

Objective: The purpose of this game is to introduce the players to a wide variety of annelids, nematodes and platyhelminthes. Often the word “worm” conjures up nothing more than an image of an earthworm. There are thousands of species of worms, many of them marine creatures that we would probably not even identify as worms. Hopefully after playing this game the participants will gain an appreciation for worms!

Number of players: Anywhere from 2 to 12 (or even a few more). Larger groups play as teams.

Time to prepare: It will take one adult about an hour to assemble the display “cages.”

Time to play: Anywhere from 15 minutes to 60 minutes, depending on how much time you spend reading the information on the cards, and how many times you play the game.

You will need:

- copies of the colored card pages (printed onto card stock, if possible)
- scissors
- glue stick or white glue (and possibly tape as well)
- colored paper to make display “cages” for the worm cards (2 sheets of each color, to make two sets of cages. You decide how many cages in each set. Recommended : 6 cages per set)
- a copy of the spinner pieces
- some cardboard (recycle some cereal boxes!)
- some very short sharpened pencils, or short pieces of dowel sharpened to a point

How to prepare:

Cut apart the worm cards and set them aside until ready to play.

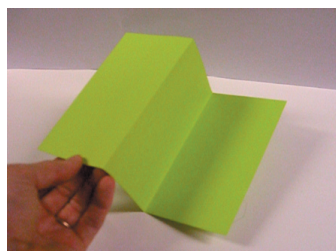
Cut out the spinner squares and glue to cardboard. When dry (or after a few minutes, if you are in a hurry) trim off extra cardboard. Prepare four pencils (or pieces of dowel rod approximate diameter of a pencil) by cutting them to a length of about 2 or 3 inches (6-8 cm) and sharpening one end. Punch a small hole in the center of the cardboard spinner using the point of a scissor or ballpoint pen. (The sharpened pencil might be used if you are careful, but chances are the point will snap.) After the starter hole is punched, push each pencil (or piece of dowel) into the hole so that the sharpened end is sticking out about an inch (2-3 cm). (See illustration on the first spinner pattern page.) Make sure the pencil is stuck in tightly. If it is loose, you may want to secure it with some glue or tape. Then check each spinner to see if works. Give it a spin, like a top, and see if it twirls well. If not, make corrections so that it spins. If does not have to spin a long time, just long enough to give the players the satisfaction of seeing it spin, and making sure it lands on a random side each time.

How to play:

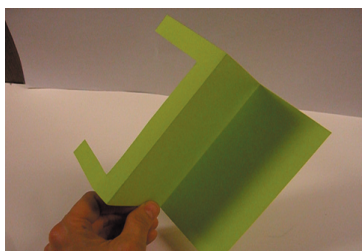
Divide the players into two teams. You don’t need to have exactly the same number of players on each team. Distribute cards to each team (or to each player if you only have two players). You may want to emphasize group cooperation, especially if you have players who may need help reading the information on the cards. Each player can hold some of the cards, or you can lay all the cards out in front of the whole team so everyone can see them. Do what works best for you. You can also vary



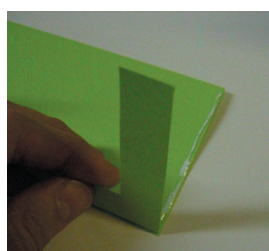
To make the zoo's "display cages" you will need sheets of colored paper. Colored cages will make the game look more exciting and interesting to the players. Fold each paper like this:



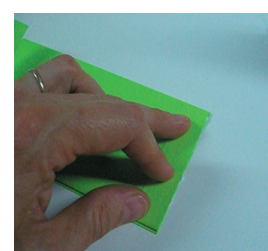
STEP 1: Fold the paper in thirds, as shown above.



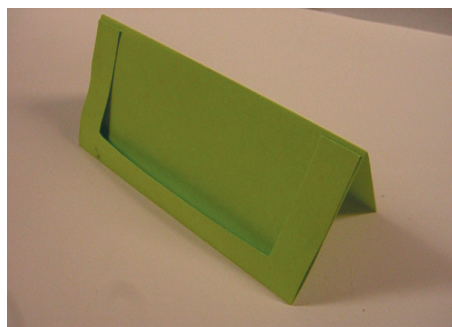
STEP 2: Cut a "window" on one side, leaving a square U-shaped hole. Keep the "scrap" piece for step 6.



