GCSE SCIENCE

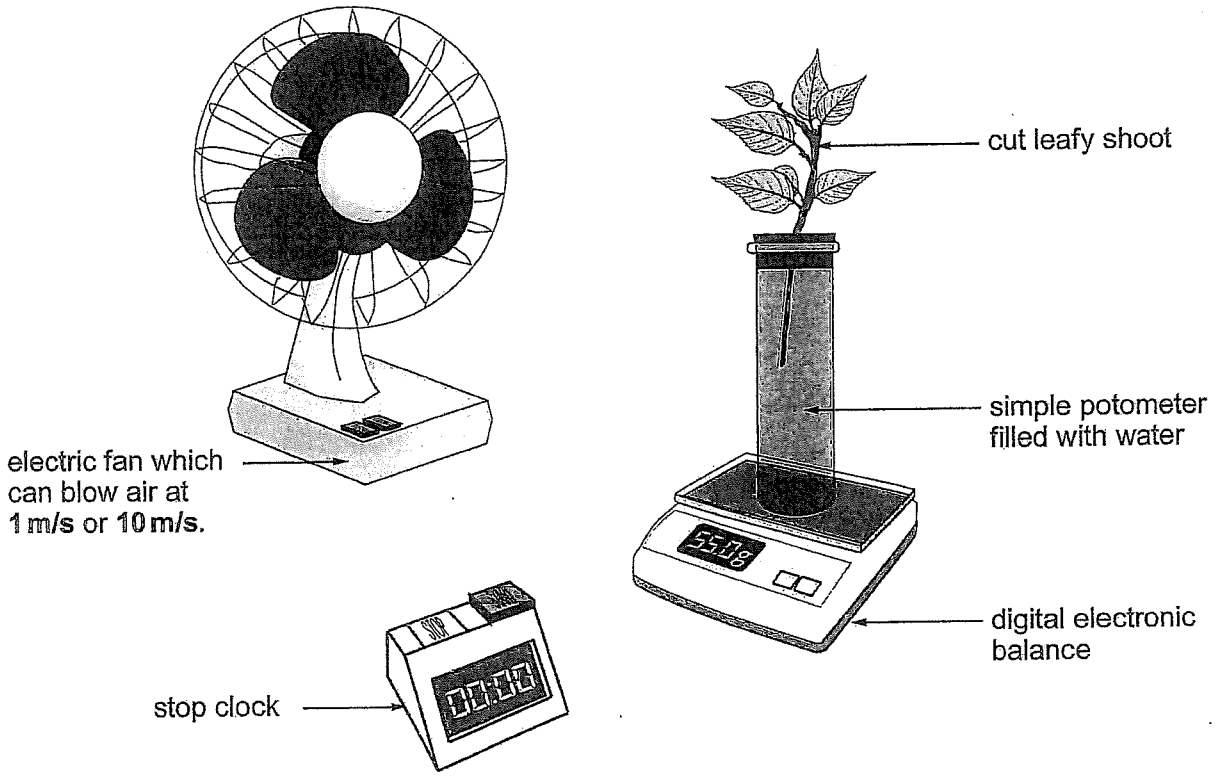
CPD – SPRING 2017

Quality of Extended Response Questions (QER)

Assessment Exercise

Examiner only

9. Describe how you would investigate the effect of **two** different wind speeds on the rate of transpiration from a cut leafy shoot using the apparatus shown below.
In your account you must include reference to the results you would expect and the conclusions you could make. [6 QWC]



To investigate the rate of transpiration at two different wind speeds I would test to see which wind speed has the biggest effect on the rate of transpiration. First I would conduct a test with a wind speed of 1 m/s. I would start the stop clock when I start the fan (same time). I would measure the weight of the potometer filled with water and the cut leafy shoot at 55 g before starting the stop clock. I would then ~~kaa~~ measure the rate of transpiration

