Stage 1: Introduction

The Farming STEMterprise project will involve children completing a range of cross-curricular tasks in order to grow their own ingredients, develop their own food and non-food products, set up a farm shop business and calculate with money in an engaging, real life context.

Learning Objective:

- To identify and describe the functions of different parts of flowering plants

Stage Overview:

In this stage, the children revise their Year 2 Science learning with an active Vertical Relay starter (concept from Talk-less teaching by Isabella Wallace and Leah Kirkman) and build on this to independently research the functions of the different parts of a flowering plant. Opportunities for practical learning and meaningful Maths are built in when the children grow their own broad bean plants and observe them at regular intervals to complete their bean diaries.

Materials needed:

- Unlabelled flowering plant diagrams (one for each group)
- Expert stickers (to assign some children to be stem, root, leaf and flower experts)
- Plant information sheets
- Non-fiction books on plants/ access to the internet
- Broad bean seeds
- Water
- Measuring jugs
- Glass jars
- Kitchen roll
- Bean diary sheets

Presentation notes:

Slide 2-4: Introduce the project	- Introduce the stimulus problem. Explain to the children that during this project, we will be learning how to set up a farm shop business and maybe one day, they could be the entrepreneurs of the future with businesses of their own!! - Give the children five minutes to think of a name for their farm shop business.
Slide 5: Where does our food come from?	- Lead a discussion about where the foods shown on the power point come from and address any misconceptions. - Raspberries grow on thick, thorny bushes and are ready to eat between May and November. - Eggs are laid by chickens. - Wheat grows in big, open fields. The seeds are ground into flour to make

	food like bread and cereals. - Milk comes from dairy cows. - Lettuce is mostly grown outdoors and grows quickly when the weather is warm. - Establish that we can grow some fruit and vegetables ourselves.
Slide 6: Growing crops from seeds	- Ask the children to think of any fruit or vegetables that can be grown from seeds in the UK and consider why all fruit and vegetables cannot be grown here.
Slide 7: Growing crops from seeds	- Share the list of fruit and vegetables and see how many the children were able to name independently. - Explain that we cannot grow some fruit, for example coconuts, in the UK because some plants require certain conditions that we don't have in the UK in order to grow e.g. a tropical climate or a certain type of soil.
Slide 8: Seasonality	- Introduce seasonality and explain that different fruit and vegetables grow and can be harvested at different times of the year. - Eating foods when they are in season means that we can support British farmers and growers by buying their produce. - If we want to buy food that is not in season in Britain, it has to be imported from other countries. The further our food travels, the more of a negative impact it has on the environment.
Slide 9: Backing British farming	- Display the red tractor logo and ask the children if they know what it means. - Explain that the red tractor logo can be found on a wide range of quality food and drink including meat, vegetables, fruit, milk, cheese, sugar and flour. - The union jack within the logo tells us that the food has come from British farms and every stage of its journey can be traced. Foods that carry the red tractor logo have been produced following rigorous food safety, animal welfare and environmental protection standards.
Slide 10: Learning intention	- Share the learning intention.
Slide 11: Vertical Relay starter	- Display several copies of the unlabelled flowering plant diagrams around the classroom (one for each group). - Divide the children into mixed ability groups of no more than 6 children. - Ask the children to stand in a line in front of their group's diagram. - Explain that when you say go, they will be challenged to label the diagrams with any information they can remember from their Year 2 plant learning as quickly as they can. - Each child is allowed to add one piece of information before passing the pen to the next child (like a relay baton) and then moving to the back of the line. - Explain that this is a race and they are competing with the other teams to be the first the label the whole diagram correctly with as much information as possible. - MRS GREN bonus round: Once the diagrams have been labelled, as a bonus round of the relay activity, ask the children to add anything they can remember about the conditions plants need in order to grow.

Slide 12: Vertical Relay starter	- Take feedback from the Vertical Relay and address any misconceptions. - Share the answers on the power point.
Slide 13: Wonderwall	- Ask the children to write a question about plants that they would like to find out the answer to on a post it note and stick it on the working wall. - You could arrange your working wall in a 'KWL grid' (a column for what the children already know, a column for what they would like to know and a column for what they have learnt which can be built up during each lesson.) The labelled diagrams from the vertical relay could be displayed in the 'Know' column and the questions on post it notes could be placed in the 'What I'd like to know' section.
Slide 14: Becoming a plant expert	- Explain that we are going to find out even more facts and become plant experts to ensure we can look after our crops well and set up successful businesses. - Give the children an expert sticker to wear. This gives them an area to focus on during their research (stems, roots, leaves or flowers). Ensure that there is a mixture of experts on each table. - Ask the children to research their area of expertise using the non-fiction books/ internet. Information sheets are provided for lower ability learners. Ask the children to pick out the key words/ phrases about their area of expertise and make brief notes. - Remind them about how to use highlighters and make notes (i.e. only highlight key words and phrases and notes do not have to be written in full sentences).
Slide 15: Jigsawing	- After 15 minutes of independent research, ask the children to move to sit with other children who researched their area of expertise to form expert groups. Seat lower ability children with more able children. - Allow 10 minutes for the expert groups to share their research findings with each other so that their notes can be expanded. If they have read something that they do not understand, this is a good opportunity to ask their peers if they can explain it. - Finally, send the children back to their original seats and give them five minutes each to use the expert knowledge they have gathered from their research and discussion on their expert table to teach the children on their original tables about their area of expertise. - Encourage the children to listen carefully to their peers' contributions while making notes. - Cross-curricular opportunity: by the end of this section, the children should have gathered enough facts to use to write a non-chronological report in an English lesson.
Slide 16: Practical application	- Explain that we are going to grow our own bean plants from seeds so we can see our plant learning coming to life in the classroom. - Explain that seeds are little packages of life. Inside them is everything needed to make a new plant if they are given the right conditions.
Slide 17: Practical application	- Display the instructions on the power point and complete them, one step at a time, with your class to plant your beans. - Grow 10 extra plants to use in stage 5 of the project.
Slide 18 and 19:	- Revise Y2 learning to discuss what plants need to grow and address any misconceptions from the starter. - Based on this, ask the children to decide where to keep our beans in the classroom.

Slide 20: Vertical relay round 2	- Repeat the vertical relay activity to demonstrate the progress that has been achieved to the children. They should now be able to label all parts of the flowering plant easily.
Slide 21-25: Bean diaries	- As their beans grow, ask the children to complete a regular bean diary using the bean diary sheet. - Children should be encouraged to observe their plants closely and draw detailed, labelled diagrams at each stage. - Model how to measure length accurately and ask the children to record the height of their plants at each stage. - Use the power point to teach the appropriate scientific vocabulary to use to label and describe their diagrams as they need it.
Slide 26: Time-lapse	- Once the bean diaries are complete, share the video clip to show the children the amazing process that their plants have been through. - https://www.youtube.com/watch?v=w77zPAtVTuI - Alternatively, you could use the iMotion HD Ipad application to record a time lapse of the children's plants growing. Set up the device (connected to power) to take photographs at regular intervals e.g. every hour and then share the video once the beans have grown.

Links to the National Curriculum:

Subject	Topic	Objective
Science	Plants	- Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers - Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant
	Working Scientifically	- Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units and a range of equipment.
Design and Technology	Cooking and nutrition	- Understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed.
Maths	Measurement	- Measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml)