VI Team - Science Tips

These are very general guidelines and not all of these suggestions will be suitable for all pupils.. Please consult with a teacher from the Visual Impairment Team for information and appropriate strategies for a specific student.

SAFETY

In addition to the normal safety procedures which operate in school laboratories the following points need to be considered for partially sighted pupils.

- Bags, stools etc. left in passageways between tables are an extra hazard for those with impaired vision.
- Pupils may like to get very close to experiments in order to observe what is happening. They should be warned of any risks from fumes etc.
- Safety goggles should be worn but these tend to restrict vision. Ideally visually impaired pupils should have their own new pair which should be kept clean and unscratched.

DEMONSTRATIONS

- Consider the most advantageous lighting. Some demonstrations will benefit from additional lighting, others, such as those involving bright chemical reactions will be better with less.
- Avoid standing with a light source behind you.
- Allow the pupil to get as close as is safe or possible.
- Give a running commentary on the progress of the experiment and what exactly to look for and where to look for it.
- For experiments where the liquid changes from clear to cloudy (e.g. when carbon dioxide reacts with calcium hydroxide) place matt black card behind the apparatus.

PRACTICAL WORK

- It is important that visually impaired pupils have the opportunity to take an active part in experiments. It can be difficult for visually impaired pupils to perform certain tasks or to see exactly what is happening especially when working in a group situation. This may need to be addressed specifically to give full access to the learning objective e.g. adult support or a carefully selected group aware of the needs of the visually impaired pupil.
- If measuring volumes of liquids, colour dyes can be added to provide contrast if this does not interfere with experiment.
- Use syringes with grooves to improve independent measurement of liquids.

EXAMINATIONS

- Pupils with a Visual Impairment may need exam access arrangements for practical assessments as well as for written exams. This could include the use of extra time or a practical assistant, for example. Discuss individual requirements with a member of the VI Team. Access arrangements should be planned in good time with your exams officer.

THERMOMETERS

- Use a thermometer with a digital display, it is easier to read and safer than a mercury/glass one.
- Some **talking thermometers** are available from the RNIB

BUNSEN BURNERS

- A tripod, secured to the bench with blu-tac, over the Bunsen burner will make it more visible and less vulnerable to knocks.
- A wire gauze on the tripod stand will glow when hot to show the position of the flame. Trim the gauze and bend down the edges to keep it in place.
- The flame is more visible in a slightly darkened room than in bright sunlight.
- The air-hole should be closed to produce the luminous flame when the burner is not in use.
- Teach the student the relative sounds of hot and ‘cold’ flames.
- Emphasise the need for CARE when turning off the gas if the burner is attached to a double tap. It is possible to turn ON the wrong tap by mistake.

READING METERS

- Use a digital meter or, to get experience of reading an analogue scale, use a large size demonstration meter.

MEASURING VOLUMES OF LIQUIDS

- Glass cylinders are usually easier to use than plastic ones for visually impaired pupils.
- Apply a strip of brightly coloured tape near the top of the cylinder to make it more visible.
- Use a "cylinder protector", a sponge rubber ring, on a glass cylinder.
- Use elastic bands to fit a piece of card to cylinders to make the scales more visible. White card for black or brown markings and black card for white markings.
- Hi-mark can be used to make the markings clearer if necessary.
- Talking measuring jugs are available from the RNIB.
- Liquid level indicators can be used to fill containers up with hot liquids

COLOUR CHANGES

- Slight changes in colour may be difficult to detect for pupils with poor vision. Deficiencies in colour vision will create different problems. Each individual's needs will require separate consideration but in general methyl orange is not easily seen by most visually impaired pupils. Alternative chemical indicators may produce more distinct colour changes.

THE USE OF COLOUR TO IMPROVE SAFETY

- **Tripod Stands** - Paint the legs in a bright colour, yellow contrasts well with bench mats. Tops can be painted only if heat-resistant paint is available.
- **Retort Stands** - Paint the base in a bright colour and mark the top of the vertical rod with brightly coloured tape.
- **Test-tube racks** - Paint the base in a dark colour and the top either white or another light colour so that the holes can be easily seen.
- **Test Tubes** - Bright tape about 1 cm from the top makes them more visible.

EQUIPMENT – See Bradford Schools Online for suppliers

Talking tape measures		Measures to nearest mm
Tactile tape measures		Uses rivets to mark each cm, with 5cm and 10cm gaps identified.
Talking scales		Electronic digital top-loading weighing scales will be the simplest to use. Although balance scales provide a better understanding of weights.
Black measuring spoons		These spoons can be used to provide contrast to effectively measure white powder.

Talking stopwatch		Time announcement and stopwatch.
Liquid level indicator		Beeps when liquid reaches contacts
Talking measuring jug		Metric and Imperial
Talking thermometer		Inside and outside temperatures