Examiner only

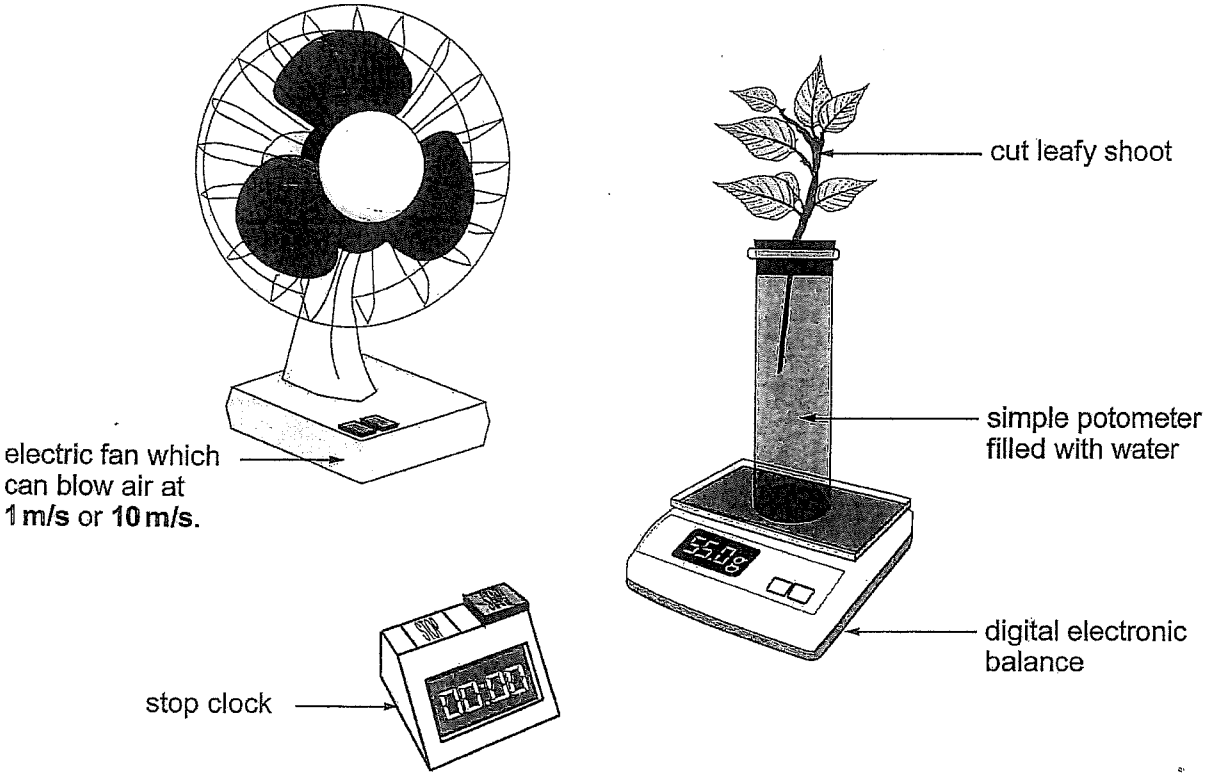
in an hour by seeing how much lighter the potometer and cut leafy shoot was. This would tell me how much water had evaporated in an hour and the rate of transpiration. I would then repeat the experiment at a wind speed of 10 m/s and record the results then compare them.

END OF PAPER

. 6

9 Describe how you would investigate the effect of **two** different wind speeds on the rate of transpiration from a cut leafy shoot using the apparatus shown below.
In your account you must include reference to the results you would expect and the conclusions you could make. [6 QWC]

Examiner only



Set up your equipment. Place plant shoot in water. Cover surface of water in a layer of oil to prevent evaporation directly from surface of water. Weigh the whole apparatus on the electronic balance. Record mass in a table. Leave plant for 10 minuets with low wind speed on fan ~~(without fan on)~~. Weigh whole apparatus again. Record mass and calculate change in mass. Repeat experiment with a different leaf but with higher wind speed of fan on. Calculate change in mass. Compare results. The plant with the high wind speed ~~fan on~~ would

Examiner only

have a heigher (higher) charge in mass (~~mass~~ decrease(d) in mass). This is because the wind from fan decreases concentration of water outside plant (so higher windspeed equals low concentration of water). Therefore a higher rate of transpiration ~~occurs~~ (occurs) as more water vapour leaves the leaf through stomata due to transpiration. High concentration of water in leaf to low (concentration) outside - Bigger the difference greater rate of transpiration.

