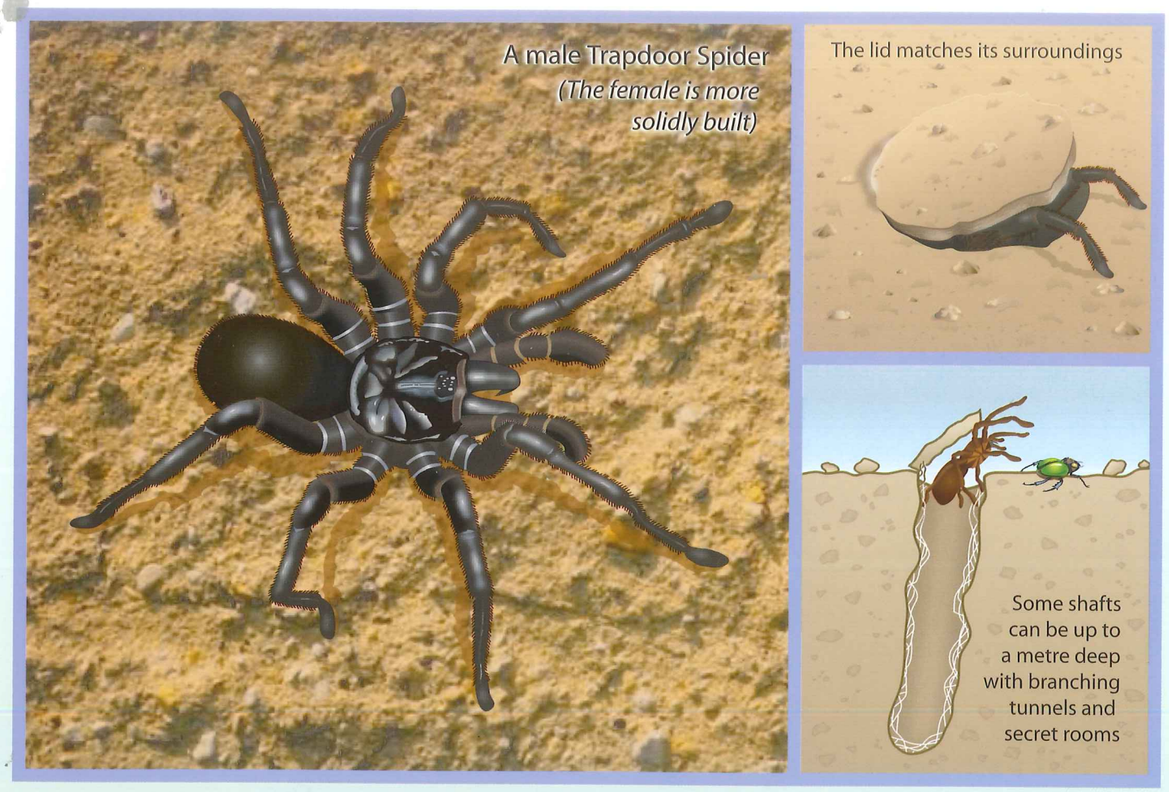


Natural Engineers

1 Take a stroll through any bush setting and you could be treading on the front door of one of the craftiest engineers in the animal kingdom. The trapdoor spider is an underground architect, building a cleverly designed burrow with a hinged lid.

How do trapdoor spiders construct their burrows?

2 Firstly, the spider chooses a spot that isn't likely to flood. Steep banks are a popular choice so water can run off when it rains.

A second consideration is trees, or rather *lack* of trees. You might be surprised to know that many trapdoor spiders prefer to build out in the open. Why? Scientists think this might be because spiderlings need a strong breeze to carry them off when they leave home. An open space ensures that junior won't be hanging around the burrow forever.

Once the building spot has been chosen, the trapdoor spider uses its sharp, rake-like fangs to dig a long, thin hole, sweeping the soil aside in little pellets.

3 In order to strengthen its burrow, the trapdoor spider needs to produce silk. Silk starts its life in a spider's *silk gland*, which is located in the abdomen of the animal. At this point, silk is a thick, protein-rich liquid that is converted into silk strands by a spider's *spinneret*. The silk that comes out of spiders is one of the strongest naturally occurring fibres. It is even tougher than most man-made materials. Scientists are still trying to develop ways of making spider silk in laboratories, but they have not been successful as yet.

4 This strength is exactly what the trapdoor spider needs. The burrow is lined with silk to stop soil slipping into the nest and if the soil is very loose, several layers of silk are applied. No slapdash job for this master builder!

Next the door itself is constructed. This is the most important building task and spiders are very fussy about their front doors. The door not only protects the spider from predators but it also plays a big role in capturing dinner.

5 The spider uses its fangs to carve out a circular flap, made from a combination of soil and plant material, held together with silk. The edges of the lid are carefully chiselled to get an exact fit. When the door is closed, the edges fit snugly into the rim. A little flap of silk hinges the door to the ground.

It is important that the door be well camouflaged, so the spider disguises it to look like the surrounding ground. Moss and other plant materials make the perfect camouflage.

6 For some crafty spiders, this neat burrow is just the beginning. Occasionally an extra hallway is added to fool any predator that gets past the front door. A second tunnel is dug into the side of the burrow and this is sealed with another door. This handy escape route will not only outwit the predator but is also a useful retreat if the burrow becomes too wet after rain.

If you look closely at an old trapdoor, you might see circles of smaller trapdoors inside. The spider adds more soil and silk to make the door larger as it grows bigger.

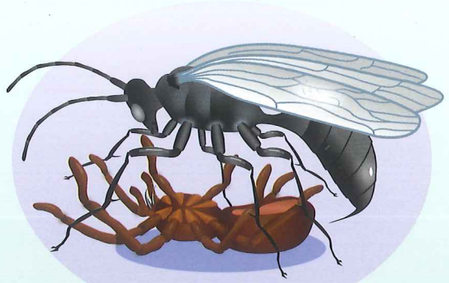
7 Now the spider not only has a cosy home but the perfect trap. How does it work?

Trapdoor spiders are nocturnal; usually setting their trap after the sun has gone down. The spider sits at the top of the burrow, with the lid slightly open. Its front pair of legs, which are sensitive to movement, stick out under the lid. When a victim comes close, the spider rushes out on the attack. Sometimes it chases the victim if it looks like it's getting away.

8 Some spiders design complex traps using small twigs wired with silk. These are placed around the burrow. The spider hides under the door and at the slightest twitch of the silken lines, it rushes out and plunges its fangs into the victim. The venom kills the prey within seconds and dissolves the soft tissues into soup that the spider can suck up.

9 The trapdoor spider is not a big traveller. Usually it stays in the same spot for its entire life, so its enemies often come hunting for it. The trapdoor spider's worst enemy is the spider-hunting wasp, which flips back the trapdoor and dives into the burrow. If the trapdoor spider clings to the underside of the door, the wasp is ruthless. It slices through the door with its shearing jaws and paralyses the spider before laying an egg inside it. When the wasp grub hatches, it eats the spider alive.

10 This is why it is so important that trapdoor spiders perfect the construction of their door and burrow: they need a device that can both trap prey as well as protect themselves from a horrible death. No wonder they have become such master engineers.



The enemy: The Spider-Hunting Wasp

Questions

1 What are two things that a trapdoor spider does not want near its burrow?
a dirt and plants
b water and trees
c other spiders and insects

2 What does a trapdoor spider use first to make its burrow?
a fangs
b spinneret
c legs

3 Spider silk is
a made in laboratories.
b protein rich.
c made from soil.

4 A trapdoor spider eats by
a chewing.
b licking.
c sucking.

5 At what time is the trapdoor spider most likely to be found at their trapdoor?
a during a thunderstorm
b at midday
c at night

6 The chances of seeing a trapdoor burrow in a thick forest are
a likely.
b unlikey.
c almost certain.

Vocabulary

Find words in the text that match the meanings below. The word is in the section shown in brackets.

7 Small ball-shaped items (2)
8 Make stronger (3)
9 To outsmart something (6)
10 Active only at night (7)
11 To be cruel and act without feeling (9)

Grammar

*A **compound word** is made of two separate words, e.g. afternoon. Make compound words from the following lists.*

12	trap	dash
13	under	door
14	slap	way
15	hall	ground

Back To The Text...

16 'No slapdash job for this master builder', means
a the spider is a careless builder.
b the spider is a careful builder.

17 What would be a good sub-heading for section 3?
a Choosing the Right Spot
b The Spider's Silk

18 Which of the following facts do we learn from the illustration on the front of the card?
a The spider often builds a second tunnel.
b The spider can build a tunnel that is a metre deep.

Cloze

Brilliant Birds

*Choose **five** of the following words to complete this cloze passage.*

her birds nest food
match sewing tree mud

Many birds can ___19___ the engineering skills of the trapdoor spider. The male hornbill is known to seal his partner inside a tree hollow to keep ___20___ and the eggs safe. He gathers all the food and feeds the family through a small hole. The smart little tailorbird uses its beak to make a home by ___21___ leaves together with plant fibre, while the weaverbird cleverly weaves fine grasses together to make its ___22___. The oven bird prefers to use mud and vegetation to make a nest shaped like an oven. These ___23___ nests are very strong and durable.

Challenge Option

Research: Find out the name of the world's biggest spider.