.) How does it find food? When a spiderling sways on its line, it can catch prey. This is called **ballooning**. Why do you think it is called ballooning?

Organizing the Idea

The class designs and makes a booklet on web-building, stressing the idea of sequence — the students verbally dictate the steps. Provide students with pictures that suggest the various stages of web-building, or students may draw their own pictures. The teacher may also use this activity to assess understanding.

Journal Writing — Write a story of how a spider catches and eats its prey — the student may select any type of spider that the class has discussed. Example: trap-door, wolf, black widow, etc.

Closure and Assessment

1. Write and illustrate a “Facts about Spiders” class Big Book.
2. Students complete **Activity** — Catch a Fly as a culminating activity.

Oral Assessment

1. Tell me about the spider web. What does it look like? How does it feel?
2. If you were a spider, where would you spin your web and why?
3. How does a spider use its web?
4. Students explain how the dissolved sugar cube in **Activity** — Spider Venom is like a spider’s venom.

Performance Assessment

1. Assess quality of completed spider webs.
2. Using labeled paper links (with plant and animal names), the student places at least three links, including the spider link, in the correct order in which the organisms exist in the spider’s food web.
3. Assess quality of completed Spider Fun and A Spider’s Breakfast.

List of Activities for this Lesson

- ▲ Spider Venom
- ▲ A Spider’s Breakfast
- ▲ Catch A Fly
- ▲ Spider Fun

▲ **ACTIVITY**

Spider Venom

Before performing this experiment the students discuss snakes having a poison similar to spider's venom. Discuss ways to avoid danger of being bitten by spiders. After the discussion, the students perform the spider's venom experiment (sugar cubes and water); use pictures of/or dead black widows or brown recluse spiders.

Objective

Students observe a simulation of the effect of a spider's venom on its prey.

Materials

One styrofoam cup per group
One sugar cube per group
Very warm water



Procedures

1. Give each group a cup with several sugar cubes in the bottom. Explain that cubes are like the inside of an insect's body — hard!
2. Have children pour a few drops of water onto the cubes. What happens?
The water dissolves the sugar cubes just as the spider's venom dissolves the insect's body when the spider spreads venom into the insect's body. Because a spider can turn its food to liquid, it can eat without chewing!
3. Discuss how people's diets would change if we didn't have teeth.

Discussion

Because the spider can only digest fluid food, predigestion must take place outside the spider's body. Some people believe that spiders suck blood; this is not correct. Spiders inflict a wound with their fangs and, through the wound, inject digestive enzymes into the wound to liquefy the tissues of their prey. Then the spider pumps the insect dry, leaving nothing but an empty shell behind.

▲ **ACTIVITY**

A Spider's Breakfast

Objective

Students recognize what spiders eat.

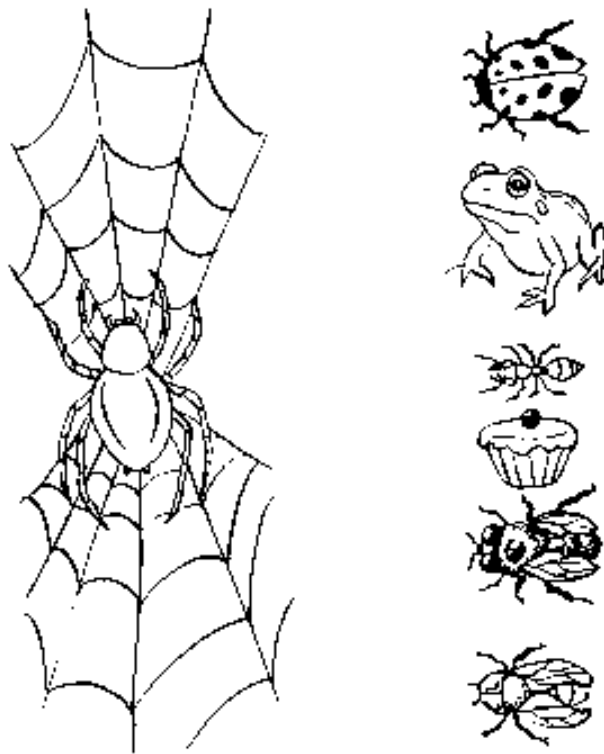
Materials

Crayons or markers

Cut-out pictures of insects and other animals, and food substances such as bread and candy, glued on cards

Procedures

Students classify pictures into "things spiders eat" and "things spiders do not eat."



Discussion

1. Which items did you mark that spiders will not eat? Why did you mark those?
2. When you observed the spiders in the vivarium, what did you see them eat? Did you try bread? Something else?

**ACTIVITY***Catch a Fly****Objective***

Students catch and count popped corn; compare which number is the largest.

Materials

popcorn popper and popcorn

sheet to place on the floor

various utensils to catch the popped corn: sheet rolled into a cone, large spoons,
box

Procedures

The children pretend to be spiders who are going to catch flying insects (the popped corn).

1. Place sheet on the floor to catch the popped corn.
2. Pop the corn in the center of the sheet to avoid the corn falling on the floor.
3. The students sit around the popper on the edges of the sheet.
4. As the corn is popping out, the students stay seated and from where they are, try to catch the popped corn with the different utensils or objects they selected. They cannot catch the corn that has fallen on the floor — only the corn that falls into their utensils.
5. After the popper has popped all the corn, the students count the number of “insects” each caught. They compare to see who caught the most.
6. The students can compare to see who got the most “insects” by either counting and comparing to see who has the largest number or by matching the corn, kernel by kernel, to see who has the most left over.

▲ **ACTIVITY** *Spider Fun*

Objective

Students make observations about spiders, naming two kinds of spiders and describing their webs and spiderlings.

Materials

scissors; glue; popsicle sticks; a tissue box; yarn; cutout of trap-door spiders; flour and water; nylon thread; cardboard tube (from paper towels); newspaper; paints or colors; markers; stapler; tape; construction paper; leaves, small sticks; grass; one balloon per child; small brown paper bags

Procedure

Trap-door Spiders

1. Use the tissue box **with its lid**, to form the trap door for the spider. The spider hides inside the trap (or the box) until it senses through the web that some prey is near.
2. Glue the leaves and small sticks on the sides of the tissue box.
3. Color and then glue the cutout of the trap-door spider on a popsicle stick.
4. Students draw, color and cut out shapes of insects: ants, bees, grasshoppers, flies, etc. (These can also be used for other activities.)
5. Staple pieces of yarn to the insects to dangle close to the opening of the trap door.
6. One student dangles the insect while the the spider pops out of the trap door to get its prey.



Purse-Web Spiders

1. Cut the cardboard paper towel tube in half to make two webs.
2. Make a paper mache mix with the flour and water.
3. Cut the thread into six-inch to eight-inch pieces; dip them in the mix and wrap them around the tube. Let the thread dry.
4. Color the tubes brown (for camouflage). Make the brown paper bags into rocks by stuffing them with newspaper and gluing or stapling them shut.
5. The purse (web) is now ready. Place it on the side of the rocks. The spider digs a hole under the web. When insects get caught in the web, the spider captures them. (Student pretends to be a spider and hides under the rocks [bags]; another student pretends to be an insect. When the “insect” touches the web, the spider captures it. The “spider” pretends to eat the “insect”.)
6. Students take turns being the spider and the prey.



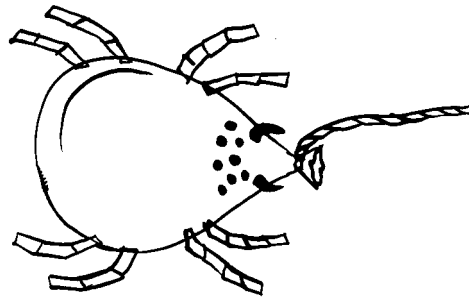
Flower Spiders

1. Each student draws a daisy with a yellow center and white petals.
2. They draw on the white petals a white spider waiting for an insect to come by.
3. The spider waits for the bee, butterfly or other insect to get close enough to it, then it strikes its prey.
4. This spider **does not use its web** to catch its prey. It relies entirely on its camouflage to deceive the insect.

Spiderlings

Each child blows up a balloon and:

1. counts and makes eight construction paper spider legs
 2. counts and colors in eight eyes at the front of the balloon
 3. makes two fangs on the sides close to the eyes
 4. tapes the eight legs to the spider balloons
 5. tapes a piece of yarn to the spider
 6. hangs the spider from an appropriate place in the classroom.
- Students observe that air currents in the room make the spiderlings sway and float.



Discussion

1. How does the trap-door spider catch its prey? Does it build a web? How do the leaves, sticks and grass help the spider? (The spider senses the vibrations of the leaves and sticks and knows that prey is outside the trap.)
2. How does the purse-web spider catch its prey?
3. A spiderling can use its spinnerets as soon as it is born. The spiderling puts out a silk line called a **dragline**. What do you suppose the spiderling uses this line for? (To catch food.) How does it find food? As the spiderling sways on its line, it can catch prey. This is called **ballooning**. Why?

LESSON

4

The Spider's Life Cycle

BIG IDEAS Spiders have a life cycle, and reproduce by laying many eggs. We can count by ones, twos, fives, or as many as we want.

Whole Group Work**Materials**

Book: **Spider Magic** by D.H. Patent.

Life-cycle sequence cards (to cut out and use in a variety of activities: pictures of spider eggs in the egg sacs; spiderlings molting in order to grow; adults dying or being eaten as part of the food cycle)

Collection of live insects such as flies and others that can serve as food for the spiders

Chart

Word tags: ballooning, habitat, life cycle, molting

Encountering the Idea

We have been collecting and observing spiders for several days now. Have any of our spiders died? Yes, some of them have died, but we keep on bringing new ones into our vivarium. New spiders have to be born, otherwise we would run out of spiders, and we have many of them all the time. Where do new spiders come from? Yes! Spiders come from eggs. Have you seen any of our spiders with eggs? Where are the eggs? Have you seen them through the magnifying glass? In this lesson we will discover many new things about the life and death of spiders.

Exploring the Idea

The teacher reads the book, **Spider Magic**, about the life cycle of spiders. What are the two ways that animals are born? Animals either hatch from an egg or else they are born from their mother when they can live on their own, like kittens or puppies. How are spiders born? Yes, spiders hatch from eggs.

At the Science Center:

1. Complete **Activity** — Spider Egg Sacs, as below.

Materials

white tissue paper; water; yarn or string; tacks; lentils, linking cubes, sugar cubes, lima beans

- Students roll out tiny spider “eggs” out of wet, white tissue paper.
 - Students put the “eggs” into a small piece of tissue paper about two inches square to form the egg sac. Tie the sac at the top with the string or yarn. Hang the sacs from the string in different places in the classroom.
2. Students review the concept of ballooning by playing with the spiderlings they constructed in the **Art Center**.
 3. Complete **Activity** — Spider Life Cycle.

At the Drama Center:

The students working in pairs or small groups select a favorite spider, dress to resemble that spider using brown paper bags on which they have drawn the spider's features, and act out a scene.

At the Writing Center, students

1. write at least two things in their journals on the life cycle of the spider.
2. describe spiders, their habitats and life cycle using number words, geometric (shapes) descriptions, and the new vocabulary words.
3. use life-cycle sequence cards to construct a book. Students dictate the life cycle to the teacher who writes it on cards, and then the students sequence the cards.

At the Art Center, students

1. color the paper bags showing the spider features for the **Drama Center**.
2. construct a spider life cycle cap (use ordinal numbers to name the steps, from one to five or six different steps in the spider's life cycle). A **spider cap** is made of a circular headband, the length of each student's head, and about two inches wide, decorated with pictures depicting the life cycle of spiders. Make a large paper spider outline cutout to form the crown of the cap and glue the legs of the spider to the headband.

At the Mathematics Center:

Students estimate, then count, the number of spiderlings that can fit into a spider egg sac. Next, use lima beans to put into the sac to simulate spider eggs; estimate how many can fit, then count. Do the same thing with lentils, linking cubes, sugar cubes or other small objects. Simulate different-size sacs with socks, plastic bags, or other types of material that can hold beans or cubes. Again, students estimate and count.

Getting the Idea

After students have had an opportunity to complete their activities in the centers, discuss the following ideas: What is a **life cycle**? What does the word "cycle" mean? Yes, like a bicycle, it is something that is in a circle. A life cycle means that animals, and plants also, live in a cycle. They are born, become adults, reproduce or make new animals or plants, and then they die. Although the adults die after they have reproduced, there are more new animals all the time. Living organisms preserve themselves in this manner all the time. When all the animals of one kind die out and no new ones are born, we say that animal has become **extinct**. We don't know if any types of spiders have become extinct, but we know that the spider is **certainly not** on the endangered species list. There are too many of them to become extinct, and they have learned to **adapt** themselves to their environment. They will always survive.

All animals need a place to be born and to live. The place where animals are born, live and die is called a **habitat**. It is very similar to the Spanish word, **habitación**. Spiders have habitats where they are born and where they live. Different spiders have different habitats. The habitats are different because the places where spiders live are very different. The spiders have to use what is around them in their environment to make their habitats. Describe some of the habitats you have learned about from the books you have read and looked at.

(Pause for students to give oral reports of the results of their activities.)

New spiders hatch from eggs. How many eggs does a female spider lay? Yes, spiders lay many, many eggs. When the eggs hatch the new spiders are called **spiderlings**. What are two things that new spiders can do as soon as they are born?

(Pause to allow for student responses.) Yes, they can spin silk and they can catch and eat prey.

As a whole group, the students write a **cinquain** expressing their feelings about spiders.¹

Organizing the Idea

1. Working in small groups, students make two lists of animals on a chart — one list of those that reproduce by laying eggs and the other of those that give live birth.
2. Students draw and illustrate a story about a particular spider's life cycle.
3. Students draw and illustrate a story about a particular spiderling and where and how it lives to become an adult.
4. Students complete **Activity** — Spider Minibook.

Assessment and Closure

Oral Assessment

Assess mastery of the use of new language structures and vocabulary in the oral interviews.

1. Are spiders and cats born the same way? Explain how each is born.
2. Why do spiders build an egg sac?
3. Describe ballooning. How is it used, and who uses it?
4. Students explain why more lentils, for example, can fit in the egg sac than lima beans. What does “estimate” mean? Is it like a guess? How is it different from a guess, or is it the same? (An estimate is like a guess. In making an estimate, however, you might be using some information to help you narrow your guess down to just a few choices. In making a guess you might not use any information at all.)

Performance Assessment

Assess understanding of the Big Idea by assessing students' completion and quality of work on **Activity** — Spider Minibook, on the story of a spider or spiderling or on the life style cap.

List of Activities for this Lesson

- ▲ Spider Minibook
- ▲ Spider Life Cycle

¹**Cinquain** — one formula

1st line - 1 word	— name of animal	Tarantula
2nd line - 2 words	— describe animal	Black, hairy
3rd line - 3 words	— describe actions of animal	Hiding, hunting, jumping
4th line - 4 words	— describe your feeling about animal	Scared stiff, can't look
5th line - 1 word	— group animal belongs in	Spider

▲ ACTIVITY *Spider Minibook*

Objective

Students draw and color four pictures depicting the spider's life cycle on separate sheets of paper, which are put together to form a minibook.

Materials

Book pages: paper rectangles, 3 1/2 x 5 inches

Procedures

1. On four separate pages or pieces of paper, students draw four stages of a spider's life cycle: eggs in the sac; spiderlings in the nest hatching and leaving the nest; spiderlings ballooning; adults spinning a web to catch prey.
2. Color the drawings.
3. Label each page or make an observation about the spider in the picture.
4. Sequence the pictures and number the pages.
5. Staple the pages.
6. Make a cover page and illustrate it.
7. Write a story, poem or cinquain (see Lesson One) for the minibook.
8. Place the minibook in the **Library Center** for other children to read.



▲ ACTIVITY *Spider Life Cycle*

Objective

The student verbally describes a spider's life cycle in correct chronological order.

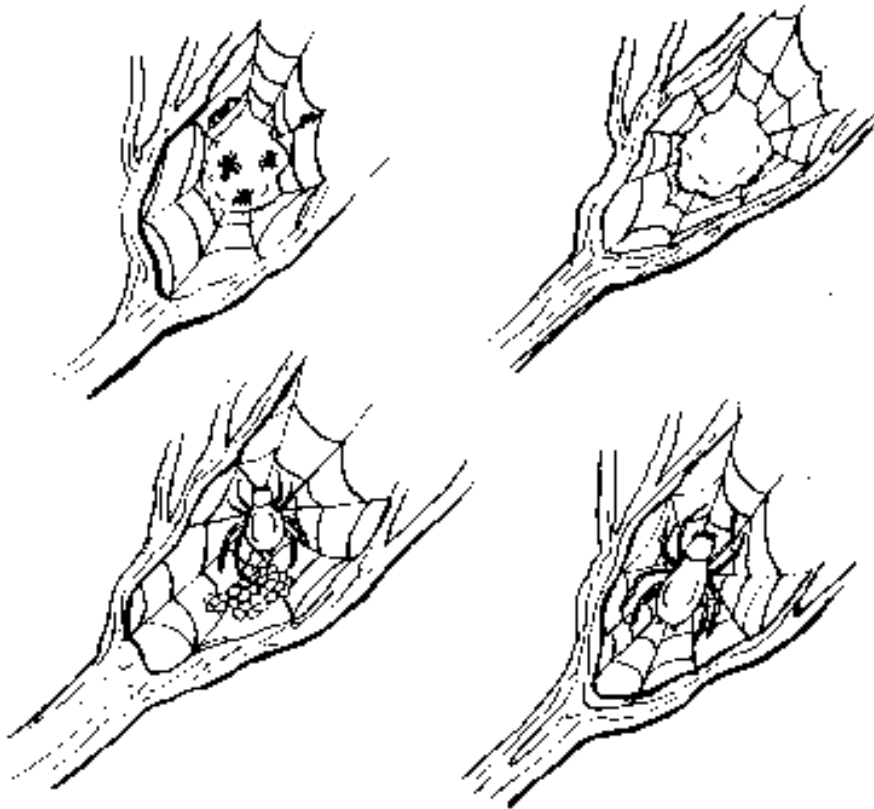
Materials

Set of four cards showing spider laying eggs, the egg sac, the spiderlings and adult spider, as shown below.

Set of pictures of animals that eat spiders: frogs, wasps, birds, snakes, ants, fish or flies.

Procedures

1. Students sequence a set of four pictures depicting the life cycle of a spider.
2. Student either points to and/or writes words (eggs, egg sac, spiderlings, adult) appropriate for the four stages.
3. Students sort a set of pictures into those of animals that eat and those that do not eat spiders.
4. The students count the life cycle cards to ensure there are four. They count them singly, or say that three and one more is four, or that two plus two is four.



LESSON

5

Spiders Have Natural Enemies

BIG IDEAS Spiders protect themselves from their natural enemies. A spider's web makes many paths.

Whole Group Work**Materials**

Books: **Spiders** by A. L. Hopf and **The Lady and the Spider** by F. McNulty

An army camouflage jacket and/or pants (green and gray), or

Leopard-spotted material (brown/yellow) to make dresses, skirts

Pictures taped on cards of spider enemies and animals that are not enemies

Frame sentences written on a poster board that students can see:

A _____ would be afraid of a spider, but a spider would not be afraid of a _____ .

Encountering the Idea

Show the army camouflage jacket and pants to the students. Ask the students to describe them. Ask the students, "Who wears these kinds of clothes?" Yes, soldiers wear them. Why do you think the soldiers wear clothes colored with these colors and spots? If soldiers are fighting in the jungle, would they be harder to see if they wear these clothes? Why? Yes, because they are the same color as the jungle, and the soldier would blend into the trees and leaves.

What about the tiger's or leopard's spots? What color are they? Yes, black and brown and yellow. Why do you think that tigers and leopards have developed these spots? Yes, to make them blend with their habitat, so their prey won't see them and get away. Yes, they want to hide from the prey and also from their enemies.

Exploring the Idea

Read **Spiders**. Focus on spiders' enemies and spiders' defense mechanisms. Open a discussion on what students would do if they saw a spider on their bed, or shoe, or simply crawling across the floor. Would they kill it or not? Say that spiders have to be careful of all types of animals including humans. Why?

Ask the students to name different animals and write animal names on a poster board. Students predict how different animals would react to spiders. Would an elephant be afraid of a spider? Why? Would a spider be afraid of an elephant?

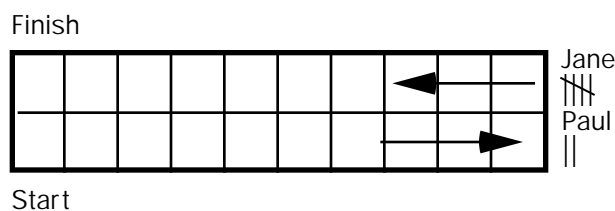
Read **The Lady and the Spider**. Discuss spiders' defense mechanisms, including camouflage.

At the **Science Center**, the students complete

1. **Activity** — Spiders Can Defend Themselves
2. **Activity** — Spider Enemies.

At the **Mathematics Center**, the students

1. sort pictures of spiders and their enemies
2. sort pictures of animals that are enemies and those that are not.
3. complete **Activity** — Spider Paths
4. play a game.
 - **Game:** two players per card; one die for each pair of students; one playing board, as below.
 - **Rules:** one student is the spider (uses the picture of a spider to move across the playing board), one student is an enemy (uses picture card of a spider's natural enemy).
 - **Object of game:** "Spider" throws the die and moves that number of spaces. "The enemy" throws the die next to try to catch the spider. The players begin moving at Start, move to the right following the arrows on the playing board, then up and on to the Finish Line. If spider reaches the Finish Line, he/she is safe. If an enemy catches up to spider by landing on the spider's square, then the spider is dead. The students take turns being the spider and the enemy. They keep a tally mark to convert to a number to see who wins.



At the **Writing Center**:

1. Students name two or more natural enemies of a spider. Write enemies' names in student journal; illustrate how enemies can harm the spider. Write why spiders should not be killed, or
2. students draw and/or write in their journals three ways that spiders defend themselves.

At the **Art Center** — Camouflage Diorama.

Students draw a garden scene with different-colored plants, flowers, leaves, branches, and other things they like. They place at least three different spiders in their webs in the garden. They draw at least 2 spider enemies in the garden. They color the spiders to blend with the environment.

Getting the Idea

1. List the dangers the spider encountered in **The Lady and the Spider** on a chalk board. Discuss how each of the barriers was removed.
2. Students discuss and share information on spiders found in **Activity** — Spiders Can Defend Themselves.
3. Spiders use their webs to catch their prey and to defend themselves. How do they use their webs to defend themselves? Look at a web under a magnifying glass. You can see that there are sticky drops of silk on some of the strings of the web, but not all. The spider knows how to travel on the web so that she doesn't get stuck; this way she can move very fast along the web and escape.
4. Discuss **weird disguises** with the students.

A **white spider** does not build a web to catch its prey. She relies on her camouflage. The white spider lives on a flower whose petals are completely white. The spider's color is also white. When a bee stops on the flower petal to pick up pollen to make honey, the bee cannot see the spider that looks like a flower petal. The spider springs, jumps on the bee and catches it for food.

One spider is a **deceiver**. The spider **pretends to be an insect**. You know that spiders have eight legs, but an insect has only six legs. How many more legs does a spider have than an insect? Yes, two more. This deceiving spider raises her two front legs and pretends they are antennae, like the spider's feelers. Since many insects cannot see very well, to them the spider pretending to be an insect has only six legs. The insect is fooled, and the spider eats it.

Organizing the Idea

1. At the **Writing Center**, the students complete frame sentences:

A _____ would be afraid of a spider, but a spider would not be afraid of a _____ .

2. Students illustrate the list of ways that spiders defend themselves.

Applying the Idea

Students draw themselves as a spider encountering an enemy and draw what they would do to survive.

Ask the students to observe the spiders in their vivarium to see if spiders use a sense of smell to detect their prey or their enemies.

Assessment and Closure

Oral Assessment

1. Why did you sort the pictures in this manner?
2. Tell me why this animal is a spider enemy.
3. If your picture was in this collection, where would you put it?
4. Show and tell three ways a spider can protect and defend herself from an enemy.

Performance Assessment

Assess:

1. Camouflage diorama.
2. Journals in which students draw spiders defending themselves.
3. Drawings of two spider enemies.

List of Activities for this Lesson

- ▲ Spiders Can Defend Themselves
- ▲ Spider Enemies
- ▲ Spider Paths

ACTIVITY *Spider Can Defend Themselves*

Objective

Students learn that spiders have many ways to defend themselves from their enemies and name at least three different ways.

Materials

Pictures of spiders defending themselves using their draglines, using their poison fangs, hiding and escaping in their webs, and looking frightening like a tarantula. See **Teacher Background Information**.

Procedures

1. Ask students what they would do if someone was going to attack them.
Make a list.
2. Students pantomime how they would defend themselves from attack.
3. Students describe how they think spiders would defend themselves.
4. Students dictate or write in their journals illustrated stories of how spiders defend themselves.

**ACTIVITY***Spider Enemies****Objective***

Students list at least three spider enemies.

Materials

Pictures (or small plastic models) of various animals, some that are the spider's natural enemies and others that are not

Procedures

1. Students examine the spiders in the vivarium to see if they can observe what things a spider fears.
2. Are spiders afraid of light? How would you find out?
3. Are spiders afraid of noise? Are they afraid of being touched, for example, by a person with a straw or a twig?
4. What happens if you touch a spider's web very softly with a straw or a small twig? Can the spider "feel" the vibrations of the web?
5. Students hypothesize about why spiders would or would not be afraid of light. (Their enemies can see them.)
6. Students will draw or collect pictures of various animals, and then sort the pictures into two categories: Spider Enemies and Not Spider Enemies.

▲ ACTIVITY *Spider Paths*

Objective

Students make different paths between two points.

Materials

Geoboards with rubber bands

Procedures

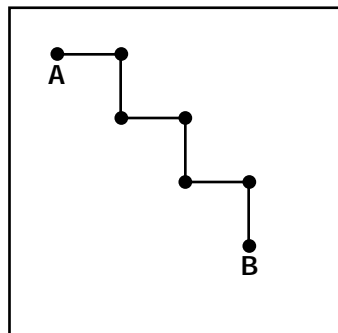
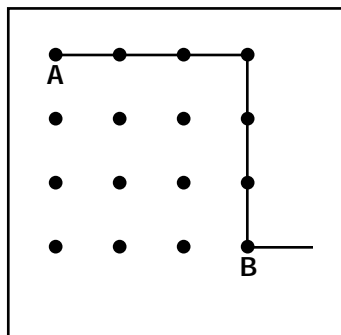
Working in pairs, students make as many paths as they can for a spider to go from A to B (the prey).

Rule: You can't go back or retrace a step.

Discussion

How many paths did you make?

Can there be more?



Draw a spiderweb and show different paths the spider could take to get to the prey.

LESSON

6

Spiders Live Everywhere

BIG IDEAS We can find spiders everywhere in the world because they have adapted themselves to living in different environments.

Whole Group Work

Materials

Various reference books on spiders that describe and tell about their habitats

Color pictures of a variety of spiders

Pictures of different spiders' habitats including the trap-door, water, grass, purse-web, tarantula and/or others

Paper, pencil, crayons

Encountering the Idea

All living organisms need a place where they can be safe, eat, sleep or rest, develop from new organisms to maturity and can become adults and be able to reproduce. Spiders are living organisms, so they too need all these things. We know that spiders live in every kind of environment there is on earth. They live in the desert; they live in cold weather. They live in the jungle, and they can live underwater. One of the reasons that spiders can live in many different places on earth is because they have adapted to their environments. They have made changes so they can live where they are. In this lesson, we are going to discover different ways spiders have adapted to their environments.

Exploring the Idea

To begin our lesson, we are going to take a nature walk to discover and observe different spiders and see where they live. The students prepare for the walk by taking jars to capture any spiders they see that are different from the ones they have in the class vivarium. They can also capture insects and other animals to place in the vivarium for spider food.

The students will keep a record in their notebooks of the number of different spiders they find. The students can draw pictures of the spiders they see. When the students return to the classroom, they complete a record of their observations. Some things they can look for are whether the spider was in the shade or out in the sun, and whether the spider was moving or being very still. They can make any other observations they would like.

I Found Some Spider Habitats

Color	Where	Web, or no	Food caught in web	Eggs, or none

At the **Science Center**, students:

1. observe and draw a picture of the habitat of one of the spiders in the vivarium.
2. complete **Activity** — Where Do Spiders Live?
3. read a book describing different spider habitats.

At the **Mathematics Center**, students complete **Activity** — Spider Number Stories.

Getting the Idea

We can find spiders anywhere on earth because they have adapted to the environment to make a **habitat**. For example, if the place where they live, their habitat, is cold or has too much rain or light or enemies are around, some spiders build tents that they use as retreats or hiding places to find shelter from all of this. These spiders roll up a leaf, wrap it and secure it with silk threads. They go into the shelter until they feel safe enough to come out. This way spiders can live under difficult conditions in different parts of the world. Some types of spiders use the tents to jump down on unsuspecting prey.

Some spiders build tents underwater. An aquatic spider builds her tent in the shape of a bell and fills it with air. Other spiders make complete envelopes out of very tough silk for themselves and their eggs until the spiderlings are capable of taking care of themselves.

Spiders do not live in captivity for a long time. Males die soon after they mate, but if kept alone in captivity they may linger for several weeks, usually refusing to eat. Females, on the other hand, live longer. In some species the female dies soon after laying eggs, but in others they may live for several years, laying eggs annually. Some large tarantulas are known to have lived in captivity for as long as 15 years.

Organizing the Idea

Students will draw a picture of a spider they found at home or on the nature walk and write about (dictate) where they found it (its habitat).

At the **Language Center**, the students make a chart:

In a whole group activity, the class suggests words to fill in blanks on four types of spiders. Then they work in small groups to complete the frame sentences.

I am a _____ (type of spider) _____ . You will find me _____

(habitat) _____ . I _____ (do/don't) _____ build a web.

My web _____ (what it looks like or what its used for) _____ .

Assessment

Oral Assessment

1. Do all spiders live in hot, dry places? Where else can you find spiders? Name at least three different habitats that you learned about in reading your book in the **Science Center**.
2. Describe how a trap-door spider builds its web.
3. If you were a garden spider, where and how would you build your web? What would you eat?

Performance Assessment

1. Assess completion of **Activity** — Where Do Spiders Live? and level of participation in and completion of frame sentences in the **Writing Center**.
2. Assess level of completion of a drawing of a spider found around the home and identification of what type (garden, trap-door, etc.) of spider it is and how the student came to that conclusion.

List of Activities for this Lesson

- ▲ Where Do Spiders Live?
- ▲ Spider Number Stories

▲ ACTIVITY *Where Do Spiders Live?*

Objective

Students say that spiders can live anywhere and name at least three different types of habitats.

Materials

Books that describe and tell about the habitats of various spiders

Pictures of different spiders' habitats including the trap-door, water, grass, purse-web, tarantula, some shown below, and/or any others

Paper, pencil, crayons

Procedures

1. Working in pairs or small groups, the students select at least three different spiders. They look in books to find out all they can about where spiders live and how spiders complete their life cycle.
2. The students draw their spiders in their journals, labeling the type of spider and where it lives.



▲ ACTIVITY Spider Number Stories

Objective

Students add and subtract using single-digit addends.

Mathematics Story Boards

Materials

Laminated poster boards with stories; erasable color markers

In this part of the activity, give the story on the poster. The children finish the story and draw a picture of the story.

Five insects stood by a flower.

Oops! Two of them fell into a spider web.

Ex: *How many did not get caught?*

Number sentence: $5 - 2 = 3$ or $3 + 2 = 5$



Four beautiful blue butterflies were on a sunflower.

Two yellow butterflies came to join them.

Number sentence: $6 - 2 = 4$

Finish the story



1. There were 11 eggs in the egg sac. Now there are only nine left in the sac. How many eggs hatched? Draw a picture of the egg sac.
2. One frog weighed 23 grams. Now it weighs 14 grams. How much weight has it lost?
3. There are some frogs and toads together in a pond. Make up and draw a number story about the frogs and toads.
4. There are some yellow and some orange fish in an aquarium. Make up number stories about the fish.

