



Science Curriculum Design

Intent: What are our aspirations for our children in Science?

Through our curriculum design, we aim to equip our children with the skills, confidence and enthusiasm to become excellent scientists. Our lessons provide an immersive experience into the world of science, through investigation, observation and discovery. All children are able to access the learning through our teaching approach and reflect their knowledge through our assessment format. We develop the ethos that anyone can be a scientist, which is underpinned by our Science themed day at the beginning of the year, led by a local scientist. Our curriculum design gives all learners the opportunity to progress through school with the skills and knowledge needed to equip them to become excellent scientists. Our science topics are carefully planned throughout the year to ensure we get the best from the unit at that point in the year. Our big question approach encourages an inquisitive mind as well as determined attitude to discover the answer. Through our well-structured questioning we aim to build a bank of enriching language, which is used throughout the unit. Our goal is to develop deep thinkers with an explorative attitude to science through enriching experiences.

Implementation: How do staff implement our curriculum?

- **Appropriate timing of the teaching of each science unit within the year.**

We carefully plan in key stage teams when we are going to teach each unit throughout the year. These decisions are based upon seasons, **society influences** and the length of the academic terms. For example Plants is often a unit that is covered in the summer term due to the factors needed, furthermore key stage one will often plan a unit in the summer term that gives potential for a trip. Appropriate timing of the units allows the children to obtain the best possible understanding of the topic.

- **Big question approach.**

A big question approach has been developed across all year groups in Science. The big question approach is where a focussed question is created based on the objectives from the National Curriculum to focus the learning of the topic. It helps the children to identify science as an inquisitive subject in which we ask and pose questions to deepen our understanding. This question is then answered at the end of the unit to show what they have learnt. Often children will think of many other questions that link to our big question that they would like to find out. These are then displayed on the board, see appendix 1.

- **Teaching approach.**

Science is taught through a range of teaching approaches to allow all children to access the learning. We teach a range of practical lessons, theory based lessons and exploration lessons.

- **Investigations.**

Investigations are a key part of all science learning and add great value to children's understanding of the topic. We create our own investigation sheets in order to fit our class needs. Children get a clear sense of the process of an investigation through our use of planning, collecting, recording and presenting information.

- **Plenary questions.**

During our planning of the unit teachers will break down the learning of the big question into small steps. Each lesson will often focus on a smaller question linking to the focussed question. Children will have the opportunity to answer the plenary questions at the end of the lesson or as a recap to the start of the next. Their answers are then used to support them in answering the big question.

- **Science skills**

Each year group has a set of five key science skills, see appendix 2. These skills are introduced to the children as important areas of how we learn as scientists. Throughout the year these skills are built upon and often used as focussed objectives for the lessons. The science skills language is differentiated dependent on the year group and what is appropriate for that child's level of understanding.

- **Language learning. Goldilocks words**

We believe it's important to discuss and value the new vocabulary that children may come across during their science learning and therefore we use our Literacy language learning approach 'goldilocks words' to embed this new learning. This approach looks at what the word means, how we may use it in a sentence and actions to remind us of the word. The goldilocks words are then recorded in the back of their science book so that they can be referred to when needed. Children begin to build a bank of important and interesting science words that will support them during further learning.

- **Accessible assessments.**

At the beginning of every unit children are given a cold assessment to identify what they already know. These assessments are used to inform the teachers of what needs to be taught. At the end of the unit children will be assessed by answering the big question through a written piece of work. This may be in the form of an information text, report or letter. As well as the written assessment, the children also complete a similar assessment at the beginning of the unit focussed on short, visual questions. Providing children with two different ways to record their learning allows all types of learners to share what they have learnt.

- **Science day**

At the beginning of the academic year a Science day is planned to enthuse and excite the children about the mystery and wonder of science. A local scientist puts on an interactive hour long assembly showcasing an array of science experiments from, popping, colour changing and dry ice amazement. The rest of the day is spent investigating and conducting their own magical experiments in their classroom as well as exploring famous

scientists. Key stage two have the opportunity to attend workshops with the local scientist who talks them through simple chemical experiments which they conduct themselves. We plan the science day to take place at the beginning of the academic year to inspire the children about the many opportunities science provides. Many photos taken on the day are put on our science boards to remind the children of what a wonderful day they had, see appendix 3.

