

A Friend for Howard



Resource Pack

Teacher notes

This book is written to support science teaching and learning at KS1. The story in the book is linked to specific learning outcomes from the National Curriculum for England and Wales but can, of course, be used with any science curriculum. The story has no satisfactory ending. The children are expected to use their science knowledge to solve the dilemma in which the character finds himself.

Lesson Support

The story can be used to support some/all lessons in the unit. The children will find investigations more relevant and interesting if they are doing the research in order to help out a character. Four practical lesson ideas are available, with appropriate worksheets. No expensive or difficult-to-find resources are used for the practical lessons.

The lesson plans focus on classifying things as living and non-living, how animals live in habitats that suit them, searching for and identifying minibeasts and constructing simple food chains.

The topic could be extended to look at the animals and plants found in other habitats such as desert, ocean or mountain. The children could also research unusual food chains such as those involving carnivorous plants.

Topic Starter Activity

You may prefer to use this book as a starter activity to gauge children's knowledge before the topic gets underway. Read them the story and collect ideas for solutions to the problem. This way you will be able to see how much children know already and whether there are any misconceptions that need to be addressed.

Topic Assessment

The story can be used for assessment. At the end of the topic, read the story and use the assessment worksheets to find out how much the children have learnt and understood about the topic. Assessment can be written, drawn or oral and done individually or collaboratively.

Beyond Science

The books can be used beyond the science curriculum.

This story could stimulate a discussion about:

- Friendship: do we need to look like and enjoy the same things as our friends?
- Animal conservation: why are beetles like Howard only found in two tiny areas of the UK? Why does his habitat need protecting?
- Measuring speed and distance: challenge the children to move as fast as Howard, or use Howard as a measuring unit (how many Howards would fit along the edge of the table?).
- Art: discuss all the different shapes and colours of the beetles on p2 of the story and then introduce the children to the American artists Christopher Marley and Lucy Arnold, who both use images of insects in their colourful work. The children could work together to produce a similar piece of art.

Lesson 1. Alive or Not?

Enquiry type: Identifying & classifying

Each group will need:

Three hoops or large sheets of paper, a selection of items to sort: a plastic cup, a glass jar, a metal spoon, a plant in a pot, some moss, a few woodlice – alive and in a suitable pot with airholes, a plastic figure, a piece of fruit or vegetable. To extend the children's thinking, also include: some dead leaves, a wooden spoon, a bone.

Label two hoops or sheets of paper: "Living" and "Not living". Show the children the collection of items and ask them to sort them into those that are living things and those that are not. Discuss what helps us to determine whether something is alive or not (movement, eating, pooing, etc). Ask the children to suggest other things that could be added to either category. If you have a class/school pet, they can be included, but be aware of their needs and, if they prefer not to stay in the sorting hoop, they should not be forced – you could use a photo to represent them.

Add the dead leaves, bones and wooden spoon to the collection. Ask the children whether these things are alive. Encourage them to consider that although they aren't alive now, they were alive/part of a living thing at some point. Using the third hoop or sheet of paper you can add the category "No longer living" and sort all the items again.

The worksheet for this lesson has pictures of Howard's friends on it. The children decide which friends are living things and which aren't and try to explain their decisions.

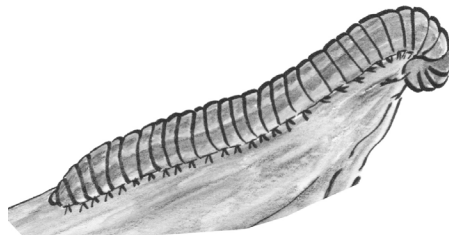
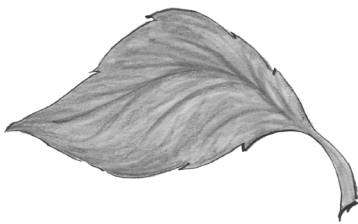


Resources available: Worksheet (2 levels), slide introducing problem.

Alive or Not? – worksheet 1

I can say whether something is living or not living.
I can explain how I made my decision.

Here are all Howard's friends.
Colour in the ones that are living things.

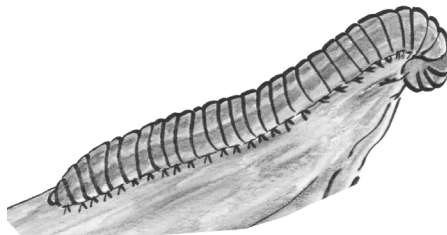
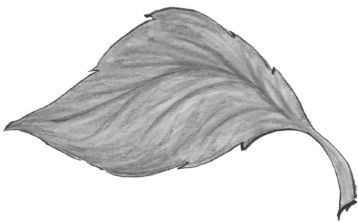


Can you explain how you decided which friends were living things?

