Unit name	Materials
National Curriculum link	• Year 1 Everyday materials • Year 2 Uses of everyday materials
Prior knowledge (EYFS)	• Use all their senses in hands-on exploration of natural materials. (Nursery - Materials, including changing materials) • Explore collections of materials with similar and/or different properties. (Nursery - Materials, including changing materials) • Talk about the differences between materials and changes they notice. (Nursery - Materials, including changing materials)
Upcoming knowledge (Key Stage 2)	• Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. (Y3 - Rocks) • Notice that some forces need contact between two objects, but magnetic forces can act at a distance. (Y3 - Forces and magnets) • Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets. (Y5 - Properties and changes of materials) • Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. (Y5 - Properties and changes of materials)
When	• Spring 1

INTENT (What will be taught)	
Substantive knowledge	• I can distinguish between an object and the material from which it is made. • I know that all objects are made of one or more materials. • I know that some objects can be made from different materials e.g. plastic, metal or wooden spoons. • I can identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock • I know that materials can be described by their properties e.g. shiny, stretchy, rough etc. • I can describe the simple physical properties of a variety of everyday materials. • I know that some materials, e.g. plastic, can be in different forms with very different properties. • I can compare and group together a variety of everyday materials on the basis of their simple physical properties. • I know that all objects are made of one or more materials that are chosen specifically because they have suitable properties for the task. • I can identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. • I know that the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.
Vocabulary	Pupils can read, write, spell and define with growing confidence: Year 1: object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, card/cardboard, rubber, wool, clay, hard, soft, stretchy, stiff, bendy, floppy, waterproof, absorbent, breaks/tears, rough, smooth, shiny, dull, see-through, not see-through. Year 2: As for Year 1 plus opaque, transparent and translucent, reflective, non-reflective, flexible, rigid shape, push/pushing, pull/pulling, twist/twisting, squash/squashing, bend/bending, and stretch/stretching.

Disciplinary knowledge	• I know how to classify objects made of one material in different ways. • I know how to classify in different ways, one type of object made from a range of materials e.g. a collection of spoons made of different materials. • I know how to classify materials based on their properties. • I know how to test the properties of objects. • I know how to record my findings. • I know how to recognise patterns from my observations. • I know how to use my test evidence to answer questions. • I can communicate my scientific findings and/or ideas to others.
Common misconceptions (These will be specifically discussed and corrected)	• Only fabrics are materials. • Only building materials are materials. • Only writing materials are materials. • The word 'rock' describes an object rather than a material. • 'Solid' is another word for hard.
IMPLEMENTATION (How this will be taught)	
Pedagogy	**At the start of the unit (Lesson 1):** All children will receive a child-friendly version of this document to stick into their science books which will be discussed and explained at the beginning of each unit. The purpose of this is to ensure that they are clear: - What substantive knowledge they will be learning. - What disciplinary knowledge they will be learning. - What vocabulary they will be learning. - What this learning is building on (how it links to previous learning). - What they will go on to learn in the future (how they will build on this learning), including which parts of the unit they will be focusing on depending on whether they are in year 1 or year 2.

	We will refer back to this at the beginning of each lesson and throughout the unit so children can see how their learning is progressing. This will replace a specific learning objectives and success criteria for each lesson as the children will be encourage to see their learning as an interwoven, interdependent and spiralled process rather than as separate, linear lessons. **Every lesson:** • **Vocabulary:** All lessons will begin with a fifteen minute vocabulary section, involving writing and spelling, discussing and defining the vocabulary for this unit. It is the expectation that this vocabulary be learnt by the end of year 2, but as this unit will be taught twice within KS1, the more complex vocabulary will receive more focus for children in year 2. • **Substantive knowledge:** Each lesson will then move onto a fifteen minute discussion-based session, which will include some parts of the unit PowerPoint presentation (either to recap and recall or as new learning), plus a class discussion activity based on a question or visual stimulus such as Explorify activities or the Primary Science Teaching Trust Pictures for Talk, Odd one Out or Big Questions stimulus; or teacher model. All pupils will be expected to contribute using teaching methods based on collaborative learning and methods such as cold questions. • **Disciplinary knowledge:** The lesson will then move onto an 'enquiry' session of approximately twenty-five minutes, looking at teaching the disciplinary knowledge in this unit based on the 'I do, we do, you do' principles to encourage pupils to be confident and independent scientists. For this unit, the practical work will focus around the following TAPS focused assessment of science plans: - Scavenger sort - Bubble snakes - Surprise materials - Bridge testers - Materials hunt - Describing materials

	- Materials for a boat - Magnetic sorting - Sorting materials - Boat recommendation - Recording discussion - Material hunter - Rocket mice explanations • **Recall and retention:** Following the principles of cognitive science and the definition of learning as *knowing more and remembering more*, each lesson will finish with a fifteen minute recall and retention activity. This may take the form of a low-stakes quiz (either computer- or paper-based), a mind-mapping or 'drawing' exercise, a story and discussion, or an internet-based activity.
IMPACT (How we will know if teaching has been successful)	
Assessment	• **Formative assessment:** questioning, discussion and observation will be used throughout teaching. Pupils will also be encouraged to identify 'what a good one looks like' prior to beginning a task. • **Evidence:** evidence of learning will be in the form of work in their science exercise books, photographs and videos where appropriate. Vocabulary and recall and retention work will also be recorded in exercise books to allow pupils and teachers to monitor progress and give feedback of how to improve. • **Feedback:** This will be mainly within lessons and verbal due to the nature of science and evidence that feedback is most useful when it is immediate. Pupils may be given written feedback such as next steps where appropriate and useful. In addition, pupils will receive a coloured stamp in their books at the end of each lesson. A red stamp will indicate that they have worked hard and participated well throughout the lesson and that they have made steps forward in their substantive and disciplinary knowledge for this unit. A green stamp will indicate that they have not participated to their full ability and have not provided enough evidence that their knowledge and/or skills have moved forward.

- **Summative assessment:** This will involve a written unit test (this will be supported where appropriate so that pupil's literacy skills are not a barrier to demonstrating their science knowledge). The TAPS focussed assessment of science used during the 'enquiry' parts of the lessons will also go towards the summative assessment of the unit, as will a small vocabulary test and number or red and green stamps.

- Science levels will be based on all of this evidence and recorded in Pupil Asset. Information will also be passed to the class teacher for use in parents meetings and end of year reports. Working at expected in year 1 would indicate that a pupil has 40-60% of the required substantive and disciplinary knowledge. For year 2, this would be 50-70%. See table below:

Level:	Year 1 (percentage of substantive and disciplinary knowledge acquired)	Year 2 (percentage of substantive and disciplinary knowledge acquired)
Well below	0-20%	0-30%
Below	21-30%	31-40%
Just below	31%-40%	41-50%
Expected	41-60%	51-70%
Just above	61-70%	71-80%
Above	71-80%	81-90%
Well above	81-100%	91-100+%

- If the summative assessment is over more than one unit, the results of all units would be averaged to give the final level on pupil asset.