- **Enriching experiences. Mad science club, in school science club**

It is important to provide children with the chance to have a hands on experience with science and this is done through the clubs we offer. A science club is run in school which is led by teachers during the year, offering hands on experiments, see appendix 4. Mad Science, an outside agency, have come in before and offered science workshops after school for our children. This has included experiences linked to ultraviolet lights, slime and chemical reactions.

- **Tracking assessment grids**

Science assessment grids provide a clear and simple way of recording what progress children have made throughout the unit, see appendix 5. They are formulated from the National Curriculum objectives and are divided in to working towards, working at and greater depth levels. We also reflect on how the unit has gone as a whole and record any findings on our assessment grids to inform our teaching for next year or inform the following teacher.

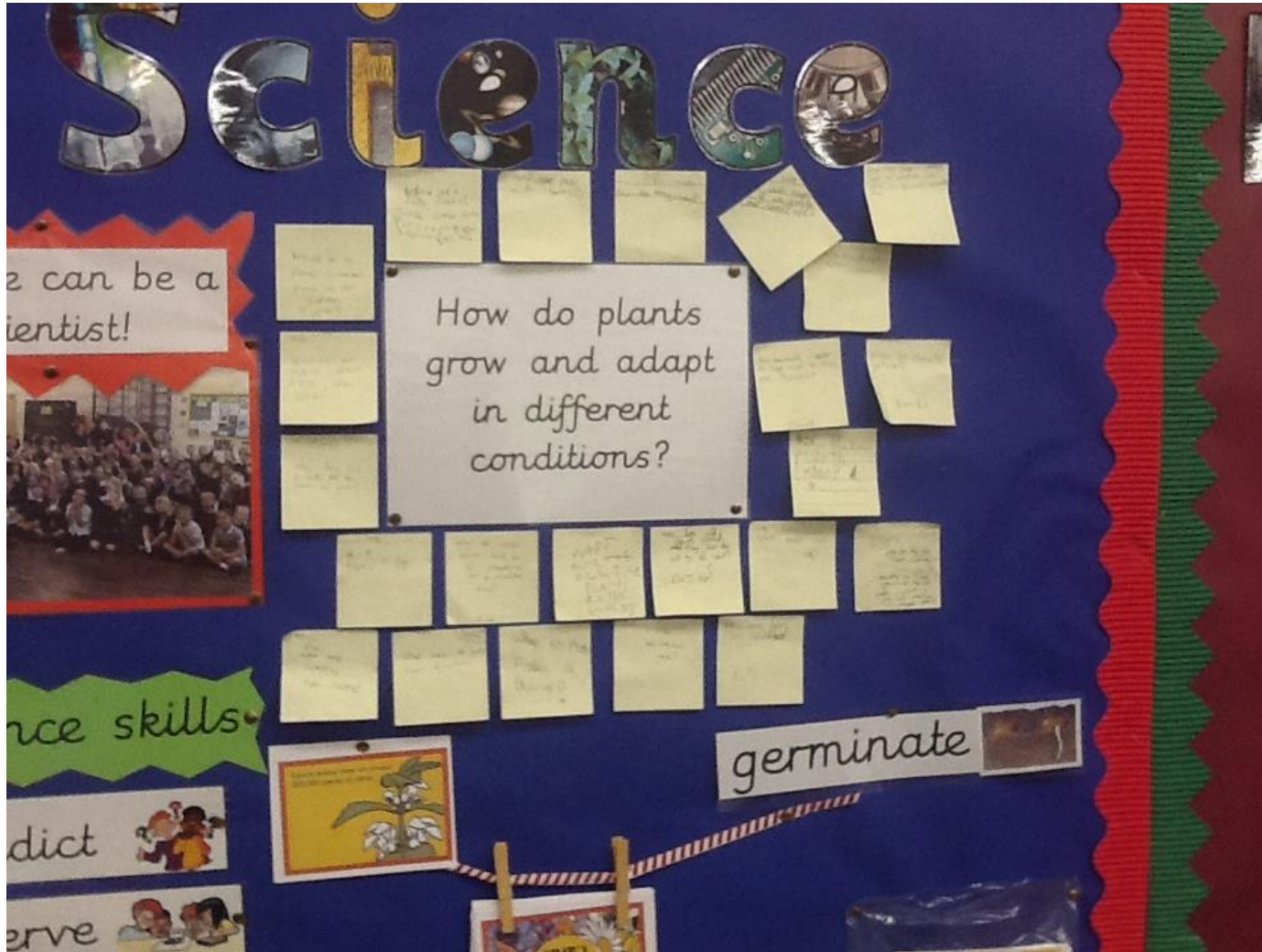
- **Cross-curricular opportunities**

Science is often explored through cross-curricular learning opportunities in all year groups. Key Stage One follow a topic based approach in the afternoon which therefore allows science to be discovered through art activities, computing and even maths. Key Stage Two often find opportunities through cross-curricular writing that helps to develop a depth of understanding about their science topic.

Impact: How has our curriculum made a difference to our children?

- Children have a strong understanding of the science curriculum.
