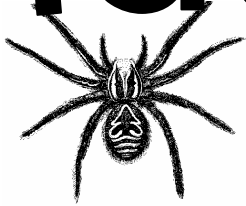


Spiders



God is Patient God is Provider

This unit of study has been designed for use with other Beacon Media resources:

Themes for Christian Studies - a Biblical foundation for learning.

Beacon Media songs - for integration with the 'Patient' and 'Provider' themes.

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Contents

Notes for teachers	3
Part 1	
Spiders: a lesson in patience	5
Part 2	
God is a provider, even for a spider	16

Notes for teachers

Christian life and character development

Students will:

- Observe the wonder of God's creation
- Appreciate the role of spiders in maintaining the balance of nature
- Appreciate the beauty and skilful construction of spiders' webs
- Recognise characteristics of patience and perseverance in the spider's dedication to web building
- Learn lessons of patience and diligence from the spider
- Understand that God provides for all of creation: even spiders
- Learn to complete a task, and work independently

Related Beacon Media resources for Biblical integration:

Themes for Christian Studies 4 - Patient

Music resources – Refer to ‘Primary Music’

God is a Provider, (even for a spider) *All Creation Sings:*

Waiting Patiently *All Creation Sings:*

Literacy

- poems about spiders
- literature. E.g. *Charlotte's Web*
- recording observations
- reading for information
- word bank of spider words

Stories about spiders:

Read the true story of Robert Bruce and the Spider from *Themes for Christian Studies, level 6, Patient*. The spider, when building its web, never gives up, even when its web is broken down.

Also read the Bible stories of the widow and the judge, Nehemiah's patience on rebuilding the walls of Jerusalem. These stories are outlined in *Themes for Christian Studies 6 - Patient*).

Art

- Make spiders webs using collage. Build up a web using white paper strips on black paper.
- Make webs with wool woven between sticks or twigs.
- Make a paper mache spider with pipe-cleaner legs.
- Weave with wool on a simple home-made loom. (Make a frame from wood and insert a row of nails top and bottom; or use a shoe-box and cut slots for wool.)

Science

- Observe spiders and their habits.
- Classify spiders according to types, homes, size, colours.
- Describe the role of the spider in maintaining the balance of nature
- Observe and describe spiders' webs
- Go on nature walks.
- Draw spiders and record data.
- Describe the difference between spiders and insects

Mathematics

- Count by eights, multiply and divide using eight times table. (spiders' legs)
- Measure lines on a diagram of a spiders' web.
- Find the total of the eyes on several spiders.
- Subtract the flies that the spider eats.

Technology

- Research information using a computer.
- Use word processing to record information and write poems or stories about spiders.
- Draw spiders and webs on the computer.

Learning outcomes

The children will:

- be aware of the diversity in the world of spiders
- be able to present information in written form and art forms
- be able to describe orally their findings

Evaluation

Did the children understand the link between the spider and *God is Patient*?

Can they remember Bible passages or Bible stories related to the patience theme?

Were the children interested in the activities?

How well did they describe their activities and record their observations?

How independent were they in their research?

Were they able to present information effectively?

Part 1: Spiders, (a lesson in patience)

Spiders: creative and resourceful

Look for spider webs at home or school. Make drawings of the ones you find.

- Are spider webs always the same size?
- Are they always the same shape?

God has given the spider the ability to make the web, but the way she does it is left to the spider to decide. Can you explain the difference between these two spiders' webs?



A spider builds her home on the things she finds around her. Here are some of the things spiders build their webs upon. Write down any others that you can think of.

- twigs and branches
- leaves
- window frames
- ceilings and walls

Now draw some spiders webs built upon these things, and write the heading, "A good place for a spider's web".

The threads for the web come from the spider's body. Spiders' webs are built for catching flies or other insects for food. The spider waits in hiding and it feels if anything touches the web. When a fly is caught, the spider may wrap it up in sticky threads to take to its hiding place.

1. Why do you think spider's webs need to be sticky?
2. How does a spider catch its food?

Spiders: patient and diligent

If you brush away a spider's web from the corner of your ceiling, what will the spider do? Soon you will have to do your cleaning all over again. A spider never gives up building her home.

