



KNOWLEDGE ORGANISER

SCIENCE: OUR CHANGING WORLD

YEAR FOUR

KEY KNOWLEDGE:

QUESTION 1: How can you classify trees from leaves?

ANSWER

It is possible to identify many of our native trees by looking at their leaves. Strictly speaking, identification should involve examination of the flowers ([petals](#), [sepals](#), [stamens](#) etc), which are less variable than leaves. However, in most cases, it is possible to make an identification using just a few features of the leaves and twigs.

Looking at leaves:

Leaves are generally speaking broad, flat, and thin: these features allow them to intercept light for photosynthesis and allow gases to enter or leave the leaf easily. The flat surface of the leaf is termed the leaf blade or lamina, as seen to the left. The top surface (or *adaxial* surface) of the leaf is often very different from the lower (or *abaxial*) surface. For example the lower surface may be hairy, or a different colour, or the veins of the leaves may be more obvious. The leaf is usually joined to the stem of a plant by a stalk; this is called the petiole. The angle that the petiole makes with the stem of the plant is termed the leaf axil. The tip of the leaf is sometimes referred to as the apex of the leaf.

The leaf margin

The edge of the leaf is known as the leaf margin. Looking at the margin of the leaf can be an important in identifying the leaf. Leaf margins may be described as entire, toothed, or lobed. The oak leaf to the left is clearly lobed.



Leaf arrangement or *phyllotaxis* is another feature of leaves that may help in you in identifying a tree is how they are arranged on the shoots or twigs of the tree.

Look at a shoot (not too near the tip).

- How are the leaves arranged?
- Do they occur in pairs?



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QUESTION 2: How can you classify a leafless tree in winter?

ANSWER

Bark: In more mature trees, another feature that can help in identification is the bark. The bark protects the underlying tissues from damage. The outermost part of the bark consists of dead cells and often has a characteristic colour and texture.

Winter Twigs: Examination of the arrangement of the buds (are they opposite or alternate?), the colour of the buds and their scale leaves, and the leaf scars can often provide enough information to identify a tree.

QUESTION 3: How can you classify a plant by flower?

ANSWER

Plants are extremely complex and diverse, and there are millions of different plant species— some that haven't even been fully discovered and studied yet! In order to continue the study and organization of plants, **botanists** (scientists who study plants) must find a way to categorize the many different species. While all plants are made up of similar parts that are essential in maintaining their survival (i.e. having roots, stem, leaves, etc.), they often look different. These differences in characteristics are used to group plants into species, which provides a way of classifying and therefore organizing plants.

Flowering plants are one such classification: angiosperms and can be further classified using a key to look at aspects such as colour, shape and number of petals as well as when the flowering occurs in the year.