

# Design and Technology

## Building a bird house



<b>Summary:</b>	Building a bird house using a range of materials and resources
<b>Learning outcomes:</b>	By the end of this lesson, students will be able to: <ul style="list-style-type: none"> <li>• Explain the importance of providing a safe habitat for garden birds.</li> <li>• Describe the basic needs of garden birds.</li> <li>• Design and construct a bird house using suitable materials.</li> <li>• Understand the role of humans in protecting wildlife.</li> </ul>
<b>National curriculum links:</b>	Design and technology: <ul style="list-style-type: none"> <li>• select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately.</li> <li>• select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities.</li> </ul>
<b>Materials:</b>	<ul style="list-style-type: none"> <li>• Pencil and ruler</li> <li>• Hammer and nails</li> <li>• Hacksaw and vice</li> <li>• 2 metal hinges</li> <li>• 20mm untreated FSC plywood boards cut to the sizes shown</li> </ul> <p>cut along dotted line for open fronted robin box</p>
<b>Introduction:</b>	<p>Habitat loss and climate change are becoming an increasing strain on British bird populations. Fewer woodlands, a decrease in hedgerows and perfectly manicured gardens make finding a suitable nesting spot particularly hard for many of our regular garden visitors. By putting up bird boxes, you can ensure you are doing your bit to look out for the welfare of our feathered friends.</p> <p>Begin the lesson by providing context for the activity and ask your students to research British garden birds and ways you can help them. Suitable links are provided below:</p> <ul style="list-style-type: none"> <li>• <a href="#">Wildlife Explorer - birds</a></li> <li>• <a href="#">Habitat explorer</a></li> <li>• <a href="#">How to feed birds</a></li> <li>• <a href="#">How to provide water for wildlife</a></li> <li>• <a href="#">How to clean nest boxes</a></li> <li>• <a href="#">RSPB – helping birds near you</a></li> </ul> <p>This activity can be completed in pairs or groups. If time permits, have children present their findings to the class in the form of a poster or a presentation. If time is a limiting factor, complete this activity as a class group, facilitated by the teacher.</p>

## Design:

A basic bird house design has been provided in the appendix, along with guideline measurements as listed above. However, there is no standard, accurate design for a nestbox. Birds do not insist on their nest sites being mathematically precise! What they do require is a nest site which is secure and weatherproof, and as safe as possible from predators. So, make the box to suit the materials available, rather than buying materials to match any given dimensions.

During the design phase, children may want to explore the different nesting needs of different species and decide on a species they would like to live in their house. Blue tits require round holes of 25mm diameter. Great tits, being slightly larger need 28mm, 38mm for sparrows and 45mm for starlings. Robins on the other hand prefer open fronted next boxes.

Working in pairs or groups, allow students to create their own bird house designs. These can be in the forms of annotated sketches, exploded diagrams, cross-sectional designs or even CAD (computer-aided design). Ensure students' plans are annotated with measurements and the resources they will be using.

Before building in wood, have children create a prototype using paper or cardboard to check that their chosen dimensions work. When building the prototype, students should be actively thinking about amendments and improvements that can be made to their final design, and annotating these onto their plans.

## Make:

### Cutting:

- Begin by measuring the wood to the dimensions in the students' plans (or use the dimensions listed in this plan). Encourage children to be as accurate as possible in their measurements and to use the correct resources for measuring and marking (pencil and ruler).
- **Adult supervision required** Begin by securing the timber in a vice or clamp. Having already demonstrated safe use of a saw, allow students to cut the timber to the correct dimensions. Repeat for all sections of timber.
- Before joining, ask children to work in pairs/groups to assemble their components (a temporary adhesive like blu-tac could be used here to keep parts together). Do the components fit together as they should? Do any changes/amendments need to be made?
- Once groups are happy that their boxes fit together correctly, it is advisable to mark on where they will be adding the nails and other fixings.

### Joining:

- Whilst most hot glue is non-toxic and therefore safe to use for wildlife, it does not hold up well in damp or wet conditions, so to create a bird house that will last for years, we recommend using hammer and nails.
- **Adult supervision required** Using the vice/clamp, secure the timber and begin to nail the sides and base together. Care must be taken not to hit thumbs/fingers with the hammer. Encourage students to start gently to secure the tip of the nail and only use heavier taps with the hammer once the nail is already secured in the wood and fingers can be moved out of the way.
- If students' carpentry is of a high standard, with evenly proportioned panels and snugly fitting joints, you will need to drill some small holes (1-2 mm diameter) into the floor panel to allow for drainage.
- Fix on the roof panel with a rubber flap 'hinge' made from scrap rubber. This should cover the join between the roof and back plate completely, so it is waterproof. Nail the rubber into the back plate first, then pull it tightly over the join and nail it onto the roof. The roof should be able to lift away like a lid.
- After construction, treat the outside of the box only with a water-based wood preservative product, such as 'Cuprinol' or 'Sadolin' (not creosote), to prolong its life and help repel water. If using planed timber, clear polyurethane may be used instead.
- If you have it, fix a piece of roofing felt to the roof to prolong the life of the box and render it even more waterproof.

