

Lesson Plan

Minibeasts

Objectives

Students will:

- develop an understanding of the similarities and differences between a variety of small creatures
- investigate food cycles and food chains
- become aware of the need for observation and attention to detail
- foster attitudes of caring and protection and develop a positive attitude towards conservation.

Skills Development

- Sorting and classifying.
- Recognizing different creatures.
- Finding information.
- Using written and oral recording skills.
- Using vocabulary and knowledge creatively, through poetry or dance.
- Applying closely-observed knowledge to artwork, music and drama.
- Using magnifying equipment. Using manipulative skills to handle minibeasts gently.
- Caring for and looking after a variety of creatures.

Preparation

Before the unit provide the following materials:

- traditional art and craft materials
- a variety of reference charts and books
- hand lenses
- small shovels
- jars, aquariums and other suitable containers
- long-handled pond nets
- large plastic strainers
- buckets

Integration

Link science, language, drama, music and art and craft to the minibeast topic. As a class, write and perform a mini-play to illustrate the life cycle of a chosen minibeast. Students might illustrate appropriate posters to depict the various life cycle stages. Provide music to accompany the play.

Explorations

Hunting Mini-Beasts

A hunt for small animals such as invertebrates and insects can begin around school, home, farm buildings, or in the bush or in paddocks. Wherever you look you will find some living creature making a safe nest — often using natural resources — in which to lay eggs and raise young.

When you are investigating plants or animals in the environment great care must be taken to ensure that no damage occurs, either to them or to you. The removal of plants and animals should be kept to a minimum and specimens should be studied in their natural habitat or returned there as soon as possible. Gloves and other protective clothing are essential.

Around Buildings

Start your hunt in and around the school or home. The first place to look is inside the building. Window frames and sills often provide undisturbed places for ladybirds, spiders, houseflies and chrysalids of moths or butterflies.

Outside, cracks in paving slabs, under plant pots, in guttering and behind drainpipes, are all places of shelter for a variety of minibeasts.

The walls of a building, ivy or other climbing plants provide an excellent and safe habitat often used throughout the year by small minibeasts. Because many animal species are on the prowl for food, foraging ants and millipedes often find well-hidden homes at the base of ivy.

If you move further away from the buildings and look for creatures in the grass and topsoil, you will find ants, earthworms, millipedes and centipedes. Millipedes eat leaves and grass and curl up into a ball when touched. They have two pairs of legs to each body segment and move rather slowly. Centipedes eat other small animals and have poisonous fangs to stun their prey. They move quickly and lay their eggs in small nests made from soil.

In Gardens

A nature area at school or in the corner of a garden is an excellent place to hunt for small animal habitats. There might be long grass, wildflowers, shrubs, trees, rotting logs, old sacking or rotting carpet, large stones and rocks, and sometimes a pond. You might find many different small animals according to the season.

A nature area with a pile of rotting logs provides an excellent habitat for many minibeasts. Some beetles need rotting wood to provide food for young grubs as soon as they are hatched. Both slugs and snails like the moist conditions in the damp ground beneath a log. Lift moss on rotting logs to look for tiny spiders and larvae. Some slugs live under stones and are never exposed to light. Dig gently in the soil under stones to find earthworms and flatworms.

Ponds and Streams

Within a natural bush area there might be another mini-habitat such as a small pond, ditch or creek. A pond provides an easily accessible hunting ground for small animals. Care must be taken near water and when dipping in ponds — you might find it necessary for some of the dipping to be done by adults, with large ponds nets, who then place water and mud samples into buckets and trays for students to study further.

Many species can be found in the mud layer at the bottom of a pond. If you are lucky, you might find a variety of creatures on the surface, such as pond skaters, beetles and water spiders.

At the edge of the pond you might find mosquitoes, and many insects might be found in flower heads. To avoid disturbing the animals, study them in their natural habitats without removing them. This is best done using the appropriate equipment.

Equipment Required

Good quality hand lenses are essential. If animals are to be temporarily removed, you might need some small shovels for scooping bits of soil as well as small jars, aquariums, plastic bags or other suitable containers. For investigating ponds you will need some long-handled pond nets, large plastic strainers and buckets.

Seasons and Weather

Investigations at different times of the year and when there are different weather conditions, such as windy, hot, dry, wet or cold days, will yield interesting comparisons.

Hunting for just one species, such as ants, will reveal the variety of habitats they use. Sometimes, two animals share the same type of habitat, and inferences can be drawn about the reasons for this. Minibeast hunts in towns and cities may reveal different habitats from those in rural areas.

Searching for small animals and embarking upon a study of their lifestyles can be fascinating and rewarding, and will help to foster a caring attitude towards living things in the environment.

Being a Good Observer

Nearly all children are fascinated by minibeasts and will eagerly await a trip outdoors to find them, but it is important to establish a code of conduct before actually stepping outside. The need to give living things proper care is important, and students should be encouraged to think about the ways to approach observing, collecting and housing the creatures they find.

Discuss with them these qualities of a good observer or collector:

- they search carefully, disturbing the surroundings as little as possible
- they handle only a few, but look at many creatures
- they replace overturned logs and stones
- if creatures are to be collected, they ensure that they are housed in a proper environment to ensure their survival.

Once students have found their creatures, the next task is to observe them closely. Hoops are useful here. Throw several on the ground in different areas and ask small groups of students to investigate the life enclosed by each hoop in that area. They will be better able to observe in groups, and can also record their findings as a group.

Very young students might be content with just finding the creatures. Encourage closer examination by asking appropriate questions:

- What color is it?
- How many legs does it have?
- How big is it compared to a five-cent coin?
- Does it have wings?
- Where did you find it?
- How does it move?
- Is it eating anything?

Older students might use detailed observation cards for a more accurate description.

Another excellent way of observing small creatures is to give each student or small group a meter length of string and some hand lenses. Place the string in a random shape in the area to be observed. Students imagine they are very small and they walk the length of the string, noting the creatures they see on the way.

This idea is a good stimulus for writing, too. Ask students to imagine that they are small people or creatures who have an adventure along this path. Because the pathway is real, students have a focus point for the start and finish of the journey.

Identification and Recording

Give very young students pictures of common minibeasts cut from old magazines. Students then go out and try to match the minibeasts they find with those on the cards. This helps to develop close observational skills without students needing to draw or write about the creatures.

These cards could also be used in the classroom for classification. Ask students to sort them into groups according to color, shape, size, number of legs, wings, body segments, and so on.

Encourage students to make their observations at different times of the day, in different light conditions and in different weather. This will enable them to build up further knowledge of the conditions best suited to each creature. They might record the findings in table form.

Students do not need to know the names of all the minibeasts they find. Encourage students to make up their own names for the creatures they find by making close observations and giving them names that will distinguish them from other creatures. Students will remember their own creature's name and will respond to characteristics. This will help them to understand the importance of different characteristics for classification.

Temporary Homes

If you want to encourage students to make detailed observations in the classroom, it is very important that suitable homes are provided for the minibeasts. Many minibeasts can live successfully for limited periods of time in glass jars or aquariums.

Students need to be aware of the shelter, temperature and food required by the creatures so that they are not harmed and can be returned safely to their natural habitat.

Aquariums

Snails

Place damp soil in the base of the aquarium and sink a small plastic lid into the soil to act as a feeding dish. Sprinkle the soil with water to keep it damp. The snails will eat oats rolled in crushed chalk. Put a few rocks and bark inside the aquarium for the snails to explore, and ensure that droppings are removed promptly. Place some netting over the top to prevent escape.

Worms

Black out the tank with dark paper, removing a section for observation. Fill the aquarium with soil and ensure that it stays moist.

Glass Jar

Ladybirds and Beetles

Feed these creatures by putting an aphid-infested plant inside the jar. Make sure the jar is large enough for the beetles to fly around.

Slugs

Put slugs in a jar with damp soil in the bottom. Feed them with vegetables or fruit and keep the soil moist. Clean the soil out every week, and don't forget to look for eggs while doing this. Cover the jar with mesh, then with cardboard.

Investigations

Write these questions and activities on cards so students can refer to them and investigate further.

- How do minibeasts move? Describe the way they move and act it out. Can they move backwards?
Sideways? In a straight line?
- Do their bodies change shape?
- Have a snail race. How long does a snail take to move 30 cm? Trace the sticky trail of a snail. Does it move in a particular pattern? Can snails move on different surfaces? Try glass, wood, sand, and so on. Record what happens.
- What does your creature eat? Try different foods, record preferences. Make a bar graph of the results.
- How do they eat? How often during the day can you see them eating? Which creatures eat the same foods that we eat?
- Make up a minibeast menu of all the foods they prefer. Cut out pictures or draw favorite foods and put them on paper plates. Make a minibeast restaurant.
- Go shopping for minibeasts. Write shopping lists of foods they like.
- Investigate spiders' webs. Are they all the same shape and pattern? Do all spiders make webs? Copy the patterns. Make webs from cotton thread.
- Do minibeasts rest? Try to time how long they stay still. Where do they like to rest? Do they hide? Where? Draw pictures of places where they rest.

Life Cycles

The best way for students to understand the life cycle of a minibeast is to observe all the stages of development within the classroom. With many creatures, such as slugs and caterpillars, all the stages can be observed. However, this is not always possible with other creatures, so other ways need to be found to research their life cycles.

Minibeast eggs can often be found in soil and leaf-litter from spring to late summer. Make sure that students note where they found the eggs, in what type of soil they were found, whether they were attached to something and how they think the eggs came to be there.

The eggs can then be brought inside and put into a container with some of the material on which they were found. Students keep a daily diary as the eggs develop.

Students might compare the eggs they find — shape, size, color, number — with other animals' eggs, such as hens' eggs.

Encourage students to make comparisons of different creatures' life cycles. How do the stages differ? Do all insects go through the same stages? Does the resting stage differ in length of time?

Students should discover that there is a definite sequence of events taking place and that if one of these events is altered in some way then the life of the creature is in danger.

Presentation

Students could present their findings in many ways: a mobile of each stage, a concertina-style book with the stages in sequence, a photographic record with students' descriptions underneath, a class wall chart recording daily observations of the stages, three-dimensional models of each stage, and so on.