How can we learn from the spider?

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It is important to keep trying, even when you think you have failed. Can you think of something that *you* need to keep trying at?

Try to find out how long a spider takes to build a web. For a spider, it probably seems like a very long time. Sometimes we have to do things that seem to take a long time. Can you think of something? It is important to keep going right to the very end of the job, just like the spider.

Have you ever seen two spiders working on the one web? No, this doesn't happen. A spider works on her own with patience and diligence. You probably know the meaning of patience. Try to find out what **diligence** means. Now try to think of a job that you have to finish on your own.

Poem

I watched a spider running round the corners of my room.
And he wove his silken threads upon his secret loom.
With a diligence untiring
And amazing artistry,
He worked out a perfect pattern
That was beautiful to see.
Surely and creatively he spun each fairy thread,
Till his job was finished
And the lace-like web was spread.
Fine as gossamer, and lovely as a sunset or tree,
Out of nothingness created
Secret things of mystery.
by Patience Strong

1. Name two crafts that people do today, that may have been learnt from looking at spiders.

2. Find the dictionary meaning of *diligence* and *gossamer*.

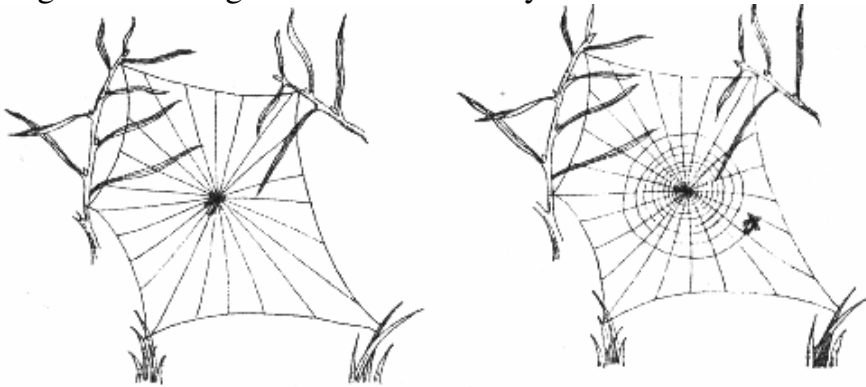
3. Write down some smaller words that have the same root as: creatively; artistry.

4. How does a spider show patience and diligence?

-
- Write a poem or story of your own about spiders.
 - Choose some art materials and make a spider's web.

Spiders' webs are strong and sticky. It is the lady spider who builds the web. First she chooses a good spot, and here she attaches the beginning of her web. Dangling on the end of the first thread, she now drops to the ground, or to a blade of grass, or a branch. Then she climbs back again, and waits for some wind to help her get across to something else, and so on until she has an outline for her web. Then she fills in the outline with threads running up and down, in every direction, all of them crossing one another like the spokes of a wheel.

Then she goes to the centre and takes the thread round and round in a spiral. Lastly, she goes over it again with a new sticky thread.



Now fill in the gaps from what you have read:

A spider's web is st_____ and st_____. It is the _____ spider who builds the web. First the spider chooses a good _____ to build her web. She d_____ on the end of the _____ thread and drops down taking her thread with her. She makes an _____ and then fills it in. Lastly she _____ her web with sticky _____.

Spiders: designed by God

Do you know how many legs a spider has? A spider has eight legs. Spiders are not insects because all insects have six legs. Spiders are in a special family of their own

