In this experiment we are going to demonstrate how to use a potometer to measure transpiration rate.

Transpiration is the loss of water from leaves by evaporation through the stomata.

For this experiment we will need the following equipment:

A potometer.

A leafy plant such as Laurel.

A clamp stand.

Scissors.

And some petroleum jelly.

First, set up the equipment.

Submerge the potometer until it is full of water.

Then draw water through the potometer using the syringe to ensure there are no air bubbles.

Cut the leafy stem from the plant under the water.

And insert it into the potometer tubing.

Then seal the tube with petroleum jelly.

Once the seal has been made, remove the potometer from the water and secure it using a stand or similar.

Use the syringe to draw air into the potometer and adjust the starting position of the water level to a marker.

In this case, the starting position is that 4 cubic centimetres of air has been drawn into the potometer and that is where we make a note of the water level.

Then place the stand with the potometer in a secure position and leave overnight.

The next day we can measure the change in water level to examine if transpiration has taken place.

We can see that the water level has dropped by measuring that the amount of air now in the potometer.

This has increased from 4 to 6 cubic centimetres showing that transpiration has occurred.

A pilot test like this allows you to see if there is a measurable change in water level in the potometer.

The same principle can then be used to investigate how different variables can effect transpiration rate.

There are 4 physical factors that effect transpiration rate.

These are:

Light intensity.

Transpiration tends to increase when conditions are brighter.

Light intensity can be increased by adding a lamp behind a glass screen close to the bubble potometer.

Humidity.

Moist air surrounding leaves prevents transpiration.

Water does not evaporate into saturated air.

Humidity could be changed by adding a humidifier or dishes of water to the room.

But it's perhaps more difficult to set up in the classroom.

Temperature.

Higher temperatures increase evaporation.

Temperature can be changed easily by setting the experiment up in different rooms set at different temperatures.

Wind

Wind increases evaporation.

Wind could be investigated using a fan at different settings.

When investigating any of these variables we would need to remember to control all other variables to ensure that the experiment is valid.

And replicate the experiments to ensure our results were reliable.