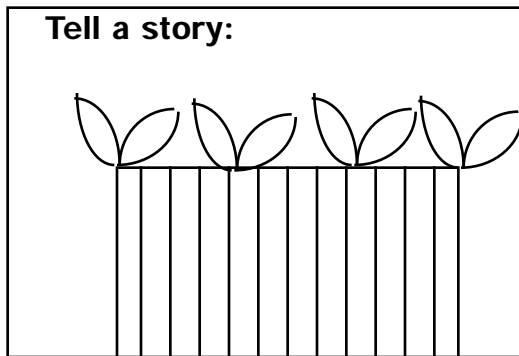
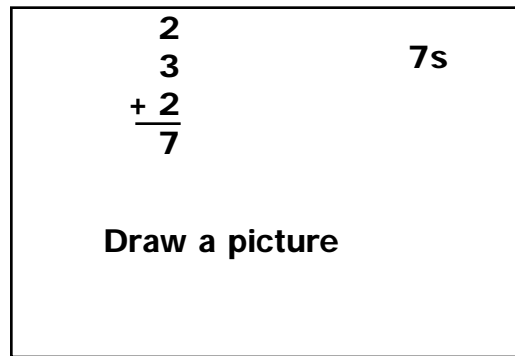
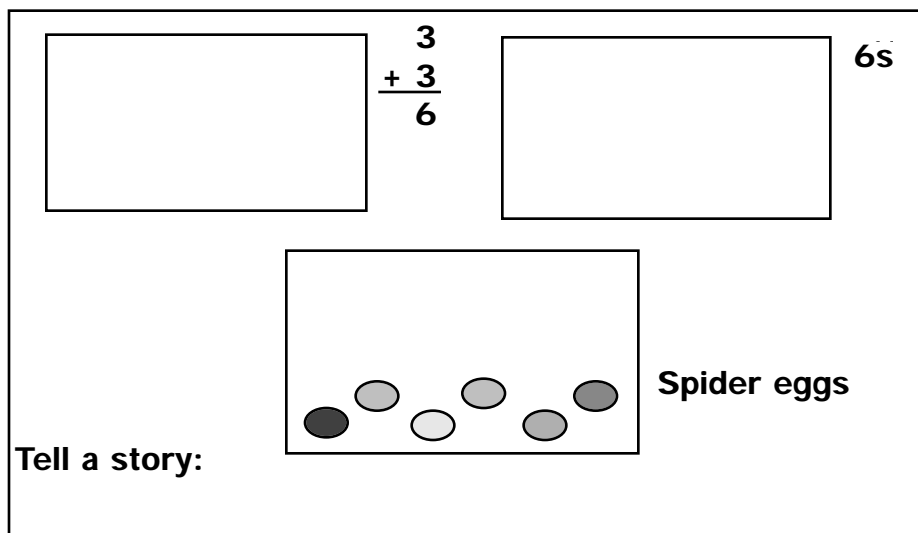
Number Story Charts**Materials**

At least three poster boards that have been laminated after the pictures and/or numbers are put on them; erasable color markers

Procedures

Small group activity.

The teacher places the laminated posters around the room where the students can write on them with the markers. Poster 1: Tell a story about these four butterflies. Poster 2: Draw a picture about the number seven.

**Poster 1****Poster 2****Poster 3**

LESSON

7

*Now We Know Spiders!*¹

BIG IDEAS Knowing about spiders helps us appreciate them. Information helps us make guesses.

Whole Group Work**Materials**

Book: **Anansi the Spider** by G. McDermott

Encountering the Idea

Read **Anansi the Spider** to the students. Discuss how spiders are remarkable. Ask students to name different things that make spiders remarkable. List key words on a poster strip for use at the **Writing Center**.

Lead the discussion so as to refer to the graphs students constructed at the beginning of the unit. Take a survey at this time. Put the new data on a poster board showing the way students feel about spiders now that they have completed the unit. Use the information in the **Organizing the Idea** phase of the lesson.

Exploring the Idea

At the **Science Center**, the students pretend they are spiders catching flies and participate in **Activity** — Catch a Fly .

At the **Mathematics Center**:

1. Students construct new sets of students liking or not liking spiders by referring to the new graph constructed at the beginning of the lesson. Students list the students in each set and count the members of each set. They identify the set that has more, or fewer, members. The students say which number is greater and why.
2. Students complete **Activity** — Spider Probability!

At the **Writing Center**:

1. Students write individual cinquains on spiders and glue or staple them on the body of the paper-plate spiders they constructed earlier in the **Art Center**; display work on the wall.
2. Students design and make a minibook, in cartoon style, showing a sequence of a spider building a web.

Getting the Idea

Students read the cinquains they wrote at the **Writing Center**. They discuss the ideas in the cinquains among themselves, comparing and contrasting their feelings about spiders.

¹This lesson can serve as a unit assessment.

Ask students if they think that knowing about something helps them develop better opinions about that thing. For example, when they first gave their opinions about spiders, did they know that spiders will not bite or attack unless they have no escape? What else did they learn about spiders that influenced their opinions? Make a list of things the students did not know about spiders. What do they know about spiders now? Explain that after learning new things about spiders people may **still not like them**, but now they have **reasons** for liking them or not liking them.

Organizing the Idea

Construct a third graph to see if students have changed their opinions on liking or not liking spiders. Record their opinions again. The responses should include reasons for changing their opinions based on facts about spiders. Compare the feelings and opinions between the first two graphs and the third graph.

Closure and Assessment

1. Students identify special characteristics of spiders through comparing/contrasting in **Spider Characteristics** sentences. They complete frame sentences such as:

A _____ is _____

A _____ is _____

A _____ is not _____

2. Assess degree of completion of cinquain and the number of ideas expressed in it.
3. Assess degree of completion of minibook and the correct sequencing of the steps in building a spiderweb.

List of Activities for this Lesson

- ▲ Spider Probability!

▲ ACTIVITY *Spider Probability!*

Objective

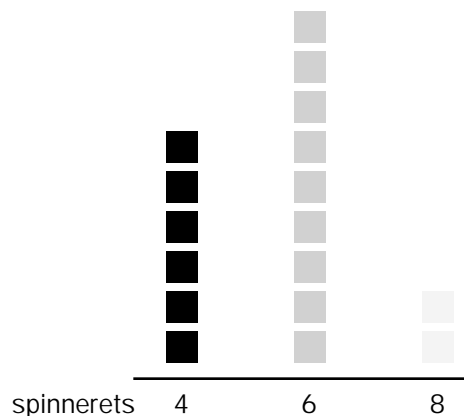
Given information about the number of spinnerets a group of spiders has, the student makes a guess about the number of spinnerets a given spider from the group has.

