



Design by Nature

School Activities



Downloadable Resource	Worksheet	Activity Worksheet	Curriculum area	Unit	Where	When	Link to Wyre education programme
Design by Nature	1	Light and shade	KS2 SCIENCE - Sc4 Physical processes KS3 SCIENCE - Sc4 Physical processes KS2 DESIGN TECHNOLOGY KS2 ART AND DESIGN KS3 ART AND DESIGN	3a-d Light and sound: Everyday effects of light 3a-f Light and sound: The behaviour of light 4a-b Knowledge and understanding of materials and components 2a-c Investigating and making art, craft and design 2.1a Explore and create: Working from first hand observation 1a-c Life processes 5a-d Living things in their environment: Adaptation and competition All units	Outdoors	Sunny day in spring/summer POST VISIT	KS2 Find Out About Forests KS2 Forest Art KS2 Plants in the Forest KS2 Investigating Materials
	2	Going batfy	KS2 SCIENCE - Sc2 Life processes and living things KS3 SCIENCE - Sc2 Life processes and living things KS2/3 DESIGN TECHNOLOGY	1a-c Life processes 5a-d Living things in their environment: Adaptation and competition All units	Indoors/Outdoors	All year PRE/POST VISIT	KS2 Animals in the Forest
	3	Photo mosaic	KS2 DESIGN TECHNOLOGY KS2 ENGLISH	All units 1-3 Speaking, listening and group discussion	Indoors/outdoors	All year	KS2 Forest Art KS2 Find Out About Forests
	4	Woodland orchestra	KS2/3 DESIGN TECHNOLOGY KS2 MUSIC KS3 MUSIC KS2 SCIENCE Sc4 Physical processes	All units 2a-b Creating and developing musical ideas: Composing skills 4a-d Listening and applying knowledge and understanding 1.1a-b Integration of practice 3e-g Light and sound: Vibration and sound	Outdoors	All year	KS2 Forest Art KS2 Find Out About Forests

DESIGN BY NATURE - Worksheet 1

Activity - Light and shade

You will need:

Sticky tape

Leaves and other woodland objects

A window or a thin sheet of clear perspex or clear plastic material

Large white sheet or piece of white paper

Paints/colour pencils

Collect lots of different leaves and various seeds, bark etc.

Tape everything to the window or clear material and then hold it up to the sun.

Place the white paper so that you can see the shadows cast by the objects.

Answer the following:

Which object allows the most light through?

Which object casts the darkest shadow?

You can arrange them in order of graded light.



KS3

Observe the light and shade in more detail:

Can you see the different colours of shade? Draw a tree or just a leaf and try to accurately reflect the colours.

Is the colour of the shadow affected by the colour of the object or the material that it is cast onto?

Now go outside and look at the trees:

Which tree has the darkest shadow underneath?

How does this affect what is growing there?

Compare two examples - one deciduous and one coniferous tree.

What else other than light affects what grows under the tree?

DESIGN BY NATURE - Worksheet 2

Activity - Going Batty

The following activities relate to Bats. The first activity encourages some personal research and uses creative skills to come up with a new design. The second uses Design technology skills to construct from a pre-designed plan. The third uses scientific principals and research to evaluate the effectiveness of the constructed bat house.

You will need:

Timber

Nails

Saw

Black Paint

Choose a species of bat (like this Pipistrelle Bat illustrated) and do your own research to find out where it roosts; breeds; etc.

Design a house to meet their needs. Some of the things to consider and research will be:

What species are you trying to attract?

How will they enter the roost?

Is it a maternity roost?

What temperature do they like?

What level of humidity do they need?

Where should the house be sited?

How many bats are likely to use it at any one time?

How high up does it need to be?

Do they need to be able to fly around inside?

What do they need inside to hang on to?

How will a researcher be able to see inside the roost to check if/how many bats are using it?

Is it possible for the general public to view the bats easily?

Links:

<http://www.bats.org.uk/publications.php>

http://www.bats.org.uk/pages/fun_batty_things_to_do.html





How to make a bat box

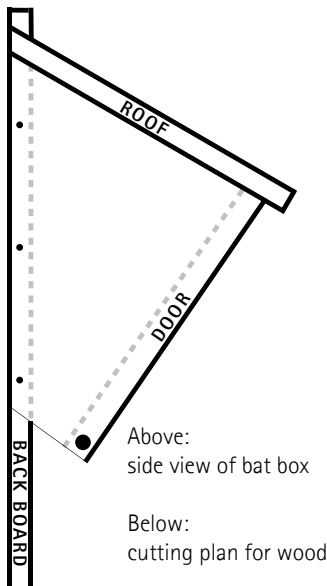
Providing bat habitats in your back garden

Bat boxes are artificial roosts, usually made of wood or woodcrete (a mixture of wood chips and concrete). They are designed to provide bats with alternative resting places to replace natural ones in tree holes, and also to encourage bats into areas where there are few such natural sites. Bat boxes have a useful place in bat conservation, but it should be remembered that bats take to boxes less readily than birds.

What makes a good bat box?

