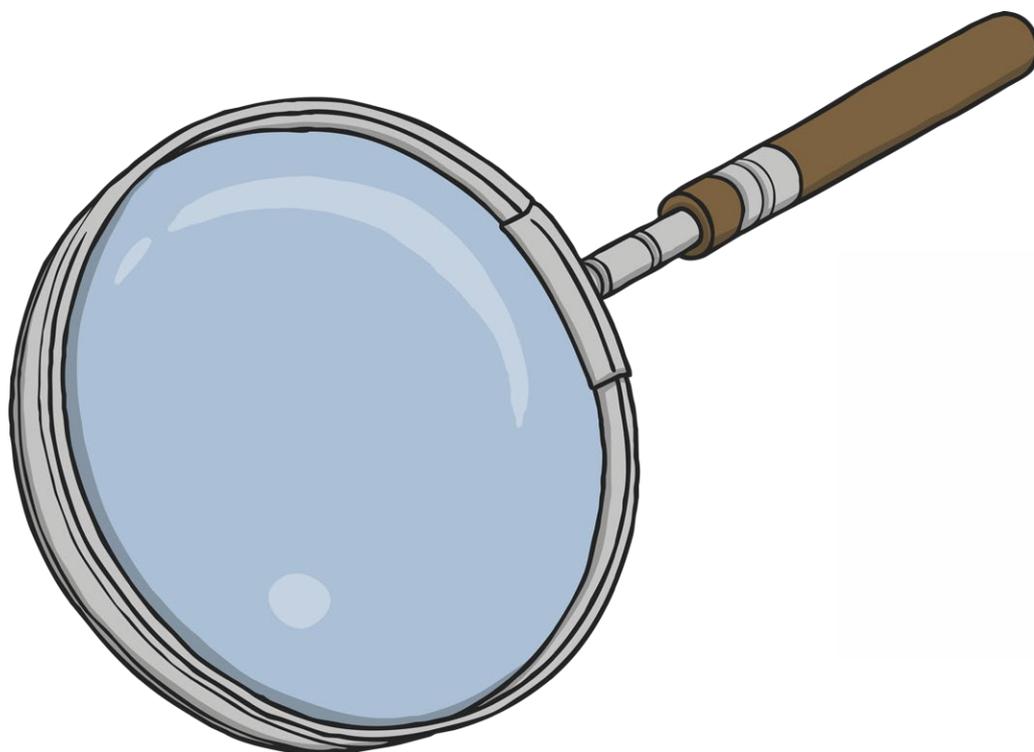


# Scientific Enquiry

Working scientifically is more than just fair testing. We need different ways of working scientifically to answer different kinds of questions.

**There are 5 main ways we can enquire scientifically or 'ways of finding out'.**



# Observing Changes over Time

## Questions

What happens to my bean seeds after I plant them?  
How will our compost heap change over time?

## Skills

Make careful observations.

Use scientific language.

Draw and label what you observe.

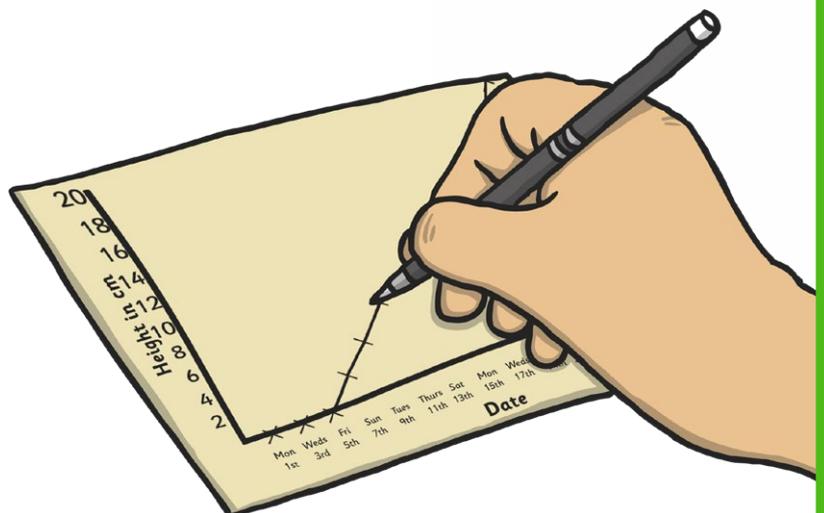
Create graphs and tables from your observations.

Use equipment and take measurements accurately.

Draw conclusions from data about the changes.

Think about the effect of changing the time and number of observations.

Talk about and explain changes using scientific knowledge and understanding.



# Looking for Naturally-Occurring Patterns and Relationships

## Questions

Do beans curl clockwise or anti-clockwise as they grow?  
Do taller plants grow from bigger seeds?

## Skills

Recognise when variables cannot be controlled and when pattern seeking will help to answer questions.

Decide how detailed data needs to be, and which equipment to use, to make measurements as accurate as possible.

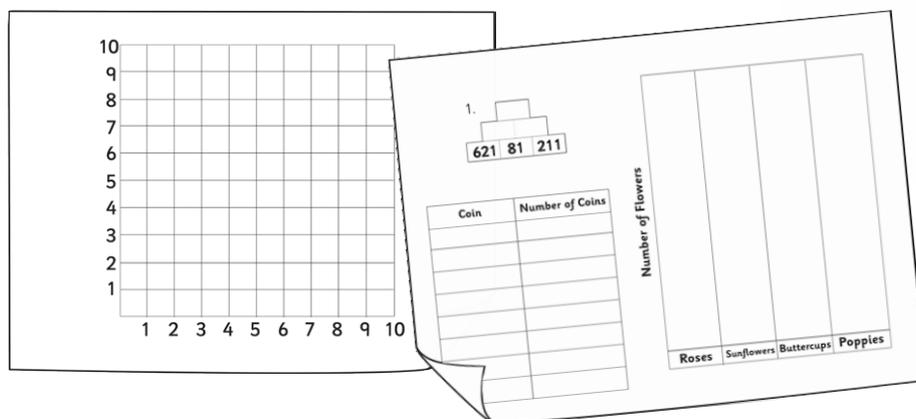
Use equipment accurately to collect observations.

Record data appropriately and accurately.

Present data in scatter graphs and frequency charts.

Recognise patterns in results.

Recognise the effect of sample size on reliability.



# Identifying and Classifying Things

## Questions

There were 12 different types of beans in the market in France!  
What were they?

Which clothes will keep us warm/dry/cool on our trip?

## Skills

Recognise when identifying and classifying will be helpful to answer questions.

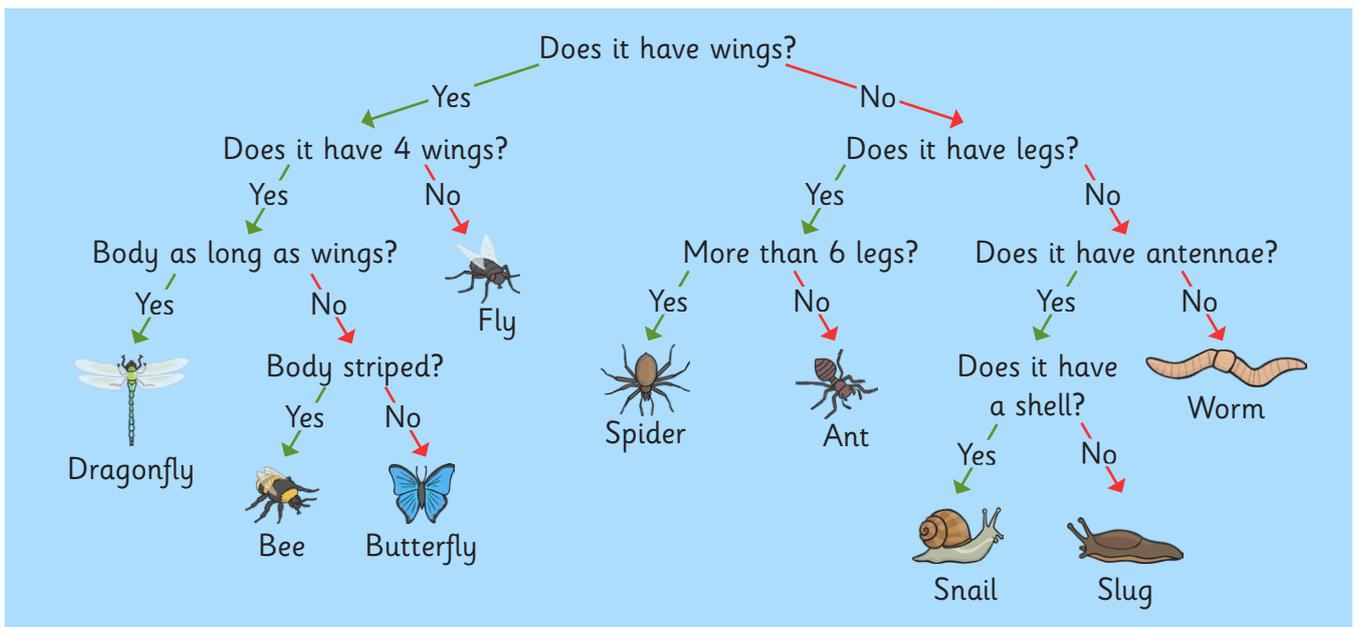
Use tests to sort and classify materials.

Use secondary sources to identify and classify things.

Make keys and branching databases with four or more items.

Use more than one piece of scientific evidence to identify and classify things.

Look for similarities and differences.



# Researching Using Secondary Sources

## Questions

Gardeners say that growing beans is good for the soil. I wonder why they say that?

How can we tell the time without clocks?

## Skills

Recognise when research using secondary sources will help to answer questions.

Decide which sources of information might answer questions.

Use relevant information and data from a range of secondary sources.

Recognise how data has been obtained.

Start to notice when information and data is biased or based on opinions rather than facts.

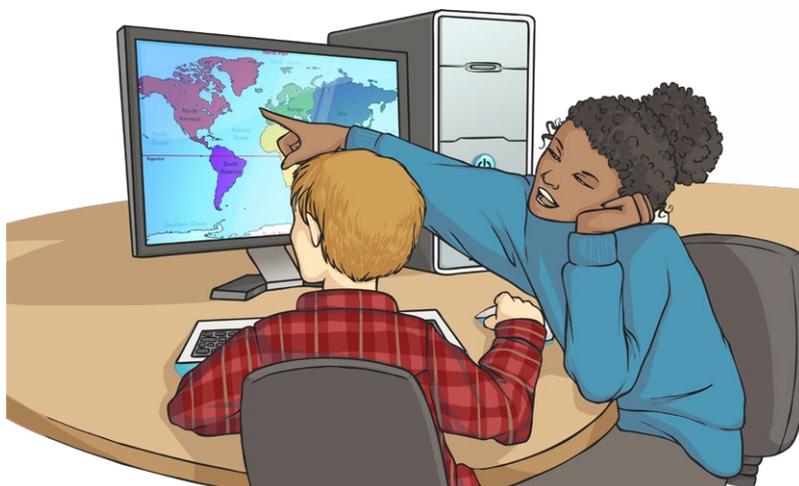
Present findings in suitable formats.

Draw conclusions from research.

Explain research using scientific knowledge and understanding.

Evaluate how well my research has answered my questions.

Recognise that some scientific questions may not have been answered definitively.



# Comparative and Fair Testing

## Questions

Does it make any difference if I put fertiliser on the beans when they are growing?

It's really sunny today. Which is the best suntan cream?

## Skills

Suggest improvements and raise further questions

Use scientific language

Use scientific illustrations

Draw simple conclusions and make predictions

Talk about your findings

Use equipment to measure

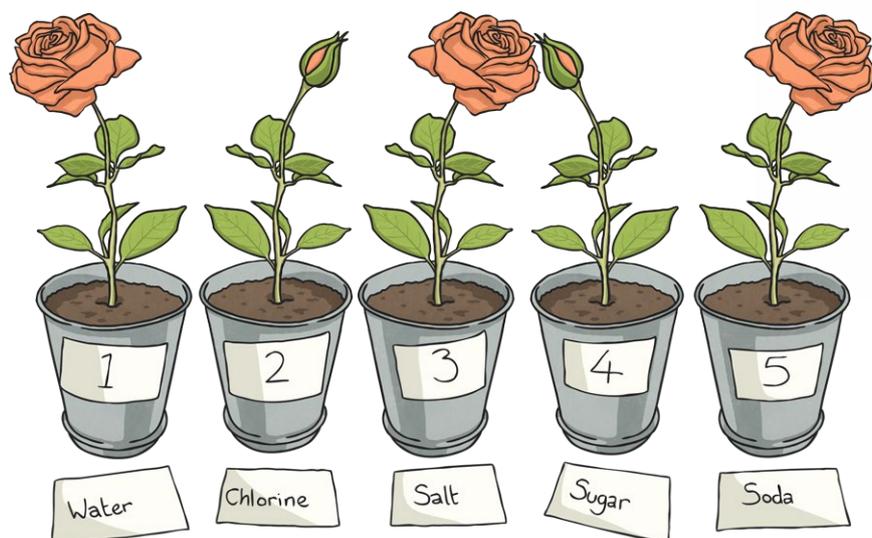
Gather, record, present and classify data in different ways; tables, labelled diagrams, drawings, keys and charts.

Make careful observations.

Ask questions and find different ways to answer them.

Use results to set up re-tests.

Take repeat readings.



# Making Things and Developing Systems

## Questions

How can you use what you already know to design a way of separating salt from water?

I know that some spiders are attracted to warmth. Design a spider house.

## Skills

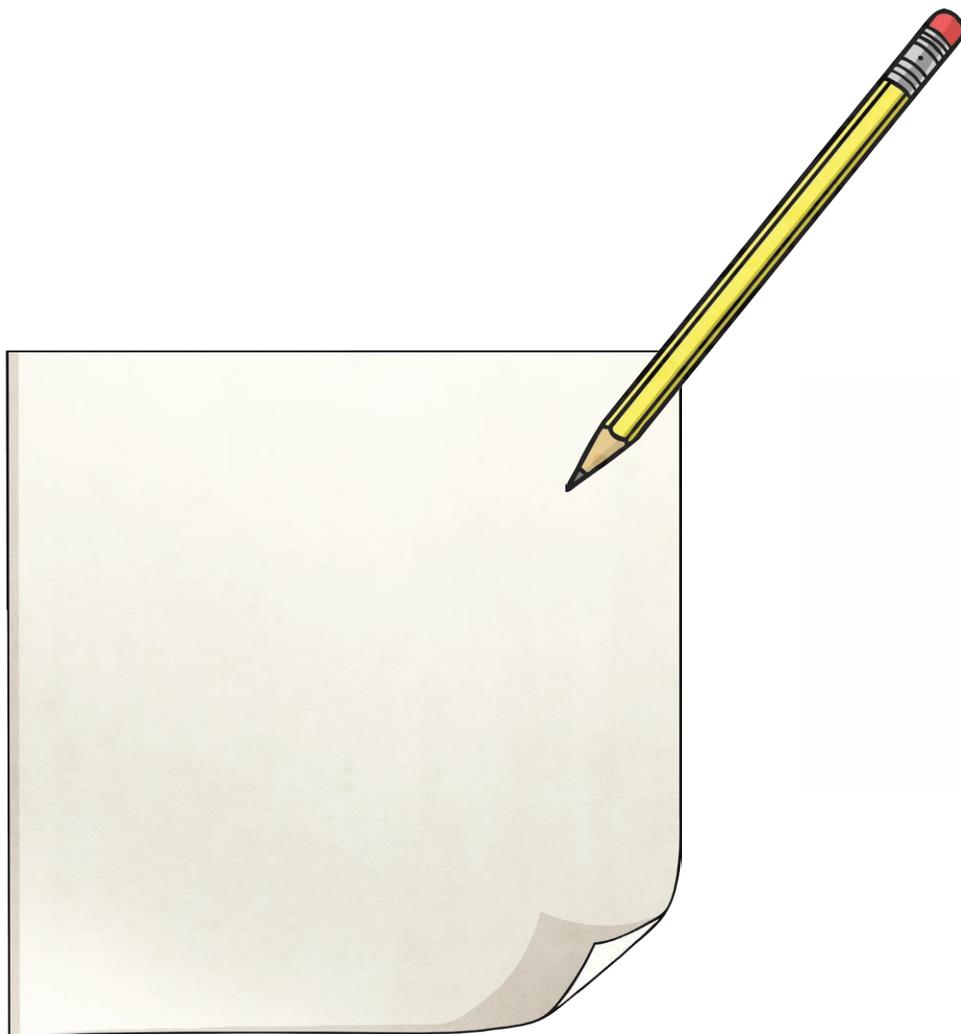
Use prior knowledge.

Design ways to find answers.

Make careful observations.

Use results to set up re-tests.

Create ways to check results and data.



# Investigating Models

## Questions

Spiders don't like conkers. Is this true?

Sugar dissolves better in warm water rather than cold.

Is this the same for all liquids?

## Skills

Use pre-existing models to develop new ideas.

Test the new idea.

Explain using scientific knowledge and understanding.

Draw conclusions.

Understand that scientific questions can be answered in different ways.