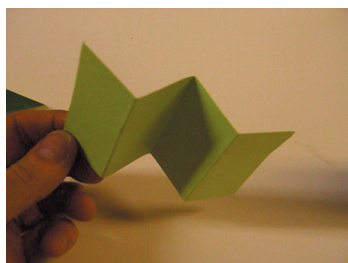
STEP 3: Glue down the sides of the U-shaped window. Use a very narrow bead of glue.



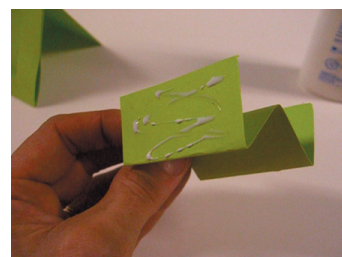
STEP 4: Press firmly to secure these side seams.



STEP 5: The "cage" should look like this after these steps are complete. Now you just need to make an internal piece that will keep the cage from going flat.



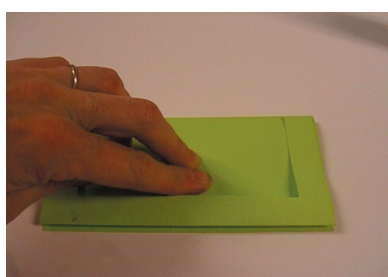
STEP 6: Take the "scrap" piece that you cut out in step 2 and make pleats as shown here.



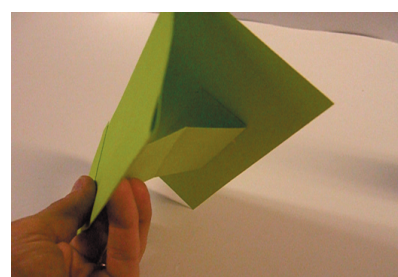
STEP 7: Put some glue on the end flaps (both ends, even though only one end is shown here).



STEP 8: Keep this piece folded and place it inside the display "cage" you just made.



STEP 9: Press and hold.



STEP 10: After dry, this interior support piece will allow the display cage to open only so far, and will also keep it from closing too easily (and will fold flat for storage).

TIP: Keep the folded cages, the worm cards, and the disassembled spinners in a flat storage envelope or plastic container and either keep it for later use or pass it along to another family.

the number cages you use in order to adjust the game for more or less players (or for a longer or shorter game). You can use as few as 2 cages or as many as 7.

The goal of the game is to fill your team's empty cages with specimens. The teams take turns being in charge of the spinners. Within each time, players can take turns spinning.

Choose how many spinners you will use for each game. Using just one spinner will be very easy and give more possible results. With each spinner you add, the number of qualifying worms decreases, lengthening the game. You can even let each team choose the spinners they want to spin. It really doesn't matter because the object of the game is to become familiar with the worms and that will be accomplished no matter which spinners you use or how the zoos are filled.) This is a flexible game that can be somewhat individualized to your particular group of students.

When the spinners have been spun and have all come to rest, someone reads the sides of the spinners that are touching the table. Each team (or player) looks through their cards to try to find one that has all those characteristics. Players can use clues that are in the written descriptions or that can easily be seen by looking at the picture (e.g. looking for feet, fans, feathers or scales). The players with those cards (on either team, either the spinning or non-spinning team) may then put those worms into one of their team's display cages. Then it's other team's turn to spin the spinners.

The first team to fill all their display cages wins the game (or wins that round, if you are playing multiple rounds--which is highly recommended). Shuffle the cards between rounds, making sure that the players end up with different worms in each round. This will allow them to become familiar with as many worms as possible during the game.

There may be times when the spinners give impossible scenarios, in which case you just spin again. Which spinners you use and how many of them you use is up to the teacher/adult. This game is somewhat flexible, and can be adapted whenever necessary.

