

Ideas for using your pocket microscope

Suitability

These activities are adaptable for children in Primary and early Secondary school.

About the microscopes

Being portable and self contained your pocket microscope is ideally suited to fieldtrips, excursions and camps. The varying levels of magnification (60x – 100x) offered give students a wide range of possibilities for examining things appropriately.

The microscope allows:

- students to look closely at rock samples for crystals or grain shapes
- small animals to be easily observed without the danger of being 'cooked' as they would if a magnifying glass was used on a sunny day
- leaf structure - veins, stomata, and so on – to be easily viewed
- water samples to be investigated for small animal and plant life
- dark samples (e.g. soil) to be investigated using the built in torch light

Colour print investigation

Colour reproduction in publications such as magazines usually depends on an optical illusion. Only four colours are usually used – black, cyan (blue), magenta (red) and yellow. To get a wider range of colours, the printer uses small dots clustered near each other to reproduce new colours. Our eyes combine these coloured dots and we 'see' the colour. This technique is also used in TV screen where coloured pixels (red, green, blue) light up in a black matrix. The combination of active pixels gives us our 'thousands of colours'.

The pocket microscope can be used to investigate these colour pixels – especially in printed publications (TV screens emit radiation and could be hazardous to be too close to for long periods).

What to do

Collect a range of coloured print material ranging from cheap (newspapers) through to high quality (e.g. National Geographic) and also include some inkjet photos and colour laser images.

Ask the students to look at the images using their pocket microscopes and record their findings. They will also notice variations in paper quality (fibres are very visible in newsprint but not so in coated papers like those that National Geographic uses). Sharpness of edges for print could also be investigated – usually the laser print is sharper with inkjet next and newsprint fairly low quality.

Fabric and threads investigation

The microscope makes this sort of investigation easy. The students can see the structure of the fibres reasonably clearly. The structure of the fabric also becomes clear – is it woven? Is it knitted? Is it felted? How are decorative features included (sewn in, knitted in, printed on the surface...)?

Outdoor scavenger hunt

Teacher preparation

Prepare an A4-sized work sheet displaying various items from a defined location. Show these as microscope images.

Hint: I used a Digital Blue QX5 digital microscope at 60x to collect the images on my laptop the day before, then inserted them into MSWord to make the worksheet.

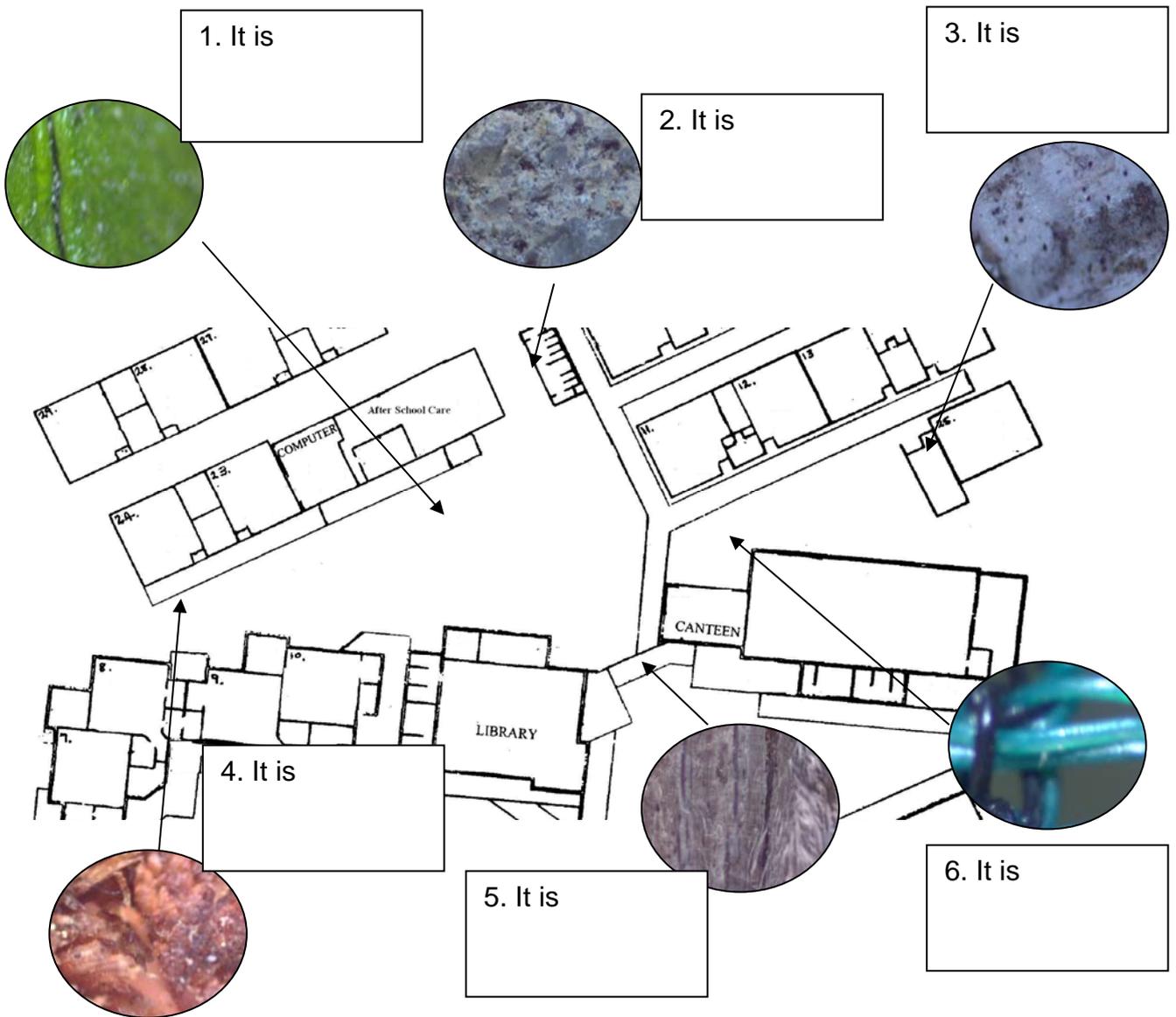
What to do

- Students work in small groups or teams of 2 or 3 with one pocket microscope for each group.
- Assign the area for them to work in.
- Give them a defined time to investigate the area and try to find out what the images are. To make it a more exciting you could make it into a competition or award a prize or certificate to the most successful group(s).

Following is a sample of a worksheet – the map is a modified school DISPLAN map and the area for investigation is contained. Six images were used and the diagram points to the approximate position where the children might find them.

For a class of 24 we suggest groups of three with eight starting points. Each group is assigned one starting point as their first area. Rotating clockwise around the whole area should help eliminate bottle necks.

Sample worksheet for Outdoor Scavenger Hunt activity



Answers:
1. fern frond
2. concrete
3. tree bark
4. edge of decking
5. wooden fence
6. shade cloth

Treasure hunt

Prepare sets of cards with identical items on each card – one set for each group.

Contents of Treasure Hunt boxes might include samples of:

Fibres	Stamps	Seeds
Fabrics	Printing	Wood
Feathers	Rocks	A computer chip
Coins, medallions	Sample of a reflective surface	A commercial slide

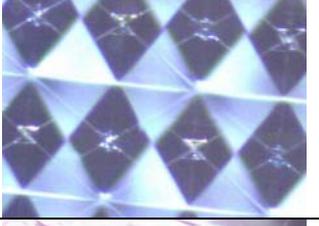
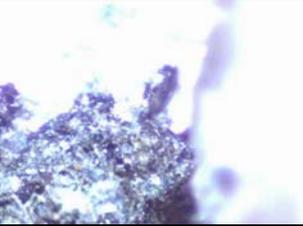
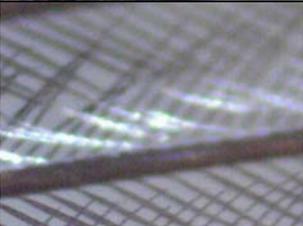
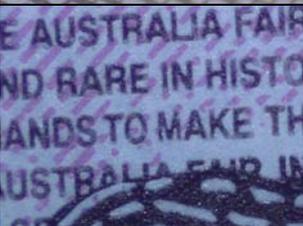
Hint: I used a Digital Blue QX5 digital microscope to collect the images for the cards and worksheet, and pasted them into a Word document table.

Students worked in groups of 3 or 4 with a pocket microscope for each group. They examine the items on the cards with the microscope then match the images on the worksheet with the correct card item.

Sample Treasure Hunt cards



Sample Treasure Hunt worksheet

Image	Where found	Image	Where found
			
			
			
			
			
			
			

See next page for answers...

Answers:

Computer chip (Interesting things card)	Medallion (Coin samples card B)
Newspaper (colour) (Printed material sample card)	String (Fibre samples card A)
Wood grain (Wood samples card B)	Reflector (Coin samples card C)
Eye of Queen from 1c stamp (Stamp samples card B)	Wool fibre (Fibre card B)
Granite (Rock samples card D)	Caraway seed (Seed samples card)
Fluffy feather (Feather samples card C)	5c coin (Coin sample card A)
The teacher also took these around	
'Federation' \$5 note –micro-printing of the words to Advance Australia Fair behind Prime minister images	Watermark \$10 note (it also has the words to Man From Snowy River behind image of Banjo Patterson)