

Structures

What are structures?



Figure 1 A basket is a man-made structure.

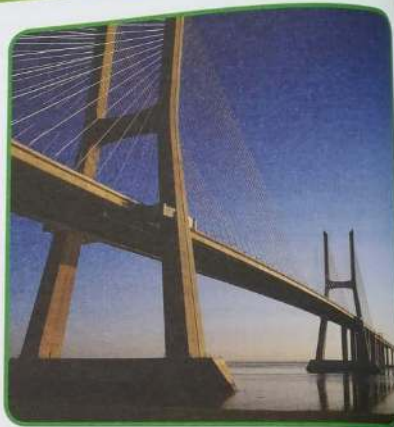


Figure 2 A bridge is a man-made structure.



Figure 3 A tree is a natural structure.

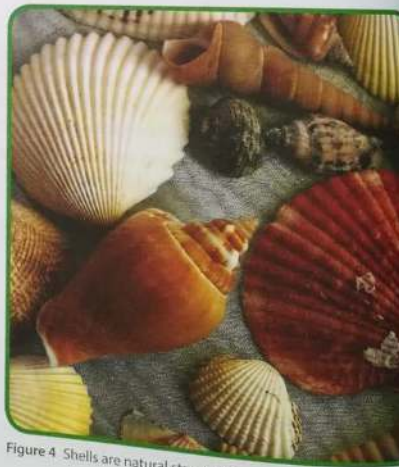


Figure 4 Shells are natural structures.

Introduction

Everywhere you look, you see structures. Your friends are probably sitting on chairs, and using desks to write on. They carry schoolbags to protect their books. These items have been made or manufactured for a particular purpose. They are all examples of man-made structures.

Your body is capable of fantastic things. You can train it to run fast, jump high and even throw a weight over long distances. Your body moves because your muscles work together with the bones of your skeleton. Your skeleton is a framework of different connected bones that help your body to keep its shape. The skeleton is an example of a natural structure – a structure that is found in nature.

One thing all structures have in common is that they can carry and support the load for which they were designed. In this chapter, we will investigate different types of structures.

What are structures?

Key words

- **structure** – something that has been built, made or put together in a particular way to support a load
- **contain** – to enclose or hold something within it
- **protect** – to keep something safe; to prevent something from being damaged
- **support** – to be able to carry or hold the weight of something
- **span** – the distance from one end of something to the other; to extend across a distance
- **natural structure** – a structure that is not artificial or man-made, but exists in nature
- **man-made structure** – a structure that has been manufactured or produced by people

Definition of structures

A **structure** is something that has been built, made or been put together a particular way. Wood and metal, for example, are combined to build a roof for a house, and keep the people in the house safe.

Purpose of structures

Structures are made or constructed for different reasons. The purpose or function of a structure depends on its use. Most structures have several functions, which include:

- **Containing objects** – a structure can **contain** or hold objects. For example, a soda can contains the liquid inside.
- **Protecting or sheltering objects** – a structure can be used to **protect** and shelter objects. For example, a tortoise's shell protects its body.
- **Supporting loads** – a structure can **support** the weight of another object, like a chair supports the weight of the person sitting on it.
- **Spanning distances** – a structure can **span** a distance, like a spider's web spanning across two branches.



Figure 6 A chair supports the load of someone sitting on it.



Figure 7 The shell of a tortoise protects its body.



Figure 8 A can contains the liquid inside.



Figure 9 A spider's web spans two branches.

Classification of structures

Structures can be classified or grouped as either natural or man-made.

Natural structures

Structures that have not been made by people and that occur in nature are called **natural structures**. Examples of natural structures include the feathers of birds or the skeleton of humans.

Man-made structures

People build or manufacture structures to help solve problems. These are called **man-made structures**. Examples of man-made structures are buildings, pylons that carry power lines above the ground, and bridges.

For a structure to be truly effective, it must be able to:

- carry the load for which it was developed without toppling over or collapsing
- support the various parts that make up the structure.



Figure 10 A bicycle



Figure 11 A bucket



Figure 12 A concrete block

Enabling Task 1 Investigate natural and man-made structures

1. Working alone, look at these images.

Copy the table below and add extra rows. Write the name of each structure shown in Figures 10–15 in the first column. Then, for each structure, identify whether the purpose of the structure is to support, protect, contain or span. An example has been done for you. (9)

Structure	Supports	Protects	Contains	Spans
A concrete block	✓			

2. Sometimes a structure can carry out more than one function. Are there any examples above that have more than one purpose or function? Describe the purpose of each. (4)
3. Collect or draw different examples of natural and man-made structures. You need a minimum of three examples of each type of structure. Keep your examples safe for another task later. (2)

[Total: 15]



Figure 13 A bridge



Figure 14 A bird's nest



Please complete the activity- Enabling Task i, and file for safe keeping.