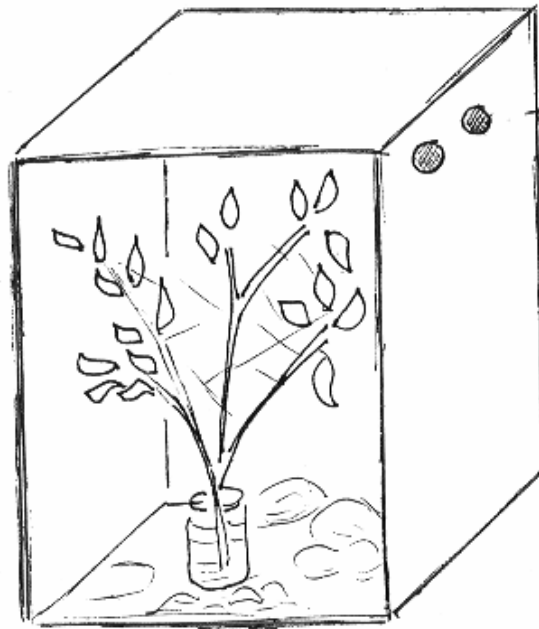
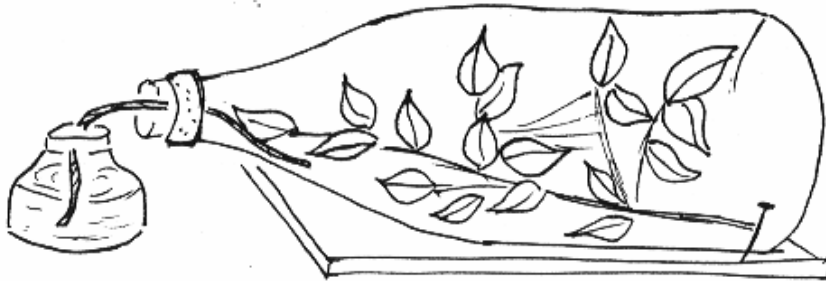
called arachnids. There is another difference too. Insects have three parts to their bodies, but spiders have only two. Nearly all insects have wings but spiders have none.

Insects change in some way before they take their adult shape. Think about a caterpillar and how it changes to a butterfly. Little spiders, however, hatch straight away from the egg.

Although spiders do not change shape, they do grow bigger. To do this, they burst out of their hard skins, and grow new ones.

A house for spiders

You can easily keep a house spider for a short time in a big glass container with air holes in the lid. Give it some water, somewhere to shelter and some insects for food.



Spiders like their food to be alive when it is caught in the web, so you will have to catch small flies for them. Sprinkle some spots of water on the home occasionally. Spiders are carnivorous, so only keep one spider in a container at a time.

The spider sucks juices from the insects and leaves the bodies. It can last a long time without food. You might see your spider spin a web. It is a good idea not to put two spiders together in the same jar, because female spiders will eat male spiders if they get a chance!

Spiders seem rather nasty creatures because they eat insects, but really, they are a help to gardeners. The spiders keep down the insect population, which would otherwise eat our flowers and vegetables. If there were no spiders, there would be too many insects.

Spiders also help us because they eat many insects that are harmful to humans. Think about flies, which eat our food and carry germs, and also insects which suck our blood and can carry disease.

Do you think that spiders had poisonous bites and ate insects when God first created them? In God's perfect creation, there was no killing. It was only when people disobeyed God, that killing began. I wonder how the spider lived at the very start of creation? All spiders and insects must have eaten plants, but maybe not the ones that humans ate, because all creation was in perfect balance and there were no pests and diseases.

Questions.

1. How are spiders different from insects?

2. Why do spiders grow new skin

3. How do spiders help us?

4. Did spiders kill insects in God's perfect creation?

5. When did spiders start to kill insects?

6. Why shouldn't you keep two spiders in the same jar?

A spider's body



A spider has eight legs. They are hairy and jointed, and end in curved claws. The claws have teeth like a comb on the inside. The claws help to hold food. Spiders also use their claws as combs for cleaning themselves. A spider has no antennae like an insect. Instead it has **palps** which are joined to the mouth parts. They are like arms and hands to a spider. Spiders use their palps for feeling and touching.

Fill the gaps:

Palps to a spider are like _____ to an insect.

Palps to a spider are like _____ to a human .

A spider usually has eight eyes. They are simple eyes that shine like jewels. People think that some spiders can see colours! A spider has to keep watch for prey. With so many eyes it can see in many directions. A spider also needs to watch out for enemies. A spider is always **alert**. Christians need to be alert too. Find out what the bible says about being alert:

Mark 14:38 and Ephesians 6:10. Write out these verses. Read 1 Peter 5:8 and find out why Christians need to be alert.

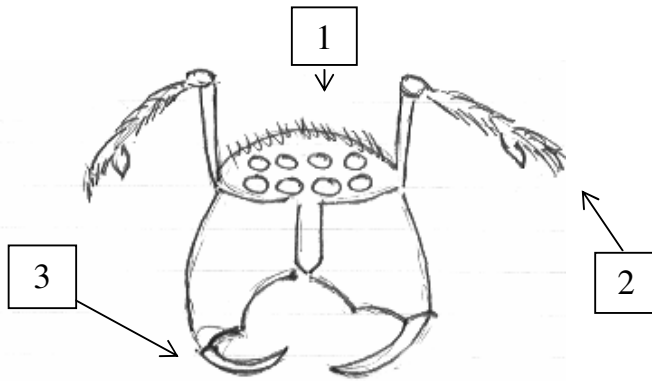
Questions:

1. Why do you think a spider needs so many eyes?

2. Can you think of any enemies the spider has?

3. Describe the way a spider might move if a fly flew past its web?

Here is a drawing of a spider's head. Find out which arrows stand for the palp, which arrow stands for the poison fang and which one stands for the eyes. Write the correct numbers next to the words.



palp
poison fang
eyes

A sense of smell is important to a spider, for catching prey. What might a spider need to smell? _____

When a male spider goes courting he finds a lady spider by her scent too!

A good sense of hearing is also important to a spider. A spider feels vibrations in the air through the hairs in its body. There are stories of spiders letting themselves down from ceilings to listen to music. They may think it is the buzzing of an insect.

Why is hearing important to a spider?

Draw a picture of a spider listening to music.

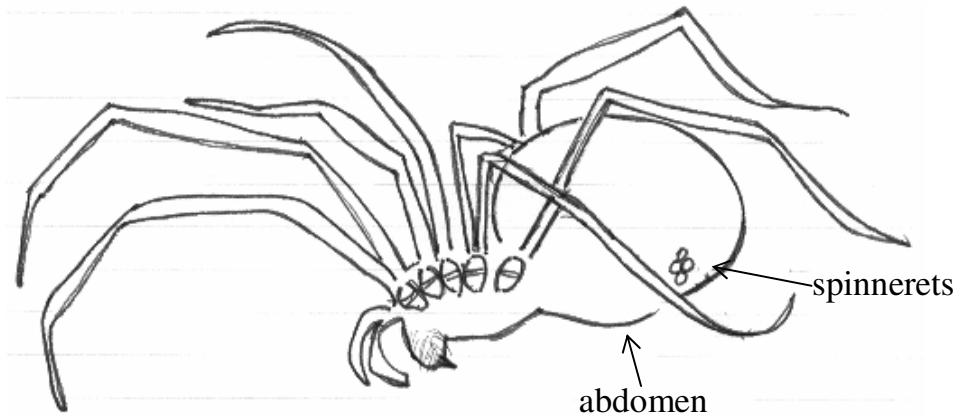
All spiders have fangs for injecting poison into their prey, but very few spiders are dangerous to humans.

When a spider catches its prey, it sticks its fangs into the prey, and instantly kills it with poison. A spider doesn't really eat its prey. It sucks out the juices from the body of the insect, and leaves just an empty skin.

Something to do:

1. Find out the names of any poisonous spiders. Draw them and write some information about them.
2. Make a list of insects a spider would like to eat.

At the end of a spider's abdomen is a factory for making silk. There are several nozzles called spinnerets.



What small word can you find in the word **spinneret** that tells us what the spider does?

Looking for spiders

Make a chart to show what you have found. Write these headings across your page:

Kind of spider	Type of web	Where found	What I noticed

Spider Quiz

1. Answer true (t) or false (f)

a) spiders are insects

b) spiders have two parts to their body

c) spiders have wings

3. What happens when a spider grows too big for its skin?

4. What does a spider need besides food?

5. Draw a pattern that a spider might have for building a web.

6. Why are spiders helpful to us?

7. Circle the correct word:

a) a spiders legs are (joined/ jointed)

b) a spiders legs have (nails/claws) on the end.

c) a spider uses (antennae/palps) for feeling.

d) a spider has (eight/four) eyes.

8. How do we know that spiders can hear sounds?

9. What does a spider use fangs for?

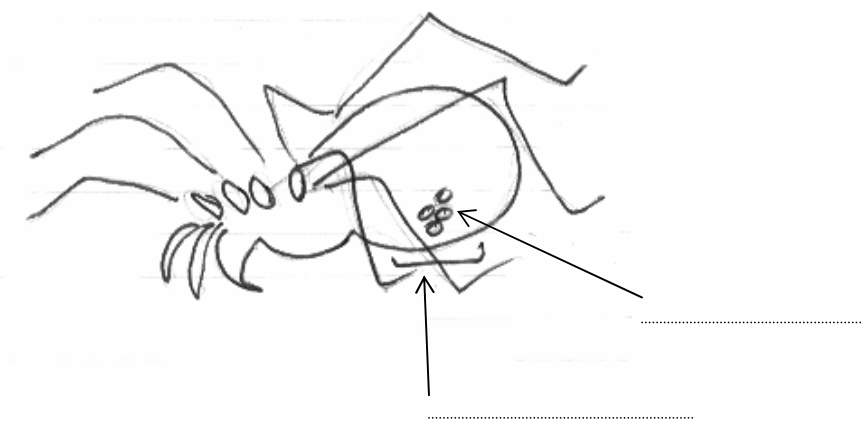
10. Name a spider that is poisonous to humans.

11. Name a spider that is poisonous to humans.

12. How does a spider eat its prey?

13. What does a spider use spinnerets for?

14. Name these parts of the spider's body:



15. What type of thread does a spider put all over her web last of all?

16. What does the spider teach us about being patient and diligent?

Read Luke 11:5-13

Why did the friend finally open the door?

Does God always answer our prayers the first time?

What will happen if we are patient and diligent in prayer?

What kind of gifts does God want to give us?

Why do you think God sometimes makes us wait for good things?

Part 2: God is a provider, (even for a spider)

God is provider

God is the Architect of our Universe. All that He has made is wonderful, and reflects His character. Just as a painting tells us something about the person who painted it, so nature can be studied to see what it tells us about God. The world which God has made has patterns and designs in it. Things like pendulums and bullets obey laws which our Father has made. Snowflakes and rock crystals show precise mathematical shapes. The numbers 2, 10, 18, 36, 54, and 86 tell us how many electrons fill each *shell* in an atom. All these things did not come about simply by chance. God is a God of order and He made things this way.

Some animals are like architects and builders in ways. Tiny single animals can make shells, while large shellfish produce beautiful shells; coral polyps have built the Great Barrier Reef, which can be seen from spaceships; ants, bees and termites build complex homes. Birds build nests, the stickleback fish builds a home, beavers resemble human engineers with their construction of dams. Both small and large animals make burrows.

God has provided all these animals with the ability to make these things which we wonder at. The spider is able to spin complex webs. Spiders are different from insects because they have eight legs, not six, and no spiders have wings. Baby spiders look like adults and don't go through the larva stage. Spiders have eight tiny eyes. Baby spiders spin webs and are not taught by their parents. God has given spiders some program, which we might call *instinct*, (which means we don't know how or why it works).

Spinning a web

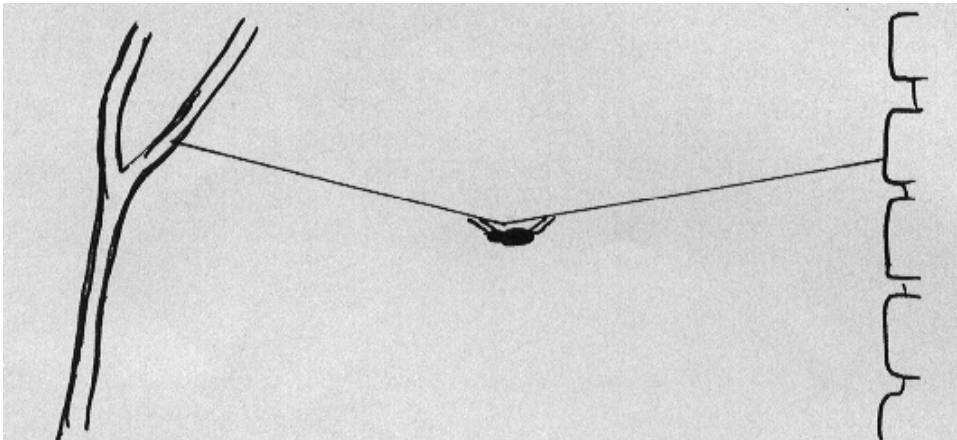
To make a web the spider usually has to cross a space with its silk.