In cases of ambiguity, it is up to the adult supervisor to determine whether a worm qualifies. (The real goal of the game is to learn about worms, not really to fill a zoo, so the determination of the supervisor will be just fine in all cases!)

EXTRA GAME IDEA: "ESCAPED!"

Here's another game you can play with the cards. (Actually, I found this game even more effective than the regular game, even with my middle schoolers!) Put the cards in a stack and in the control of the supervising adult. The supervisor begins laying out cards, face up, saying the name of each worm as it is laid down (and possibly pointing out some important features or information about the worms if you are trying to sneak in content wherever possible). In the first round, only four cards are laid out. Then the students must turn around (or close their eyes if they can do it without cheating) while the supervisor removes one worm card. The supervisor may rearrange the remaining cards to make it more difficult to determine which one is missing. The students then look carefully at the cards and try to determine which worm has "escaped from the zoo." If they can say the name of the missing worm, the card is returned. The supervisor then adds another card and the process is repeated with five cards. With each round, the supervisor adds another worm. After 8 or 10 rounds, it will become much more difficult to determine which card is missing. (With older students you can start out with 6-8 cards.)

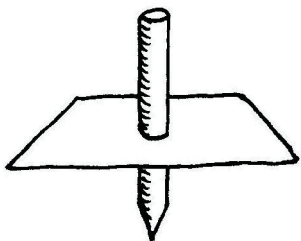
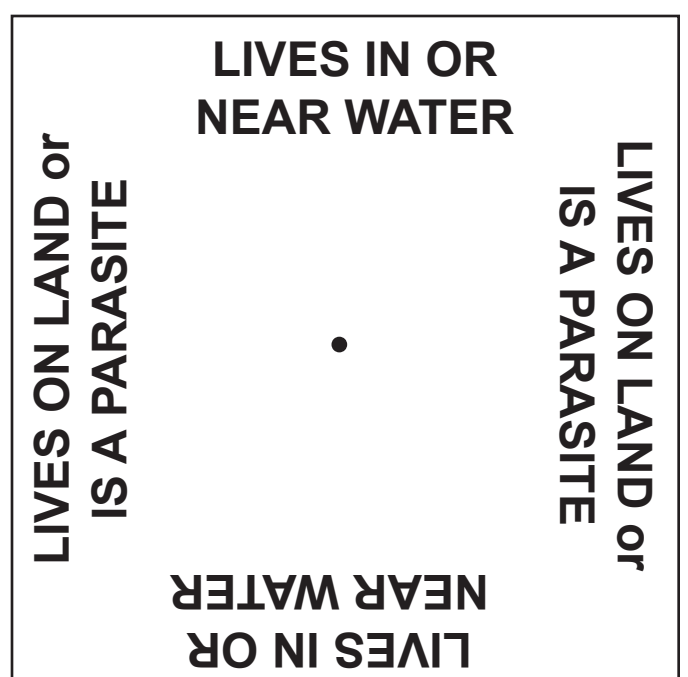
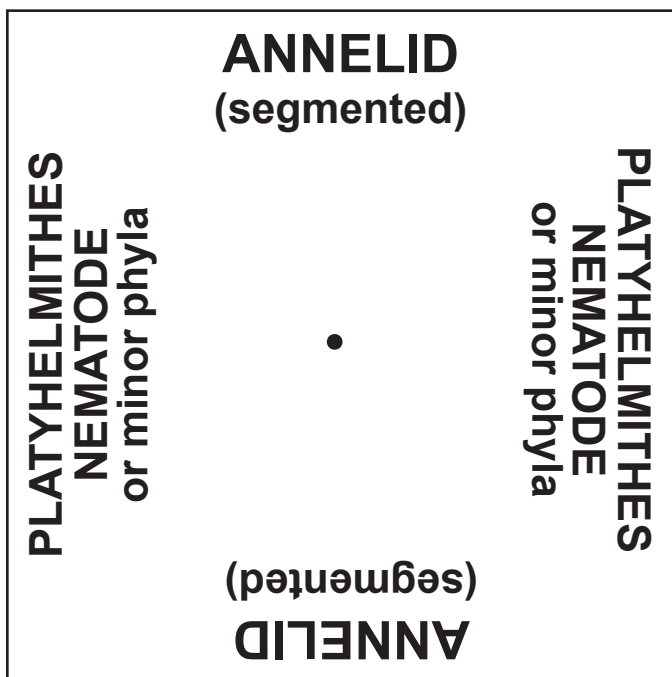
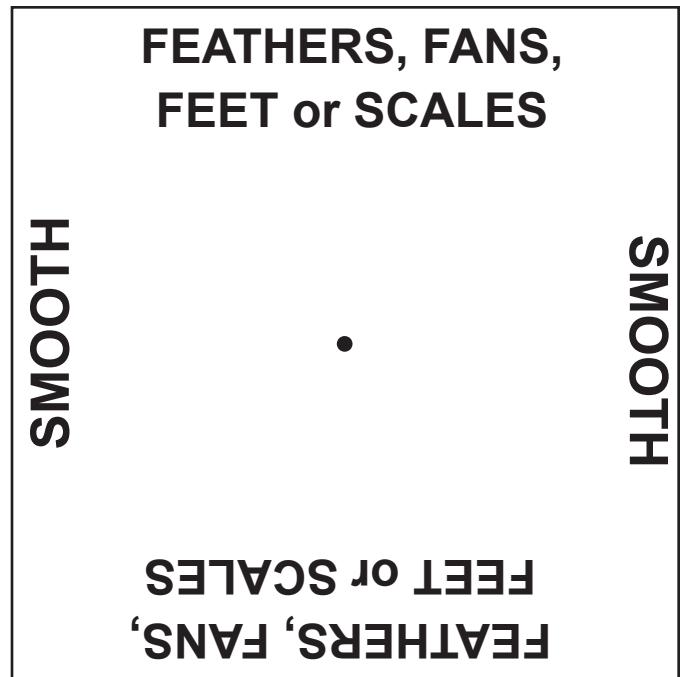
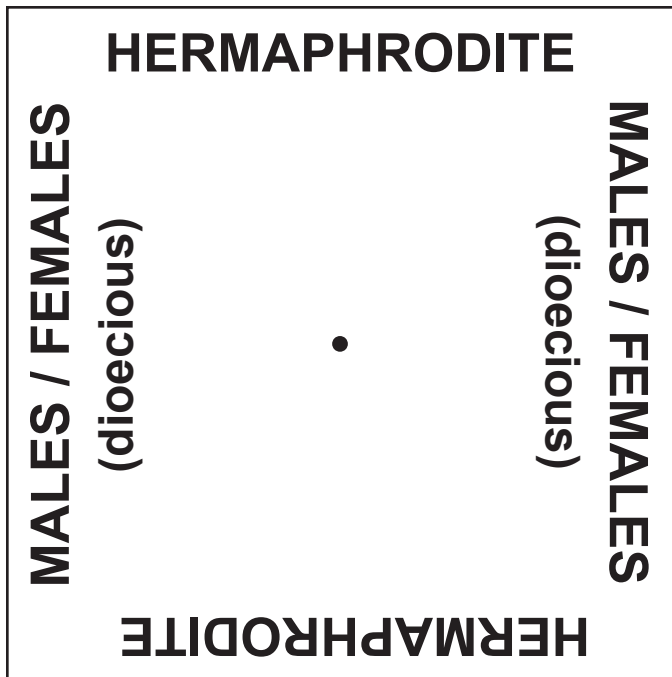
To make it even more fun, set a timer giving the students only 30 seconds to correctly guess the missing worm. If the worm is not identified in that amount of time, the worm is has successfully escaped from the zoo, and the card is not returned. You could even keep score: HUMANS vs. WORMS. Give the students a point for each worm they return and give the worms a point for each successful escape. For this variation, start the game with at least 10 cards, to give the worms a fair chance at winning.

VIDEO ACTIVITY:

Watch some videos of some of these worms on Ellen McHenry's kid-safe YouTube channel: [YouTube.com/eejm63](https://www.youtube.com/eejm63). Playlist: Worms



ellenjmchenry.com



The spinners should look like this when assembled.

AUSTRALIAN BEACH WORM



This marine annelid can grow to lengths of 2 meters (6 feet). They live under the sand on ocean beaches, eating whatever they find on the sand. Fishermen love to catch them and use them as bait. Probably hermaphrodites.

HORSEHAIR WORM

"California blackworm"



These worms have their own phylum: Nematomorpha. The adults live in fresh water, but the larva are parasitic and live in insects. There are males and females. They can grow to 100 cm (40 in.) long and can tie themselves in knots.

EARTH WORM

Lumbriculus terrestris



This annelid lives in soil, eating all kinds of plant and soil particles. It is a hermaphrodite. Scientists believe the earthworm is not native to N. America but was intentionally imported to the New World by European colonists.

LEECH



There are many species of leeches, but all are members of the annelid phylum. Most live in fresh water and most are hermaphroditic. They are free-living but get their nutrition from the blood of fish and animals.

LUGWORM



This marine annelid (also called “rock worm”) digs J-shaped burrows along ocean beaches. It eats small particles that flow with the water into its burrow. The males’ sperm washes into the females’ burrows.

LUMBRICULUS VARIEGATUS



This tiny annelid is only about an inch (3 cm) long. Its body is fairly transparent, which makes it popular for biology labs. Like many annelids it is hermaphroditic and free-living.



EUNICE WORM

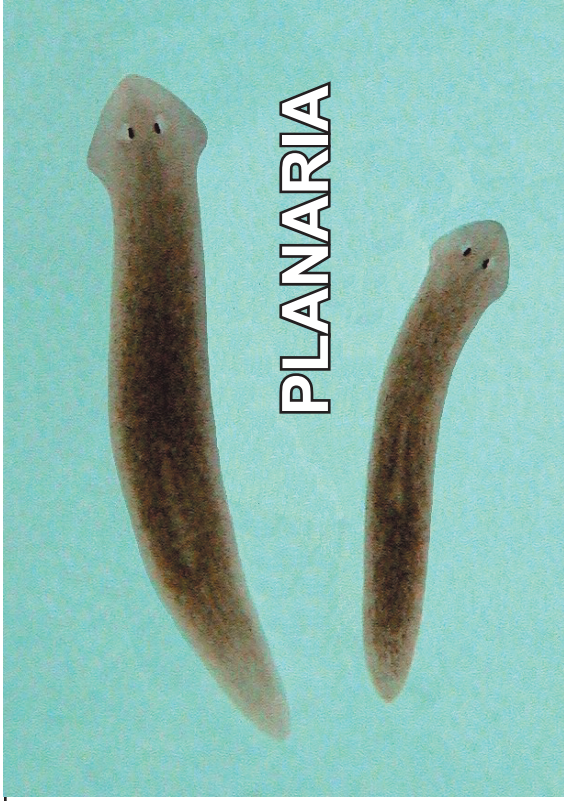
They live in shallow ocean waters and hide in the sand in order to spring out suddenly and catch unsuspecting prey with their sharp teeth. There are males and females. They can be over 1 meter long.

SOIL NEMATODES

“C. elegans”



Soil nematodes are microscopic hermaphroditic nematodes found in soil. There are thousands of them in just one bucket of dirt. Like earthworms, they help to return nutrients to soil.



PLANARIA

Planaria are free-living, harmless members of the flatworm family (platyhelminthes). Various species can be found in fresh water, salt water or on land. They are hermaphrodites but can also regenerate.