- Children feel confident to use and apply science skills throughout their learning.
- All children are given the opportunity to deepen their understanding through Let's Explore.
- Children begin to use well-structured questions to ask about the topic.
- Children develop an inquisitive attitude towards learning.
- Learning of new language is exposed to all learners.
- Children are provided with an opportunity to see how science is used in the real world.

Appendix 1



Appendix 2



Appendix 3



Appendix 4



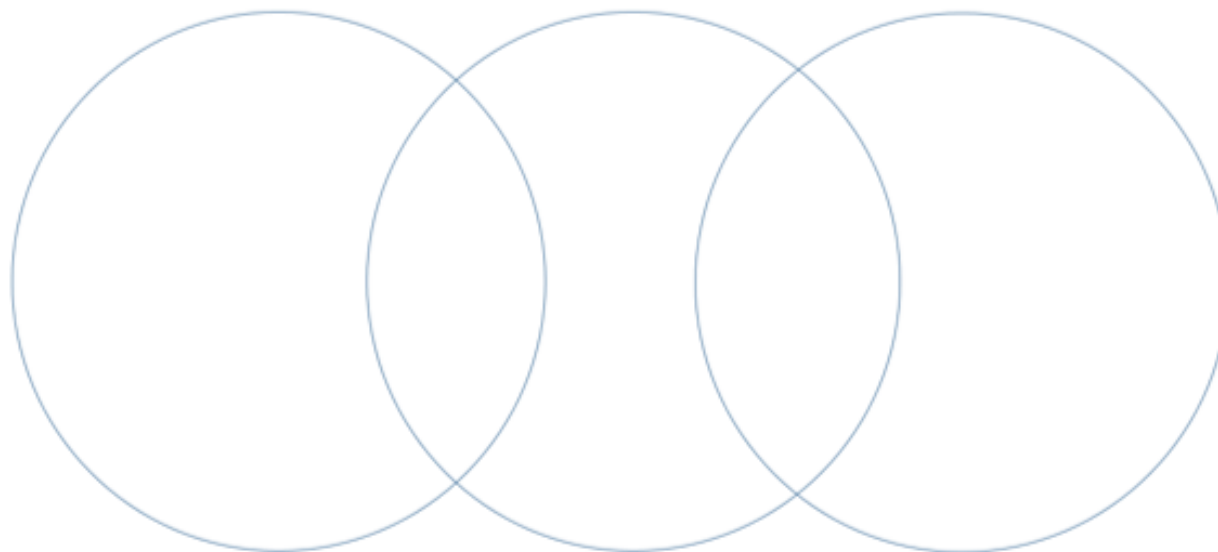
Appendix 5

Key Stage 2 Assessment	Term: Spring 2 2018	Class Name: The Kelpies (Year 3)
Key Question: What is light and what happens to it?		Strand:
Working Towards	Secure	Exceeding
Identify that light is necessary for vision. Identify that mirrors reflect light. Recognise that light from the sun can be dangerous. Recognise that light cannot pass through some objects. Identify that the size of shadows can be changed.	Relate being able to see to the presence of light. Describe how some objectives reflect light. Describe how and why our eyes should be protected from sunlight. Explain how shadows are made. Describe how to change the size of a shadow.	Recognise that vision involves light travelling to the eyes. Recognise that some surfaces are better at reflecting light than others. Explain why sunlight can be dangerous and how types of protection works. Suggest how light is travelling to form a shadow. Relate position of an object and position of a screen to the size of the shadow.

Working towards

Secure

Exceeding



My findings from the end of unit assessments:
