



# SCIENCE

## PORTFOLIO



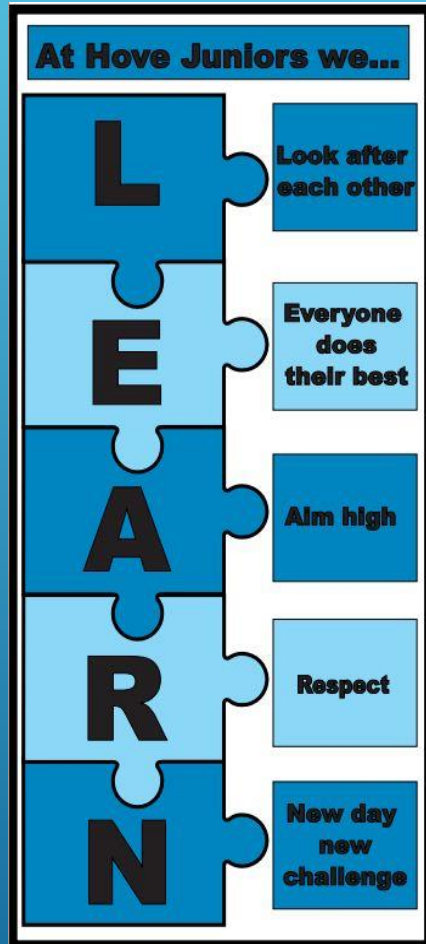
# SCIENCE AT HOVE JUNIOR SCHOOL

As a science team, we strongly believe that all children should be learning science through active investigations and enquiry based learning. They should be encouraged to discuss and debate the 'big ideas' of science and through this discussion ask questions about the world around them. Our curriculum overview ensures children are exposed to the facts and theories set out in The National Curriculum giving them a progression of knowledge that builds from year to year. However, it is the understanding and investigation of key ideas that allows children to further explore events and phenomena that influence their lives.

Our goal is that science units allow children to learn through enquiry. Starting with their initial questions, that will be based on their existing ideas and experience, we encourage children to make predictions, explore concepts through investigation, collect data and return to their original idea to reflect and pose further questions. This cycle develops over the key stage as children are taught a clear progression of skills to become scientific thinkers.

Our aim is that children will develop a life-long interest in science and their world.





|   |              |
|---|--------------|
|    | Question     |
|    | Collaborate  |
|    | Reflect      |
|    | Take Risks   |
|   | Independence |
|  | Perseverance |

Our LEARNING CHARACTERISTICS support and define how the children become successful learners.



# CURRICULUM DRIVERS:





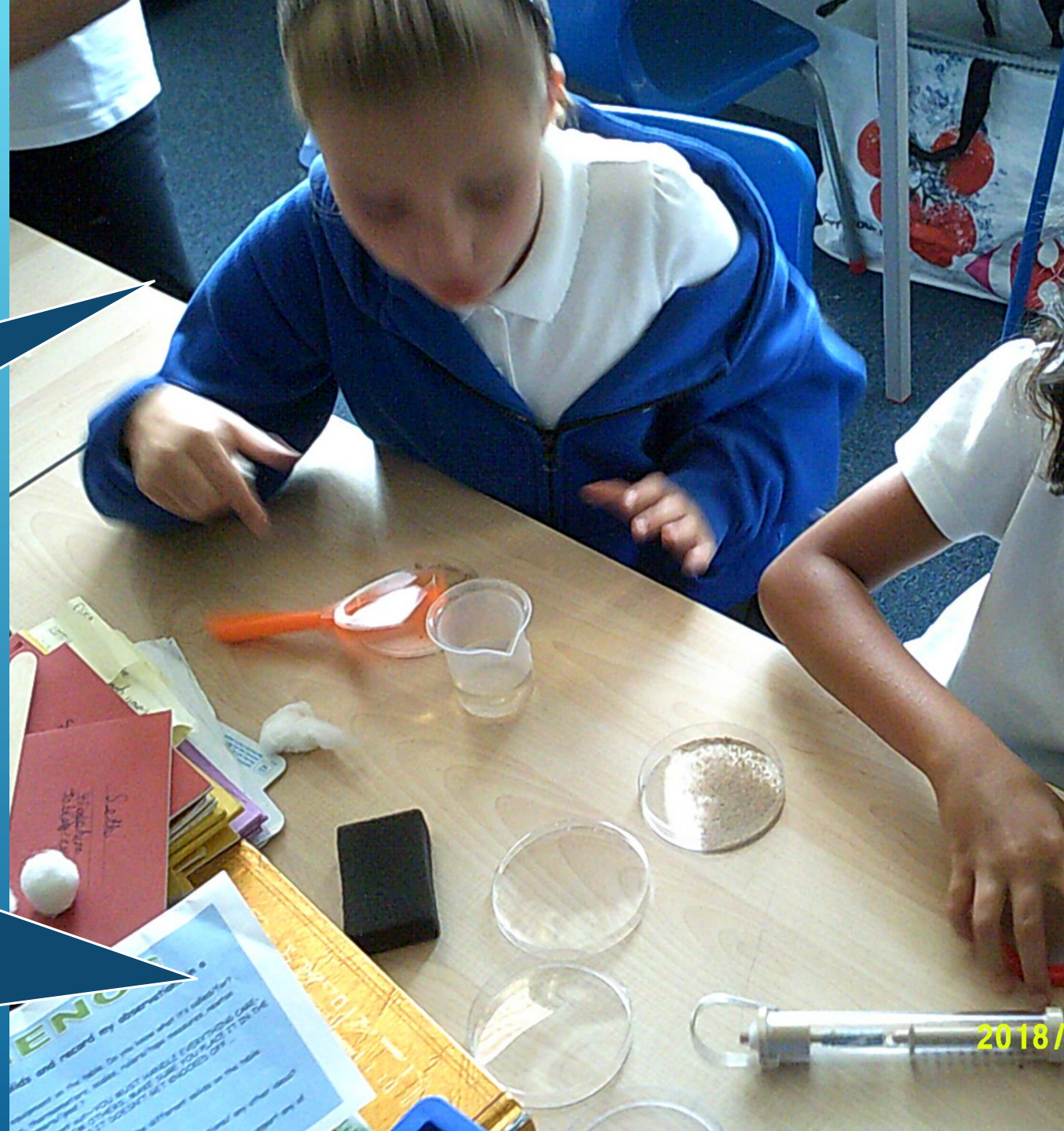
- The children at Hove Junior School are passionate about Science. Their curiosity and enthusiasm shines through during their lessons.

