

'15-ish minute Forum'

# Types of Scientific Enquiry


## What do we mean by ‘Scientific Enquiry’?

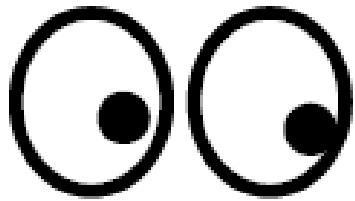
‘The 5 enquiry types are 5 different ways of finding answers to scientific questions.

Note: Enquiry methods come under the umbrella of ‘working scientifically’ in the NC.



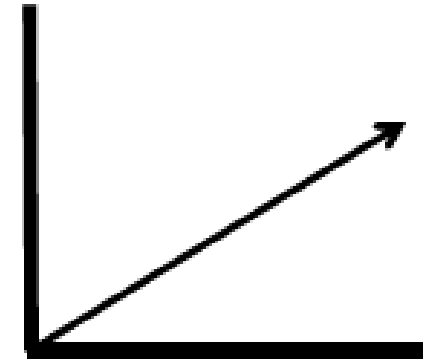
There are 5 types of Scientific Enquiry:

- 1) Observation Over Time
  - 2) Pattern Seeking
  - 3) Identifying, Classifying and Grouping
  - 4) Comparative or Fair Testing
  - 5) Research using Secondary Sources
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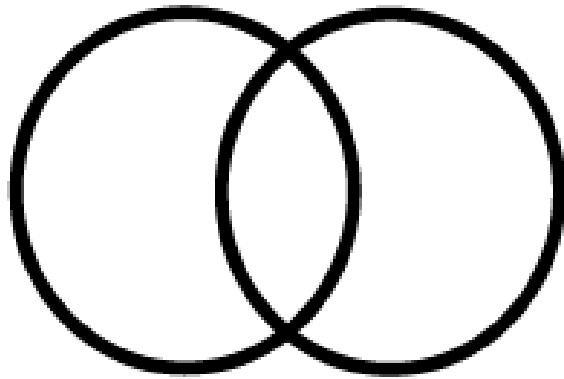


Observation Over Time

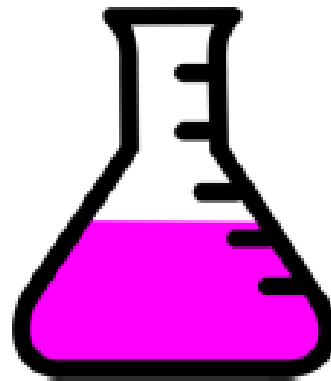
# Types of Scientific Enquiry



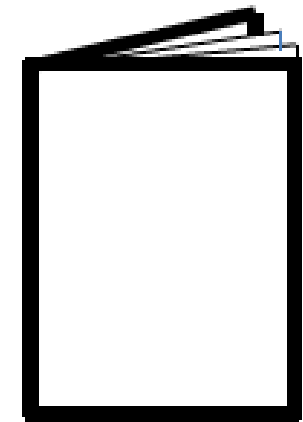
Pattern Seeking



Identifying, Grouping and Classifying



Comparative and Fair Tests



Research Using Secondary Sources

## 1) Observation Over Time

*The children address the experiment question by carefully monitoring and observing over seconds, minutes, hours, days, or even longer!*



### Example Question:

“How do shadows change throughout the day?”

Or maybe...

“Would a paper boat float forever?”

“What happens to a bean after I planted it?”

“What happens to a snowman?”

## 2) Pattern Seeking

*The children address the experiment question by gathering data or making observations, then looking for patterns.*

### Example Question:

“In Autumn, do trees with BIGGER leaves drop their leaves first?”

Or maybe...

“Do bigger seeds grow into bigger plants?”

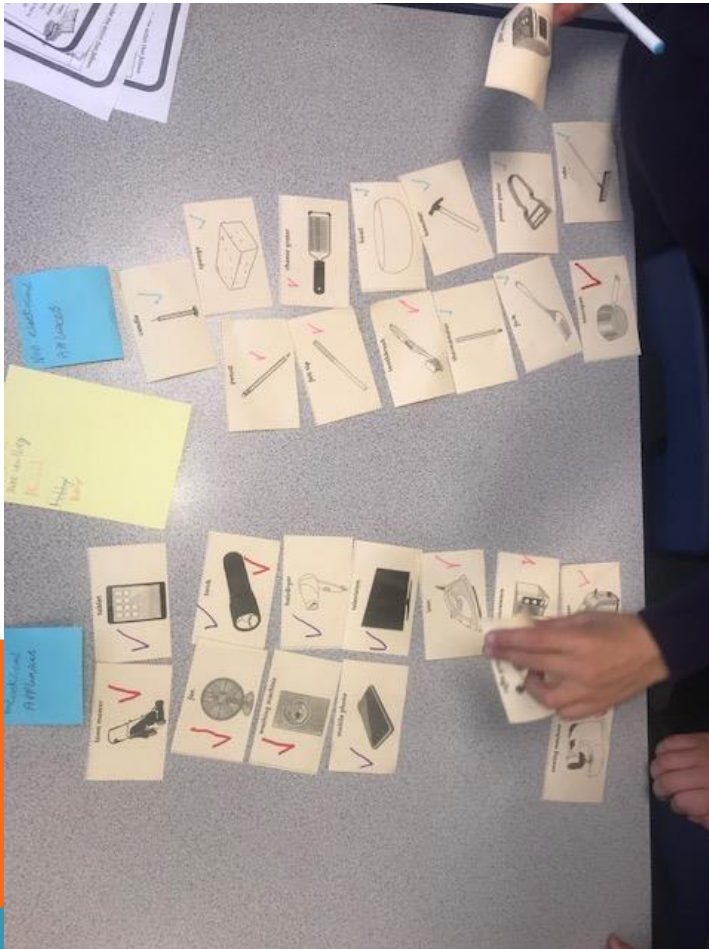
“What colour flowers do insects prefer?”

“Which room has the most electrical sockets in a house?”



### 3) Identifying, Grouping and Classifying.

*Solving enquiries by organising things into groups and making connections.*



#### Example Question:

“How would you organise these appliances?”

Or maybe...

“How can we group the food we eat?”

“Which materials are magnetic?”

“Can we group these materials into solids, liquids or gases?”

## 4) Research using Secondary Sources.

*Finding answers using books, the internet or surveys.*

### Example Question:

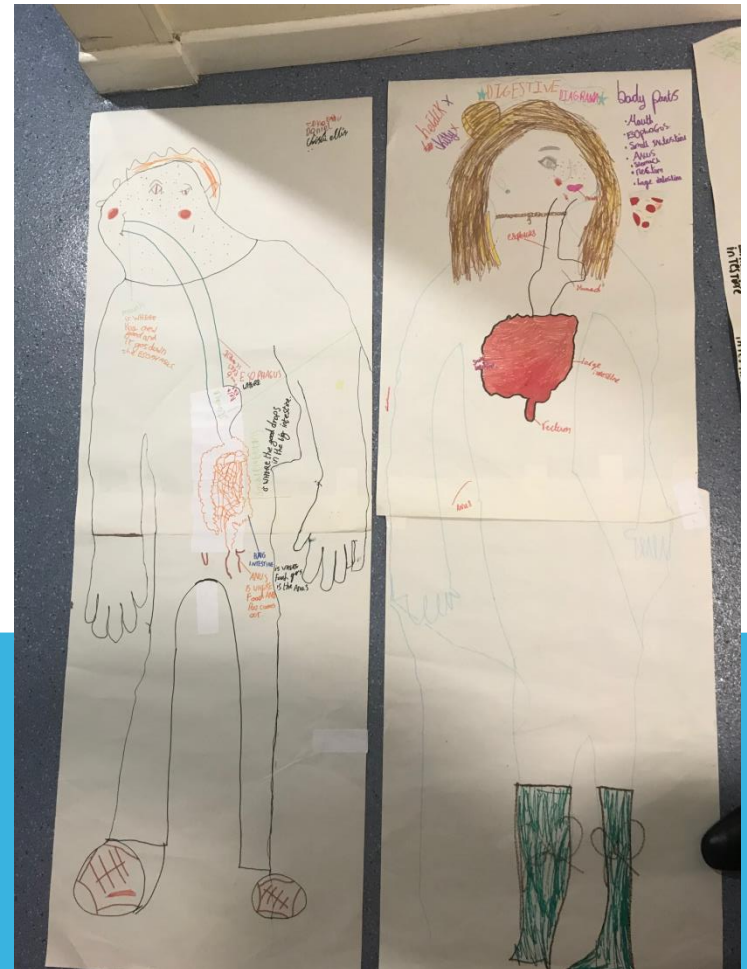
“What function do the parts of the digestive system perform?”

Or maybe...

“How are bricks made?”

“How do dentists fix broken teeth?”

“What are microplastics and how are they harming the planet?”





## 5) Fair Tests and Comparative Tests. *These two enquiry methods are similar.*



Fair Test example Q:  
“Does the size of a parachute affect the speed that it falls?”

Or maybe...

“How does age affect human reaction times?”

“How does the volume of a drum beat change as you move away from it?”

Comparative Test example Q:

“Which material soaks up water the best?”



Or maybe...

“Which magnet is strongest?”

“Do cress seeds grow quicker inside or outside?”

15 Minute Forum: Types of Scientific Enquiry.

| Observation Over Time | Pattern Seeking | Identifying, Sorting and Classifying | Comparative and Fair Testing | Research using Secondary Sources. |
|-----------------------|-----------------|--------------------------------------|------------------------------|-----------------------------------|
|                       |                 |                                      |                              |                                   |

- 1) How does a light bulb work?
- 2) Is there a relationship between a mammal's size and its gestation period?
- 3) How does my height change over the year?
- 4) How can we group the food we eat?
- 5) Does the temperature of water affect yeast growth?
- 6) Which shoe is most slippery?
- 7) Are high calorie foods always high in sugar?
- 8) How does the Sun make light?
- 9) Which materials float and which sink?
- 10) How does an eggshell change when left in vinegar?

| Observation Over Time   | Pattern Seeking   | Identifying, Sorting and Classifying   | Comparative and Fair Testing  | Research using Secondary Sources.   |
|---|---|--|---|---|
| <p>3) How does my height change over the year?<br/>(KS1)</p> <p>10) How does an eggshell change when left in vinegar?<br/>(KS1/KS2)</p> | <p>2) Is there a relationship between a mammal's size and its gestation period?*(KS2)</p> <p>7) Are high calorie foods always high in sugar?*(KS2 Y4)</p> | <p>4) How can we group the food we eat?<br/>(KS2/Y3)</p> <p>9) Which materials float and which sink?*(KS1)</p> | <p>5) Does the temperature of water affect yeast growth?<br/>(FairY6)</p> <p>6) Which shoe is most slippy?<br/>(Comp: KS1Y2 or KS2Y5)</p> | <p>1) How does a light bulb work?<br/>(KS2/Y4)</p> <p>8) How does the Sun make light?<br/>(KS2 Y3/Y6)</p> |



# Working scientifically

Develop children's skills in observing over time

## Introduction

Observing over time enquiries are a fantastic way for children to be curious about the world around them. The changes they observe can take place in seconds, minutes, hours, or days, or over longer periods of time, such as weeks or months. This type of enquiry lends itself to observing the natural world, but can also be used when comparing materials and observing physical processes. There are many opportunities to take children outdoors when carrying out these types of enquiries, and children's observations will often lead on to other, different, types of enquiries.



## Big questions

Here are some examples of 'big questions' that can be explored by observing over time in KS1 and KS2. There is at least one for every area of the curriculum, so it is easy to plan opportunities for children to revisit this type of enquiry and develop their skills.

| Year 1   | Year 2  | Year 3  | Year 4   | Year 5  | Year 6   |
|--|---|---|--|---|--|
| How does a catfish's tail change over the year?                    | What happens to my teeth after I have planned it? | What happens to water when it is left in a glass of coloured water? | How does the variety of insects on the school field change over the year?  | How do birds change over their lifetime?                        | What happens to a piece of bread if you leave it on the windowsill for two weeks?          |
| How does my sunflower change each week?                            | How does a tadpole change over time?              | How do flowers in a vase change over time?                          | How does an egg shell change when it is left outside?                      | How does a bean change as it germinates?                        | How does my heart rate change over the day?  |
| How does the oak tree change over the year?                        | How does the school pond change over the year?    | How does tumbling change a rock over time?                          | Which material is best for keeping our hot chocolate warm?                 | How does our compact disc change over time?                     | How do different animal embryos change?  |
| How does my height change over the year?                           | How much food and drink do I have over a week?    | What happens when water freezes in an icecube?                      | How does the level of water in a glass change when left on the windowsill? | How does a container of salt water change over time?            | How much exercise do I do in a week?   |
| What happens to materials over time if we bury them in the ground? | How long do bubble bath bubbles last for?         | If we magnetise a pin, how long does it stay magnetised for?        | How does the mass of an ice cube change over time?                         | How does a paper tube change as it is left in a glass of water? | Does the temperature of a light bulb go up the longer it is on?                            |
| What happens to drinking water over time?                          | What will happen to our mountain?                 | When is our classroom darkest?                                      | How long does a battery light a torch last?                                | How does a nail of salt water change over time?                 | How would you group electrical components and explain how they are used to make things do? |
| How does the colour of a lit leaf change over the day?             | Would a paper boat float forever?                 | Is the Sun the same brightness all day?                             | When is our classroom the quietest?  | How long does a pendulum swing for before it stops?             | How does my shadow change over the day?  |

Awesome Resource:

# The Ogden Trust

<https://www.ogdentrust.com/resources-cpd/resources?type=&age=&series=working-scientifically>