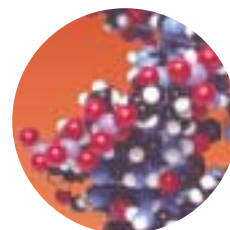


TeachAssist Resource Worksheets

Series 1 of 16



"How to use a microscope and prepare an onion epidermis slide"



TeachAssist Resources

TeachAssist resources are written with the practical needs of science teachers in mind. Each resource covers a practical activity that is integral to the QCA schemes of work to provide quick and easy preparation for practical classes.

Please feel free to photocopy the sheets to suit your needs.

Each TeachAssist resource contains:

- Student worksheet with practical instructions and activities.
- Technicians' equipment list for a class of 30 students.
- Reference to allow trouble-free ordering of materials and resources.

A summary table links each resource to the National Curriculum programme of study which allows TeachAssist practical activities to be quickly included into lesson plans and schemes of work.

If you require other booklets in the series, please telephone the Griffin Education Sales team or send your request to the following address:-

Griffin Education
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Leicestershire LE11 5RG

STUDENT WORKSHEET

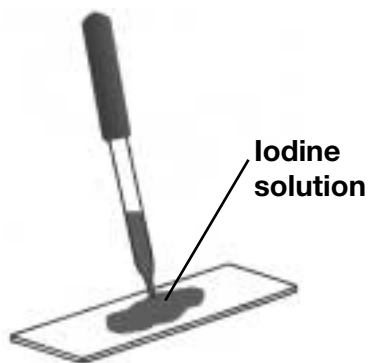
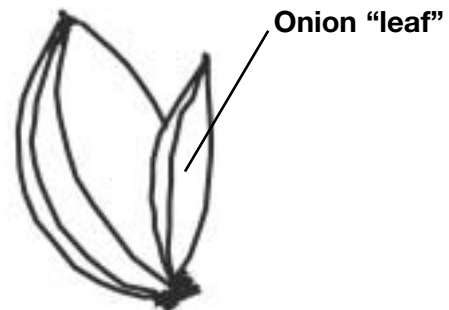


Important information:

Follow all the safety instructions that your teacher gives you.
Careful: scalpels, knives, glass slides and cover slips have sharp edges.
Wear safety glasses when handling iodine solution. Quickly wash off any that gets onto your skin. It will stain yellow-brown.

Looking at onion skin cells

1. Use the white tile as a cutting board. Carefully cut a piece of onion "leaf" about 2cm x 2cm square.
2. Use the tweezers to peel the outside (shiny) skin off the leaf. It is really thin and easy to break. If it folds over or sticks together, try with a fresh piece of onion.

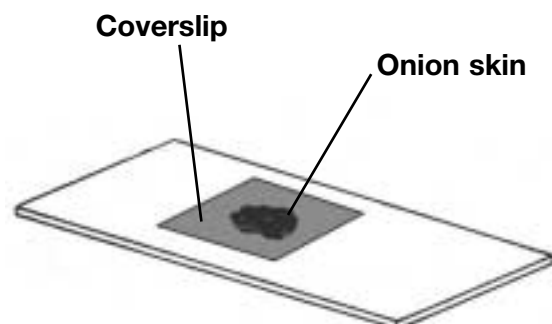


1. Use the dropper to put two drops of iodine solution onto the middle of the glass microscope slide.

Take care not to get the iodine solution onto your skin. It will stain it yellow-brown.

2. Place the piece of onion skin onto the iodine solution. Keep it as flat as possible and avoid getting it creased..

1. Use the tweezers to carefully place a small cover slip over the onion skin.
2. With a paper towel, carefully soak up any excess iodine solution on the slide.
3. Place the slide onto the microscope stage and view the cells. Start with the lowest magnification and work up to the highest magnification.



STUDENT WORKSHEET

Using a microscope

Eyepiece

Look through the eyepiece to see the image.

Check the number on the side to see its magnifying power. X10 = ten times magnification.

Lenses

Turn a lens until it clicks into place.

The magnification is shown on the side (usually X4, X10 and X20).

Stage

Use the clips to hold down the glass slide. Make sure that the cover slip is facing upwards.

Focus

Turn the wheel to bring the slide into focus.

Mirror

Angle the mirror to bounce light through the glass slide on the stage.

Some microscopes will have a built-in bulb to produce the light.



Magnification

$$\text{Total magnification} = \text{Eyepiece magnification} \times \text{Lens magnification}$$

Setting up the microscope

1. Place a glass slide onto the stage.
2. Turn the lenses so that the one with the smallest magnification clicks into place over the slide.
3. Adjust the mirror so that light passes through the glass slide and into the lens.
4. Look at the slide from the side of the stage. Use the focus knob to move the lens down so that it is just above the slide. Take care not to hit the slide with the lens.
5. Look down the eyepiece and turn the focus so that the lens moves away from the slide until the slide looks like it is in focus.
6. Change the magnification by turning the lens until it clicks into place. Do not change the focus as it should be nearly in focus. Look down the lens and make any fine adjustments with the focus wheel.