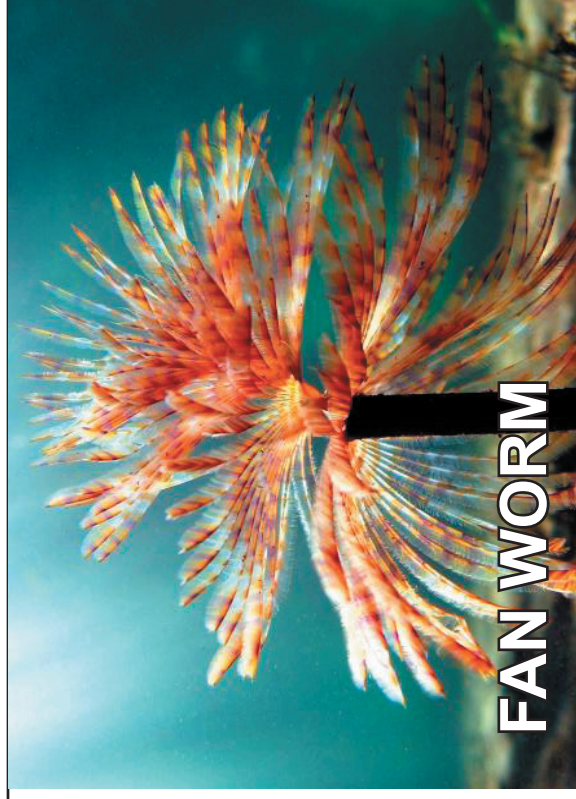
RAGWORM

This annelid lives on ocean beaches but will also swim up rivers. It has sharp teeth and both hunts and scavenges. It can be 1 ft (25 cm) long. It is a hermaphrodite, but spawns only once, then dies.



PINWORM

This parasite is a nematode (roundworm). It can be found in the digestive tracts of humans. The males are much smaller than the females. The females crawl out of the anus at night to lay eggs.



FAN WORM

This marine annelid stays under the water. It builds a tube around its body, using mucus and sand. It sticks out its tentacles to feed on particles that drift by. There are males and females.



PEANUT WORM

These worm-like creatures form phylum "Sipuncula." They live under rocks along ocean beaches. They eat small particles using tentacles. They have males and females and grow to be about 10 cm (4 in.).



TRUMPET WORM

This marine annelid stays under the water and builds a tube around itself using mucus and sand. It is about 1 in (2.5 cm). It feeds on small particles or small animals. There are males and females.



TAPE WORM

Tapeworms are hermaphroditic, parasitic flatworms. Different types of tapeworms infest various vertebrates. Humans can become infested by eating undercooked meat. The worms can grow to 6 ft (2 m) long.



VINEGAR EEL

Vinegar eels are not eels. They are microscopic, free-living nematodes. They love acidic environments such as vinegar. They eat bacteria and yeast cells in the vinegar. They have males and females.

FLUKE



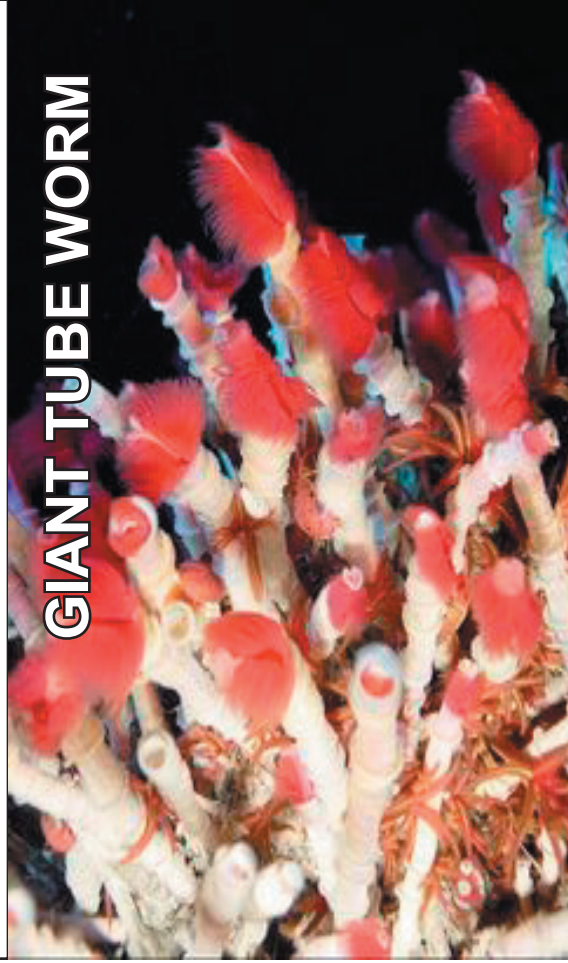
Flukes are hermaphroditic parasites from the platyhelminthes (flatworm) phylum. Their life cycle requires more than one animal. Usually they start out in a mollusk or crustacean and then move to a vertebrate.