6

Examiner only

9. Sodium chloride is made when sodium hydroxide solution reacts with dilute hydrochloric acid.

$$NaOH + HCl \longrightarrow NaCl + H_2O$$

Describe a laboratory method for making **crystals** of pure sodium chloride from sodium hydroxide solution and dilute hydrochloric acid. [6 QWC]

Diagrams may be used as part of your answer.

(A) Set up experiment to find out how much NaOH is needed to neutralise HCl.

1) measure out 25 cm^3 HCl of concentration 0.1 $mol.dm^{-3}$ and pour into conical flask

2) Add 3 drops of universal indicator.

3) Add NaOH, drop by drop from the burette until universal indicator goes green.

4) Record amount of NaOH used, repeat 3 times and take an average reading. This is how much NaOH is needed to neutralise the HCl

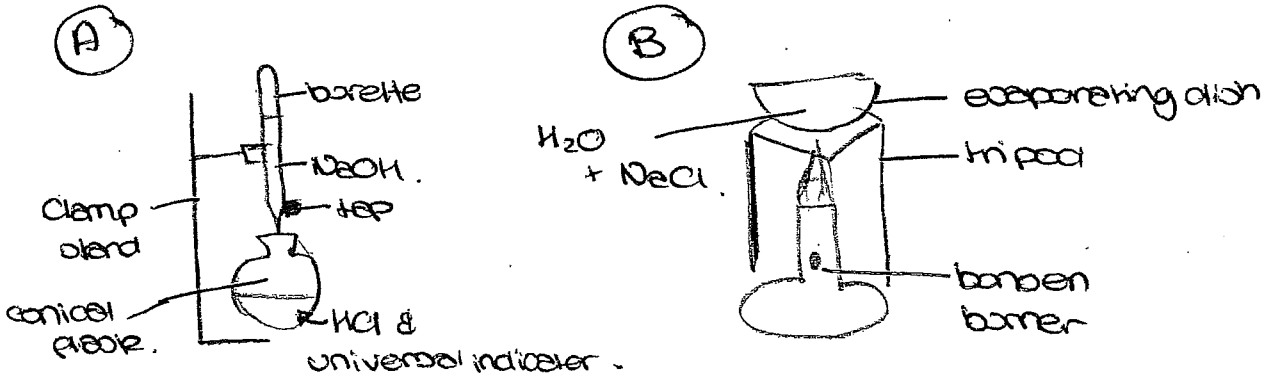
(B) Formation of crystals

1) Use the burette to add the amount of NaOH as determined in part A.

2) Place the liquid in an evaporating dish over a bunsen burner flame.

3) Once most of the liquid is evaporated, leave the rest to evaporate slowly on the windowsill so NaCl crystals can form.

6



END OF PAPER

Examiner only

9. Sodium chloride is made when sodium hydroxide solution reacts with dilute hydrochloric acid.

$$NaOH + HCl \longrightarrow NaCl + H_2O$$

Describe a laboratory method for making **crystals** of pure sodium chloride from sodium hydroxide solution and dilute hydrochloric acid. [6 QWC]

Diagrams may be used as part of your answer.

Firstly, perform a titration to calculate the amount of acid that you need to add to the alkali. Use a pipette to measure 25cm³ of the Sodium Hydroxide into a conical flask, and fill the burette (to the zero mark) with Hydrochloric Acid. ~~Next~~ ~~Slowly~~ Add some universal indicator to the NaOH. Next, Slowly add the acid from the burette into the conical flask, ~~and~~ until the indicator changes colour, from colourless to pink. indicating that the ~~alkali~~ Sodium Hydroxide has been neutralised. Record the volume of Hydrochloric Acid added. Repeat this 2-3 times more, until you reach a point where there are very few anomalies. Take the mean volume of Hydrochloric Acid added (excluding anomalies), and set up the burette and conical flask as before, but WITHOUT the universal indicator. Add the mean volume of Hydrochloric Acid to the Sodium Hydroxide, and then pour this into an evaporating dish, before leaving to evaporate. The water and ~~Sodium chloride will separate, the~~ will evaporate, leaving just ~~pure~~ crystals of pure Sodium Chloride.

6

END OF PAPER