Alive or Not? – worksheet 2

I can say whether something is living or not living.
I can explain how I made my decision.

Here are all Howard's friends.
Draw a ring around the ones that are living things.



All living things _____

Can you finish this sentence? Use the words in the box to help you.

eat

move

have

breathe

need

grow

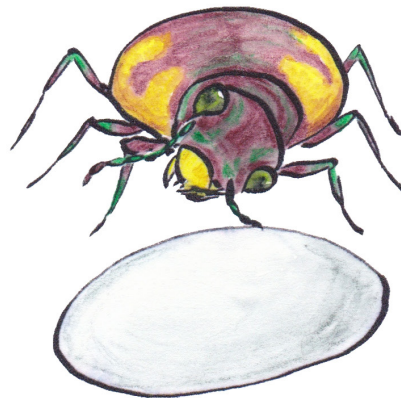
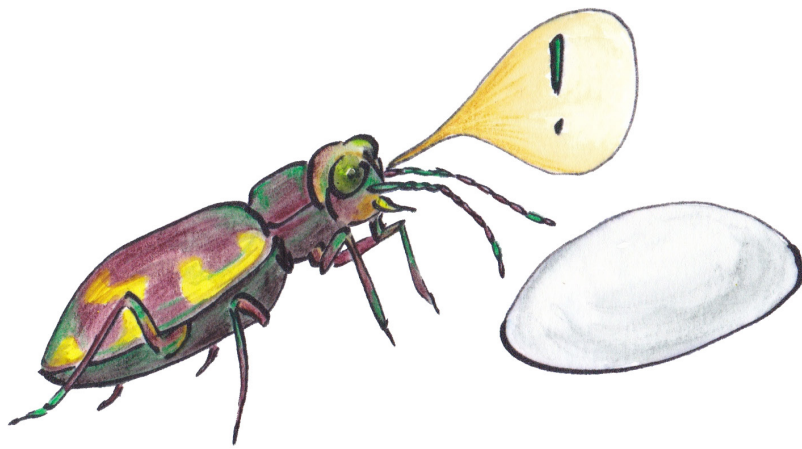
babies

talk

batteries

cannot

feel pain



Not all Howard's new friends were alive.
Can you help him to decide which were living things and which were not?

Lesson 2. The Right Habitat

Enquiry type: Observation over time, Fair testing

Each group will need:

Two plastic boxes with lids, kitchen towel, black paper or fabric, a handful of leaves, 3 or 4 woodlice.

Introduce the idea of habitats. Even though Howard has found a friend, he finds it difficult to live with him as he can't hide or find food that he likes. This is because Howard is in the wrong habitat. Animals fit well into their own habitat. They will choose a habitat that provides them with suitable shelter, food and climate. You can use woodlice to show this. Collect some woodlice and let children observe them. How do they move? What happens if they are scared? This is an opportunity to explain to the children that even tiny minibeasts must be treated with respect and returned to their habitat after the lesson.

Ask the children what habitat a woodlouse might like. Start by considering whether the woodlice like dry or damp conditions and whether they prefer it dark or light. The children can predict what conditions they think the woodlice will choose. The worksheet provides a grid for the children to record their observations.

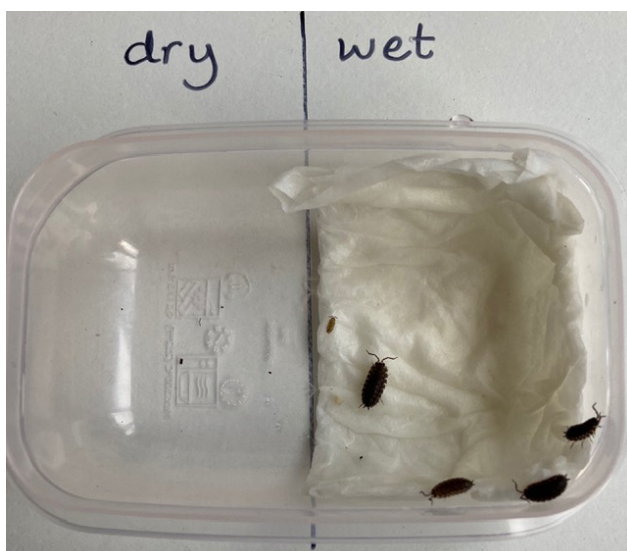
Prepare choice chambers for the woodlice:

Dark or light? Line the box with a layer of damp kitchen towel. Put the leaves into one half of the box and cover that half with the black paper or fabric. Leave the other side uncovered, with no leaves.