Materials

Multiple cards of pictures of spider spinnerets, as follows: nine with six spinnerets; six with four spinnerets; and two with eight spinnerets.

Procedures

1. The students count the number of spinnerets each spider has.
2. The students place the pictures into three groups — those spiders that have four, six or eight spinnerets.
3. The students place each of the pictures on a pictograph, as below.
4. They count the pictures in each group.
5. Students identify the spinneret-group that has the most spiders in it. (The six group, since it has nine spiders in it.)
6. Students identify the spinneret-group that has the fewest spiders in it. (The eight group, since it has two spiders in it.)
7. Students identify the spinneret-group that has more than the smallest group but less than the largest group of spiders in it. (The four group, since it has six spiders in it.)
8. The students take turns identifying the smallest and the largest groups using the appropriate terminology; they say that six is greater than two, but six is less than nine, and other similar comparisons.



After the students have had an opportunity to classify the pictures according to the number of spinnerets the spiders have, discuss the following ideas with them in a whole group activity.

Discussion

Tell the students that **all** spiders have either four, six or eight spinnerets. Today, a new spider has come to join the group of spiders that students have placed in the pictograph. Show the students an additional card, but do not let them count the number of spinnerets.

1. From the information the students have, which type of spider is the new spider most likely to be — the four, the six, or the eight-spinneret type?
2. Ask the students to make a guess. The students give their reasons for the guess. (The six-spinneret type is the most likely type to appear; from the sample, there are more pictures of the six-spinneret type than of the others.)
3. Ask students, who would guess that the new spider has four spinnerets? (The new spider **could** be of the four-spinneret type, but that is not **as likely to occur** as the six-spinneret type. **Maybe**, the new spider would have four spinnerets.)
4. Ask students, who would guess that the new spider has eight spinnerets? (The new spider **could** be of the eight-spinneret type, but that is not **as likely to occur** as the six or the four-spinneret type. **Maybe**, the new spider would have eight spinnerets, but the probability is that the new spider would not have eight spinnerets.)
5. Would any of the students guess that the new spider has only one spinneret? Why? (**All spiders** have at least four spinnerets. It is not **probable** that the new spider has only one spinneret.)
6. Does the new spider have **at least** four spinnerets? Would you guess that this spider has at least four spinnerets? (Yes, every spider will have four spinnerets; some spiders may have two more, or six; others may have four more, or eight, but every spider will have at least four.)

References

Children's Annotated Books

- Bayley, N. (1984). *El gato araña*. Barcelona: Editorial Lumen, S.A.
This story explores the life of a garden spider, spinning its web, trapping its prey.
- Carle, E. (1984). *The very busy spider*. New York: Philomel Books.
Well illustrated, this book shows the sequence of how a web is built.
- Dallinger, J. (1981). *Spiders*. Minneapolis: Lerner Publications.
This contains good pictures of spiders and their webs.
- Daly, K. N. (1977). *A child's book of insects*. New York: Doubleday and Company.
This contains pictures of insects to compare with those of spiders.
- Holloway, J., & Harper, C. (1990). *Concept science: Spiders are animals*. Cleveland, OH: Modern Curriculum Press.
- Hopf, A. L. (1990). *Spiders*. New York: Cobblehill Books, E. P. Dutton.
This contains life photographs of spiders, as well as types of spiders.
- Lexau, J. (1979). *The spider makes a web*. New York: Hastings House.
This tells how spiders spin webs.
- McDermott, G. (1972). *Anansi the spider: A tale from Ashanti*. New York: Holt, Rinehart and Winston.
This is a folk tale about spider and his son.
- McNulty, F. (1986). *The lady and the spider*. New York: Harper and Row.
A spider lives in a lettuce head and comes close to being put down the drain, but is released by the lady.
- Moon, C. & B. (1983). *Look at a spider*. San Diego: The Wright Group.
This addresses characteristics of spiders, web building and life cycle.
- Patent, D. H. (1982). *Spider magic*. New York: Holiday House.
This contains good black-and-white pictures of spiders, their eggs and webs.
- Petty, K. (1985). *Spiders*. London: Franklin Watts.
This contains good pictures of different spiders, as well as a sequence of pictures of web building.
- Woodman, J. (1988). *La araña despistada*. Spain: Europa Ediciones, S. A., Brimax Books Limited.
This is a fantasy story about a spider. It doesn't give information about spiders, but it is a good story for language arts.

Teacher Resource Books

- Conklin, G. (1972). *Tarantula: The giant spider*. New York: Holiday House.
This book contains information about tarantulas.
- Martin, L. (1988). *Tarantulas*. Vero Beach, FL: Pourke Enterprises.
This volume contains good big, colored pictures of tarantulas.
- Morrill, L. (1979). *Black widow spider, danger*. New York: Holiday House.
This describes black widow spiders.
- Parson, A. (1990). *Amazing spiders*. Eyewitness Juniors. New York: Alfred A. Knopf.
Text and photographs introduce fish-eating spiders, spitting spiders and banana spiders.
- Rosen, E. (1968). *Spiders are spinners*. Boston: Houghton Mifflin Company.
This is an informative book about spiders done in rhyme.
- Victor, J. B. (1979). *Tarantula*. New York: Dodd, Mead and Company.
This is a complete book of tarantulas from characteristics, to molting, to webs.