*I wanted to do a victory dance when my circuit lit up!*

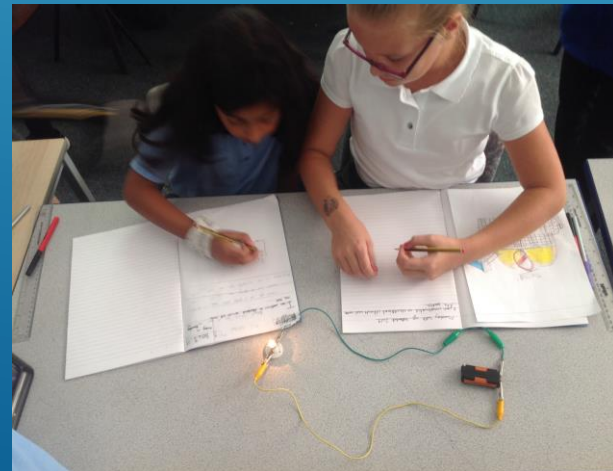
*It was so fun, seeing how the different things made the teeth rot - I know I need to avoid coke now!*

*It was so funny when we made a model of the digestive system - it even had fake poo - but some people said it was disgusting!*

*I loved drawing the fossils, using the magnifying glasses to see their details. I wonder how many more fossils are left undiscovered.*





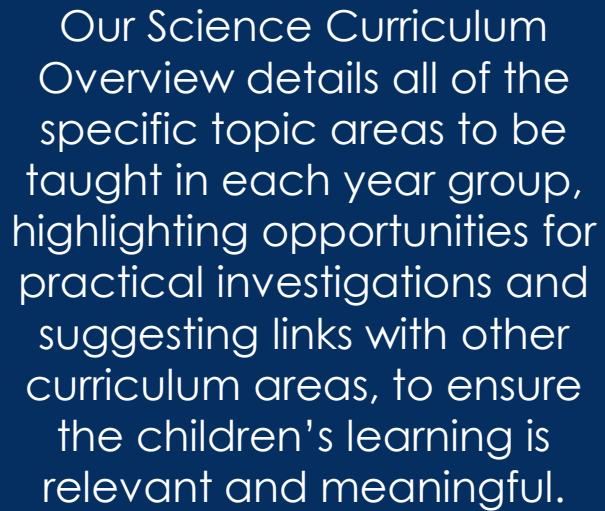


## CURRICULUM

Our curriculum aims to inspire children's curiosity about the world and how it works.

It encourages collaborative learning, alongside independent thinking and investigation.

Lessons are designed to encourage the development of key scientific skills.



|                  |  |   |                                     |  |
|------------------|--|---|-------------------------------------|--|
|                  | Switch investigate materials and decide need to come at conductors and | Year 5<br><a href="https://www.hamilton-trust.org.uk/science/year-5-science/">https://www.hamilton-trust.org.uk/science/year-5-science/</a> | Animals including humans            | <ul style="list-style-type: none"> <li>Changes as humans old age (Puberty)</li> </ul>  |
| of digestive     | Build a Buzz-wir   |   |                                     |  |
| Item - each tail | Collage material to build 3D pict digestive system                     |   | Properties and changes of materials | <ul style="list-style-type: none"> <li>Grouping materials properties (hardness, transparency, conductivity, insulation, response magnets)</li> <li>Dissolving materials form a solution – remove substance from a solid</li> <li>Separating mixtures</li> <li>Give reasons (evidence) for conclusions</li> </ul> |
| scers,           | Digestion re-en-tights, plastic bag crackers, orange plate             |   |                                     |  |
|                  | Use "Virtual" Tei  |   |                                     |  |

|                           |   |   |  |
|---------------------------|---|---|--|
| develop to                | <a href="https://www.hamilton-trust.org.uk/science/year-5-science/animals-including-humans-life-explorers/">https://www.hamilton-trust.org.uk/science/year-5-science/animals-including-humans-life-explorers/</a>                       | Building upon SRE in Y4   | Chronological Report: Describe the changes that occur between baby and child |
| by, solubility, activity, | <a href="https://www.hamilton-trust.org.uk/science/year-5-science/properties-materials-music-festival-materials/">https://www.hamilton-trust.org.uk/science/year-5-science/properties-materials-music-festival-materials/</a>           | Can build upon learning in year 4 and the water cycle.  | Poetry – exploring physical changes in old age                               |
| in liquid to covering a   | <a href="https://www.hamilton-trust.org.uk/science/year-5-science/changes-materials-changing-material-education-pack/">https://www.hamilton-trust.org.uk/science/year-5-science/changes-materials-changing-material-education-pack/</a> | Year 6<br><a href="https://www.hamilton-trust.org.uk/science/year-6-science/">https://www.hamilton-trust.org.uk/science/year-6-science/</a> | Recount: Write to stall book<br>Evolution and Inheritance                    |
| use from fair             |   |   | Evolution and Inheritance  |
|                           |   |   | Evolution and Inheritance  |

|              |              |              |              |
|--------------|--------------|--------------|--------------|
| <p>Topic</p> | <p>Topic</p> | <p>Topic</p> | <p>Topic</p> |
| <p>Topic</p> | <p>Topic</p> | <p>Topic</p> | <p>Topic</p> |
| <p>Topic</p> | <p>Topic</p> | <p>Topic</p> | <p>Topic</p> |

|  |   |  |           |   |
|--|---|--|-----------|---|
|  | to see the digits   |  |           | everyday materials  |
|  | Observe human shapes related to functions (identify teeth of animals, linked to function)   |  |           | <ul style="list-style-type: none"> <li>Reversible/irreversible</li> </ul> |
|  | <a href="https://www.brit.org.uk/science/animals/humans-excuse-these-your-teeth">https://www.brit.org.uk/science/animals/humans-excuse-these-your-teeth</a> |  | Earth and | <ul style="list-style-type: none"> <li>Movement of the Earth</li> </ul>   |

|  |  |  |
|--|--|--|
| <p>card type but not identical</p> <p>aptions to environment and this may lead to evolution</p> <p>classification of living things by common observable characteristics<br/>animals/gophers/monkeys</p> <p>e reasons for classifying animals based on characteristics.</p> | <p>agitation / top trump cards</p> <p><a href="https://www.hamiltontrust.org/science/classification/commission/">https://www.hamiltontrust.org/science/classification/commission/</a></p> <p>Making good choices</p> | <p>Fiction: Explain how certain features of animals have evolved</p> <p>Year 4 – classifying, using branch diagrams</p> <p>Chronological report or persuasive writing: Write a chronological report about the life and work of Carl Linnaeus or a persuasive piece of writing arguing why he is one of the greatest scientists.</p> <p>Non-chronological report: Research some unusual living things and write up all findings</p> |
|--|--|--|

|  |       |   |
|--|-------|---|
|  | Space | <ul style="list-style-type: none"> <li>• Relative to the Sun in the Solar System</li> <li>• Movement of the Moon relative to Earth</li> <li>• Sun, Earth, Moon and other celestial bodies</li> <li>• Day and night – why does the Sun seem to move across the sky?</li> </ul> |
|--|-------|---|

|  |   |               |   |
|--|---|---------------|---|
| <p>brightness of light/soundness of buzzers and association with number/voltage of cells used in circuit</p> <p>A recognised symbol when representing simple circuits in a diagram</p> | <p><a href="https://www.hamilton-trust.org.uk/science/year-6-science/electric-celebrations/">https://www.hamilton-trust.org.uk/science/year-6-science/electric-celebrations/</a></p> <p>Festive Light decoration competition</p> <p>Create a dimmer switch</p> <p>Making wire buzzer games<br/>(possible overlap with Y4)</p> | <p>Year 4</p> | <p>Explanation: Carry out a series of enquiries that explore the effects of voltage on electrical circuit components and write up your findings, causal relationships and explanations in a written report.</p> <p>Persuasive writing: Write up the research and development of your festive lights decoration in order to persuade the Dragons that yours is the best.</p> |
| <p>Recognise light seems to travel in straight lines</p> <p>How we see objects reflect light into eyes etc.]</p>   | <p><a href="https://www.hamilton-trust.org.uk/science/year-6-science/crim-tab-investigation/">https://www.hamilton-trust.org.uk/science/year-6-science/crim-tab-investigation/</a></p>  | <p>Year 3</p> | <p>Explanation: Report and present findings from your light enquiries, including conclusions, causal relationships and explanations</p>   |

# CURRICULUM OVERVIEW



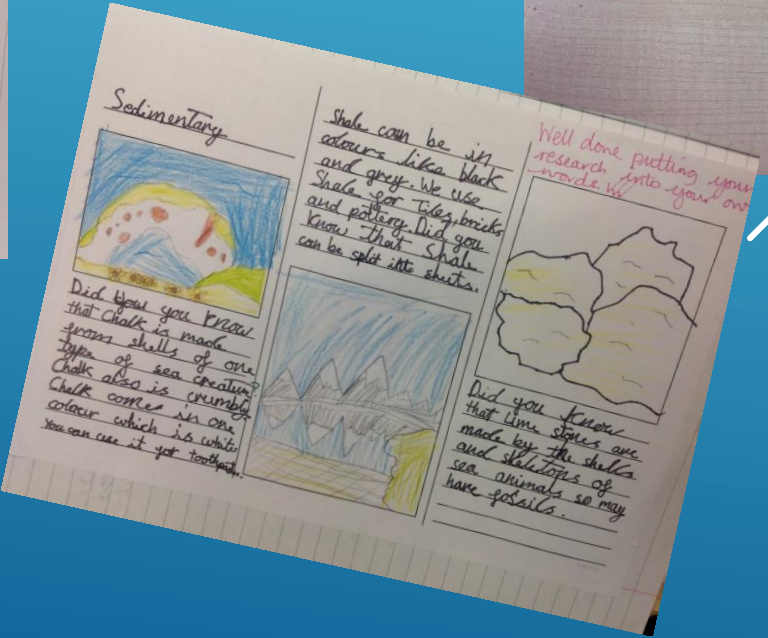
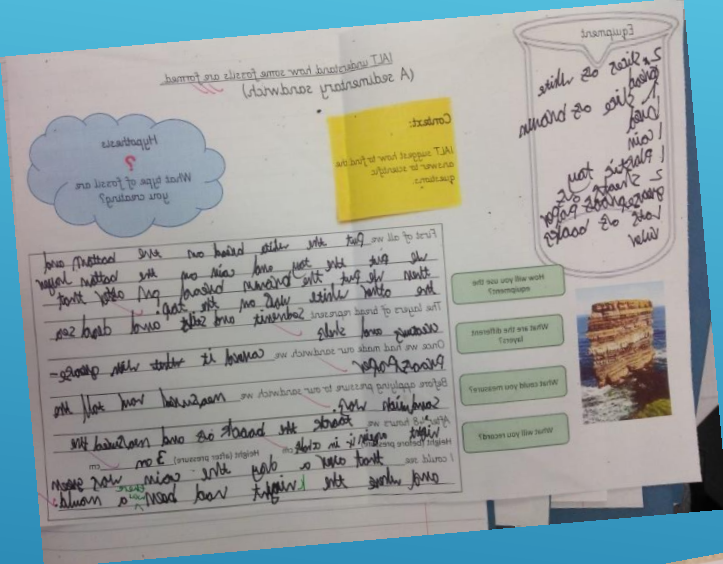
# STANDARDS

The standard of work produced in Science is very high at Hove Junior School. We encourage the children to see themselves as Scientists during these lessons: considering safety matters; selecting effective ways to record their observations; working in a team, where relevant, to achieve the best outcomes.

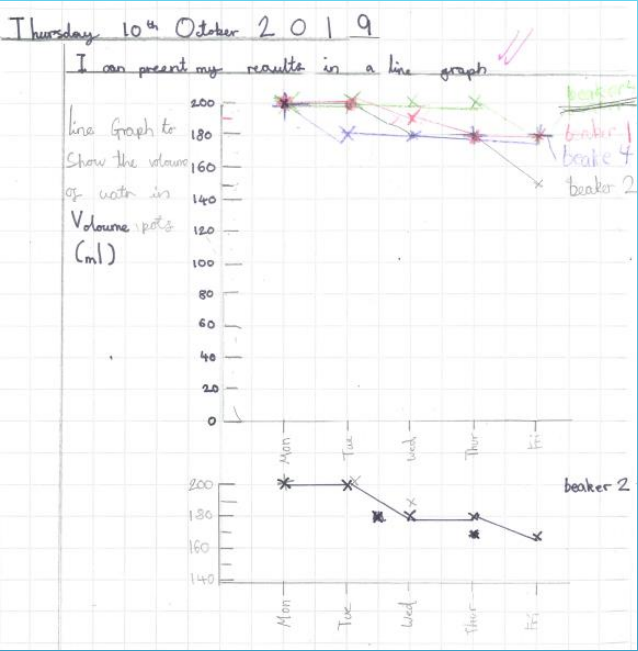
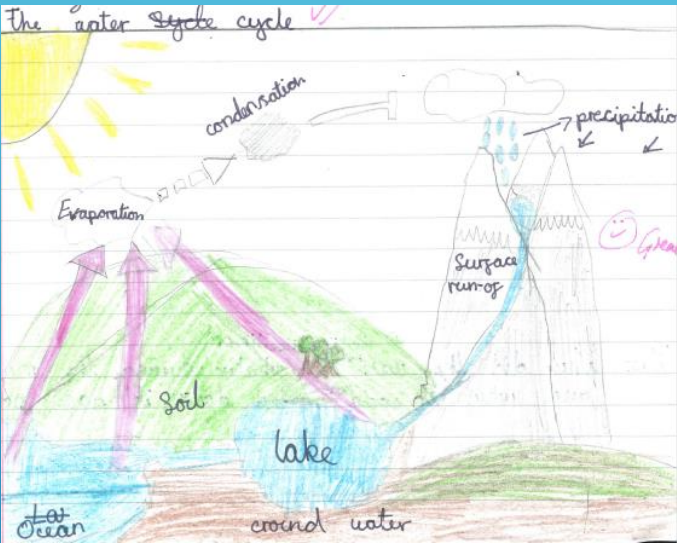




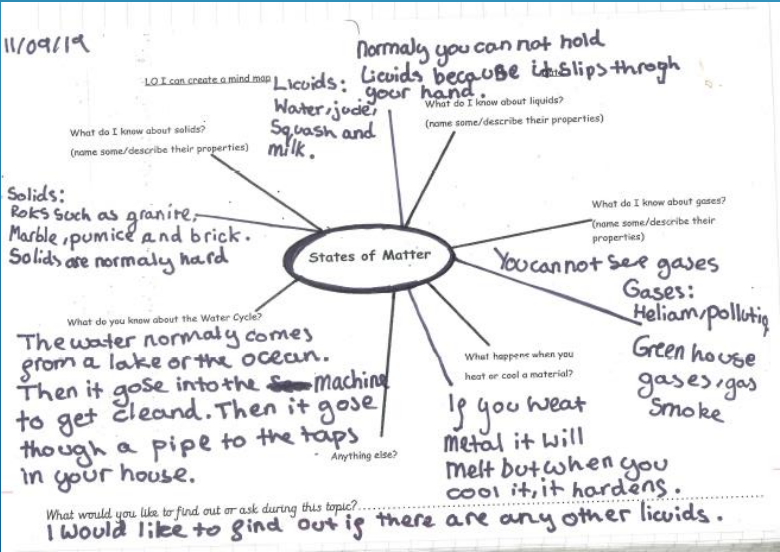
# STANDARDS IN YEAR 3



# STANDARDS IN YEAR 4



| Name of material | State of matter | Can you change its volume? | Can you change its shape? |
|------------------|-----------------|----------------------------|---------------------------|
| unfix block      | Solid           | no                         | no                        |
| water            | liquid          | yes                        | yes                       |
| air              | gas             | yes yes                    | yes                       |
| Sand             | Solid           | no                         | yes                       |
| perfume          | gas             | yes                        | yes                       |
| honey            | liquid          | no                         | yes                       |



What solids don't melt?  
Can solids freeze again after they have melted?  
Are most solids that have melted opaque, translucent or transparent?  
Do most liquids that have melted freeze?  
Can butter rise again after it has melted?



# STANDARDS IN YEAR 5

How many types of forces are there?  
Why is there no gravity on the moon?  
Where does gravity come from?  
What would happen if we jumped in space? What would happen if we had gravity in space?

What will happen to the newtons when I place the force meter in the water?

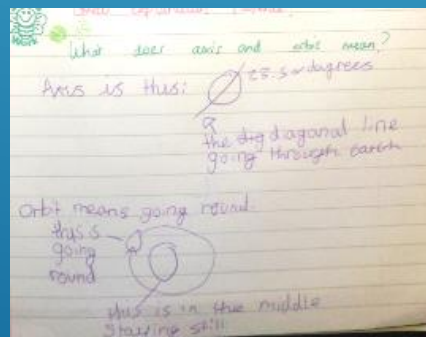
## Results

| Object     | Force meter reading in air (Reading 1) | Force meter reading in air (Reading 2) | Force meter reading in water (Reading 1) | Force meter reading in water (Reading 2) |
|------------|--|--|--|--|
| Lego       | 6.8 N                                  | 5.2 N                                  | 0.0 N                                    | 0.0 N                                    |
| mug        | 3.0 N                                  | 3.1 N                                  | 1.0 N                                    | 2.0 N                                    |
| marble jar | 10.0 N                                 | 10.0 N                                 | 1.4 N                                    | 1.4 N                                    |
| points     | 1.2 N                                  | 1.4 N                                  | 0.0 N                                    | 0.2 N                                    |
| plants     | 3.4 N                                  | 3.4 N                                  | 0.0 N                                    | 0.0 N                                    |

## Conclusion

I found out that no matter how heavy or how light the object was, it upthrust reduced the newtons when they were

put in the water. (Most of them were 0.0 N!) All of the objects except the mug were buoyant (because of its shape) were buoyant. The upthrust worked against the force gravity so make sure the objects floated. I was surprised because even some of the heavy objects (like the big marble jar) were buoyant and didn't sink. If I were to do this



Thursday 20/10/2020  
I can understand that air resistance slows moving objects.  
Notes

Gravity pulls objects to the centre of the Earth. Even if, like a paperclip and a glue stick, they have a different mass, they will still fall at the same time. It's not how heavy it is, it's how strong the gravity's pull is. But, if you have air resistance, objects fall slower. But if you have streamlined objects, they'll go faster. A famous scientist, called Galileo Galilei (1564-1642) led an experiment about gravity and climbed to the top of the leaning tower of Pisa with two balls and one was heavier than the other. He dropped them and they landed at the same time. Say you dropped a hammer and a feather. The hammer will drop quickly, more so than the feather because A) It's streamlined, and B) It's heavier. The feather would float down slower because A) It's lighter and B) It's got more air resistance.

Wow!



| Results   | Observation   |
|---|---|
| Parachute   |   |
|   | Didn't land very well and flipped over the bench.           |
|   | Landed OK but flipped over as it landed on floor.           |
|   | Fluctuated for a second and landed great. Didn't flip over. |
| Evaluation  |   |
| Two of the parachutes dropped and flipped over onto the bench and floor, but the large parachute didn't flip over or land badly. Overall, it was 2/3 that went wrong. |   |



# STANDARDS IN YEAR 6



Friday 18th October 2019.

**QUESTION**  
What conditions makes mould grow faster?

**PREDICTION**  
I predict that the wet piece will grow mould faster because of its moist surface the mould will find it easier to grow.

**VARIABLES**  
What I will change  
I will change the dampness of the bread.  
What I will observe/measure  
  
What I will keep the same  
the type of bread, the place the bags and person putting the bread in the bag.

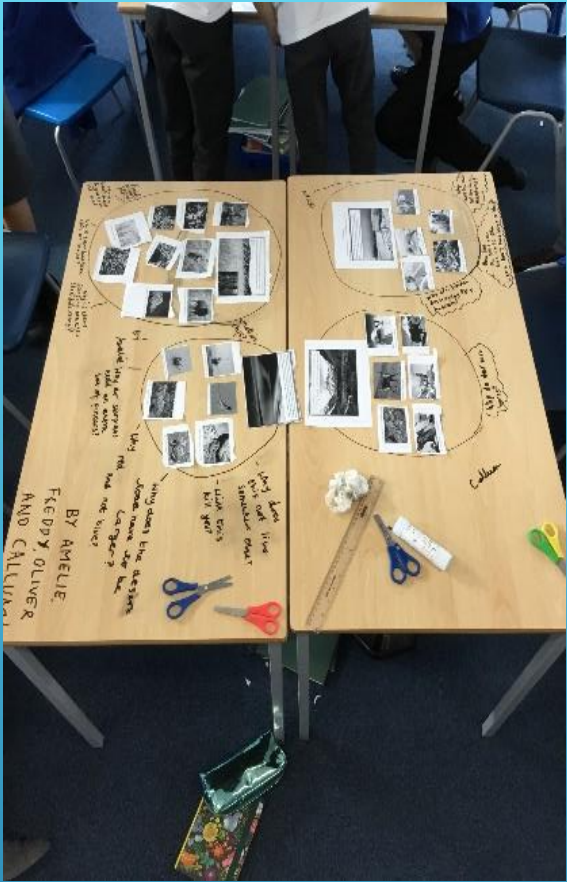
**Living Things - Mould Experiment**

**Results**

|                 |            | 1 <sup>st</sup> observation       | 2 <sup>nd</sup> observation                    | 3 <sup>rd</sup> observation |
|-----------------|------------|-----------------------------------|--|-----------------------------|
| Bread Example 1 | dry bread. | slightly mouldy (brown and green) | very mouldy (green and brown, 5 large patches) |                             |
| Bread Example 2 | wet bread. | not mouldy.                       | not mouldy.                                    |                             |

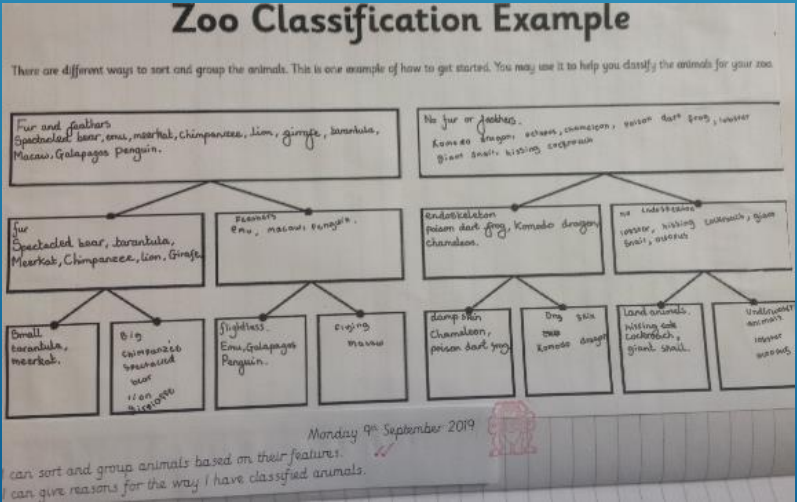
**CONCLUSION**  
My prediction said the mould would grow faster on the wet bread. I was right. I can see from my observations that the moist surface of the wet bread had a big impact on the moulds growth. I found out that because the wet bread had more mould, the moisture of the bread helped the moulds growth. It is reasonable to conclude that it is easier for mould to grow on wet bread because there was alot more mould on the wet bread than the dry one.

**MATERIALS**  
2 slices of bread, 2 ziplock bags and water.



**Microorganisms**

Having conducted our experiment on mould growth and bacteria, we used our Design and Technology skills to create our very own microorganisms. We researched what a microorganism is and found images for them, we then used clay to replicate what they look like.





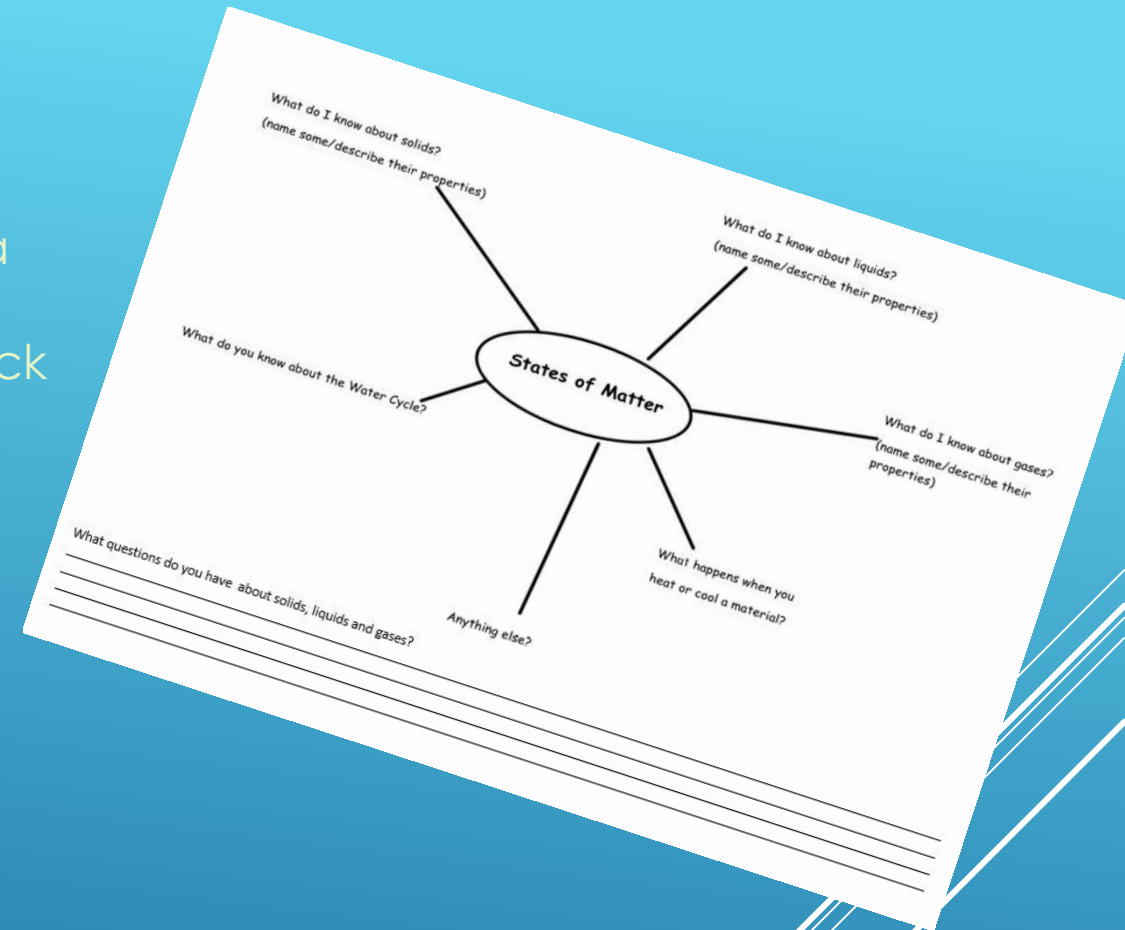
# ASSESSMENT IN SCIENCE

Each year group has a skills-matched assessment sheet/check list to complete throughout the school year.

**Year 3**

I am a Scientist

| Scientific Skill   | Date of the lesson you learned or used this skill | Confidence with this skill (teacher ticks) |
|--|---|--|
| <b>Asking Questions</b>  |   |  |
| I can come up with my own ideas about what I want to investigate.  |   |  |
| I can ask questions using sentence stems.  |   |  |
| I can suggest how to find the answer to scientific questions.  |   |  |
| <b>Planning and Setting up Different Types of Enquiries</b>  |   |  |
| I can make a prediction, suggesting what might happen and why.   |   |  |
| I can suggest a range of ways to find things out from a scientific enquiry.                                    |   |  |
| I can select the best method of enquiry from those suggested by my teacher/peers.                              |   |  |
| I can choose the correct equipment from that provided by my teacher to carry out a scientific enquiry.         |   |  |
| <b>Performing Tests</b>  |   |  |
| I can understand why a test needs to be fair and through discussion, say if a method is fair or not.           |   |  |
| I can, from the list provided by my teacher, select variables that should be kept the same for a fair test.    |   |  |
| I can set up simple practical enquiries, both comparative and fair tests, and consider the variables involved. |   |  |
| I can explain how working with others may improve my results.  |   |  |
| <b>Using Equipment</b>   |   |  |
| I can select appropriate equipment and explain why I am using it and how it will be used.                      |   |  |
| I can follow instructions on how to use equipment accurately and safely.                                       |   |  |
| I can suggest what the possible dangers of using equipment/materials are.                                      |   |  |
| <b>Observing and Measuring</b>   |   |  |



Mind maps are used to show children's knowledge, understanding and misconceptions at the start of a unit of learning. Children are also asked to consider any questions that they would like to be answered. At the end of the unit, children return to the mind map and update it with their new knowledge, thus evidencing their Learning.

The Progression of skills for working scientifically, from Lower KS2 to Upper KS2, is clearly identified and opportunities for developing these are specifically planned for.

# WORKING SCIENTIFICALLY

Children engage in personal reflection about how their own skills are developing.

