How do nutrients affect plant growth?

Lesson overview:

In this lesson, children explore the requirements of plants for life and growth and are challenged to design a fair test to investigate the effect of fertiliser on plant growth. The importance of soil health in agriculture is explained.

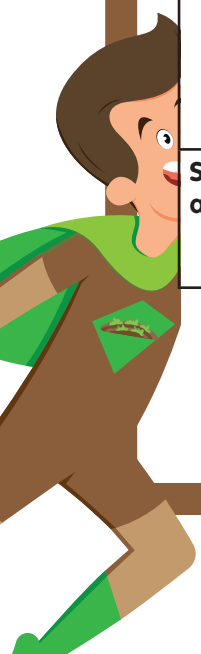
This lesson could be used to start the children thinking about how they might design an idea, invention or innovation that will help farmers continue to care for the environment and be climate superheroes for their Farmvention competition entry.

Equipment needed:

- A selection of vegetable seeds
- Small plant pots (made from a biodegradable material)
- Child safe plant fertiliser

Presentation guidance:

Slide 2: What do plants need?	• Explain that just like humans, plants need some things in order for them to grow and be healthy. • Ask the children if they can remember any things that plants need (water, light, air, correct temperature, nutrients from the soil and room to grow). • Share the Carrot Farm video to demonstrate the conditions needed for carrots to grow in the UK.
Slide 3: Nutrients from soil	• Explain to the children that they are going to be exploring the effect of nutrients on plant growth. • Plants take their nutrients from soil. Ask the children if they know what soil is? What is it made up of?
Slide 4: What is soil?	• Soil is made up of minerals (from broken down rocks), air (containing gases such as carbon dioxide and oxygen), water and organic matter (decaying plants and animals).
Slide 5: Healthy soil	• Farmers have to work hard to ensure that their soils stay healthy and full of plenty of nutrients for their plants. • One of the ways that farmers do this is by applying fertiliser to their soil. Fertiliser puts the nutrients back into the soils that the plants have taken out ready for the next crop. • Fertiliser can be organic (animal waste) or synthetic (man-made). • We are going to use a synthetic fertiliser in our investigation.
Slide 6: Healthy soil and climate change	• Healthy soil also stores carbon. Carbon in the atmosphere causes climate change so by looking after their soil and keeping it healthy, farmers are helping to fight against climate change.



Slide 7: Fair testing	• Share the slide about fair testing and challenge the children to design a fair test that they could use to investigate the effect of nutrients on plant growth. • The investigation could be growing three plants from seeds, giving each one a different number of plant fertiliser pellets and observing any differences in how the plants grow. • The children should choose which variables they measure i.e. some may focus on speed of growth, the plants' heights and or the size of the vegetable that is grown. • Give different groups different seeds to investigate so that you have a range of results within the class.
Slide 8: Observation	• Ask the children to work in groups to set up their investigation. • Remind them to clearly label their plants at the start of the investigation so they know which plant's soil had the most/ least fertiliser. • The children should keep an observation journal and update their table of results regularly.
Slide 9: Conclusion	• Ask the children to study their results and write an explanation of what they found. • In their conclusion, they should explain what this tells them about the effect of nutrients on plant growth. • Ask groups to present their ideas to the rest of the class and write a conclusion about the effect of nutrients on different types of plant. • Why do they think this is important for farmers? Why is this important for helping them to fight climate change?
Slide 10: Evaluation	• Ask the children to think critically about their investigation. Was there anything that was not controlled that could have affected their results? Did they conduct a fair test? How could they improve their investigation if they did it again? How could they make their results more reliable?
Slide 11: Farmventing	• Encourage the children to think about how they could use their learning about what plants need and soil health to help them design an idea, invention or innovation that will help farmers continue to care for the environment and be climate superheroes.

Key Stage 2 Curriculum Links:

Subject	Topic	Objective
Science	Year 3 Plants	• 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
	Year 3 Rocks	• Recognise that soils are made from rocks and organic matter.
	Lower Key Stage 2 Working Scientifically	• Asking relevant questions and using different types of scientific enquiries to answer them • Setting up simple practical enquiries, comparative and fair tests • Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers • Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables • Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions • Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions • Using straightforward scientific evidence to answer questions or to support their findings.