NE206 Teaching biology: inspiring students with plant science

Equipment list

1.9 Popping giant cells

2 x 2 cm^2 piece of bell pepper

Mounted needle

Hand lens or microscope

1.10 Taking osmosis practicals step further (change in mass)

¼ of a bell pepper

50 cm^3 1M sucrose solution

75 cm^3 Distilled water

Test tubes x 11

10 cm^3 Graduated pipettes x 2

Pipette filler

Cutting tile

Kitchen knife or scalpel

Petri dish with lid

Paper towels

Laminated graph paper

Blunt forceps

2 decimal place balance x2 or 3

1.12 A simple potometer

Small glass jar – glass baby food jars may be found to be suitable for this. Shorter jars make it easier to assemble to whole unit under water to eliminate air bubbles.

Rubber bung (to fit jar) with two 4 mm holes and one 2mm hole drilled into it

1 cm^3 plastic graduated pipette

10 cm^3 or 20 cm^3 plastic syringe

Washing up liquid

Paper towel

Sink or bowl filled with tap water

Woody plant cuttings, at least 15-20cm long with stem diameter of approx. 5mm, e.g. Sycamore

Container of water for collection of cuttings – it is important to put any cuttings in water as soon as possible.

Scissors or secateurs

2.7 Using a respirometer

Germinating Peas

Non-germinating Peas

Glass Beads

25cm^3 measuring cylinder

Absorbent Cotton Balls

Non-absorbant cotton wool or foam

3 Respirometers (glass vials with bungs fitted with graduated pipette)

15% Potassium hydroxide

Water bath or tray of water

String or tape

Paper (White or Lined)

Stopwatch (Timer or Clock)

2.8 Germinating seeds in flasks

25 germinating pea seeds

25 boiled and cooled germinating pea seeds

Glass beads

Glass measuring cylinder

Tap water

3 vacuum flasks of same volume

3 cotton wool bungs for flasks

Data logger and 2 temp probes OR 3 thermometers

2.9 Gas Exchange in plants

1% Hydrogen carbonate indicator solution

Bright lamp (at least 1200 lumens)

Black sugar paper

With pondweed

Pondweed (see notes at http://www.saps.org.uk/secondary/teaching-resources/190-using-cabomba-to-demonstrate-oxygen-evolution-in-the-process-of-photosynthesis- for sourcing)

Universal vials and lids

With algal balls

Algal balls (see preparation at http://www.saps.org.uk/secondary/teaching-resources/235-student-sheet-23-photosynthesis-using-algae-wrapped-in-jelly-balls)

Bijou bottles and lids

With basil leaves

Basil plant

Glass vials with bungs

3.7 Taking cuttings

Plant such as *Tradescantia zebrina*

Scissors

Boiling tube

Boiling tube rack

Tap water

3.8 Cauliflower cloning

'Diluvials' or small sterilised glass jars containing medium (MS, 20g/l sucrose, 2.5mg/l Kinetin, 0.032% SDICN – see media prep notes)

White ceramic tile / chopping board

Forceps

Scalpel

0.5% Solution Sodium Dichloroisocyanurate (SDICN) in small glass jar with cap (for sterilising forceps)

10ml 0.5% SDICN solution in Universal bottle (28ml glass bottle) with screw cap. (1 x 4g Milton tablet in 160ml DI water, 2 in 320ml, 4 in 640ml or 5 in 800ml – see media prep notes)

Petri dish

Safety glasses and disposable gloves

Lab coat

70% ethanol for wiping down surfaces

paper towels

Cauliflower curd (the white 'floret' part) cut into 10mm3 pieces. Curd should be taken from a fresh, whole cauliflower, not ready-prepared cauliflower pieces.

Glass or plastic beaker for waste solutions

Media prep notes can be found at http://www.saps.org.uk/secondary/teaching-resources/706-cauliflower-cloning-tissue-culture-and-micropropagation

3.9 Root tip mitosis

250cm^3 beaker

2 x vials large enough to hold a growing garlic clove

100cm^3 bottle of 1M Hydrochloric acid

3 x 3cm^3 plastic pipettes

3-day old rooted garlic clove, suspended over water with a cocktail stick

Cutting tile

Beaker containing tap water (for rinsing)

1% toluidine blue stain

Dissection scissors

Microscope slide

Cover slip

Mounted needle

Paper towels

Compound light microscope (100-400X magnification)

Timer/stop clock

Water bath at 40°C