Activity 1.1,
Testing a leaf for starch

Lets see the experiment

Use iodine to test a leaf for starch | Plant Physiology | Biology

- https://www.youtube.com/watch?v=0s_xZqvwm_s

Each pair or group will need:

- access to a plant that has been photosynthesising; *Pelargonium* plants work well, but anything with reasonably thin, non-waxy leaves can be used
- a mat, tripod, gauze and Bunsen burner or spirit burner
- a beaker containing water
- a large test tube or boiling tube, that can stand in the beaker
- forceps (tweezers)
- a white tile
- iodine in potassium iodide solution

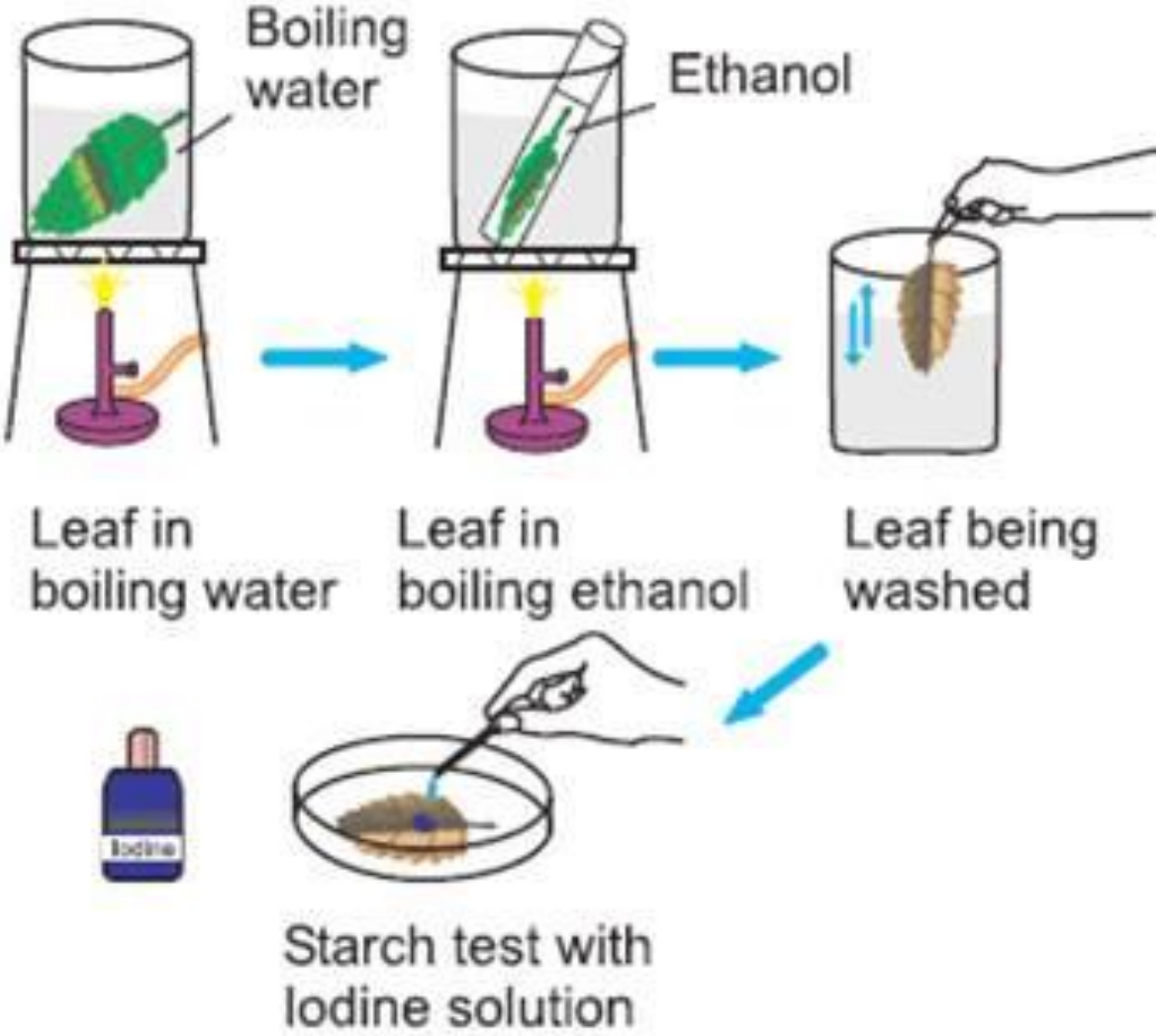
SAFETY! the damp cloth.