ARROW WORM



Arrow worms belong to their own phylum, *Chaetognatha*, meaning "hair-jaws." They can be found at the bottom of many ocean environments. They are hermaphroditic and are predators..

GIANT TUBE WORM

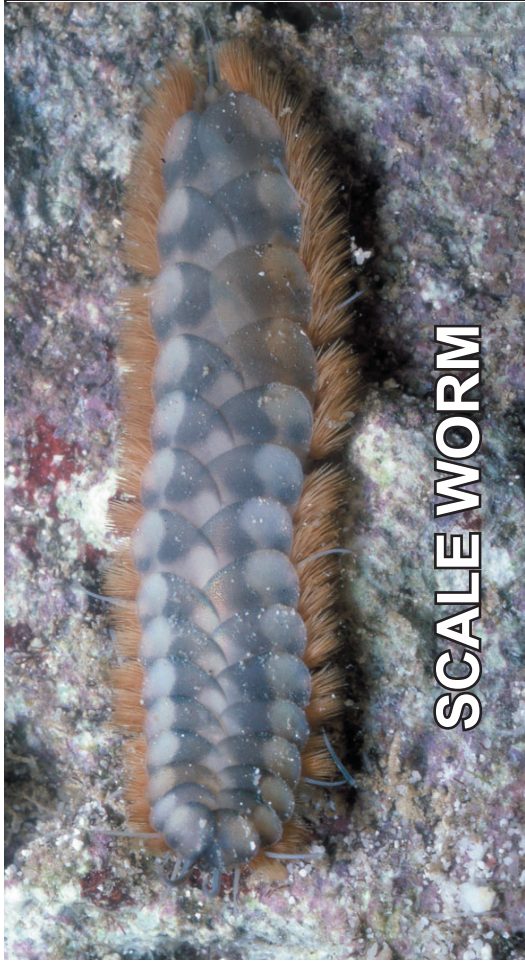


Tube worms are annelids that live around hot vents at the bottom of the Pacific Ocean. The red tip absorbs hydrogen sulfide to feed the symbiotic bacteria that live inside it. There are males and females.

RIBBON WORM

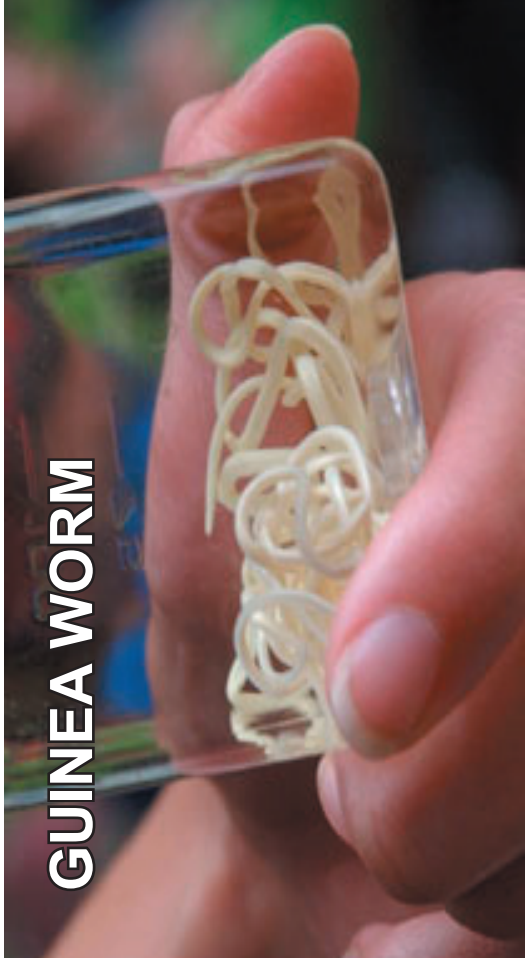


Ribbon worms are part of phylum Nemertea. They are extremely long; the record is 177 ft. (54 m.). They use a venomous proboscis to kill prey. Freshwater Nemerteans are hermaphrodites, marine species are not.