TECHNICIAN'S EQUIPMENT LIST

QCA Unit 7A: Cells

| | | |
|--------------|-------------|---------------------|
| Date: | Room | Time/Period: |
|--------------|-------------|---------------------|

| Equipment Class of 30 pupils, working in pairs. | Quantity | Check | Out | Back |
|---|-----------------|--------------|------------|-------------|
| Microscopes | 15 | | | |
| Glass slides | 40 | | | |
| Glass cover slips | 40 | | | |
| Iodine solution (in 100ml bottles) | 15 | | | |
| Dropping pipettes | 15 | | | |
| White tiles | 15 | | | |
| Scalpels | 15 | | | |
| Tweezers | 15 | | | |
| Onions | 5 | | | |
| Cutting board and knife | 5 | | | |
| 500ml beaker / container with soapy water (for used slides) | 4 | | | |
| Video: The living cell | 1 | | | |
| TV and video player | 1 | | | |



Important information:

The activity contains reagents and procedures that can be hazardous. It should not be performed unless an appropriate risk assessment has been made.

Iodine solution is classed as harmful and should be handled accordingly. Care must be taken with sharp edges on slides, coverslips, scalpels and knives.

ORDER REQUISITION

| Equipment | Griffin Catalogue No. | Page | Unit cost (£) | No. Required | Cost (£) |
|---|-----------------------|------|---------------|--------------|----------|
| Microscope Junior Model 2 | YSF-600-D | 455 | 72.40 | | |
| Glass slides (76x26mm, 1 – 1.2 mm thick) pack of 50 | YSH-102-L | 381 | 2.60 | | |
| Glass cover slips (100 per box) | MNJ-450-010C | 460 | 2.85 | | |
| Microscope slide dispenser (60, 76 x 26mm size slides) | MNK-120-R | 461 | 28.55 | | |
| Iodine solution (1% w/v in potassium iodide, 2.5ltr) | J/4450/17 | 161 | 20.18 | | |
| Amber Glass dropping bottle, 100ml, 16/16 stopper size | BTR-505-070N | 367 | 7.40 | | |
| White ceramic tiles (150 x 150 mm, pack of 5) | PRC-300-050A | 543 | 6.65 | | |
| Disposable Scalpels (blade-fitted, plastic handle, pack of 10) | SCA-310-030k | 399 | 3.30 | | |
| Tweezers, plastic, (pack of 10) | DKC-301-A | 398 | 3.50 | | |
| Cutting / dissection board (300 x 462mm, wood) | YSJ-300-030B | 398 | 11.00 | | |
| Safety glasses | FB55125 | 492 | 2.25 | | |
| 500ml beaker, plastic, (pack of 10) | FB50309 | 363 | 15.00 | | |
| Beginner's microscope slide set (12 slides) (see catalogue for other slides) | ZKY-400-U | 275 | 19.10 | | |
| Video: The living cell (biology 14+ series) | ZVD-110-060Q | 230 | 45.90 | | |
| | | | | Total cost | |
| | | | | VAT | |
| | | | | Order total | |

Complete the order form above and place your order with Griffin Education in your usual way. Prices are correct at time of print, please contact the Griffin Sales Office or check on the Griffin Education website for the latest prices.

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By email: griffin@fisher.co.uk

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SUMMARY TABLE

| QCA unit | KS3 NC programme | Y7 TeachAssist | Activity | Relevant experience from Key stage 2 |
|---|--------------------------|----------------|---|--|
| 7A: Cells | Sc1.2f Sc2.1a | 1 | How to use a microscope and prepare an onion epidermis slide | Use of hand lenses and basic microscopes. Plants and animals, including internal body organs and plant structures |
| 7C: Environments and feeding relationships | Sc1.2g | 2 | Using a data logger to monitor environmental conditions | Some use of data loggers How organisms are suited to their environment |
| | Sc1.1a,c,d Sc1.2h,k,o | 3 | Wood lice in choice chambers | Asking questions and designing a fair test How organisms are suited to their environment |
| | Sc2.5b,e | 4 | Organisms and food chains in leaf litter | How organisms are suited to their environment Food chains as a feeding relationship |
| 7E: Acids and alkalis | Sc3.3d | 5 | Finding the pH using universal indicator solution | Little or no previous coverage of pH |
| | Sc1.2g Sc3.3e | 6 | Using a data logger to monitor changes in pH when an acid is added to an alkali | Some use of data loggers Identification of patterns and trends |
| | Sc3.3e | 7 | Investigating the neutralisation of acids with antacid tablets | Use of tables and line graphs to represent data Mixing materials can lead to a change |
| 7F: Simple chemical reactions | Sc3.3a | 8 | Reactions of metals with acids | Describing how materials change when mixed or heated and how irreversible changes produce new materials |
| 7H: Solutions | Sc1.2a Sc3.1h | 9 | Purifying salt from rock salt | Use of dissolving, filtering and evaporation to separate mixtures |
| | Sc3.1h | 10 | Simple distillation | Knowledge of evaporation as a separation technique |
| | Sc3.1h | 11 | Paper chromatography of ink | Separation of colours in food colourings such as sugar-coated sweets |
| 7I: Energy resources | Sc1.2f | 12 | Using the Bunsen burner | Possible use of methylated spirit burners or candle-burners |
| | Sc4.1c Sc4.5a,e | 13 | Demonstrating solar energy: solar cells and absorption of heat energy by different surfaces | Little or no previous coverage of energy |
| | Sc4.5a | 14 | Finding the energy content of foods | Little or no previous coverage of energy |
| 7J: Electrical circuits | Sc4.1a | 15 | Current in series and parallel circuits | Construction of series circuits from circuit diagrams |
| 7K: Forces and their effects | Sc1.2f,g,j,k Sc4.2b | 16 | Extension of springs and elastic bands | Push and pull in springs Testing elastic band catapults. Some may have extended bands with masses Measurement of forces and weight |