Earthworms

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

Themes for Christian Studies: God is Creator

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Introduction
God is Creator

In the beginning, God created the heavens and the **earth**. (Genesis 1:1)

- God is still creating

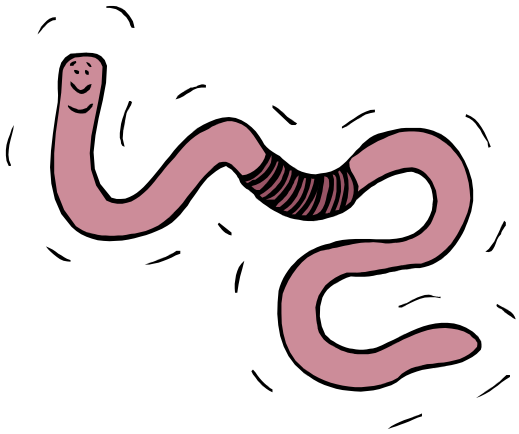
The earthworm turns useless material into good soil that is useable to plants. God creates plant food through the earthworm.

- God has created everything for a purpose.

When God created the world He said that it was **good**. (Genesis 1:31)
We must not underestimate the importance of the lowly worm. All of God's creatures play a vital role in the balance of nature.

- The earthworm is a very important part of God's creation.

God has ensured the continuation of the species through reproduction. The earthworm has a unique ability to grow again even if it is cut in half. One earthworm cut in half becomes two complete earthworms. This means that it is very difficult to kill, and therefore unlikely that the species will die out. God also made each earthworm to be both male and female. More baby worms are born that way. Their job is so important that we need them all!



Earthworm Observations

1. Let a worm crawl on your hand. What does it feel like?

2. Rub a finger gently along the underside. What can you feel?
(You should be able to feel some small bristles in the lower half of a worm's body. The worm can pull them in or out. They help the worm move)

3. Can you see the worm's head and tail?

4. What is the difference between the head and the tail?

5. Why do you think the head is pointed?

6. About how many rings does a worm have?

7. Do small worms have as many rings as big worms?

8. Watch carefully how a worm moves. Does all of the worm's body move at once?

9. In the part that is moving, what happens to the rings?

10. Do worms move more easily on rough or smooth surfaces?

11. What happens when worms are taken from a cool dark place and placed in the light?

12. Do you think worms can tell light from dark?

13. Can worms feel when you touch them?

14. What makes you think this?

15. What does a worm feel like when you touch it?

16. Why do you think worms must be kept moist and slippery?

17. Why do you think there are usually lots of worms in a compost heap?

18. Which animals like to eat worms?

19. Do worms get dirty when they move through the soil?

20. Why or why not?

Our friend the earthworm

How earthworms help us

Worms that live in the ground are some of our most useful helpers. You know how important it is to loosen-up the soil before planting? Earthworms help us by loosening up the soil for us.

First the earthworm burrows down into the soil, and then he eats large quantities of it. He eats pieces of decaying leaves and plant material that are useful to him as food. The soil and decaying matter pass through the earthworm and comes out as fine crumbly material called 'castings'.

When an earthworm burrows into the earth making little tunnels, the earth walls don't cave in. This is because the earthworm has special glands that give off a special cement. As he chews his way through the soil the cement sticks to the walls of his tunnel. An earthworm can dig and gobble two and a half metres in four days! The tunnels important to plants because air can get into the roots, gases can escape from the soil and rainwater can drain away.

Questions and activities

1. What very important job does the earthworm do for us?

2. An earthworm loosens the soil by _____

down into it and _____ lots of it.

3. Draw and name some of the decaying (dying) matter in the soil that would be good food for an earthworm. Think of a compost heap.

4. Does the earthworm need the actual soil for food or just the decaying matter?

5. How does the soil look when it comes out of the earthworm?

6. What type of plants do earthworms eat – dead or living?

Earthworm experiment

Take two identical jars. Set them up as follows:
Put some soil at the bottom.
Put a layer of sand in the middle.
Put another layer of soil on top.
On the top put leaf litter or grass clippings.
Put in enough water to make the soil moist.
Cover the sides of the jars with dark paper.

Put 3 or 4 earthworms in one jar, but none in the other. The one without worms is the control jar. This helps us to see the difference between the two jars.
Put both jars into a warm place, like a window sill, and leave for a few weeks
At the end of the time, remove the dark paper and see what work the earthworms have done.

Draw the two jars at the end of the experiment and describe the differences.

An earthworm's body

An earthworm can be reddish brown or grey. The job of the red earthworm is to bring good soil to the top of the ground. The job of the grey earthworm is to release his soil underground.

Let's look at the earthworm. He is a moist slippery tube, without legs, feet, eyes, ears, feelers or wings. He can sense vibrations in the earth. At night when he comes out looking for food, he will quickly disappear into his burrow again at the feeling of an approaching footstep.

