

# Resistant Materials in our Environment

## Lesson 5: Choosing materials. It is not as easy as it seems.

### Learning Objectives:

- To look more closely at the environmental impact of a material chosen for a product.
- To show an ordered sequence in managing the decision making process.
- To understand other environmental considerations, apart from origin, disposal and energy consumption, when designing a product.
- To consider environmental design criteria when choosing materials.

### Resources:

- Samples of wood or wooden products to include: recycled wood, hardwood, softwood, new wood with a sustainable certification, tropical hardwood such as mahogany, teak, spele etc, hand crafted product, mass produced product.
- Enlarged copy of the decision making diagram on Activity Sheet 5 as a visual aid.
- Photocopy of Activity Sheet 5 for each pupil.
- Barn Elms Wildfowl and Wetland Centre website gives details of how to arrange a visit.

### Activity:

Remind pupils of the previous lesson on the design of products used in a nature reserve.

Ask the pupils why so many of the products were constructed entirely or mainly from wood. (*It is an appropriate material in a nature reserve because it is renewable and looks aesthetically pleasing. At the end of its life it can rot or biodegrade and support further life in the nature reserve*).

Now show the pupils the enlarged copy of the decision making diagram on Activity Sheet 5 as a visual aid.

Explain that when thinking about the environmental impact of their design there is a need for pupils to:

- look closely at the material chosen to make a product;
- make an ordered sequence of choices.

Using the visual aid explain that each of the arrows represents a choice. Choose two different coloured felt tip pens. Establish a colour that represents the *best choice for the environment*. Discuss the first decision on the diagram ie *if you are making something from wood you can choose to use new wood or recycled wood*.

Show pupils examples of recycled and new wood.

Ask the pupils which is the most environmentally friendly decision and the reason(s) for their choice. *If you recycle existing wood it reduces waste that is being discarded. It also reduces the demand for new wood. In addition transport and energy use from processing new wood are both reduced which has benefits to the environment*.

Use the coloured pens to colour the appropriate arrows as an example.

Now discuss the other decisions on the diagram establishing the reasons for, but not marking, the appropriate environmentally friendly choice. (Details are in the introduction to this unit of lessons). Show pupils examples of wood and products when appropriate.

Give out Activity Sheet 5 and ask pupils to complete it.

In a plenary session discuss pupils answers to each of the questions.

Finally explain that when making products from wood the decision making does not end with choosing the appropriate material. The way the wooden product is finished is important for both the product and the environment too.

Discuss and establish the following sequence:

1. Like other materials all wooden products will eventually decay;
2. The decaying process is carried out by living organisms such as wood worm, wood lice, beetles, fungi and other micro organisms;
3. These decomposing creatures thrive best in damp conditions where oxygen is present;
4. Some durable hardwoods, such as chestnut and elm, and some resinous softwoods, such as larch and Douglas fir, are more resistant to these decaying organisms. However, these timbers are often expensive;
5. Other types of wood can be treated or painted to deter attack from these organisms;
6. Many of these treatments use a combination of chemicals that act as pesticides to kill or deter decaying organisms;
7. Some of these chemicals have caused environmental harm and have been found to damage both human health and wildlife populations eg lindane.

Answers to questions 3, 4 and 5 on the activity sheet.

3. If you're making a product and have to use new wood what decisions could you make to benefit the environment?

*If possible, use wood that has been sustainably produced, British, from native trees and made using traditional skills.*