Damp or dry? Line half of the box with damp kitchen towel and leave the other half dry.

Add a few woodlice to each box and put the lids on. Leave the woodlice for about half an hour and observe.

If the woodlice will be in the boxes for more than 30 minutes, punch some air holes in the lids.



If you have time, you can extend this investigation to find out what sort of ground covering (sand, soil or pebbles) and food (dead wood/bark, grass or leaves) woodlice prefer. After they have observed the woodlice making choices, the children can discuss why they think that Howard was unhappy in his new habitat.

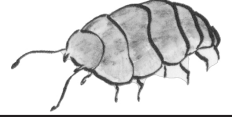
Resources available: Worksheet, slide introducing problem.

The Right Habitat – worksheet

I can observe minibeasts and treat them with respect.

I can explain how I discovered what conditions a minibeast likes.

Draw what you saw at the start and the end of the experiment.



Start

End

Wet

Dry

Wet

Dry

Dark

Light

Dark

Light

What did you discover about your minibeasts?



Animals should feel safe and comfortable in their habitat.
Was Howard in the right habitat?

Lesson 3. Feeling Hungry?

Enquiry type: Research from secondary sources

You will need:

Picture cards from the food chain resource sheet.

Each group will need:

Paper/plastic cups, paper, felt pens, glue.

Howard thought that one of his friends tasted good and another friend thought that Howard would be tasty. Using the picture cards from the resource sheet, show how Howard falls into the middle of a short food chain (caterpillar → Howard → hedgehog). Recall or introduce the words: predator, prey, carnivore and herbivore.

Explain that a food chain shows what eats what in a habitat. Ask the children what Howard's caterpillar friend might eat and add a leaf to the start of the food chain.

Using the rest of the picture cards, build more food chains with the children. Show them that each food chain starts with a plant and ends with a carnivore.

Food chains provided:

Leaf → caterpillar → Howard → hedgehog

Grass → rabbit → fox

Weed → fish → otter

Wheat → mouse → owl

1) Make a food chain: children draw each animal or plant on a strip of paper and then join them together in the correct order to make a paper chain.



2) Make a stacking food chain: children stick pictures of the animals and plant in a food chain onto the outside of plastic/paper cups. The cups can be lined up or stacked to show what eats what.

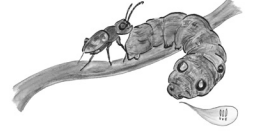


Resources available: Worksheet (2 levels), slide introducing problem, Food Chain Resource Sheet.

