

What to look for outdoors in Autumn

Hornbeam Spinners

What you need:



Have a magnifying glass in your pocket.

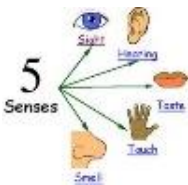
First, look for a **hornbeam tree**.

In autumn, the Christmas-tree shaped clusters of seeds are a give-away clue.



Hornbeam leaves and clusters of seeds in autumn

The leaves are crinkled like crinkle-crisps, they have double-serrated edges and a wonky point at the tip.



Feel how smooth the grey bark is. If you are lucky enough to find a mature hornbeam, you will see that its bark has long stripes down its length.

Question



Can you think why I call them stretch marks?

Yes, the bark has to stretch each year as the trunk grows wider.



A mature hornbeam tree

Another way to be sure you have a hornbeam is to check that the buds curl close to the twig.



Hornbeam buds

Pick a cluster of seeds and prise it apart into individual seeds each nestling in its own 3-lobed bract.



See how the attachment of each seed-nest to the stalk is thread-thin.



Questions



I wonder whether it has always been so thin or whether it has become thin now that the seeds are ripe.

When the wind blows strongly the seed-nests will easily be detached and blown away.



What advantage do you think the bracts give the tree?



Are they protecting the seeds while they dangle down?

If so, from what? From insects? From birds? From the wind? From being knocked?

I don't think the bracts would protect them from any of these things. What do you think?



Perhaps the bracts will protect the seed when it lands on the ground?

Would the bract be underneath to give the seed a soft landing?

Or would the bract be on top of the seed to shelter it?

Do

Let's see what happens when the seed falls from a good height.

Hold a seed-nest by its thread-thin stem so the bract hangs down as it does on the tree.

Carefully climb on a chair, steadying yourself, of course, by holding the back of the chair – or perhaps get someone to help you.

Hold the seed-nest as high above you as can and let it drop.

Which way up did it land?



I dropped 10 seed-nests and every one of them landed with the bract beneath the seed.

There is a very low probability that this would have happened by chance.



If there were an even chance of anything landing one way up rather than the other, the chance of it landing a particular way up would be 1 in 2 or 0.5. The chance of it landing the same way up 10 times in a row would be 1 in $2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 = 1024$ times.



$2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2$ is called '2 to the power of 10' and is written 2^{10} .

Any number multiplied by itself can be written in the same way. The number at the top (the superscript) represents the number of times the number is being multiplied by itself.



I am sure we can say which way up your seed-nest landed, but I am also sure that you have something to say about the way the seed-nest fell!

Every time I dropped a hornbeam seed-nest it dropped straight down at first and then began to spin. That surprised me. Do you find the same with your seed-nest?



Try it again with other seed-nests.

Do they all drop and then spin? Do they all land with the bract beneath the seed?



Prise a seed out of its nest and try dropping that on its own.



Do you think the seed will spin?

I didn't think it would.

Was I right? The seed on its own doesn't spin, does it?

I don't have a timer that is precise enough to measure the very short time it takes for the seed to fall even when I dropped it from ceiling height, but we don't need a timer to tell us that the seed on its own falls very much more slowly than when it is within its bract.



Have we found the advantage(s) of the bract to the tree?



Clue: Scientists have done studies to show that the longer it takes for a seed to descend from a tree, the further it will be carried by the wind.



You have discovered that the bract slows down the descent of the seed so that the seed will be carried further from the tree.

This is an advantage to the tree because the further away the seed falls, the less it will be competing with the parent tree for light, water and nutrients.



What do you think it is about the 3-lobed bract that makes it spin?



Have a look at the bract lobes. Are the ones on either side exactly the same as each other? No they are not. One is always bigger than the other.



Of my 10 bracts, 5 had smaller lobes on the left and 5 had smaller lobes on the right.

I wonder whether the seed-nests are in pairs, one left-small the other right-small. I couldn't tell. See what you think. With the thread-thin stems being so fragile, I couldn't tell. Detailed botany books say that hornbeam seeds develop in pairs.



Let's remember to find a hornbeam tree in the spring when the seeds are developing. Perhaps we shall be able to see more clearly then.

Meanwhile, we mustn't forget the all-important seed itself!



The botanical term for seeds like those of a hornbeam seed is 'nutlet'.



Let's look at the nutlet through our magnifying glass. Hornbeam nutlets are described as heart-shaped? Is that the term you would use?



I think the hornbeam nutlet is too straight across the top to be heart-shaped, but near-enough, I suppose.

A hornbeam seed taken from its bract

See how ridged the husk is. A ridged structure is usually stronger than a smooth one.

Hornbeam seeds are programmed to germinate in the spring as the temperature rises so that it is no use keeping the seeds at room temperature and hoping they will start to grow: they need to be kept cold for some months and then gradually get warm. We say the seeds need to be 'stratified' before they will germinate.



'Stratify' in a seed-growing context means to keep the seed cold. 'Germinate' means begin to grow.

If you would like to grow some hornbeam seedlings, you will need to soak the nutlets in cold water for 24 hours then put them in a well labelled plastic bag at the bottom of the fridge or mix the nutlets in moist compost, put the mixture in a pot covered with netting to keep little mammals from eating the nutlets, and leave the pot outside through the winter.



Is there anything else you have noticed about the hornbeam, its shape, buds, bark, leaves or nutlets and bracts?

It is fun to make a note of what you saw and did today and what you think it might be worth looking for next.



For more about hornbeams and other trees, see Hello Trees Resource Sheets at <http://hellotrees.co.uk/>