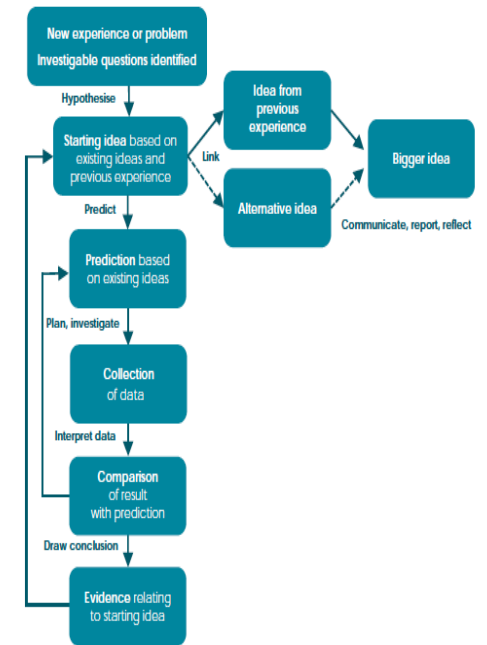
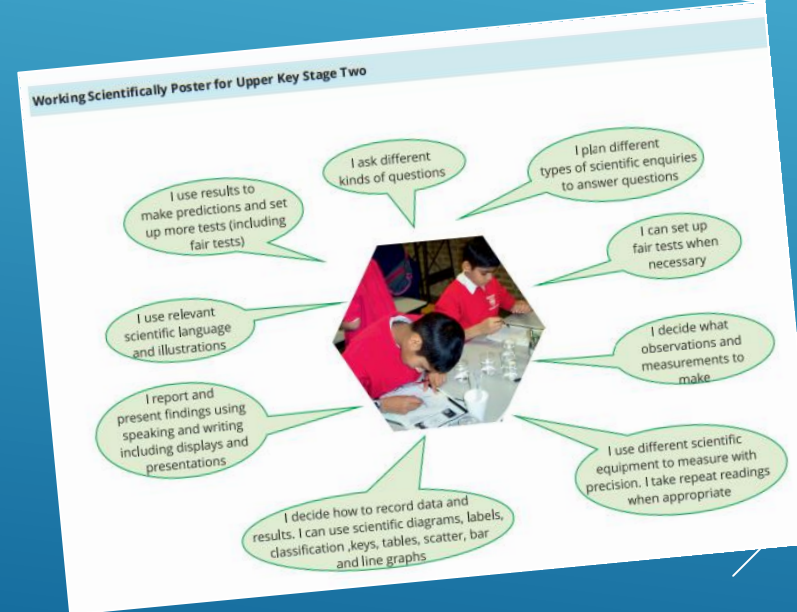
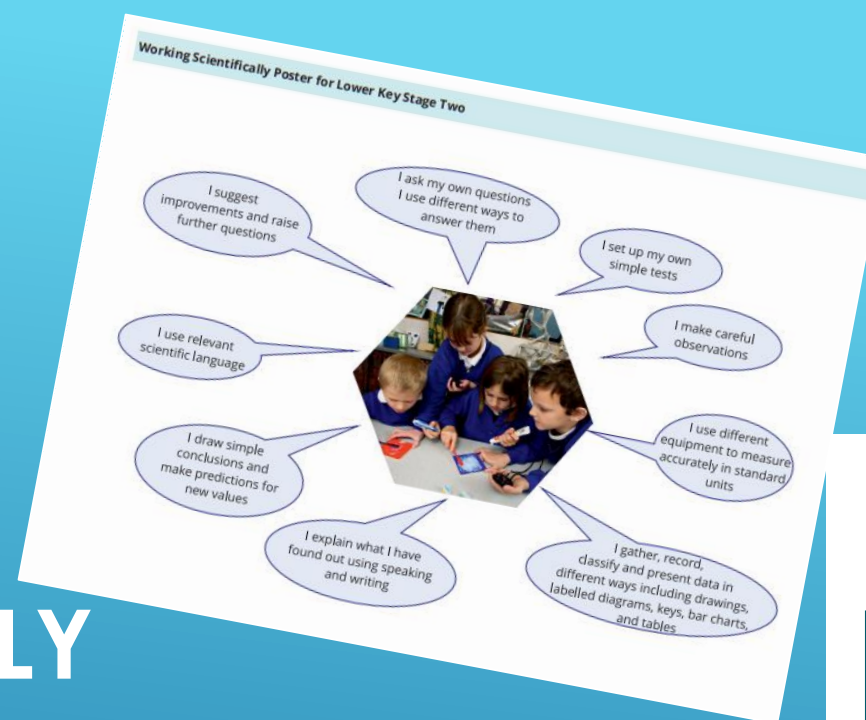


Figure 2:  
A model of learning through inquiry

Learning  
through enquiry



# GREATER DEPTH OPPORTUNITIES



## To secure a greater depth of understanding children need to:

- Show understanding of a concept by using scientific vocabulary correctly
- Apply knowledge in familiar related contexts, including a range of enquiries
- Work scientifically to explore the concept with a greater degree of independence

Sprinkle some rice on the drum.  
Tap the drum gently with the drum stick.

**What happens to the rice?**

**Can you change how high the rice jumps? How?**

**What does this tell you about how sounds are created?**

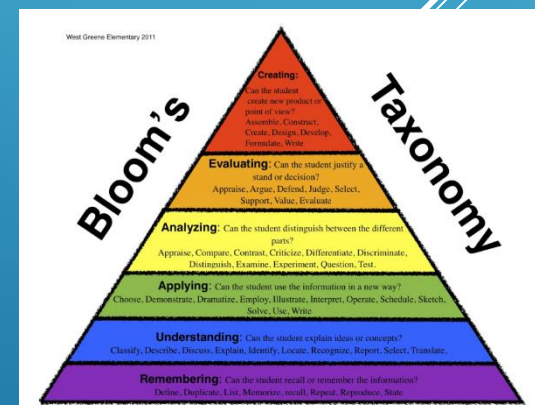
Over time a seedling grows into a large tree - where did the mass of the large tree come from?

Big Question

PMI

Scenario: People have their own plant-like green skin, so they can create their own food in sunlight

**P: the positives**  
**M: the minuses**  
**I: the interesting associated ideas**



Having considered the problem or context, they should be encouraged to raise their own questions, *select and plan* the most appropriate type of enquiry.