Science & Nature Investigation Kit

Use the binoculars to explore the natural world and make it easy to see things close up.

Record observations by taking photos, videos and using the time-lapse digital camera.

The waterproof endoscope is a valuable tool to observe aquatic ecosystems and explore wet environments.

The kit can be used with a range of activities. Here are some ideas to start you off. They have been designed by a science and nature specialist. We hope you enjoy them.

Hands-on tools ideal for exploring.

Bird Watching Activities

It is a good idea to have a bird feeder in place for a few weeks before you start bird watching. This way the birds become accustomed to being fed and you are more likely to get a result. The type of food you provide will also affect the type of birds that visit.

Five main types of bird food:

1. **Single seeds** –these seeds aren't mixed with anything. Straight seeds include black sunflower, Niger and peanuts.
2. **Seed mixes** –seeds are mixed into different blends, with the main advantage being that a greater mix of seed types attracts a greater mix of bird species.
3. **Husk-free seed mixes** – similar to the types above but the seeds in these mixes have had their husks removed, so there is much less mess to clear up and birds that can't crack husks (such as blackbirds) can also eat the mix. Some husk-free mixes also contain other foods like dried mealworms and suet pellets.
4. **Suet** – this food comes as blocks, balls, and pellets. Lots of birds like suet and it provides a vital source of energy for them, particularly in the winter months.
5. **Live mealworms** – a brilliant food to provide in the breeding and fledgling season.

It is also important to provide a source of water. A shallow bowl or upturned dustbin lid are ideal, or you could have a ready-made bird bath.

You can also make your own bird food! (See instructions in suggested activities)

Keeping bird feeder spotlessly clean is very important as these can be the source of germs which transmit to the birds and can cause a variety of infections, some of them fatal.
The positioning of bird feeders does take some consideration.

Here are some points to help you:

Quiet – Try and position your feeder in a place in your school grounds that has the least amount of human traffic.

In the open and safe - with a good all-round view so that the birds can see they are safe from predators while they feed. The table should be safely away from cat ambush sites. These include fences and trees from which cats can leap and dense bushes in which they can hide.

Sheltered - in a position where it gets neither too much sun nor too much cold wind.

With a lookout point - a small bush about two metres from the table gives the birds somewhere safe to perch while they look to see if it is safe to feed, to 'queue up' for a place on the table, and to dash to if disturbed. This could be a potted shrub if you don't have a garden area.

Mounted - a raised bird table has the advantage of being more visible for children and can be placed on top of a post, hung from a branch or a bracket or even from the washing line.
Some birds, however, such as blackbirds, other thrushes and chaffinches, prefer to feed on the ground, so consider providing more than one type of feeding station.

Birdwatching Activities

The RSPB run a Big Schools' Birdwatch every January. There are lots of resources to support this on their website. However, you can watch the birds all through the year and this enables you to discuss topics such as lifecycles, seasonal change, habitats, animals, including humans - food chains and webs and evolution and inheritance.
https://www.rspb.org.uk/fun-and-learning/for-teachers/schools-birdwatch/resources/

Make a Bird feeder
You can make a variety of bird feeders yourself. An easy idea is to use an orange.

You will need:
- 1 orange
- 1 cup bird seed (or a mix of sunflowers seeds, peanuts, and dried fruit)
- 100g lard or vegetable fat (be mindful of religious and dietary requirements of pupils)
- String
- Scissors
- Bamboo skewers, twigs, or sticks
- Tablespoon
- Bowl

Instructions:
1. Cut an orange in half and use your tablespoon to scoop out the centre of both halves. (You can eat this!)

2. Put the lard or vegetable fat into a bowl and add the bird seed and mix well to combine.
3. Using the tablespoon (or your hands) pack the orange shells with the mixture.
4. To create a ledge for the birds to sit on, carefully push two bamboo skewers into the orange to create a cross shape – adult supervision needed here.
5. Finally, attach a piece of string to the middle of each of the four skewers.
6. Tie the string at the top
7. Once you have finished, find a tree to hang your bird feeder on and wait to see if any birds want to come by for a snack.

Here are some other ideas for making bird feeders:
https://www.rspb.org.uk/search/?q=make+a+bird+feeder
Using the camera on the video setting, record bird song and then use the following website to see if you can identify the bird.
https://www.rspb.org.uk/birds-and-wildlife/bird-songs/what-bird-is-that/

Springtime is when birds are the most vocal when they are protecting their territory and attracting a mate, but you can hear birds throughout the year.

Bird beak (Darwen's finches)
Set your pupils the challenge of taking photographs of the birds they see then zooming into look closely at their beaks. This is a perfect way to instigate a discussion around adaptation and evolution.
You can follow these observations up with an activity which looks at how bird's beaks are adapted to eat different types of food.
https://www.stem.org.uk/resources/elibrary/resource/25290/darwins-finches

Owl pellets
If you are lucky enough to have owls in the vicinity of your school, you may find owl pellets. These are the regurgitated parts of the owl's prey – the parts such as fur, bones claws, which cannot be digested. These components form a pellet in the owl's crop and are then coughed up. It is fascinating to dissect these and see what it has been eating.

Other birds that eat prey such as buzzards, kestrels, crows, gulls, and kingfishers also produce pellets. If you can't find a pellet the site below allows you do carry out a virtual dissection.

You can also buy owl pellets online from various sources including
https://kidwings.com/virtual-pellet/

Top Trump Cards
Use the camera and your bird watching observations to create Top Trump Cards using these categories:
- Big Garden Birdwatch position
- Length (cm)
- Weight (grammes)
- Maximum number of eggs
- UK population (pairs)

If you create a school/class folder for photographs these can be used on the cards.

Make a Nest to protect the eggs

If you have trees and shrubs in you school grounds, you may have nesting birds in springtime. If you don't, you can research different birds and the nest they make.

You can challenge your pupils to make a nest themselves using a selection of natural materials such as twigs, moss, leaves, mud, feathers and even animal hair. They are not allowed to use glue or tape.

When the nest is finished set them the challenge of placing a real egg, uncooked, inside and see if they can lift the nest without the egg falling. This activity is an outdoor one!

Feathers

If you attract birds to your school grounds, you are likely to see feathers as birds. These provide a fascinating opportunity to look closely at the different types of feathers birds have and discuss the functions of each type.

Make a collection of feathers and allow the children to observe the different shapes and textures. The use of hand lenses and microscopes would be useful here allowing the children to notice the fine detail of the different feather types. Feathers are held together and in place by a hollow tube called the shaft. The shaft is made of a very hard material called keratin.

Though every feather is different, there are some key things to look for.

- Colour
- Size
- Shape
- Feel can also be an important factor in identifying two similar looking feathers.

Birds have three basic types of feathers:

1. Contour feathers which cover the wings, body, and tail and streamline a bird to help give it a smooth, sleek shape. They are stiff, flexible, and very strong yet lightweight.
2. Down feathers are fluffy feathers which are close to the body, underneath the contour feathers. They help insulate a bird and keep it warm.
3. Flight feathers are special contour feathers on the wings, shaped to fan the air, creating "lift" to help a bird get off the ground, move about in the air, and land safely.

Feathers from the wings can be instantly recognisable. These are split into three groups, with some more patterned and colourful than others:

1. Primary feathers are the largest and closest to the wingtip. Most birds have about 10 on each wing. Without these, they can't fly
2. Secondary feathers are around the middle of the wing
3. Tertiary feathers are those closest to the body.