4. Why might it be better for the environment to make a new product in wood rather than in plastic, metal or concrete?

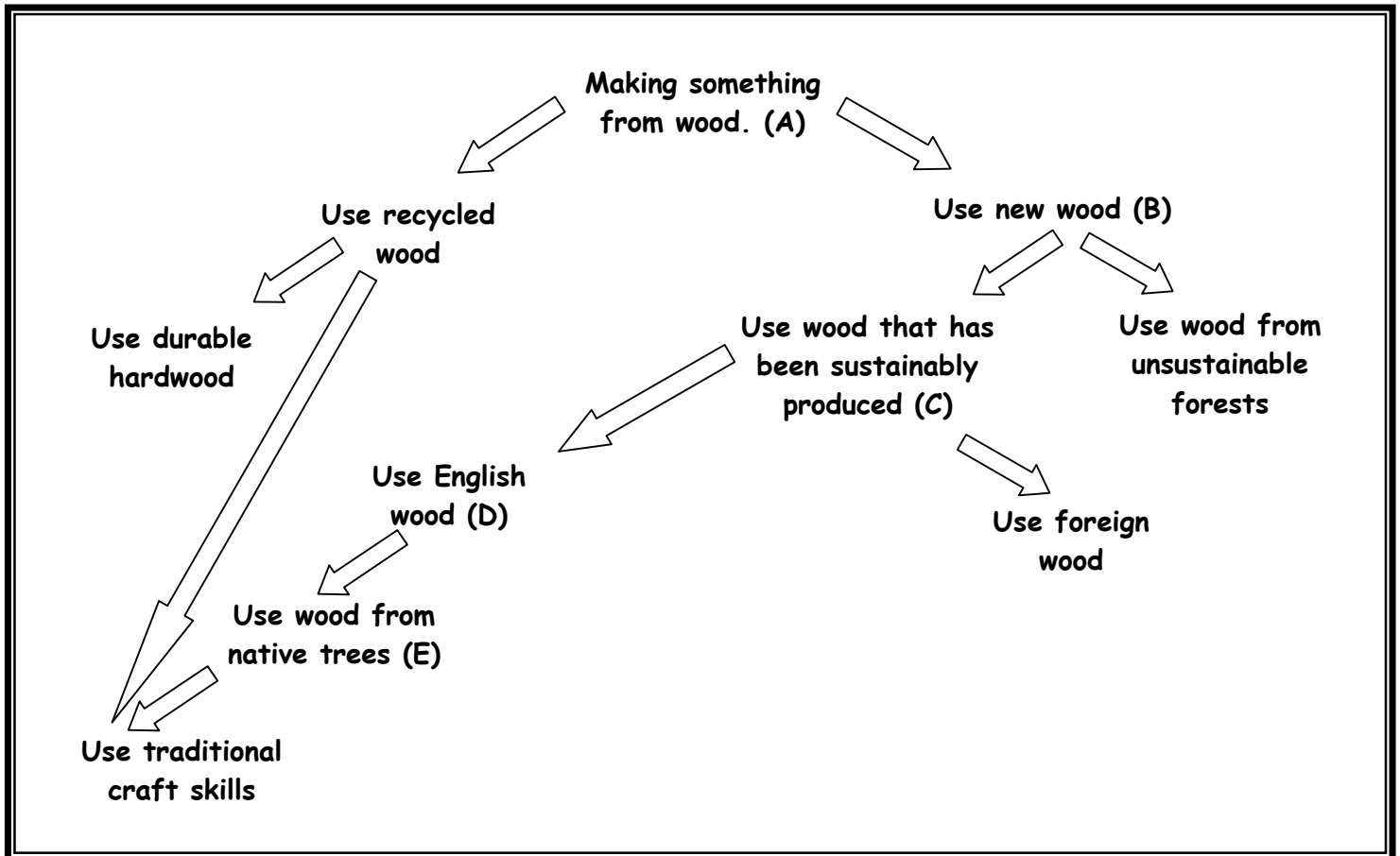
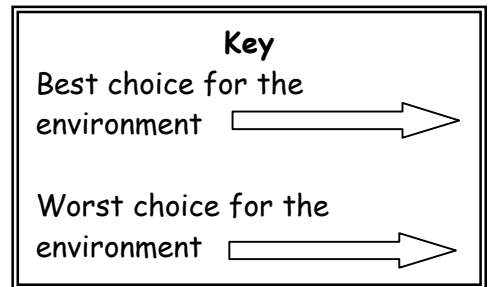
*It is a renewable resource and, providing you make sensible choices, causes less environmental damage.*

5. If you buy products made from wood what would you try to avoid in order to help the environment?

*Mass produced products using foreign woods from unsustainable forests treated with environmentally damaging wood preservatives.*

**Activity Sheet 5****Choosing Materials! It's not as easy as it seems.**

1. Look at this decision making chart.  
Each set of choices includes at least one that is better for the environment than the other choice(s).  
Choose two different coloured pencils or pens.  
Complete the key  
Colour each arrow in the diagram in the correct colour.



Write your answers to the following questions on the back of this sheet of paper.

2. Look at the decisions you made at A, B, C, D and E.  
For each decision, explain the reasons why one choice is more friendly to the environment than another.  
Here is an example:  
Decision A. When you decide to make something from wood it is better to use recycled wood than new wood. This helps save trees from having to be cut down.
3. If you're making a product and have to use new wood, what decisions could you make to benefit the environment?
4. Why might it be better for the environment to make a new product in wood rather than in plastic, metal or concrete?
5. If you buy products made from wood, what would you try to avoid in order to help the environment?