Recent research has shown that good insulation and avoidance of draughts are more important for attracting bats to boxes than is the material from which they are made. Bats do not like draughts, and prefer well-insulated boxes where temperature and humidity remain constant. Well-sealed joints are therefore important, as is the avoidance of large, loose-fitting front panels. The warmest area in a box, and the area that bats use most, is at the top – therefore a well-insulated top is important. Removable lids should be avoided, again to reduce draughts, but also to prevent disturbance or unintentional injury to bats when the box is opened. A special licence is required to disturb or handle bats in the UK, and any disturbance without a licence is illegal. For more information on bats and the law call the Bat Helpline (0845 1300 228).

All timber used in bat boxes should be rough-sawn to allow bats to cling and climb, and must also be untreated, since bats are very sensitive to the chemicals used for timber treatment. A 'bat ladder' or other landing area is essential, as is an entry slit wide enough to admit bats but narrow enough to keep out predators.



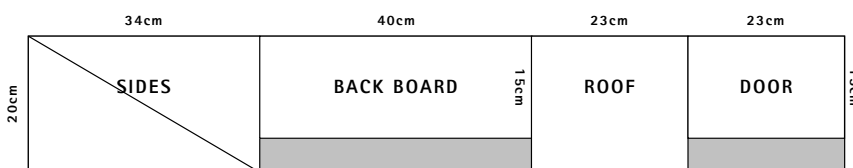
Making a bat box

Bat boxes take many shapes and sizes; here we give the details for a simple wooden wedge-shaped design that has been known to work well.

The cutting plan above is self-explanatory, except that the acute angled ends of the triangular sides are cut off to give the entrance slot of the required width, after allowing for the thickness of the door (ie cut off higher for a wider opening). The top edge of the back board and the rear edge of the roof must be bevelled to fit. The roof and back board are next to each other on the cutting plan so that, with a tilting circular saw or jigsaw, the bevels can be cut in one go. The cutting angle is approximately 62%.

The front-opening door is pivoted at the bottom on two clout nails. A hole is drilled high up through one side of the box and into the side of the door. This takes a loose-fitting clout nail which holds the door firmly closed against the door stops. These are cut from 10-12mm strip and are fitted at the top and sides of the door-opening to act as a door frame and aid weather-proofing. The side door stops are cut off about 3cm short of the bottom to allow freedom of movement of the door. A small screw is fitted as a knob for opening the door.

The only other point is to ensure that the door is a loose fit to allow for the wood swelling - the door stops take care of the gaps. We recommend gluing as well as nailing to ensure that there is the minimum of heat leakage - we suggest Extramite, which is an odourless wood glue.



With thanks to the Gwent Bat Group for this bat box design

Where should I put my bat box?

Boxes are most likely to be used if they are located in places where bats are known to feed. Woodland, parkland and river banks are good places, as are gardens close to ponds, rivers or parks. Sites should be sheltered from strong winds and exposed to sunlight for as much of the day as possible to increase their internal temperature. They should also be close to a hedge or tree line, as some species of bat use these to navigate and are reluctant to cross open spaces to get to and from roosts. Boxes should be positioned so that the bats' approach to them is clear of impediments such as tree branches, and should be as high as possible not only to maximise their exposure to sunlight but also to ensure security from cats or human vandals.

Ideally, two or three boxes should be clustered, facing in different directions in order to allow bats to select a range of roosting temperatures at different times of year – preferably south, south-east and south-west. Try to avoid due west, as this is the prevailing direction of the wind & rain!

For more information on bats, bat boxes and encouraging bats to your garden, visit www.bats.org.uk or call 0845 1300 228

Evaluating your Bat Box

Learn to identify British bats from their echolocation sounds. Use a bat detector to find out what species are in your local area:

http://www.bats.org.uk/pages/listen_to_and_watch_bats.html



Once you have installed your bat box, monitor it at dusk to see if you can visibly see any bats using it.

Have you sited it in a place where there is likely to be good feeding on insects? Have you already seen bats in this area? How can you find out what species of bat are there?

http://www.bats.org.uk/pages/count_bat_project.html

DESIGN BY NATURE - Worksheet 3

Activity - Photo Competition

Suggest that the students set categories and run their own photographic competition. Photographs are to be taken on site in Wyre Forest. This could be run as a small group activity or as individuals depending on the number of cameras available to the students. Let them decide who will judge the competition to make it fair. They will need to write a set of criteria for judging.

Possible categories to consider:

- Wyre wildlife
- Trees of Wyre
- Life in the leaf litter
- People and Wyre
- Devil's in the detail



DESIGN BY NATURE - Worksheet 4

Activity - Woodland Orchestra

Design and make as many different musical instruments as you can. Opposite are a few ideas. How many more can you come up with? As you walk through the woods use your ears to listen to the natural sounds all around you. Make notes of your ideas. Think about what two objects would sound like if they were hit together.

Take simple materials like string, rope and tape to help make all the instruments.

Find a suitable clearing in the woods and ask your students to make as many different instruments as possible. They can also use their own voices to mimic sounds that they hear.

Stand or seat everyone round in a semicircle with you in the middle as conductor. Start with everyone being very quiet and listening intently to the natural woodland orchestra.

Create your own woodland orchestra by asking one person to start up a regular beat which they keep repeating. Gradually add in more and more instruments until everyone is involved and the piece reaches a climax. (As the conductor, you could group students into sections eg: rhythm, animal sounds, leaves scrunches, bird calls, etc. These sections could be brought in all together or occasionally dropped out) To end the music gradually exclude instruments one at a time until only the original beat is left. End by listening to nature again.

