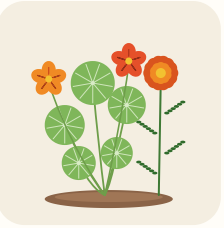
AGES 11–14 · TEACHER PAGE

Photosynthesis in action

By covering part of a leaf, pupils show that starch only forms where light reaches.



2 sessions of 55 min, 48 h apart | MAVA : HYDRO SLIM OLLA COMPOST

KEY QUESTION **Do leaves make their food in the light?**

OBJECTIVES

1. Write the word equation for photosynthesis.
2. Show that a leaf in the light produces starch.
3. Link the light reaching MAVA plants to their growth.

MATERIALS

- A broad-leaved MAVA plant: basil, nasturtium, lettuce
- Aluminium foil, paper clips
- Kettle, water bath, ethanol in a boiling tube
- Iodine solution, Petri dish, tweezers
- Safety goggles, pupil sheet

CURRICULUM LINKS

NGSS	**MS-LS1-6**: Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms.
NATIONAL CURRICULUM	**KS3 · Photosynthesis**: reactants, products and word summary; adaptations of leaves.
IB MYP SCIENCES	Criteria **A** (Knowing and understanding) and **C** (Processing and evaluating)

LESSON STEPS

1	**Prepare (day −2)** 10 min	On the MAVA, cover half of a leaf with foil on both sides, held by a paper clip. Leave it in the light for 48 h.
2	**Decolourise** 25 min	Teacher demonstration: the leaf for 1 min in boiling water, then in a tube of ethanol in a water bath, never over a flame, until it loses its colour. Rinse.
3	**Reveal** 10 min	Leaf in a Petri dish, a few drops of iodine: the lit part turns blue-black (starch), the covered part stays pale brown.
4	**Explain** 20 min	Carbon dioxide + water → glucose + oxygen, using light captured by chlorophyll. Glucose is stored as starch.

ASSESS

The pupil writes the word equation and interprets the result for each part of the leaf.

VOCABULARY

photosynthesis, chlorophyll, starch, glucose, carbon dioxide, oxygen

EXTENSION

Compare the starch in leaves taken from the top and the bottom of the tower.

⚠ **Safety :** Ethanol is flammable: no flames, heat in a water bath only. Goggles. Hot water is handled by the teacher. Iodine stains.

AGES 11–14 · PUPIL SHEET

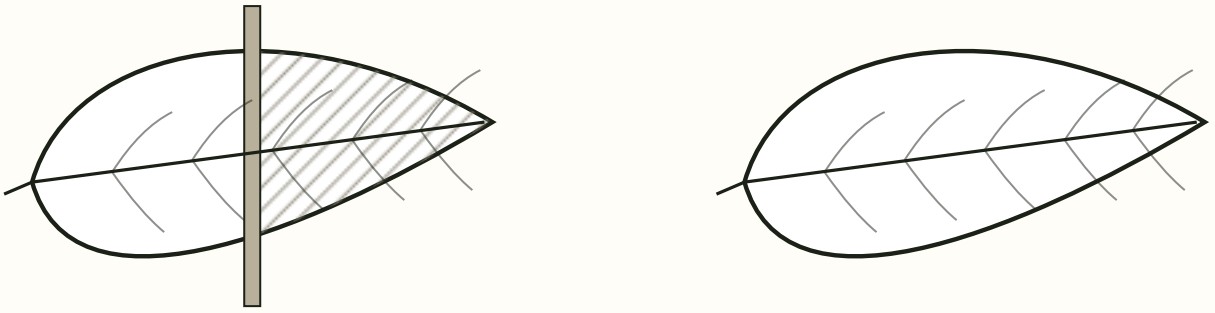
Photosynthesis in action

NAME _____ CLASS _____ DATE _____

1 My hypothesis

_____

2 Draw the result.



Before: the hatched part is under the foil.

After iodine: colour in the result.

3 Record your results.

Part of the leaf	Light received?	Colour with iodine	Starch?
Uncovered			
Covered			

4 Complete the word equation for photosynthesis.

carbon dioxide + _____ —(light, chlorophyll)→ _____ + oxygen

5 Why is the leaf put in boiling water, then in ethanol?

_____

_____

6 What does the covered part prove?

_____