

The Conifers

Often the first step in identifying a tree species is to observe its [silhouette](#). There are in fact many different shapes of trees. In general, conifers have a well-known silhouette that differs from that of broadleaf trees. Observe the conifers in your area and determine what silhouette they have. Are they sphere- or cone-shaped?



[Needles](#) also come in different shapes and lengths, and are very important in identifying conifer species. Furthermore, the way they are bundled together and their location on the twigs help distinguish different kinds of trees. Trees can often be correctly identified by observing their needles.



[Cones](#), the fruit of conifers, contain the seeds for reproduction of the species. The trunk and branches are enveloped in a protective covering called [bark](#). It serves the same function as skin does for humans. The fruit and bark are often used to help identify a tree.



Conifer Silhouettes

Did you know that it is possible to identify a tree simply by its silhouette? The silhouette is very important in dendrology. But it does take an expert eye to identify the exact species of a tree by its silhouette alone. Often, you will need to observe the leaves, fruit and bark to correctly identify a tree.

Although conifers are generally all cone-shaped, there are differences between the species. How does the silhouette of a black spruce differ from that of a balsam fir? Do the eastern hemlock and eastern redcedar have the same silhouette? Are branches on the trunk of a [lodgepole pine](#) distributed in the same way as those on a white spruce? By asking yourself these kinds of questions, you will begin to see the different silhouettes.

The [black spruce](#), the narrowest conifer, resembles a cylinder more than a cone, whereas the [white spruce](#) is wider and is shaped more like a cone.

The lodgepole pine and the [balsam fir](#) are both cone-shaped. However, the lodgepole pine does not have many branches near the base of the trunk, unlike the fir. Notice how the fir is tapered and pointed at the top!

The [Douglas-fir](#) is neither quite cone- nor cylinder-shaped. Its silhouette is somewhat similar to that of the black spruce, but without branches at the base of the trunk.

The [larch](#) has a lot fewer needles than other conifers. Moreover, this cone-shaped tree is the only conifer that loses its needles in winter.

The branches of the [eastern white pine](#) branches are at right angles to the trunk, giving the tree the shape of a cylinder. The eastern redcedar has branches that shoot upward, giving it a cone-shaped silhouette.

The [eastern hemlock](#) has a distinctive silhouette. It becomes narrow toward the base, which makes it appear diamond-shaped.

When observing trees outdoors, it is recommended that you look at a single, isolated tree. This will enable you to observe the shape of its silhouette, without interference from other trees.



The Shape of Needles

Observing the needles on conifers is the most efficient means of identifying these trees. The shape and length of the needles are key to differentiating these species.

You can determine the shape of a needle (i.e., whether it is four-sided, round or flat) simply by rolling it between your thumb and index finger. Or you can cut the needle width wise, that is, with your scissors at a right angle to the needle, and examine the shape of the cut edge. The illustrations will help you understand how to determine the shape of needles.



The needles of some conifers, such as the [eastern white cedar](#) and [eastern redcedar](#), are made up of scales layered one on top of the other.

Almost all conifers have evergreen needles that stay on the tree year round. Only the larch, which has [deciduous](#) needles, is an exception to the rule. Conifers retain their green coats year round, embellishing winter landscapes. Furthermore, this quality helps to significantly reduce wind speeds, much to the delight of those who love winter sports.

Types of Needle Bundles

The pine family has needles that are grouped together in bundles, consisting of 2, 3 or 5 needles joined together at the base.

In other species, such as the [larch](#), the bundles may consist of more than 5 needles.





Because the base of the needles or needle bundle in some species is covered in a very thin sheath, you should use a twig for identification, not just a single needle. You will therefore be able to properly observe how the needles or needle bundles are arranged.



Conifers such as firs and spruces have single needles.

The arrangement of needles

The way needles are arranged on a twig is a key feature. Many conifers are characterized by this observation criterion.

As you can see, needles are either arranged in bundles or singly placed on the twig. Identifying conifers with needles in bundles is easy to do. However, to identify conifers with single needles, you need to look at other features such as the way the needles are arranged on the twig.

Needles may be arranged in pairs opposite each other at the same position on the twig. These needles are said to be opposite needles. They can be observed on the [eastern white cedar](#).



When needles are placed around the twig at the same position, they are said to be alternate. Take a look at a [black spruce](#) branch and check to see whether the needles alternate. Then try to find other species with alternate needles.

If the needles are placed star-like around the twig at the same position, they are said to be whorled. Although you may occasionally see whorled needles on some junipers, in most cases they are in opposite pairs.

Needles are often arranged on one plane, not all round the twig. This occurs mainly when the needles are flat. You will see this feature if you look at a [balsam fir](#) branch.



The Fruits of Conifers

Conifers have two types of cones: pollen cones and seed cones. Depending on the tree species, you may find both types of cones on the same tree or on different trees. When seed and pollen cones are found on different trees, the species is called dioecious.

Pollen cones are often smaller than seed cones and have a catkin-like structure. Pollen cones produce the pollen that is released to fertilize seed cones. Once the pollen has been shed, the pollen cone withers away and is no longer useful for identification purposes.

Female cones have scales under which the ovules are found. Once fertilized by the pollen, the ovules become seeds. As of that time, the seed cone is considered a fruit because it has everything needed to reproduce a tree.



Seed cones are useful means of identification because they persist on the tree or on the ground around it. Seed cones are often called simply cones. Cones have different forms. They may curve inward like those of the [jack pine](#). They may be very small like [eastern white cedar](#) and [tamarack](#) cones. Or they may be of varying lengths depending on the species.

Cones are valued for their decorative qualities. When you have a chance to gather some, take one apart to observe the seeds. You will find cones come apart easily when dry. Also, many animals feed on conifer seeds.

Many conifers have arils instead of cones. Arils are fruits composed of a fleshy membrane that partially encloses the seed. You will find arils on the Canada yew. But beware. The fruit of the yew is toxic. So make sure you do not eat any.

Protective Layers of Bark

The bark on trees has two layers: an outer layer of dead wood and an inner layer of living tissues. The inner layer is made up of living cells that are continually dividing. The inner cells need water to live. They take in water through pores and lenticels. When the cells are deprived of water, they die and become part of the outer dead layer, which serves as an effective barrier against injuries and environmental stresses. Since this layer consists of dead cells, it can no longer grow. It cracks or breaks away as the inner cells continue to grow and push the older cells outward.

You have certainly noticed that the bark on different species varies considerably. It can be sticky because resin or sap is secreted by the tree. The bark on fir trees, for instance, is covered with balls of resin that can be easily pierced with a fingernail. This represents a very useful criterion for identifying fir trees.

To identify a tree by its bark, you have to observe the texture, colour and pattern of the bark.

Some trees, like the [red oak](#) have smooth bark. Others like the [white ash](#) have rough bark. Bark may be thin as in the [beech](#), or thick, like on the [white oak](#).



There are four major characteristics to consider in observing bark. Some bark sheds in strips or flakes. Look at the [white birch](#); it sheds in long horizontal strips. Bark can also be scaly as on the [white spruce](#). Bark may also have shallow or deep grooves depending on the species. The [white ash](#) has straight grooves. Bark can also be covered in cracks as in the [white elm](#).

To practise identifying bark, try feeling different types of bark with your eyes closed. Touching is an excellent way of developing your ability to identify bark.

