St Olave's
Grammar school

Transition

Science
Work Booklet

Science

Transition Activities

Welcome to the Science Transition booklet. This is designed to help get you ready for learning science at secondary school. You should work through it during your summer holidays, and bring it in with you to your first science lesson at St Olave's.

There are spaces provided for all your writing in the booklet, so you will not need any other pieces of paper. One of the activities is a simple practical, in which you will make and use a rain gauge. It is a good idea to get started with that activity in plenty of time, as it requires two weeks' of readings of rain fall. It is possible that it might not rain for the two weeks that you take readings – if this happens, do not worry.

Science Tasks

Target Sheet

- In the first column, tick off anything that you can already do (before you work through the booklet).

- After you finish the booklet, come back to this page and put a tick in the second column next to anything else you can now do.

Target	I could do it before working through this booklet	I can do it now I've worked through the booklet
State the units we use for measuring length, volume, mass and temperature.		
Carry out a Scientific Investigation.		
Be able to decide on an appropriate scale for use on a graph.		
Plan a scientific investigation.		

Task 1
Safety Rules

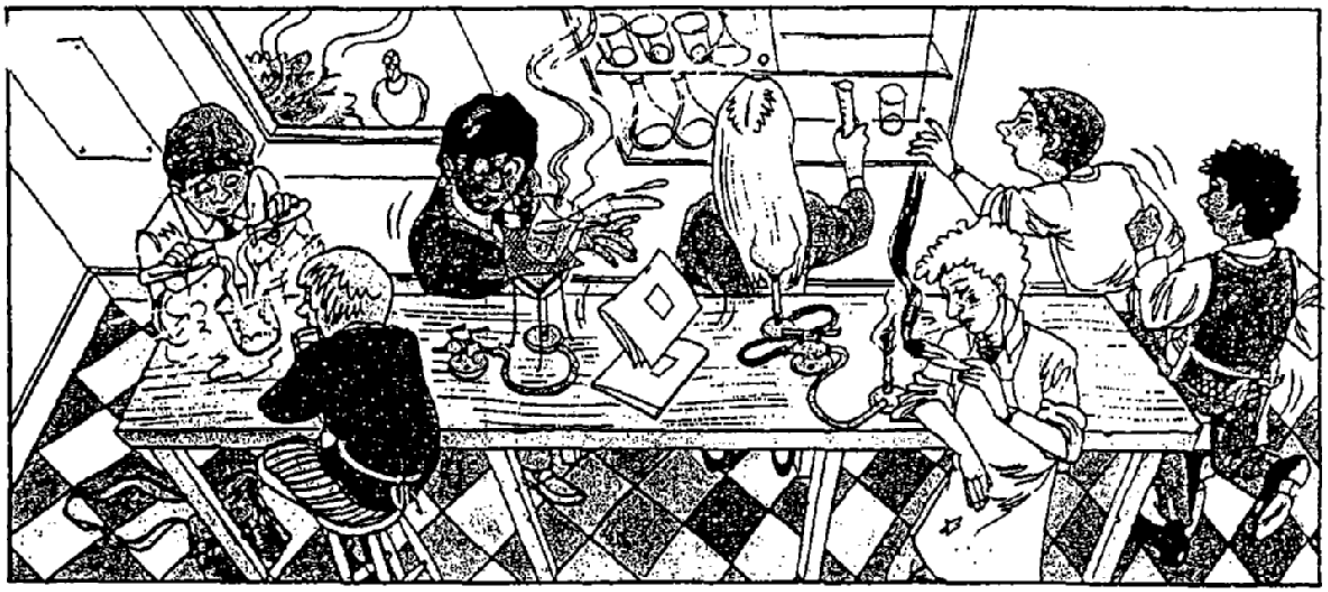
A good scientist always works safely

It's very important to work safely. Carelessness can cause accidents. That's why it is a good idea to have a set of safety rules to follow.

Use the pictures below to help you to write your own safety rules:

1 Spot seven differences between the two pictures.
2 Write a safety rule about each difference.

Science class AZ (a danger to everyone)



Science class AZ (on their best behaviour)

Your 7 Rules:

ST. OLAVE'S GRAPH-DRAWING POLICY

1. Drawing (axes, points, lines, curves) should be done in *sharp pencil*; writing (labels, titles) should be done in *pen*.

2. When plotting graphs of experimental data, the variable that has been *controlled* should go on the *x-axis*.

3. When axes are labelled, the numbers should be written *on the line*, not in the squares.

4. Axes should be evenly and clearly labelled in such a way that it will be easy to read off intermediate values (eg do not use 3 cm to represent 10).

5. Axes *do not* have to start from zero, and *do not* have to have the same scales. Choose scales that will spread the points out on the page, using all of the allocated space.

6. Axes should always be labelled with titles indicating what they show, including the unit of measurement where relevant. In 'real life' or experimental situations, the overall graph should also have a clear title, underlined with a ruler.

7. Lines should be drawn with a single, clean stroke, and with a ruler.

8. Where relevant, the equation of a line should be written on the line.

9. Remember to use the actual scales when calculating gradients; do not just count squares (unless the same scale has been used on each axis).

10. Lines of best fit should be drawn so that they pass as close to all the points as possible. A rule of thumb is that there should be a similar number of points above and below the line. For scatter diagrams, the line should pass through the mean point.

11. Lines of best fit should not extend beyond the data values in the question/obtained from the experiment. Other straight line graphs should be continued to fill the axes.

12. Curves should be drawn freehand, as smoothly and neatly as possible. Points should not be joined with line segments, unless you are instructed to the contrary.

Task 2

Rain Gauge Investigation

You are going to make and use a rain gauge. You will then plot a graph which will show how the rainfall has varied over a period of 2 weeks.

1. Making your rain gauge.

You will need:

A 2 litre plastic bottle (eg, large coke bottle)
A packet of brightly coloured jelly
Scissors
3 or 4 paper clips
A ruler (marked with cm and mm)

Cut off the top of this bottle about a quarter of the way down where it reaches a consistent diameter. Be careful to cut this smoothly. Simply remove the bottle top and invert the upper part of the bottle into the bottom part. It should fit snugly but to make sure it does not fall out use a few paper-clips to hold the two halves together

You need a completely flat bottom to be able to measure depth accurately. One way of getting this is to use some brightly coloured jelly mixture and let it set in the bottom of the bottle. Then you can measure the depth from the top of the jelly where the water starts. You can always eat the rest of the jelly!

2. Taking your measurements

Place your rain gauge in a location where it will collect rain without being affected by buildings or trees etc. You need to partly bury

your rain gauge in soil, sand, or gravel, so that it won't be blown over.

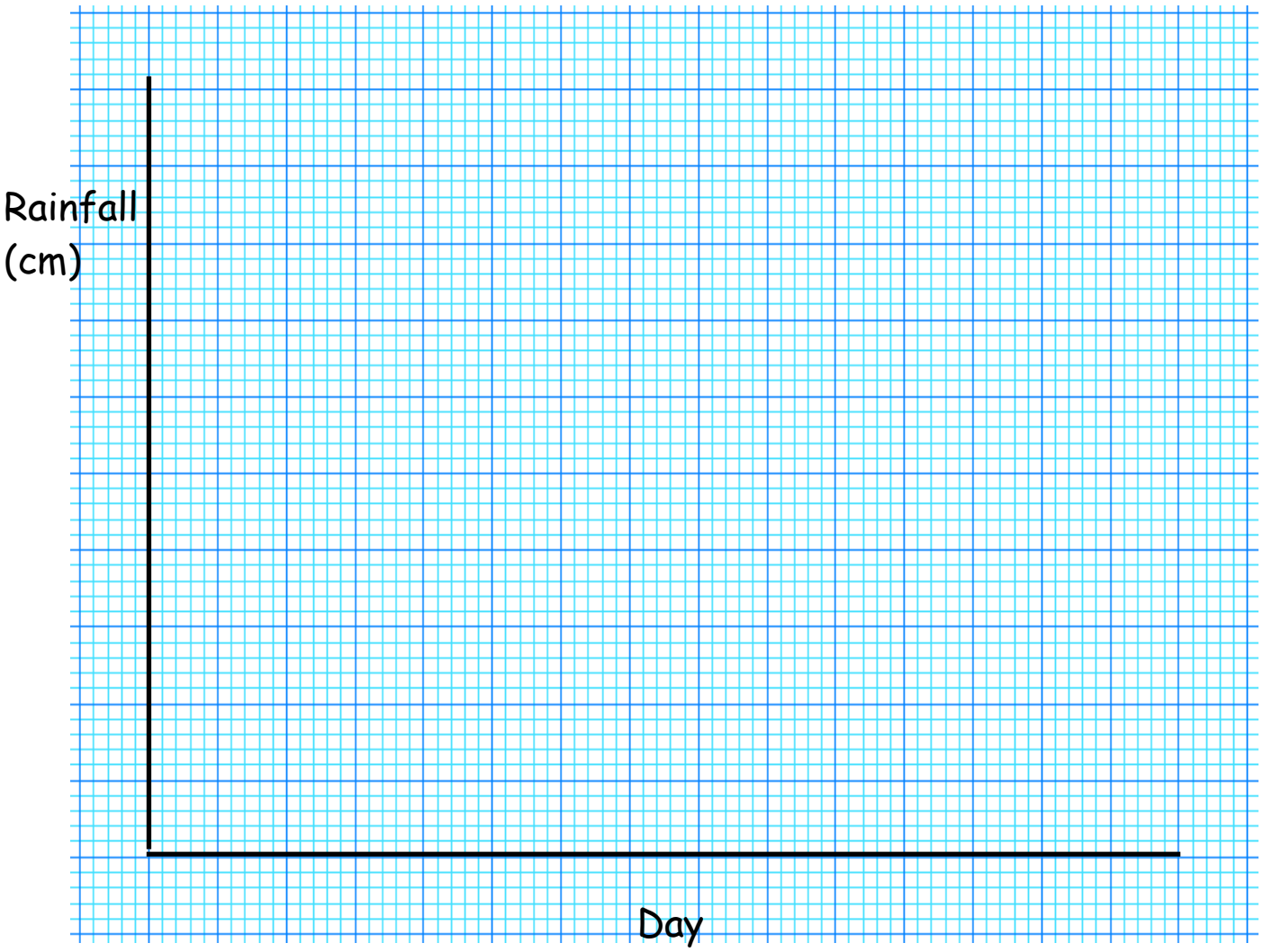
You must measure the depth of water at the same time each day for the two weeks you carry out the investigation. Use your ruler to measure the depth of water to the nearest half centimetre. Measure from the top of the jelly to the top of the water. Write down your measurement, and then empty the water out of the bottle, ready for the next measurement.