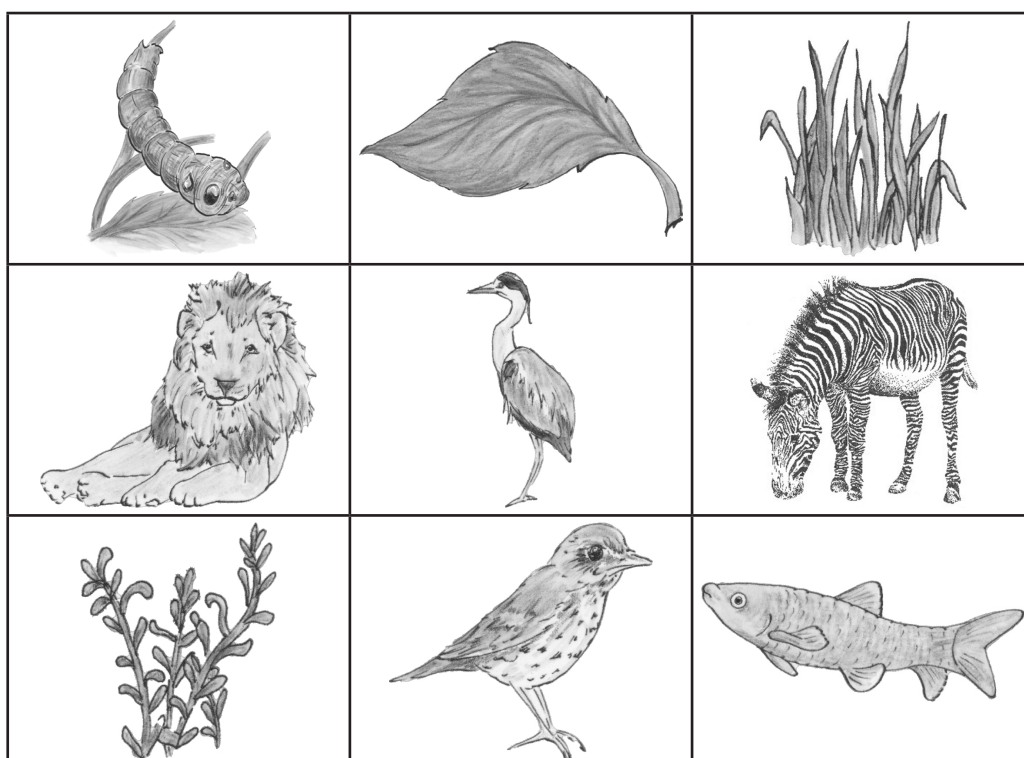
Feeling Hungry? – worksheet 1

I know that animals get their food from plants or other animals.
I can make a simple food chain.

There are three food chains in this muddle. Can you sort them out?
Cut out the pictures and stick them onto the sheet in the correct order.



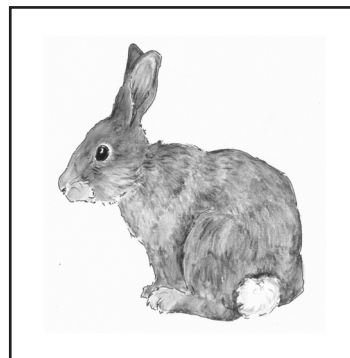
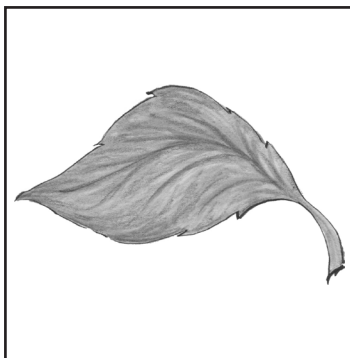
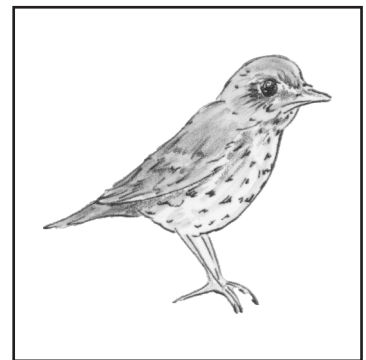
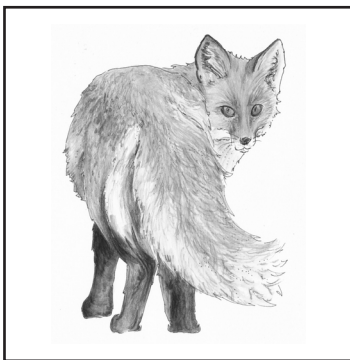
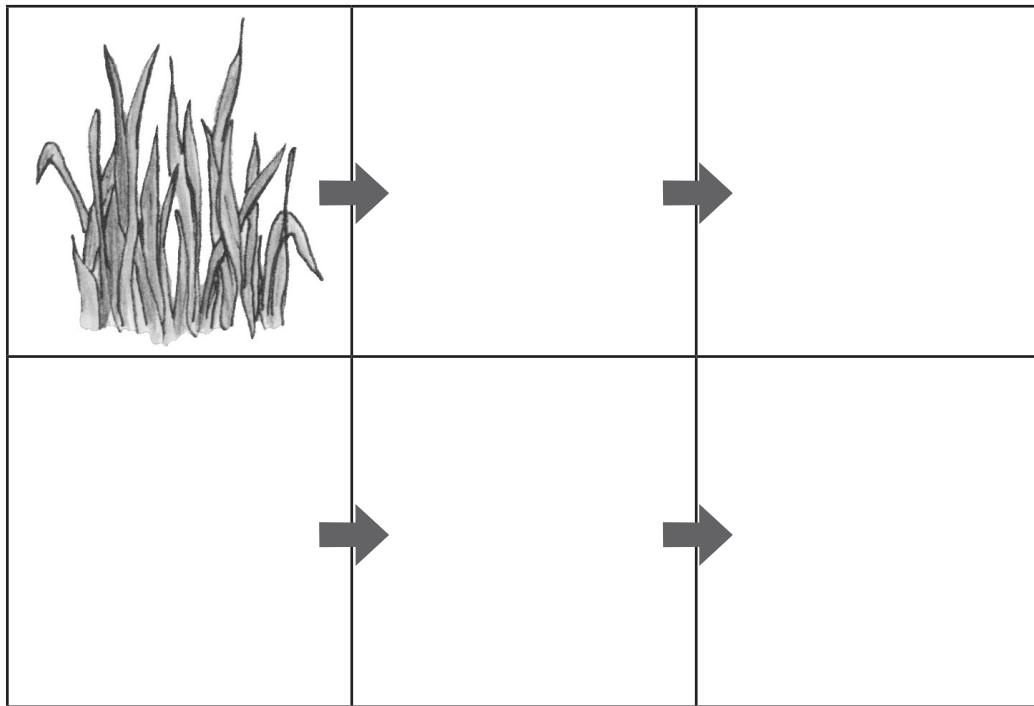
	→		→	
	→		→	
	→		→	



Feeling Hungry? – worksheet 2

I know that animals get their food from plants or other animals.
I can make a simple food chain.

Can you sort out these food chains?
Cut out the pictures and stick them in the right boxes.





Howard found one of his new friends rather tasty.
Many animals eat other animals – can you think of any examples?

Lesson 4. Minibeasts

Enquiry type: Identifying and classifying

Each group will need:

Magnifying glass/hand lens, minibeast ID sheet (e.g. *Guide to Land Invertebrates* by Gatekeeper Educational Ltd available from: <https://www.millgatehouse.co.uk/product/individual-animals-identification-guides/>), spoons, small pots, paper cups.

Go on a minibeast hunt in the playground/local park/woodland. Before you start hunting, ask the children to describe the habitat. What makes it different from the classroom? What places might provide shelter from danger and what food is available? Lift up fallen branches and dig in piles of leaves to find minibeasts. The children can use a spoon to gently scoop up the minibeasts and place them in a small pot for further observation.

Try to identify the minibeasts and note down where they were found. If there is time, note any larger animals and plants in the habitat, and look at the colours of the surroundings.

Remember to return all living things to the place they came from!

Once you are back in the classroom, talk with the children about where the minibeasts were found. Most minibeasts are well camouflaged and are hidden in small holes or crevices. Can the children think why? Did the children find any evidence to show what the minibeasts eat?

The children can then design a minibeast hotel to mimic the habitat they have investigated. Using the hotel outline on the worksheet, they can decide what they will fill each “floor” of the hotel with. They can write or draw their design, or, if you have double-sided tape, put a strip along each section so that the children can stick the appropriate natural material onto the hotel outline.



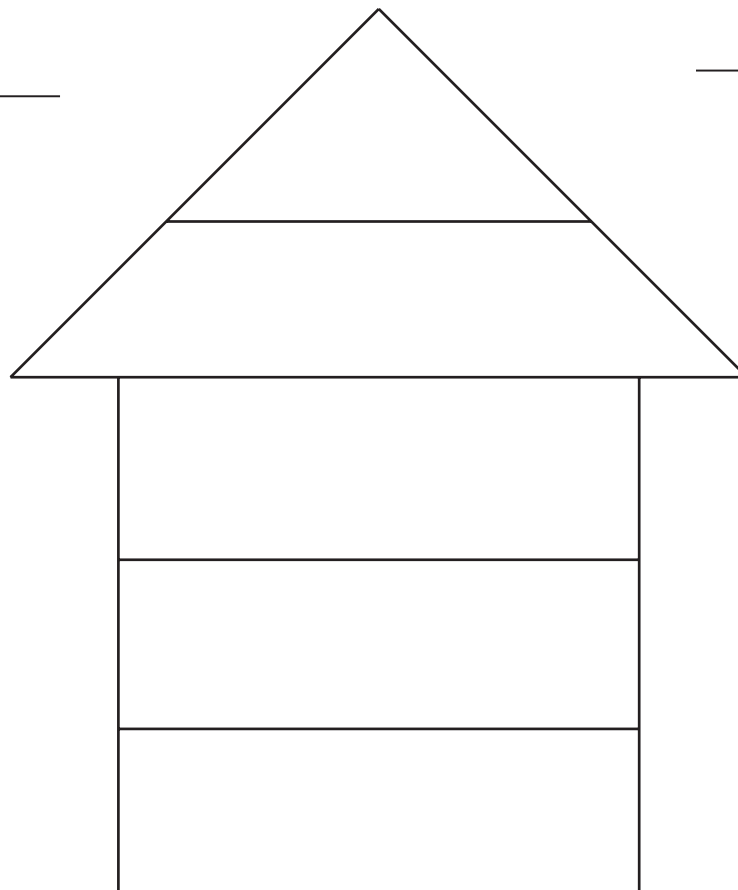
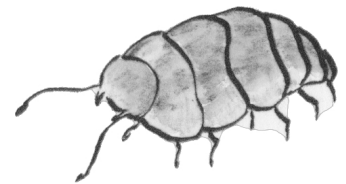
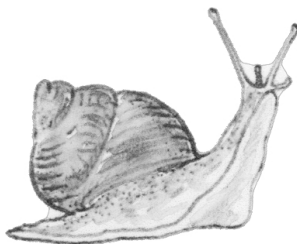
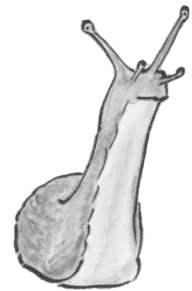
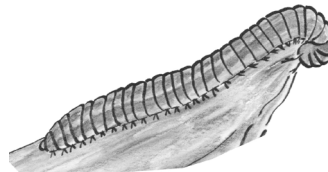
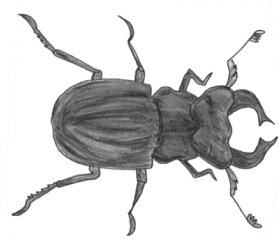
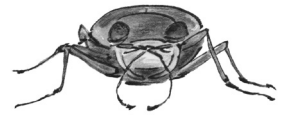
Once the hotel designs are completed, build the hotel "rooms" in paper cups. To make the hotel, stack all the filled cups into a large plant pot or plastic box and place outside. Look later in the year to see what has moved in.

Resources available: Worksheet (2 levels), slide introducing problem.

Minibeasts – worksheet 1

I know that living things live in habitats that suit them.
I can identify and name some common minibeasts.

Identify these minibeasts and then design a minibeast hotel with rooms where they will feel safe and comfortable.



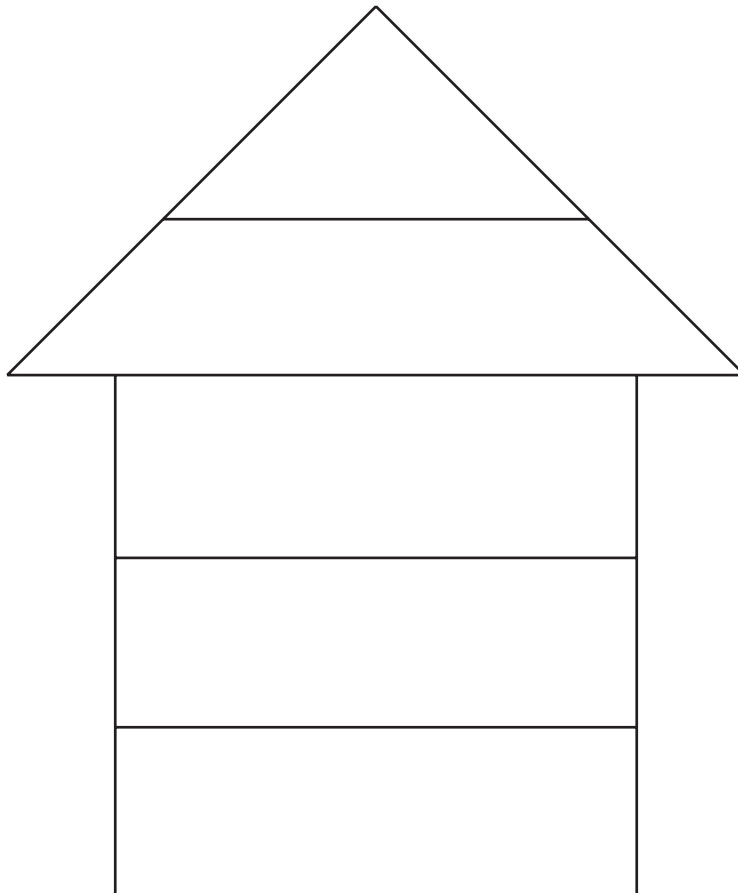
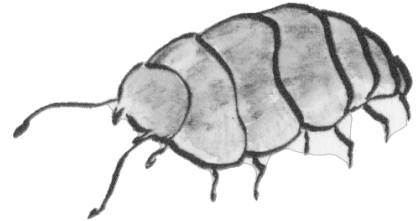
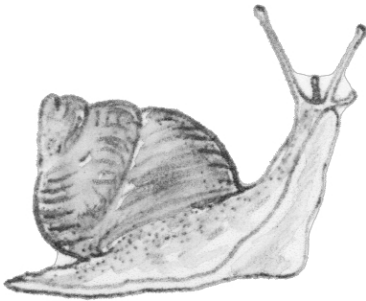
Word list:

slug
woodlouse
snail
beetle
spider
millipede

Minibeasts – worksheet 2

I know that living things live in habitats that suit them.
I can identify and name some common minibeasts.

Identify these minibeasts and then design a minibeast hotel for them.



Word list:
woodlouse
spider
snail



Habitats are places where animals feel safe.
How do minibeasts use their habitats to stay safe?

Assessment

You can assess the children's learning in this topic using the large habitat picture either as a slide or as printed copies.

Ask the children to find all or some of the following:

- 1) The living, non-living and no longer living (dead) things.
- 2) Different habitats and microhabitats.
- 3) The animal homes.
- 4) Minibeasts – you may also like to ask the children to suggest what they would find if they could lift up the pots and bricks.
- 5) Parts of food chains – challenge the children to complete the food chains.

Answers:

Living things	Sheep, badger, blackbird, squirrel, owl, geese, dragonfly, robin, deer, weasel, beetle, fox, snail, frog, snake, mouse Trees, grass, plants in pots
Non-living things	Stones, bricks, flowerpots, plastic/metal bucket, fence wires
No longer living (dead) things	Wooden fence post, dead leaves, fallen branch, skull
Habitats	Grassland/field, woodland Microhabitats: tree, under the brick/pot, the fallen branch
Animal homes	Nest, hole in tree, badger sett, burrow
Minibeasts	Snail, dragonfly, butterfly, beetle
Minibeasts under pots and bricks	Some examples: woodlice, slugs, millipedes, earwigs, worms
Food chains	Sheep eating grass – <i>add human at end of chain</i> Blackbird with a worm – <i>add (dead) leaves to start of food chain</i>

Now the children are habitat experts, they can design a habitat for Howard. Use the Howard Fact Sheet to find out what sort of conditions he will need in order to feel comfortable. The children can draw or make a model of a sandy habitat for Howard. They can add information about what other animals and plants Howard needs in his habitat.

Resources available: Slide introducing problem, habitat picture slide (b/w and colour), Howard Fact Sheet (2 levels).

Assessment – worksheet

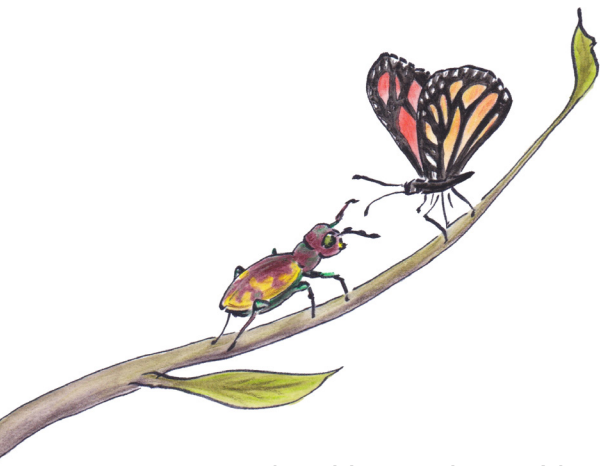
Can you design a comfortable habitat for Howard?
Use the Howard Fact Sheet to help you.



A large, empty rectangular box with a thin black border, intended for the student to draw their habitat design for Howard.

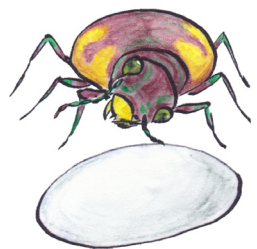
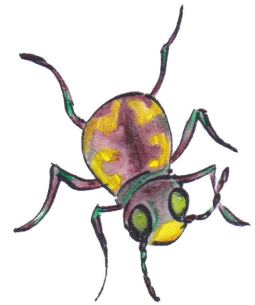