Ethanol is flammable.

Keep a damp cloth to hand. If ethanol catches fire, cover immediately with

- You will remember that we can test for starch using iodine solution.
- But just adding iodine solution to a leaf won’t work, because the starch is inside the leaf cells.
- Iodine solution can’t get through the cell membranes of the leaf cells.

Overall of experiment

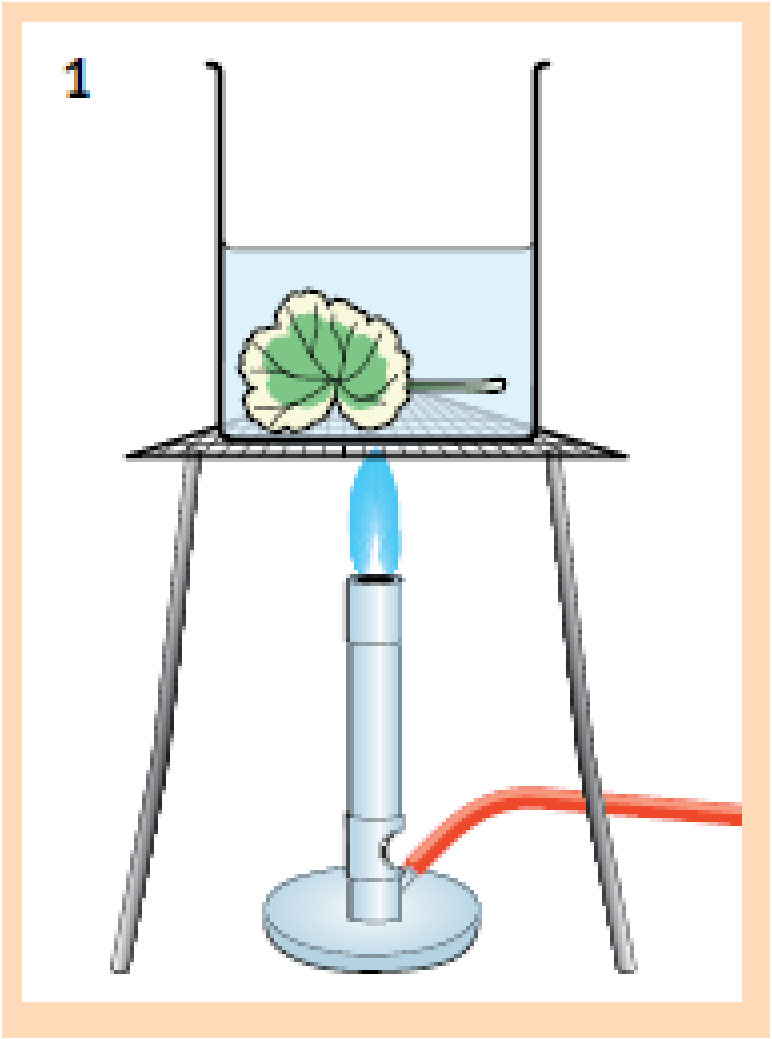


Step 1

Boil some water in a beaker.

Add a leaf to the boiling water.

This will break down the cell membranes around the leaf cells.

