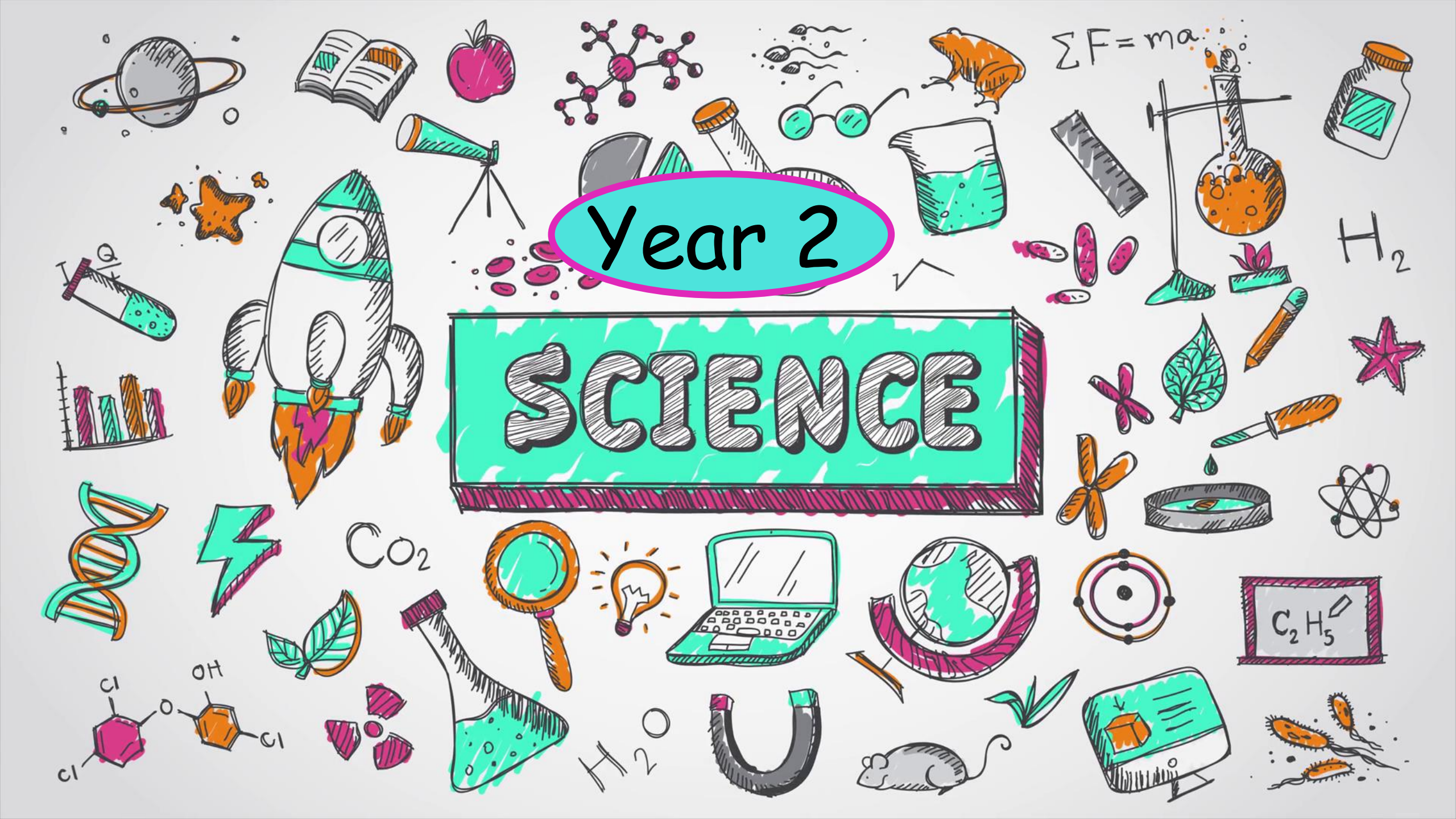

Year 2
SCIENCE

- Opportunities for Maths

- Recording measurements from observations.
- Creating graphs that show the data they have collected from investigations, enquiries or observations.
- Within each topic there is a short explanation about how you can use Maths in your lessons.

- Opportunities for English

- What I know, what to know and know now grids.
- Writing hypothesis and predictions.
- Oral/ written evaluations of experiments.

Recording information in books

In year 2, much of science is sorting or recording processes that the children discover. Their recording of these experiments and investigations is up to the teacher. Drawings and photographs that the children can label is most useful, but sheets for sorting or ‘filling in the blanks’ are other options.

Towards the end of the year, the children could be introduced to some of the KS2 sheets, so that in year 3 they are experienced in using them.

Our aim is to get the children to know the process of these sheets well enough for them to create their own graphs, tables, plans and predictions etc.

Including cross-curricular links is essential in Science and it is important that any investigations/observations are recorded in the children’s books. After an ‘activity lesson’ we should be asking the children a question about what they have learnt so they can make predictions using the knowledge they have gained from that lesson.

When children are recording their findings they should be doing so using their mathematical knowledge to record and present their data in tables, graphs and charts.

Marking should be light touch with Reasoning questions after ‘activity lessons’, these can be printed for ease.

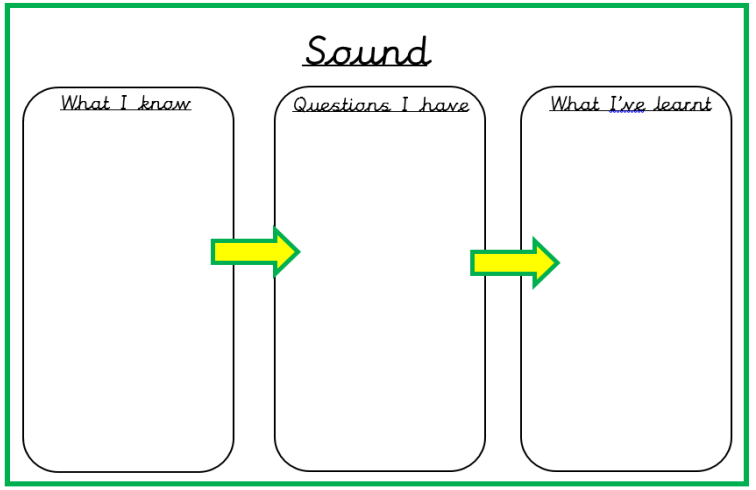
How we assess.

Assessing Knowledge of a subject.

The easiest part of our summative assessment would be the “What I know, questions I have and what I’ve learnt” grid. Children will fill in the things they have learnt at the end of a half-term. However, this isn’t going to be enough information to build a picture of a whole unit of work’s progression. Which is why we use the deeper learning questions after an ‘active lesson’ to ask questions that make the children explain their thinking and their knowledge.

Teachers should use a broad range of assessment approaches, for example:

effective questioning;
KWL grids
teacher observation;
peer and self-assessment;
Deeper learning questions.



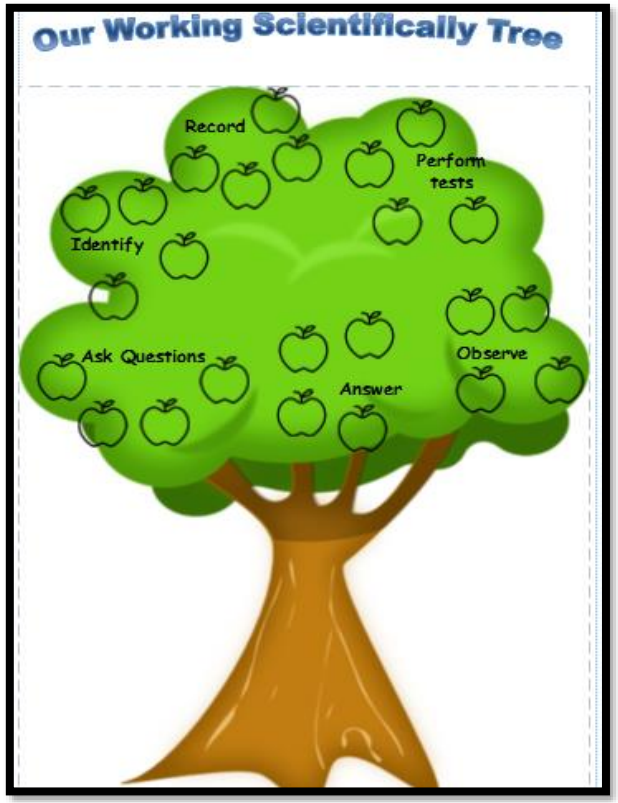
KWL grid used at the start of each topic in Science across the school.

At the end of the year teachers will moderate 2 HA, 2 MA and 2 LA children’s books to check their assessment of the children is similar.

Assessing Working Scientifically.

With the new scheme all children will be taking part in different experiments, investigations and observations. These are designed to meet the Working Scientifically objectives throughout the year, as well as providing the children with a range of experiences in the science curriculum.

Within each lesson there is a lesson objective as well as at least one objective in Working Scientifically. The children will have a sheet at the back of their science books that they can record how often they fulfil a WS objective. At the end of the year teachers can easily identify how well the children have met the WS objectives.



For children in KS1

The children will be directed to colour in an apple each time they have worked scientifically in a lesson.

Working Scientifically

- Asking simple questions and recognising that they can be answered in different ways
- Observing closely, using simple equipment
- Performing simple tests
- Identifying and classifying
- Using their observations and ideas to suggest answers to questions
- Gathering and recording data to help in answering questions.

Plants

- Observe and describe how seeds and bulbs grow into mature plants
- Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.

Equipment needed
Real plant bulbs
Beans
Paper towel [school ones are ideal]
Stapler
Plastic bag [the A4 sized kind which seals at the top works best]
Ruler
Small container (yoghurt pot or empty egg shell)
Cotton wool
Googly eyes or felt tip pen
Cress seeds

Useful websites
Excellent information about different methods of seed dispersal from www.vtaide.com
Information for teachers on hydroponics from www.hydroponics-simplified.com
Time lapse of a sprouting bean seed (3 min 26 secs) from www.YouTube.com
Cbeebies' Mr Bloom talks about how to make cress grow from tights from www.bbc.co.uk
Time lapse of cress growing from www.YouTube.com
Teacher information about growing cress, including the nutritional value (rich in vitamin C) from www.healwithfood.org

Working Scientifically objective	How we can work scientifically
• Ask simple questions and recognise that they can be answered in different ways. • Observe closely, using simple equipment. • Perform simple tests. • Identify and classify. • Use their observations and ideas to suggest answers to questions. • Gather and record data to help answer questions.	Explore the outdoors, looking at how plants disperse their seeds and why. Think specifically about plants that spread their seeds by utilising the wind. Make a seed helicopter and a dandelion seed. Make a seed helicopter and try it out in the playground. Collect dandelion plants and look carefully at their seeds, using a magnifying glass. Make a dandelion seed each and form together to make a dandelion plant. – photograph the children doing this and stick photos in their books. Give children a writing structure to support their write up of what they have learnt about seed dispersal.
• Ask simple questions and recognise that they can be answered in different ways. • Observe closely, using simple equipment. • Perform simple tests. • Identify and classify. • Use their observations and ideas to suggest answers to questions. • Gather and record data to help answer questions.	Talk about what bulbs need to grow into healthy plants. Plant beans in bags of water and watch them grow. What will happen to the bean left growing in a cupboard? Discuss hydroponics and the concept of growing bulbs in water. Set up and plant a bulb in a glass.
Ask simple questions and recognise that they can be answered in different ways. Observe closely, using simple equipment. Perform simple tests. Identify and classify. Use their observations and ideas to suggest answers to questions. Gather and record data to help answer questions.	Think about the conditions for healthy plant growth and plant your own cress seeds. Record their growth. How long will it take for them to be long enough to eat? Record the teacher's cress that does not get any water or light. How does it differ? Use the observation sheet from the server.

Animals including humans

- Explore and compare the differences between things that are living, dead, and things that have never been alive
- identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other
- identify and name a variety of plants and animals in their habitats, including micro-habitats
- describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.
- notice that animals, including humans, have offspring which grow into adults
- find out about and describe the basic needs of animals, including humans, for survival (water, food and air)
- describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.

Equipment needed
Dead spiders and toy spiders
Magnifying glasses and microscopes
Cameras
iPads or other tablets
Clip-on macro lenses (Amazon, under £10)
Investigating microhabitats resource
Clip boards
Sketch books
Pencils
Magnifying glasses or bug boxes with magnifying lids
Sticky notes
Food chain game resource sheet (server)
PE kits **Timers for each pair** **Different PE equipment (hoops, skipping ropes, beanbags, etc.)** **Clipboards and pencils** **Whistle or instrument to mark change of activity** **Elastic bands (one kept in the freezer and one at room temperature)** **= All in healthy hearts lesson.**

Useful websites
BBC Bitesize Dead or Alive: Is it Alive? from www.bbc.co.uk
Minuscule. Vol 4, episode 1 from www.YouTube.com
Microhabitats from www.YouTube.co.uk
BBC Bitesize: Woodland habitats from www.bbc.co.uk
How to build a bug hotel from www.wildaboutgardens.org.uk
Excellent and detailed information showing the variety of bug hotels that can be created from www.inspirationgreen.com
Animated food chain game from www.bbc.co.uk
BBC Bitesize: What is a food chain? from www.bbc.co.uk
BBC Bitesize: Food chains from www.bbc.co.uk
BBC Bitesize: What do Humans need to stay healthy? from www.bbc.co.uk
Quiz: What Foods should we eat? (You can view the questions without subscribing/joining) from www.educationquizzes.com
Animation about the role of the heart from www.aboutkidshealth.ca
BBC Bitesize: The Major Organs of the Body from www.bbc.co.uk Guide on taking your pulse from www.cyh.com

Working Scientifically objective	How we can work scientifically
• Ask simple questions and recognise that they can be answered in different ways. • Observe closely, using simple equipment. • Identify and classify. • Use their observations and ideas to suggest answers to questions.	Look at a live spider, a dead spider and a toy spider. What are some of the differences between the live spider and the dead one? And the dead spider and the toy one? How can we work out what's alive and not alive? Is it sometimes difficult to tell? Armed with all these questions, go outside and collect something alive, something dead and something that was never alive. Sort these specimens into three categories. Engage in further discussion and thought around these questions: A robot can move, so why is it not alive? If a robot magically came to life, how could we test to make sure this were true?
• Ask simple questions and recognise that they can be answered in different ways. • Observe closely, using simple equipment. • Identify and classify. • Use their observations and ideas to suggest answers to questions. • Gather and record data to help answer questions.	Explore the school grounds on the hunt for microhabitats. Zoom in on the tiny world of these habitats and draw or photograph what is going on there. Consider and draw conclusions about what lives in these microhabitats and why. You could also as part of an art/DT lesson design and create a bug hotel (See the website for links and the server for some information on a sheet)
• Ask simple questions and recognise that they can be answered in different ways. • Identify and classify. • Use observations and ideas to suggest answers to questions.	Role play food chains in the hall. Understand that, in a healthy habitat, all living things depend on each other in different ways. Explore the school grounds, looking for examples of food chains (living things eating leaves, for example).

Working Scientifically objective	How we can work scientifically
Ask simple questions and recognise that they can be answered in different ways. Use their observations and ideas to suggest answers to questions. Gather and record data to help answer questions.	Ask children to bring in pictures of their families of different ages (e.g baby, toddler, teenager, adult, elderly person) Put them on a time line all together. Give the children the match the baby to the adult sheet and get them to try to match them up in their books.
• Ask simple questions and recognise that they can be answered in different ways. • Use their observations and ideas to suggest answers to questions.	Create a desert island in the classroom! Imagine being stranded on the island. What would make you happy? What would your needs be? Send letters in bottles across the material sea, asking for essential provisions! Discuss together questions to assess learning, such as: what do humans need to survive? Why do you need food? Why do you need water? What do animals need to survive? Is there a difference?
• Observe closely, using simple equipment. • Perform simple tests. • Use their observations and ideas to suggest answers to questions. • Gather and record data to help answer questions.	Feel your heart pumping before and after running in the playground and discover that exercise makes your heart pump harder and faster! Carousel around different physical activities, observe the effects and answer questions in pairs. In this lesson they should; Understand that exercise makes the heart work and that warming up before exercise is important, know that some exercise makes their heart beat fast and some slows it down and begin to understand that they can observe changes and record data in a simple table.

Everyday materials

- identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses
- find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.

Equipment needed
Sticky notes
Wax crayons
Beakers of water
Pipettes
A selection of fabrics
A selection of materials for each group, including lengths of wood, metal, plastic, card (Make them similar lengths: you could use plastic, metal and wooden rulers)
String
Tape
Small weights (100g)
A selection of old clothes (sock, jeans, thin vest, overalls, sweatshirt)
Coarse grain sand paper
Wood block

Useful websites
Instructions from Nikwax on waterproofing a book cover from www.nikwax.com
https://www.hamilton-trust.org.uk/science/year-2-science/

Working Scientifically objective	How we can work scientifically
• Ask simple questions and recognise that they can be answered in different ways. • Observe closely, using simple equipment. • Perform simple tests. • Identify and classify. • Use observations and ideas to suggest answers to questions. • Gather and record data to help in answering questions.	Investigate the absorbency of fabrics by stretching them over a jar to make them taut and using a dropper to drop water onto the cloth. Observe and measure the number of drops and the time they stay on the cloth before being absorbed. Explore different fabrics and investigate how waterproof they are using a dropper of water. How can we make the fabrics waterproof? Colour them in with wax crayon and repeat the investigation!
• Ask simple questions and recognise that they can be answered in different ways. • Observe closely, using simple equipment. • Perform simple tests. • Identify and classify. • Use their observations and ideas to suggest answers to questions. • Gather and record data to help answer questions.	Examine a selection of different materials and explore their rigidity by devising an investigation to test them. Why is it important that some materials bend and flex? Understand that some materials need to be able to 'give' a little and not break (for bridges carrying heavy traffic, for example). Explore a selection of materials and discuss how they might be tested for their rigidity (identical lengths of wood, plastic, metal, card). Devise and carry out an investigation to test how much they will bend and discuss the results.
• Ask simple questions and recognise that they can be answered in different ways. • Observe closely, using simple equipment. • Perform simple tests. • Identify and classify. • Use their observations and ideas to suggest answers to questions. • Gather and record data to help answer questions.	Identify and discuss the materials/properties of objects and sort them according to criteria. Test materials for their durability and toughness and consider the usefulness of materials for our everyday lives. Consider the question: if everything I touched became flexible, how would my life be different? Tell stories to each other about an average day in a world where nothing was rigid. Sort objects in the classroom according to these criteria: flexible, rigid, hard, soft, stretchy, stiff.