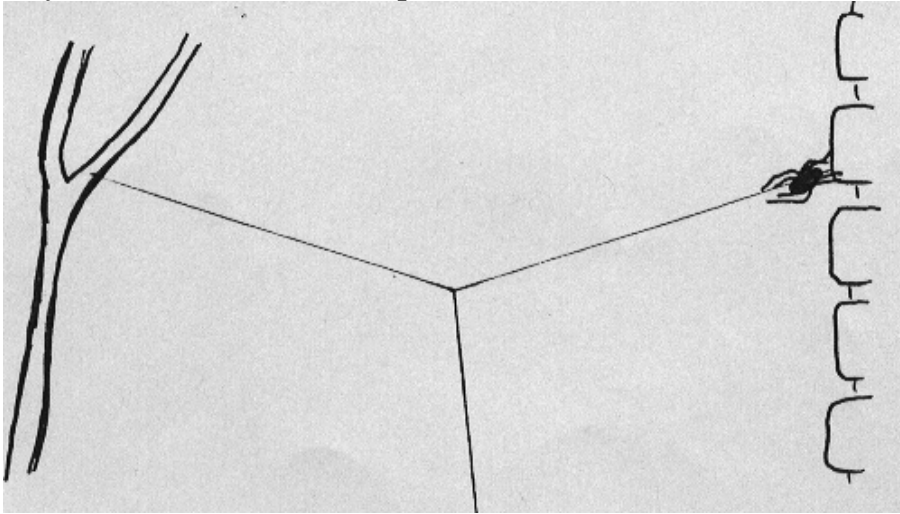
From its end, (the abdomen), the spider makes silky threads which form a sail made in a fan shape. This 'kite' can be carried on any air current. The kite is released and the spider makes one thread to follow it. If the kite does not get stuck somewhere the spider pulls it all back and eats it so that the thread is not wasted. Once the kite sticks somewhere, the spider fastens its end of the thread and begins to cross the bridge.

As the spider crosses the bridge for the first time, it cuts the thread holding both ends with its front and back legs. As the spider moves forward, it winds up the first thread, making a fresh new thread from behind. Because the spider makes the new thread longer, the new bridge sags.

The spider drops from the middle of the bridge and fixes the thread to the ground at an angle. The spider then climbs to the centre of the bridge which becomes the centre of the web.



The spider climbs back to the place where it started and makes an extra thread on the way back. From here, new spokes of the thread are made.



The spider then puts down a dry spiral shaped thread starting from the outside and working towards the centre. When this is done, the spider begins again, making a more closely wound spiral that is sticky.

The spider eats up the dry thread. Now our spider is ready to wait for an insect to fly into the sticky web. The glue on the web needs to be replaced every few days so the spider eats up the old thread making a new sticky one. The spokes and frame are not usually rebuilt unless something large breaks part of the web.

The spider can keep very still and sit in the centre of the web, or in a hide-out made of leaves woven together on the side. The spider can be seen and may be eaten by birds if it stays in the centre of its web. The web is never vertical. It is always on a slope to let the spider move around easily. The spider moves on the dry parts of the web so that it doesn't get caught. Also, the spider moves on the underside of the web, and by hanging upside down, keeps free from the sticky thread.

The spider knows if it has caught something because the web's spokes are tense and vibrate if something is caught. It is similar to us holding a fishing line. When a fish is caught we feel the line move. A big fish moves the line a lot more than a little one, so we know its size. A spider, in a similar way, knows the size of what has been caught in the web.

If the insect caught is big, the spider runs over and spins a lot of threads around it. Many spiders can inject poison to kill the insect. The spider eats the soft part on the insect and throws the shell away.

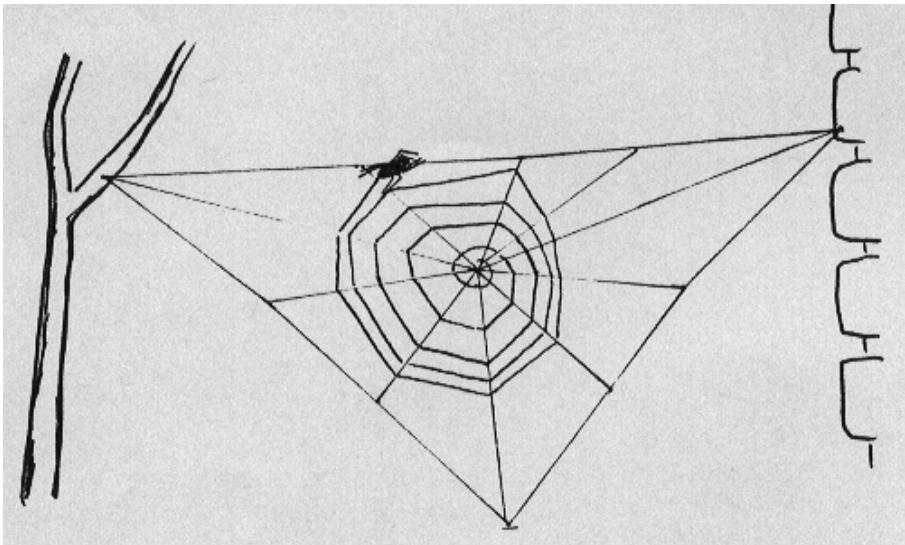
Not all spiders spin webs. The Funnelweb and Trapdoor spiders of Australia are examples of spiders that catch food without using webs.

People have looked at spiders with interest and amazement from ancient times until today. A long time ago, a poem was written about the wonderful things God made.

How wonderful are Your works, God! In wisdom you made all of them...They all look to You to give them their food at the proper time.

You can read this for yourself in Psalm 103:25-27.

Job said: *ask the animals, and they will teach you* that God's hand can be seen in all His marvellous creation. (Job 12:7)



Spiders do not have jaws and mouthparts, or feelers, (antennae), like many insects do. Spiders eat by injecting digestive juices called enzymes into the prey. The enzymes turn the inside of the insect into soup. The shell of the insect is thrown away because it is too hard and dry to digest.

Male spiders are usually smaller than female spiders. This means that they face the risk of being mistaken for prey and eaten! When it comes time for mating, the male spiders use many kinds of tricks. Some male spiders vibrate the female's web with a special rhythm to tell her that they are not to be mistaken for food. Other types of male spiders give the female a present to distract her attention. The present is an insect wrapped up in silk. Some clever male spiders suck up the food from the insect first, then spin the insect shell into a pretty silk cocoon for the female. When she finally gets it open she is in for a surprise because there is nothing to eat! Things don't always go well for the male spider. Why do you think that one type of spider is called the black widow?

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As a result of mating, the female spider lays a group of eggs. She hides these under leaves of bark. Sometimes she makes a silk box for them. Baby spiders can make thread soon after they born. Some can use their thread like a kite to carry them away on the air from the nest.

Do you think that our Father who has provided so many things for the spider to enable it to live, has done an even better job providing for us?

Are you not much more valuable than them to God? (Matthew 6:26)

Spider Quiz

1. What do these words mean: architect, universe, character, mathematical, angle, vertical, ancient, crystal, larva, prey, enzyme, rhythm and widow.

2. Some spiders don't spin webs. How would they catch their food?

3. List five animals that are builders.

4. Why is a spider not the same as an insect?

5. How does the spider begin top build its web?

6. Draw a complete spider web. Make sure that the spiral thread is continued.

7. How does the spider know if it has caught something?

8. Why do you think that the spider eats up the silk threads that it doesn't want?

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