

LIVING AND BREATHING SCIENCE

BRING THE NATURAL WORLD TO LIFE IN VIVID COLOUR AND DETAIL

Use the interactive projector to clearly display scientific processes, so students can gain a full understanding of cause and effect. Pause at each stage to make detailed observations, and allow students to mark up developments on-screen. Once groups have discussed and labelled the processes, print all annotations and teaching notes for individual analysis at home – and create a time-lapse video for further exploration, using the visualiser.

Preparation

Prior to the lesson, you will need:

- Interactive finger-touch projector
- A4 printer – optional
- Visualiser – optional



Age range:

5-16 years

Outcome:

Gaining a full understanding of natural scientific processes

Key skills:

Collaboration, inference, analysis, discussion, planning and self-discovery

Timing:

Approximately 1 hour

PRIMARY ACTIVITY

Objective: Investigate the way in which water is transported in plants

Equipment

Pairs or groups of students should be provided with:

- Measuring cylinders
- White carnations / sticks of celery
- Water
- Food colouring
- Thermometers

Method

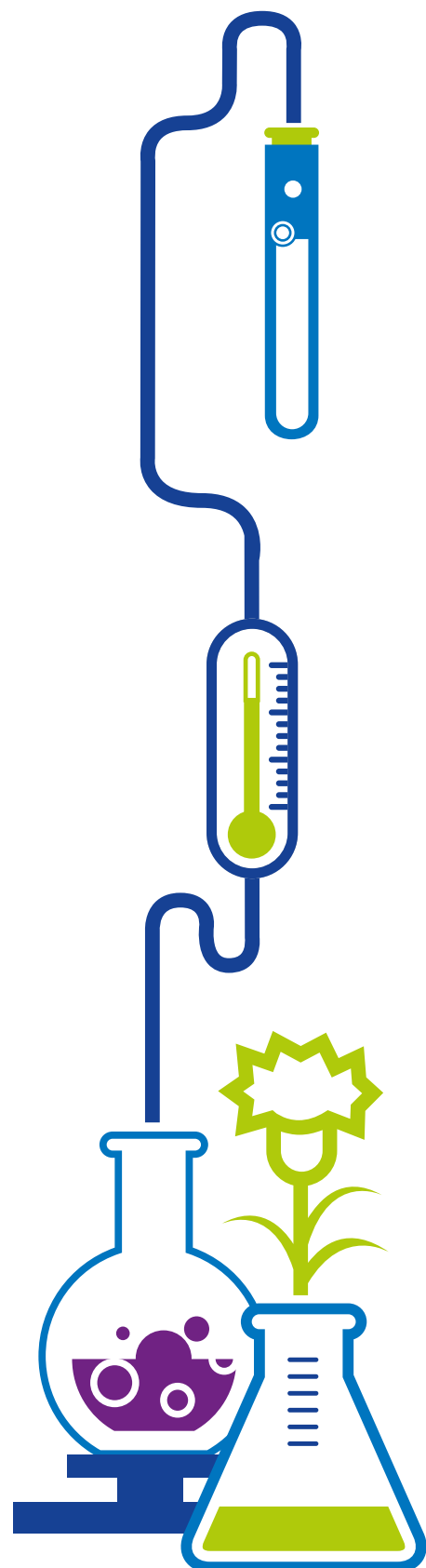
1. Equipment is distributed equally between small groups. Each group discusses how they could use the equipment to test the way water is transported in plants.
2. All ideas are then discussed as a class, using the interactive projector to watch videos and make notes. The students collaborate on how to make it a fair test by annotating an image of the plant, and suggest ways to record the results of the test.
3. Once agreed, a table is created on the screen and printed out for groups to fill in as they follow the method (for example, how much water is left in the measuring cylinder after certain time intervals).
4. The annotated image remains on the large screen throughout the experiment as a visual aid for the class. Each group sets up their experiment and measures the water level in the cylinder at given time intervals. Results are recorded using the printed table.
5. The visualiser could also be used to record the effect on the plant over a period of time, allowing students to produce a time-lapse video for further analysis and discussion.

Plenary

Groups reveal their findings to the class, and a mean average of the results is written up in an on-screen table. Students discuss the outcomes, and record their conclusions about how this scientific process occurs in the natural world.

Extension

This data could be put into a bar chart or line graph as part of a maths lesson. Groups could also create a PowerPoint presentation in an IT lesson to explain the experiment, and create tables or charts using Microsoft Office software.



SECONDARY ACTIVITY

Objective: Gain a full understanding of gas exchange systems

Method

1. Using the interactive projector, students are shown an animation of working lungs before being split into pairs or groups to discuss the action.
2. The animation is played again and paused at certain intervals, allowing the class to discuss each stage with the teacher. When the main image is displayed, each group steps up to label a part of the anatomy on the screen (for example, trachea, alveoli, and bronchioles).
3. The annotated image is printed off for each group. This is used as a reference for students to create the first part of a health leaflet, explaining how gas exchange takes place in healthy humans.
4. The visualiser could also be used to show a 3D model of human lungs in microscopic detail to help support further group analysis.

Plenary

Students discuss their hypotheses about the effects of smoking, asthma and exercise on gas exchange.

Extension

As part of their coursework or in a subsequent lesson, students could research smoking, asthma or exercise, and write up their findings in the second part of the health leaflet.



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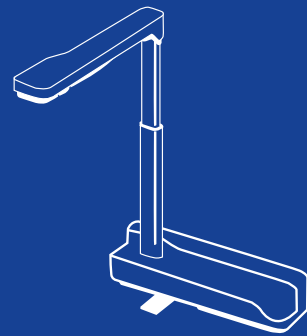
EB-595WI **Finger-touch projector**

- Quality image: Epson 3LCD technology
- Finger-touch and dual pens annotations
- Lamp life of up to 6000 hours



Workforce Pro WF-5690DWF

- A4 multi-function colour printer
- Cost and energy-effective: Ideal for the classroom
- Up to 34ppm mono, 30ppm colour (20ppm ISO)
- Monthly duty cycle of up to 35,000 pages



ELP DC06 Visualiser

- Easy to carry: Weighs under 1kg
- Two-in-one USB cable connection
- Powerful 4x digital zoom, 90° head rotation and autofocus function

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