SCALE WORM

The scale worm is a marine annelid that grows up to 10 in. (30 cm). It is related to the sea mouse. It is a predator with sharp jaws. It can sometimes be luminescent. There are males and females.



GUINEA WORM

The guinea worm is a parasitic nematode named after the country of Guinea. The larva live in tiny crustaceans. People drink infested water and unknowingly swallow larvae. There are males and females.



SEA MOUSE

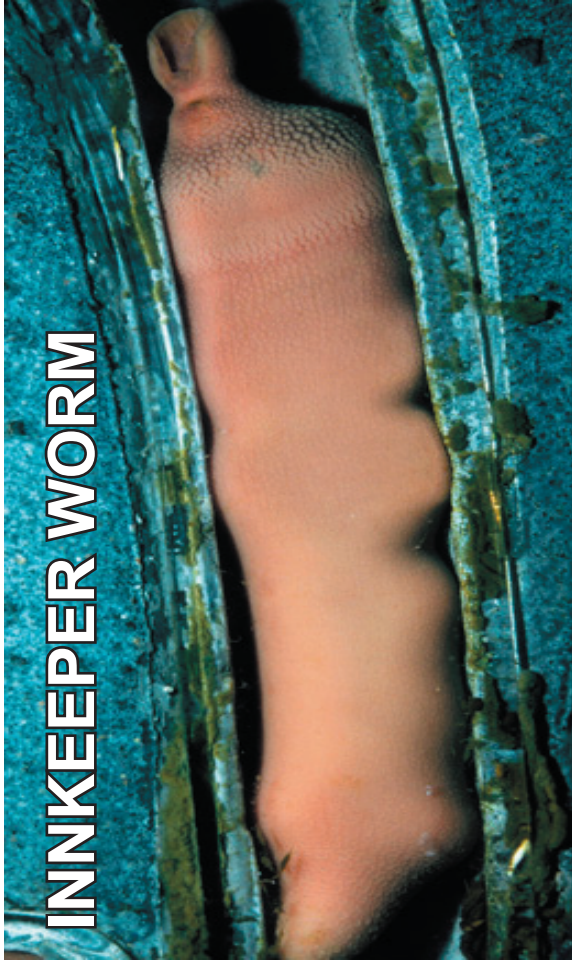
The sea mouse is a marine annelid that is covered with long setae that look like hairs. It is a predator but is harmless to people. It lives in the North Atlantic. It has foot flaps and is a hermaphrodite.



TRICHINELLA

The trichinella worm is a nematode parasite that infects many animals, including humans. It lives in muscle cells. Humans usually get them from eating under-cooked pork. There are males and females.

INNKEEPER WORM



This worm and its close relatives form phylum Echiura (the "spoon worms"). The innkeeper lives in a U-shaped burrow on sandy beaches and feeds on tiny particles. Other animals live in the burrow, too. There are males and females.

BEARDED FIREWORM



This marine annelid lives in warm coral reefs. It has poisonous bristles on its sides and is a predator. Its breeding seasons are determined by the phases of the moon. The males and females rise to the surface and glow.

HOOKWORM



The hookworm is a parasitic nematode that lives in the intestines of mammals. The symptoms can be fairly minor. Humans can get hookworms by going barefoot in an infested area. There are males and females.

VELVET WORM



Scientists disagree about whether this worm is really a worm. It is in phylum Onychophora. It has a velvet texture and lives in moist forests. It catches insects using a sticky mucus from its antennae. There are males and females.