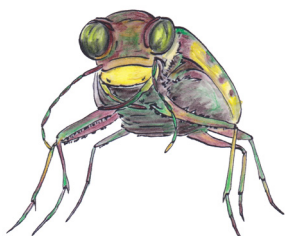
Howard Fact Sheet

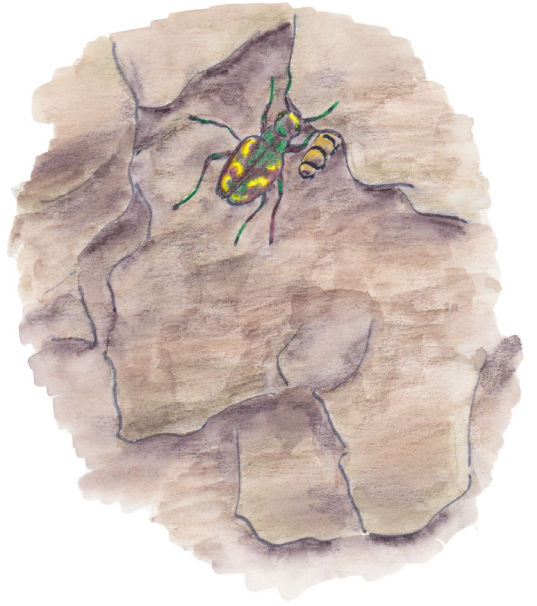
1. Howard is a Northern dune tiger beetle, *Cicindela hybrida*.
2. Northern dune tiger beetles are 2 cm long.
3. They are one of the fastest beetles on the planet – reaching speeds of 2.5 m/sec.
4. They are rare in the UK: found only in the sand dunes at Sefton, Merseyside and Drigg, Cumbria.
5. They eat any insect they can catch – particularly ants and flies, also spiders and moth larvae. They catch and crush their prey using their large mandibles.
6. Their main predator is the sand lizard.
7. They can fly but are not very good and tend to crash land after a few meters.
8. They have excellent eyesight and can spot prey from long distances.
9. They live in burrows in the sand that can be 20 - 30 cm deep and have crescent-shaped openings.
10. They are active from April to October if the sand is warm enough. If it is too cold, they stay in their burrows. If it is too hot, they sit in the shade of marram grass.



A Day in the Life of Howard

7 am – 10 am	Leave burrow and sunbathe until warmed up (about 30°C)
Rest of day	Hunt and eat
6 pm	Return to burrow





Howard Fact Sheet

Howard is a Northern dune tiger beetle.

He is 2 cm long.

He is the fastest beetle in the world.

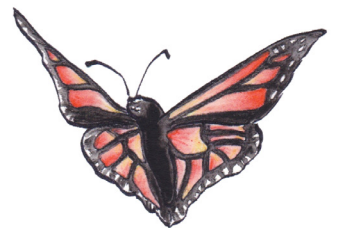
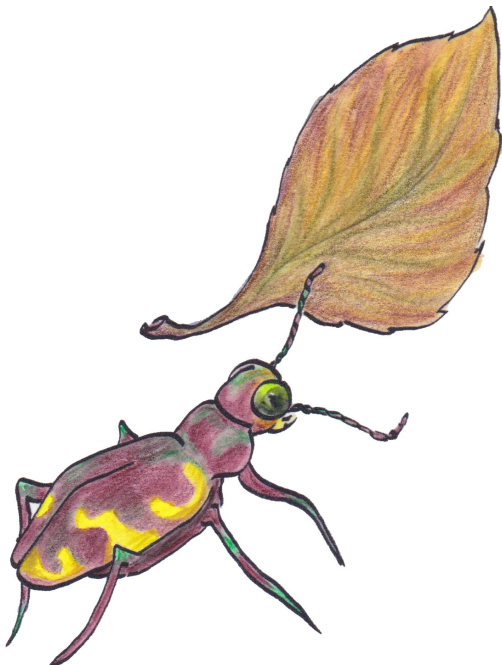
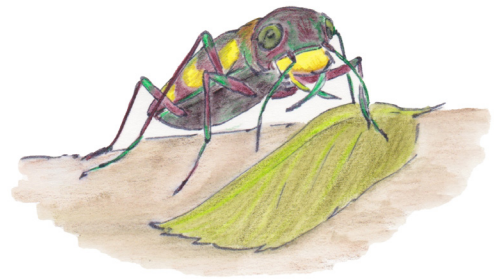
He lives in a burrow in the sand.

His burrow is 20 cm long.

He eats ants, flies, spiders and insect larvae.

He only comes out of his burrow when the sand is warm enough (30°C).

He hides in grass if it gets too hot.



Food Chain Resource Sheet