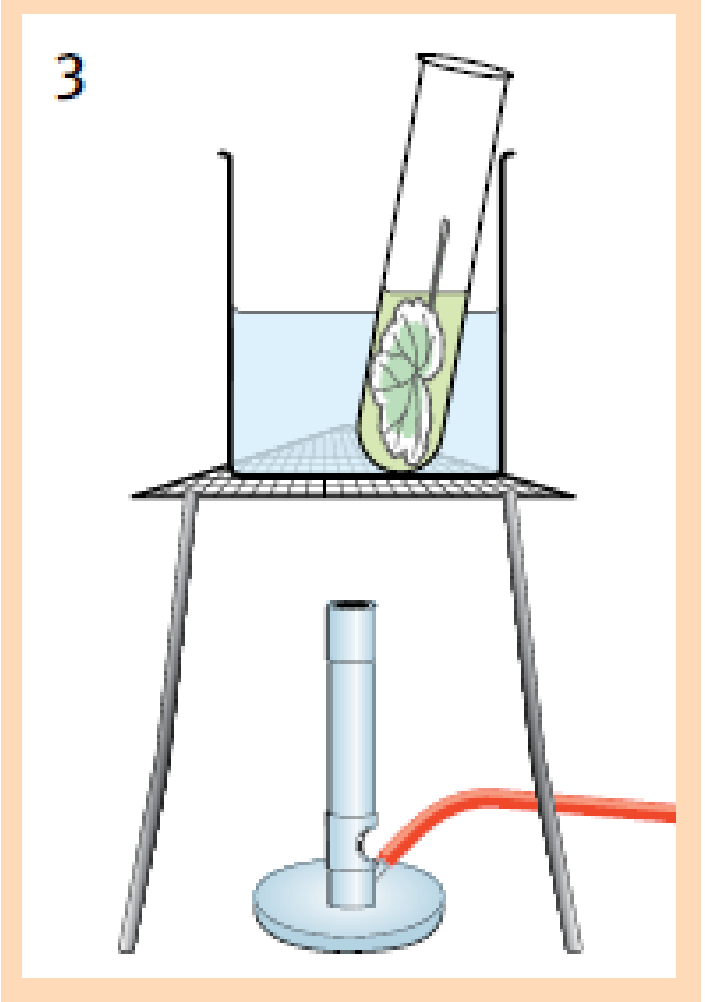


Step 2

- Turn off your Bunsen burner or spirit burner.
- This is important because you are going to use ethanol in the next step, and ethanol is very flammable.
- Using forceps (tweezers), remove the leaf from the water. Be gentle – it will be very soft and easily torn.

Step 3

- Collect some ethanol in a test tube.
- Stand the test tube in the beaker of very hot water.
- Put the leaf into the ethanol.
- You will see the green colour (chlorophyll) coming out of the leaf, into the ethanol.

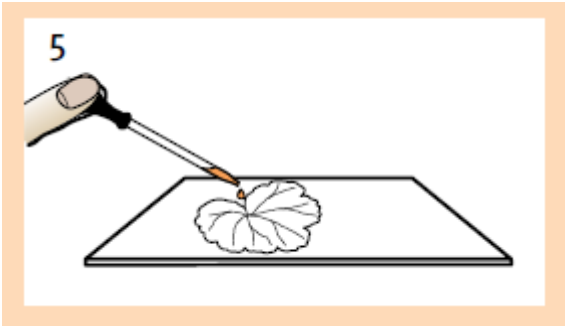


Step 4

- When you think most of the colour has come out, take the leaf out of the ethanol and dip it into the water to soften it.
- Spread the leaf out on a tile.

Step 5

- Now you can add iodine solution to the leaf.
- If the leaf contains any starch, it will turn blue-black.



Question

A1 Explain why the leaf needed to be boiled before testing with iodine solution?

Answer

Boiling breaks down the cell membranes, which allows the iodine solution to get into the cell and make contact with the starch stored inside it.

Question

A2 Suggest why it was useful to remove the green colour from the leaf, before testing it with iodine solution.

Answer

This makes it easier to see the colour that is produced when iodine solution is added to the leaf.

Question

A3 Describe two things that you did in step 2 to reduce the risk of anyone being hurt.

Answer

- Turned out the flame before using ethanol, because ethanol easily catches light and could burn someone.
- Used forceps to take the leaf out of the hot water, to stop fingers being scalded.

Question

A4 Explain why leaves often contain starch.

Answer

Leaves change surplus glucose into starch, to store it. Starch is a better storage substance than glucose because it does not dissolve in water.

Summary

Before testing a leaf for starch, you need to boil it to break down the cell membranes.