

It's a green world! (Part 2)

— The ivy lift

(Germany)

You will need

- ✓ Baking soda,
- ✓ washing-up liquid,
- ✓ ivy leaves,
- ✓ office hole punch,
- ✓ three small beakers,
- ✓ 500 ml water,
- ✓ 20ml plastic disposable syringes.

Follow these steps:

1. Dissolve a pinch of baking powder in 500 ml of water and add two drops of washing-up liquid.
2. Use an office punch to punch twenty leaflets discs out of **green ivy leaves**. Five of the ivy leaf discs are placed in beaker 1 without further treatment.
3. The remaining ivy plates are placed in a disposable plastic syringe without a needle. The syringe is half-filled with the baking powder solution.
4. The open end of the syringe is closed with the thumb and **the plunger is pulled out** almost completely for about 10 seconds. Then lift the thumb and repeat the procedure again.
5. The leaf discs are distributed between beakers 2 and 3.
6. All three glasses are half filled with the remaining baking powder solution.

7. Beaker 1 and beaker 2 are placed in the sun, the beaker 3 is placed in a closed cabinet.

So what happened?

The ivy plates in glass 1 will swim at the top of the water level, in beaker 2 and 3 the leaf discs are at the bottom of the class. Because of the light, the discs in beaker 2 go up after a few minutes. The leaf discs without light (beaker 3) will stay at the bottom.

It is worthwhile to discuss the experimental setup and to have the pupils explain the purpose of the method steps indicated in bold (see above).

Baking powder (carbon dioxide source); washing-up liquid (facilitates the penetration of water into the ivy plates); office punch (produces plates of the same size), green (only chlorophyll-containing plant

parts carry out photosynthesis); ivy (relatively hard leaf, can be easily punched); plunger (produces a negative pressure which draws the gas out of the plates so that water can penetrate and the discs therefore sink downwards).

What next?

The experiment can be varied and extended in many ways. The necessity of chlorophyll can be demonstrated using variegated ivy leaves. The influence of temperature (different water temperatures in the glass), the influence of pH, light intensity, amount of carbon dioxide (baking powder), the difference between light and shadow leaves of ivy, the wavelength of light (coloured cups that fit over the glass) can be demonstrated by simply measuring the time it takes for all the leaf discs to reach the water surface.

