

Hello Trees Resource Sheet



KS1 Y1 Science Diary Item

Christmas Trees

OBJECTIVE: FIND OUT MORE ABOUT CHRISTMAS TREES

Christmas trees are another example of the **EVERGREENS** that pupils are required to identify for Key Stage 1 Plant Science.

WHAT WE NEED **THIS CAN BE AN INDOOR OR OUTDOOR ACTIVITY**

A Christmas tree to examine

and/or a cutting or two from outer twigs **and inner twigs** of fir trees.



fir twigs and leaves

spruce twigs and leaves

closeup: smooth fir twig

closeup: spruce pegs

Background information: 'Flat needle' or 'flattened needle' are the terms used by botanists to describe the shape of the leaves of many conifers: all the firs, spruces, hemlocks, coastal redwood, dawn redwood, swamp cypress and yews.

Each flattened needle is a leaf.

Spruce leaves are on **pegs** ('p' in 'spruce' and 'peg')

True Fir leaves sit in a little hollow (or **cup**, three letters in 'fir' and 'cup').

Pegs and hollows can be clearly seen on inner twigs where leaves have fallen off.

[Norway spruce, *Picea abies*, is the original traditional Christmas tree but it is not often sold for indoor decoration because it tends to lose its needles in dry air.

When the leaves drop off, they leave pegs, confirming that the tree is a spruce.]



WORKING SCIENTIFICALLY

✓ **Experience & observe** + ✓ notice **patterns & compare** + ✓ **group** & classify
+ ✓ **Curiosity and questioning** (all suggestions acceptable):

- Which bit is a leaf? [**each flattened needle is a leaf**]
- How would you describe its shape? [squashed needle? 'flat needle' or '**flattened needle**' are the terms used by botanists to describe the shape of the leaves of many conifers: all the firs, spruces, hemlocks, coastal redwoods and yews]
- Think of other words to describe the leaves [tough/stiff/leathery, waxy, shiny/matt, pointed/rounded at the tip]
- How would you describe the colour of the top of the leaf? [?]
- Is the top of the leaf the same colour as the underside? [?]
- How would you describe the colour of the underside of the leaf? [silvery? waxy? ...]
- If waxy looking underneath, what do you think is making the leaf look waxy? ['wax', is the answer! The wax helps to keep moisture in on the underside of the leaf]
- Christmas tree leaves fall off when they have been cut from their roots and brought indoors, but do the leaves ever fall off while the tree is growing outdoors? [yes, but not all at once. They are **evergreen**. Notice that leaves have fallen off parts of branches close to the trunk where there is not much light]
- How would you describe the way the leaves are grouped along twigs? [like a feather? flat spray? coming out in every direction? coming straight out from the twig? ...]

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- **Is each leaf in a hollow on the twig or on a tiny peg?** Check the twigs where leaves have fallen off (probably inner branches). They will be smooth if the leaves are in hollows, rough if on pegs. **[This is important:**



If a tree has **flattened needles in hollows** the tree is a **true fir**.

If a tree has **flattened needles on pegs**, the tree is a **spruce**.]

- **What shape are Christmas trees?** **[cone-shaped**, like a 3D triangle!]
- How would you describe the way the branches grow from the trunk? **[straight out? Curving out and up? In whorls. Conifers grow one new whorl each year]**
- How can you **tell how old a Christmas tree is?** **[count the number of whorls]**
- Why do you think branches at the bottom of the tree are wider than those above? **[each year, new shoots grow out from existing branches, extended their width and length, branches on bottom whorls have had more years to extend]**

✓ Tests to answer questions

Will one whorl and one new shoot per whorl per year make a Christmas-tree shape?



Draw your own Christmas tree using a different colour for each year's growth or do the same thing with Lego or pipe cleaners. See below.

Result: Do you get a Christmas-tree shape?

- ✓ school locality: where in relation to the school locality pupils have seen Christmas trees.
- ✓ grow our own: you could transfer a little Christmas tree into a bigger pot or plant it outdoors in the soil.
- ✓ observe changes over time: see if well-watered, healthy Christmas trees lose their leaves.
- ✓ **tree identification:**

We know that a **true fir tree** has flattened needles that sit in little hollows – or tiny **cups**.

We know that a **spruce** has flattened needles that sit on **pegs**.

I can also tell you that **spruce cones hang down and drop off when ripe**, so we have an easy way to remember lots of information about a spruce:



there is a **P** in **spruce**, *Picea* is its genus, its leaves are on **pegs**, its cones are **pendulous** and **plummet** to be **picked up** by **pupils** (and other **people**).