The wetness of his skin moistens the earth around him and makes it easier to work through. He also has rows of tiny bristles covering the length of his entire body. He can draw in or project these bristles whenever he wants to. When they are out, he can grip the soil firmly, and when they are in he can slide forward easily.

His body is made up of hundreds of rings, which he stretches and contracts as a means of moving around. If you watch an earthworm move along you will see him stretching himself out long and thin, then drawing himself up short and fat.

An earthworm has a bulging part called a girdle. This is where the eggs are laid. When the eggs are laid the girdle is cast off and left in the earth. It is sealed at both ends so that the eggs are safe. This is now called an egg cocoon. Usually only one of the eggs hatches out into a baby worm. It stays inside the cocoon for a while, and then when it is ready it wriggles out into the open soil.

Earthworms have five hearts. These are found in sections 7 to 11 of its 16 sections. Please treat earthworms carefully, because God has asked us to be caretakers of his wonderful creation.

1. What amazing thing can an earthworm do even though he has no eyes, ears, feelers or wings?

2. How does an earthworm's wet skin help him in his job?

3. What can an earthworm do when his bristles are out?

4. What do the rings help the earthworm to do?

5. Draw an earthworm with his rings stretched out.

6. Write the dictionary meaning of 'contracted'.

7. Draw an earthworm with his rings contracted.

8. What is the girdle used for?

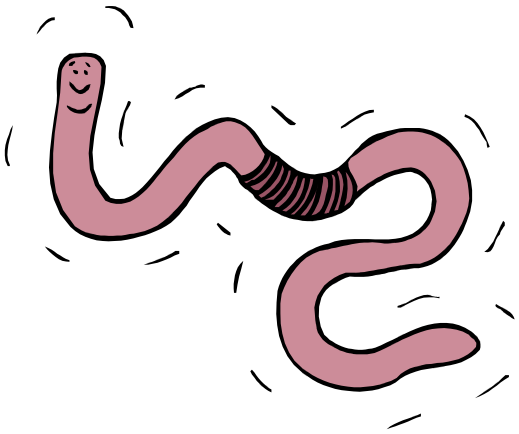
9. Draw an earthworm showing the girdle. Label it.

10. What does the girdle become when the worm casts it off?

11. How many babies will usually hatch from a cocoon?

12. Draw an earthworm with its 16 sections and show where you would find its hearts.

13. Why should we treat earthworms with respect?



Some earthworm riddles

Work with a partner and ask each other these riddles.

1. What animal is both male and female, has five hearts, and enjoys being buried alive?

Ans: an earthworm

2. What happens if you are digging in the garden and cut an earthworm in half?

Ans: The section that contains its heart will grow a new tail, and soon he will be like new.

3. Where would you find an earthworm's hearts?

Ans: in the middle (sections 7, 8,9,10, 11)

4. If an earthworm weighs 2 grams and eats as much food as his own weight in a day, how mush would he eat in a week?

Ans: 14 grams

5. Name three things an earthworm would eat:

Ans: dead grass, dead leaves, soil, dead flower petals

6. Why did God make each earthworm to be both male and female?

More baby worms are born that way. Their job is so important that we need them all!

7. When an earthworm burrows into the earth making little tunnels, why don't the earth walls cave in?

Ans: The earthworm has special glands that give off a special cement. As he chews his way through the soil the cement sticks to the walls of his tunnel.

8. How far can an earthworm dig and gobble in four days?

Ans: two and a half metres

9. Why are the tunnels important to plants?

Ans: air can get into the roots, gases can escape from the soil and rainwater can drain away.

10. What are the two colours that earthworms can be?

Ans: reddish brown or grey

11. What is the job of the red earthworm?

Ans: to bring good soil to the top of the ground.

12. What is the job of the grey earthworm?

Ans: To release his soil underground.

Earthworm Test

1. True or False

a) An earthworm has wet skin ___
b) When an earthworm has his bristles in he can grip the soil easily ___
c) An earthworm cannot feel vibrations ___

2. Match the following by drawing lines.

a) contract	a) It is used to lay eggs in
b) stretch out	b) A worm leaves it on the ground
c) rings	c) An earthworm is long and thin
d) bristles	d) An earthworm is short and fat
e) girdle	e) An earthworm has hundreds of them
f) casts	f) They help an earthworm grip the soil

3. How many babies will hatch from an earthworm's cocoon? _____

4. If you are digging in the garden and you cut an earthworm in half with the spade, each section will _____ again.

5. God made each earthworm to be both male and female so that would be _____ of them.

6. When an earthworm burrows into the earth he makes little tunnels that don't cave in because he uses _____ from his body to support the walls.

7. You would most likely find a red earthworm at the _____ of the soil.

8. You would find a grey earthworm at the _____ of the soil.

9. Earthworms help plants to get _____, water and nutrients to the roots.

10. An earthworm is very important to us because he helps to _____ up the soil.

Answers:

1. a) T b) T c) F
2. a-d; b-c; c-e; d-f; e-b
3. one
4. grow
5. many / lots
6. glue
7. top
8. bottom
9. air
10. break