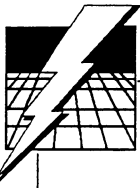


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Introduction

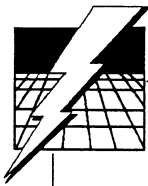
This book introduces you to the world of materials. Materials are all around us. We use many different ones – some old, some new – every day.

Whenever you use or buy anything, it is useful to know what it has been made from and how it has been made. Whenever you make anything, it is important to know what the material is, why you are using it, and how to use it. This book will help you to learn about a range of materials and their uses.

It can be used on its own or, better still, as a resource for the other books in the series. There are tasks and projects designed to get you thinking about materials in many ways. When doing projects, perhaps from other books in the series, this book will serve as a useful reference.

When you come across an important word for the first time, it will be printed in **bold** letters. Try to remember these words and what they mean.

At the back of the book there is a mini-dictionary which explains the meaning of words that you may not have come across before. If you are not sure about a word, *look it up*.



Introducing Materials

What Are Materials?

Every day we come into contact with many different **materials**.

Project 1

Think about one part of today. Can you count up the number of different materials you were 'in contact' with? What about the few minutes you spent washing this morning!

If we think about what a **material** is, the number in your answer might increase.

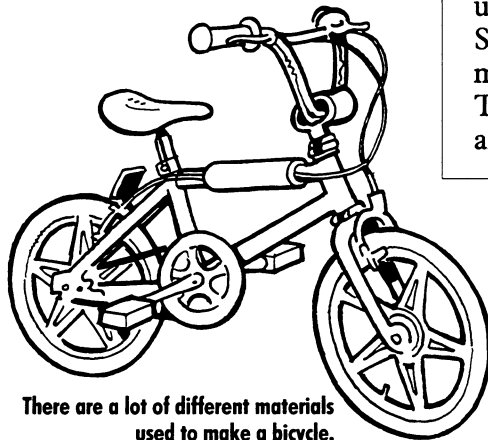
A material is 'that from which a thing is or can be made, stuff, fabric . . .' (*The Oxford School Dictionary*).

There are lots of materials – some more obvious than others, for example:

wood, metal, plastics, stone, glass, rubber, leather, paper, grass, fur, skin, ceramics, foam, plants, bone.

Project 2

Write down any other materials you can think of to add to the list given above.



There are a lot of different materials used to make a bicycle.

Task: Identify the different materials used on the different parts of the bicycle. Start with the obvious, for example, metal, plastic, etc. Then try to be more specific, i.e. find out any of the *types* of metal, plastic, etc.

Organic and Inorganic Materials

Are some of these materials part of the same 'family'?

Is stone 'related' to ceramics?

Materials are usually divided into two categories: **organic** and **inorganic**. These words may sound complicated but they simply mean:

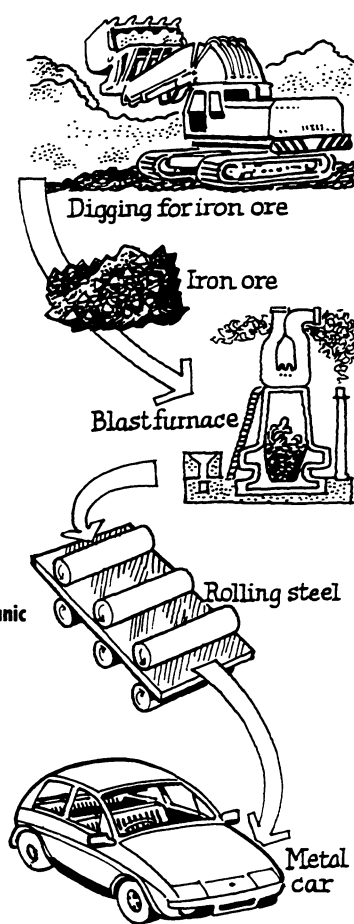
Organic: 'from living beings or things'

Inorganic: 'not from living beings or things'