Art and Craft

Modeling Minibeasts

Observational drawing is an important part of investigation. Drawing from life, or from photographs, helps students to learn about shape, line, texture and construction. Selecting, analyzing and recording are all important skills which can be developed through close observational work.

Allow students to experiment with soft pencils to discover the different effects they can produce.

Younger students benefit from being shown how to achieve a variety of lines, dots, and soft or dense shading. They tend to use an impressionist style, while older students show increasing attention to detail. Encourage this with every age group so that as much authentic detail as possible is drawn. Pastels and charcoal can be used as alternative media.

Inkblot Moths and Butterflies

Fold a piece of paper in half. Open it out and put blobs of ink or paint along the fold line. Refold the paper along the same line, pressing and smoothing the paint away from the fold.

Unfold the paper, allow the paint to dry and cut out a butterfly or moth shape. Use the shapes to make mobiles, friezes or pictures.

Marbling

Marbling inks can be used to create particularly attractive butterflies. Use drinking-straws to put some inks into a bowl of water. Stir gently to mix them. Put a sheet of paper on the surface of the water, wait a few seconds, lift the paper and lay it flat to dry. Cut out butterfly shapes. Use pipe-cleaners to represent antennae.

Modeling

Modeling minibeasts is an excellent follow-up to drawing from observation, as students will have some knowledge of the creatures' shapes, covering and coloring. Clay, plasticine and dough can all be used for modeling. Cold clay dries hard without firing and looks most effective when painted and varnished.

Moths

To make a moth, draw a simple outline on paper and cut it out. Put this template on a slab of clay and pinprick around the outline, through the paper and into the clay.

Remove the paper, join up the pinpricks and cut out the shape with a knife. (Supervise younger children.) Use a small coil of clay for the moth's body and attach antennae and wings, bending them slightly to make the moth more life-like. Paint the moth.

Ladybirds and Beetles

Ladybirds and other beetles can be made from thumb-pots. Pat a small lump of clay into a ball. Press the thumb of one hand into the ball of clay. Keep your thumb inside the hole and your fingers on the outside. Turn the pot, pressing evenly to form the sides, making sure that they are not too thin.

Make a smaller pot in the same way for the head and join the open ends of the pots with slip (a thick paste made from clay and water).

Use a modeling tool to form the head and the body, and attach legs made from thin clay coils.

Drama

Float Like a Butterfly.....

Start by introducing insects with running, creeping, jumping, slithering and flying activities.

- Image: Running
- Movement: Quick, light steps from space to space with sudden statue stops and changes in direction.
- Image: Creeping
- Movement: Slow, light, stretched steps on hands and feet.
- Image: Jumping
- Movement: From two feet to two feet or from two hands and two feet.
- Image: Slithering
- Movement: Twisting and curling along the floor, slowly.
- Image: Flying Movement: Running stretched up and bent over, with elbows representing wings held above the rest of the body. Arms flutter fast. Introduce pauses and moments of stillness.
- Now that students are familiar with some of the different ways in which minibeasts move, name specific insects and examine their shape, size, behavior and habitats in more detail.

Organize a movement session based around the life cycle of a butterfly.

The Birth of a Butterfly

- Image: Caterpillars
- Movement: Start from a variety of curled shapes on the ground, move into slow stretching, arching, shrinking and curling actions.
- Image: Weaving chrysalises
- Movement: Slow turning and spiraling movements from low to high to low levels.
- Image: Wings unfolding
- Movement: Strong pushing actions from curled shapes, with elbows and arms slowly unfolding.
- Image: Wings fluttering
- Movement: On the spot, with sudden fluttering actions and intermittent stopping points.
- Image: Butterflies
- Movement: Run and stretch high, then glide to low levels with wings closed around the body. Emphasize the words 'fly', 'float', and 'settle'.
- Image: Life cycle of a butterfly
- Movement: Form small groups of three or four students. Allow each group freedom to interpret ideas, working towards forming a complete, repeatable sequence of movements as described above.

Ugly Bug Ball

These ideas and others could culminate in an Ugly Bug Ball, which starts with the slow, ceremonious entry of the Queen Bee, followed by a follow-the-leader procession of minibeasts around and around the room. With you, or a student as leader, the class forms a wide, stretched circle shape. The Queen Bee returns to the center of the circle, and students in the circle make a slow, exaggerated bowing action towards her.

The insect entertainers follow, including:

- daring Daddy Long Legs, matching a variety of balanced shapes on hands and feet
- a long-jump competition featuring the greatest grasshopper in the world
- a snail or flea race with students starting and stopping in pairs
- a spider spinning, stepping and balancing on the high wire
- Black Boots, the tap-dancing beetle, who responds spontaneously to appropriate drum rhythms or music
- an ant band which forms lines and circles between and around each act — the band could be part of an ant army, following its leader, marching, running and on tiptoe. Meanwhile, the other ants are at work searching for food by running and stopping in different directions; carrying loads with bent backs; and making an enormous hill with students curling in a small circle around you and then growing into a tall, wide group shape together.

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