- ✓ Use secondary sources of information:

Look at images of fir and spruce trees online . See also [Hello Trees 'Conifer Basics'](#)

PLENARY

1. Many conifers have leaves that look like flattened needles.
2. Each single flattened needle is a leaf.
3. Pupils can name and identify spruce and true fir trees:
 - a. both have flattened needles,
 - i. true fir tree leaves sit in little hollows,
 - ii. spruce leaves sit on pegs.
4. Fir trees and spruce trees are EVERGREEN.
5. Fir trees and spruce trees are shaped like a cone.

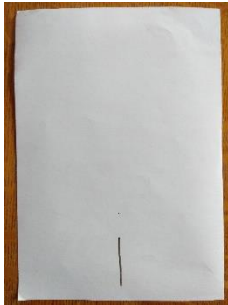
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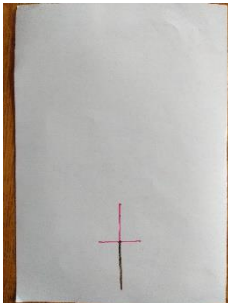
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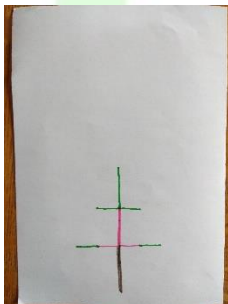
DRAWING TYPICAL CONIFER GROWTH PATTERNS USING DIFFERENT COLOURS TO REPRESENT EACH YEAR'S GROWTH.



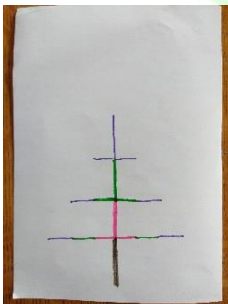
Year 1:
a single stem



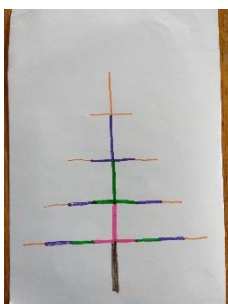
Year 2:
new header shoot
1 new whorl of branches
stem slightly thickened



Year 3:
new header shoot
new whorl below new header shoot
new shoots at end of branches on last-year's whorl
previous years' stems and branches thickened slightly more



Year 4:
new header shoot
new whorl below new header shoot
new shoots at end of branches on previous whorls
previous years' stem and branches thickened slightly more



Year 5:
new header shoot
new whorl below new header shoot
new shoots at end of branches on previous whorls
previous years' stem and branches thickened slightly more

There would also have been new sideways shoots on last-year's growth along each branch.

Note that each year, the previous leading shoot becomes part of the stem (trunk).

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REPLICATING TYPICAL CONIFER GROWTH PATTERNS USING LEGO



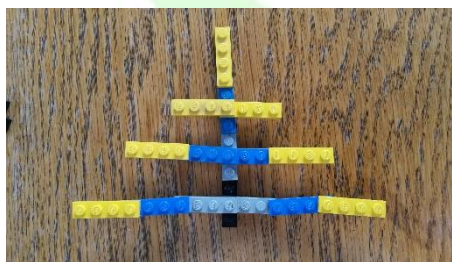
Year 1:
a single stem



Year 2:
new header shoot
and 1 new whorl



Year 3:
new header shoot
new whorl below new header shoot
new shoots at end of branches on last-year's whorl



Year 4:
new header shoot
new whorl below new header shoot
new shoots at end of branches on previous whorls



Year 5:
new header shoot
new whorl below new header shoot
new shoots at end of branches on previous whorls

There would also have been new sideways shoots on last-year's growth along each branch and thickening of previous years' stem and branches.

Note that each year, the previous leading shoot becomes part of the stem (trunk).

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REPLICATING TYPICAL CONIFER GROWTH PATTERNS USING PIPE CLEANERS

The great advantage of using pipe cleaners is that it becomes possible to replicate typical conifer growth in 3 dimensions.

I found it horribly fiddly, but you might find it is just the thing for a practical pupil in need of occupation!



Year 2:
new header shoot
and 1 new whorl



Year 3:
new header shoot
new whorl below new header shoot
new shoots at end of branches on last-year's whorl
new sideways shoots on last-year's growth along each branch



Year 4:
new header shoot
new whorl below new header shoot
new shoots at end of branches on last-year's whorl
new sideways shoots on last-year's growth along each branch