3. Drawing your graph

When you have a complete set of results for the 2 weeks, you are ready to plot your graph on the axes provided. You must decide on a suitable scale for each axis. Make sure that you can fit all your data on to the graph. Write your scale on to each axis. Plot each point carefully with a pencil, using a small cross. You can then link all your points together using lines drawn with a ruler.

Results and Graph

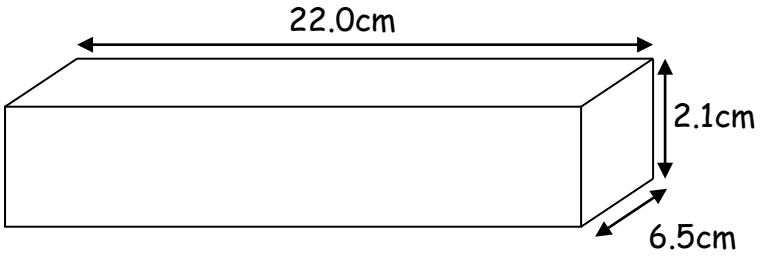
Day	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Rainfall (cm)															



Task 3

Volume of Plasticine Planning Activity

Mandy and Julin are opening a new box of plasticine. The packet says it has a mass of 500g. Before they reshape the block of plasticine, Mandy measures the block. She makes a note of her results as shown below.



Find the volume of the block. Write down your working, and include a unit with your answer.

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Julin reshapes the plasticine into a long, thin cylinder. He says that the volume will now be less. Mandy disagrees. She says that if the mass of the plasticine has stayed the same, the volume will stay the same no matter what shape it is made into.

You are going to plan an experiment to test their ideas and find out who is right. You should include the following headings in your plan:

- Aim (What are you going to find out?)
- Method (Step by step guide to what you will do)
- Apparatus (Equipment you will need)
- Safety (Explain how any risks can be reduced)
- Prediction (What do you think the result will be?)
- Results Table (What data will you record?)

You do not have to carry out your plan, so your Results Table will not have any data in it. Use the following pages for your plan (or you may do it on a computer and then stick in your work). When you have completed your plan, answer the following questions in full sentences.

1. In your plan, what was the thing that you changed?
2. What was the thing that you measured?
3. What things did you keep the same throughout to make it a fair test?

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Well done, you have completed the booklet.

- Do not forget to update the Target Sheet at the front.

- It is really important that you bring this booklet to your first science lesson at St Olave's.