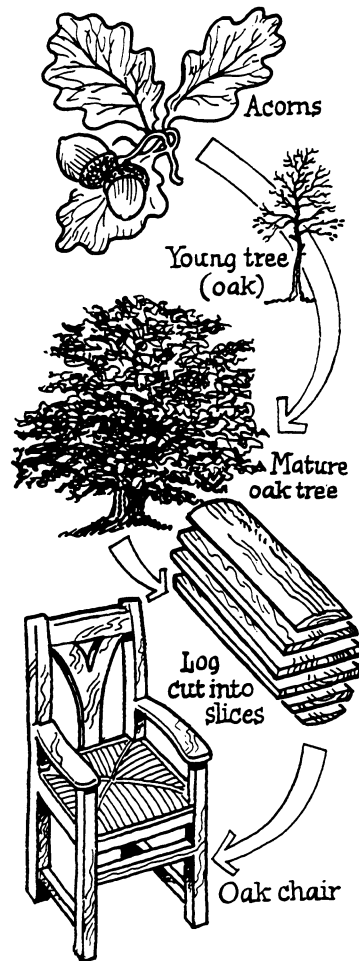
Examples of organic materials are wood, leather, fur, ivory, plants. Examples of inorganic materials are metal and stone.

Project 3

Can you think of other materials to go into the two categories of organic and inorganic?



One example of an inorganic material. The iron ore is dug from the ground, processed and used to make steel objects, for example, car bodies.



One example of an organic material. The oak tree grows and can then be used to make things, for example, oak furniture.

Introducing Materials

Materials through the Ages

In the development of human beings materials have been very important. Today it is generally thought that Earth as a planet has been around for 4,500 million years.

We need to think about when different materials were discovered and used during Earth's lifetime. The different 'ages' of human history – the **Stone Age**, **Bronze Age** and **Iron Age** – all have the names of materials:

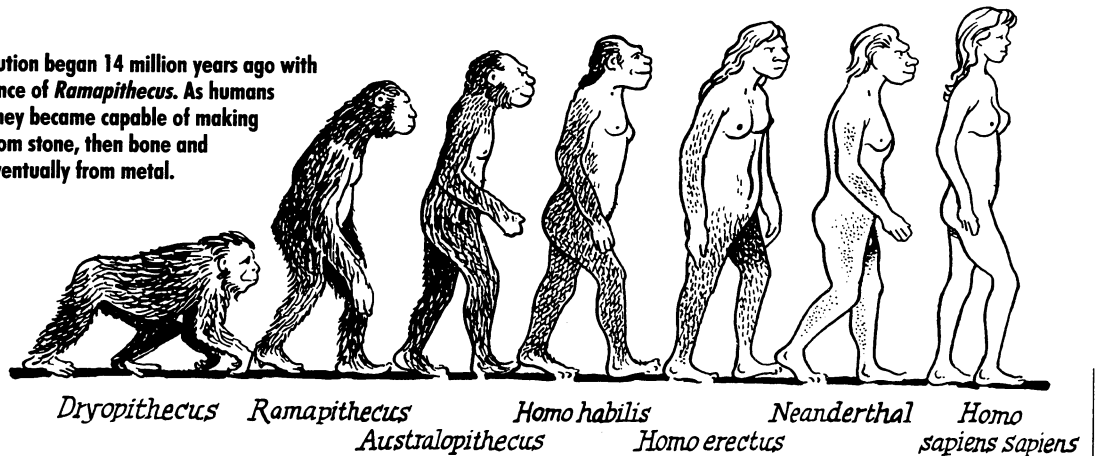
Stone Age: Two million years BC.

Bronze Age: 25,000 years BC.

Iron Age: 2,000 years BC.

Think of the length of this book as the Earth's age. The Stone Age started around page 38. The Bronze Age started about two-thirds of the way down the last page. The Iron Age started during the last but one line (the penultimate line).

Human evolution began 14 million years ago with the appearance of *Ramapithecus*. As humans developed they became capable of making tools, first from stone, then bone and wood and eventually from metal.



Fact File

The world is made up of thousands of different substances – for example, wood, water and salt.

All of these are made up from one or more of about 100 basic substances called 'elements'.

About 70 of these elements are metals!

Project 4

Using the length of this book as a guide, when were **plastics** discovered?