Main activity:

	<p>Having completed the building of the bird house, students can start getting the home ready for bird occupation and think about suitable locations within the school grounds.</p> <p>Whether fixed to a tree or a wall, the height above ground is not critical to most species of bird as long as the box is clear of inquisitive humans and prowling cats. If there is no natural shelter, it is best to mount a box facing somewhere between south-east and north to avoid strong direct sunlight and the heaviest rain. The box should be tilted slightly forwards so that the roof may deflect the rain from the entrance.</p> <p>You can use nails to attach the box directly to a tree trunk or branch; or you can use rope or wire wrapped right around the box and trunk (remembering to protect the trunk from the wire cutting into it by using a piece of rubber underneath it). Both methods are satisfactory, but obviously annual maintenance is easier if the box is wired and can be taken down easily for cleaning.</p> <p>The number of nestboxes which can be placed in a garden depends on the species you wish to attract. Many species are fiercely territorial, such as blue tits, and will not tolerate another pair close by; about 2 to 3 pairs per acre is the normal density for blue tits. Other species, such as the tree sparrow, which is a colonial nester, will happily nest side-by-side.</p> <p>Do not place your nestbox close to a bird table or feeding area, as the regular comings and goings of other birds are likely to prevent breeding in the box.</p>
	<p><b>Evaluate:</b> Having completed their build, have children consider the following evaluation points. These could be written into books or could be discussed in groups or as a class.</p> <p><b>Aim of the project?</b></p> <ul style="list-style-type: none"> <li>• What was the aim of this project? What were you trying to achieve? Did you meet this aim?</li> </ul> <p><b>What went well?</b></p> <ul style="list-style-type: none"> <li>• What went well with the project? What do you like most about your final piece? When tested, did it work as expected?</li> </ul> <p><b>Next time?</b></p> <ul style="list-style-type: none"> <li>• What would you change about your design next time? How would you change this? How could you make these adjustments?</li> </ul> <p><b>Skills?</b></p> <ul style="list-style-type: none"> <li>• What skills have you learnt in this project? What tools did you use? How did these skills help you make your final piece? What other projects will these skills be useful for?</li> </ul> <p><b>Challenges you faced?</b></p> <ul style="list-style-type: none"> <li>• What unexpected obstacles did you need to overcome? What didn't go to plan?</li> </ul> <p><b>Overcoming challenges?</b></p> <ul style="list-style-type: none"> <li>• How did you overcome these challenges? How did you adjust?</li> </ul>
<p><b>Extension activities:</b></p>	<p><b>Habitat Research and Report:</b> Have students research and create a report on bird habitats in the local area. They can use books, websites, and interviews with people to gather information.</p> <p><b>Bird Life Cycle Study:</b> Explore the life cycle of a range of different birds. Students can create posters, diagrams, or even a mini-book illustrating the different stages of a different bird species lives. Some birds, such as blue tits, will co-parent whereas birds such as cuckoos are brood parasites and will lay their eggs in the nests of other bird species, who will then raise the cuckoo chicks as their own.</p> <p><b>Bird Art and Illustration:</b> Encourage students to create artwork or illustrations related to birds, their habitats, or the bird house project. They can use various mediums, such as pencils, paints, or digital tools.</p>

**Health &  
Safety:**

Consider the following when creating your Health and Safety risk assessment:

**Training and Supervision:**

- Ensure students are trained in safe tool use through demonstrations.
- Encourage controlled movements.
- Always supervise students when using tools.

**Safety Equipment:**

- Require students to wear appropriate PPE, such as safety goggles and gloves.
- Ensure PPE fits properly and is in good condition.

**Workspace Safety:**

- Maintain a clean, organised workspace, removing trip hazards such as cables, chair legs and bags.
- Ensure good lighting, ventilation, and minimal distractions – ensure adequate behaviour management strategies are in place.

**Hazard Identification:**

- Teach students to identify potential tool-related hazards.
- Discuss common risks, such as sharp edges and flying debris.

**Emergency Procedures:**

- Ensure students know what to do in case of an accident or injury.
- Maintain a first aid kit in the workspace.

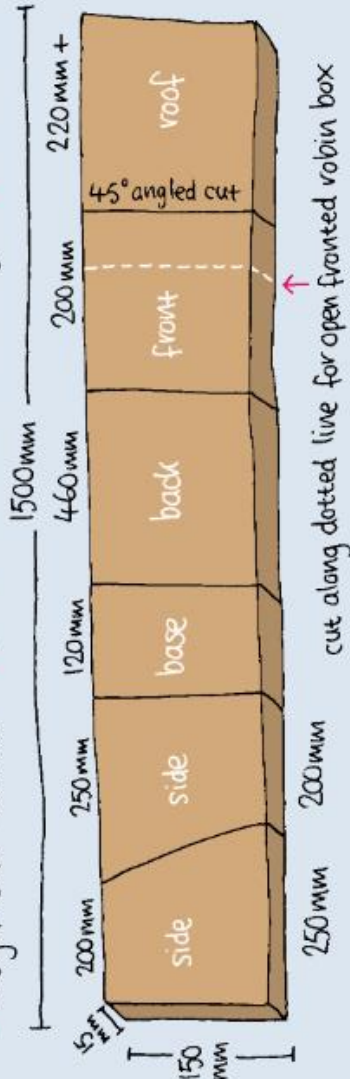


# How to make a nest box



## What you need:

- rough cut timber
- some old rubber or a hinge
- 20mm nails
- tools:



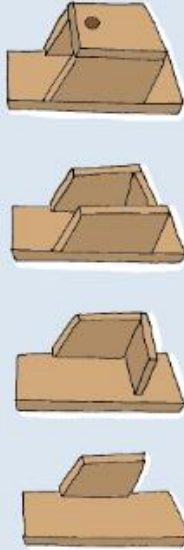
always get an adult to help with tools!

## 1 Mark out and saw panels

Use diagram above, and write the name of each panel onto the marked out wood.

## 3 Assemble the box

Nail the panels together:



Fix on the roof panel with a hinge or strip of old rubber.

## Where to put it:

2-5 metres above the ground, somewhere sheltered.

