Science & Technology Provision Map - Session 5

Key Descriptions of learning within Progression Step 3:

I can engage with scientific and technological evidence to inform my own opinions.

I can understand how my actions and the actions of others impact on the environment and living things.

I can draw inspiration to design from historical, cultural and other sources.

I can creatively respond to the needs and wants of the user, based on the context and on the information collected.

I can identify and consider factors when developing design proposals.

I can consider how my design proposals will solve problems and how this may affect the environment.

I can use design communication methods to develop and present ideas, and respond to feedback.

The Four Purposes: ambitious, capable learners who:

• Can explain the ideas and concepts they are learning about;

Enterprising, creative contributors who:

• Connect and apply their knowledge and skills to create ideas and products;

Integral Skills: Creativity and innovation:

Science & Technology Statements of What Matters:

- Being curious and searching for answers is essential to understanding and predicting phenomena.

-Design thinking and engineering offer technical and creative ways to meet society's needs and wants.

Key Links to other Statements of What Matters:

Humanities: Enquiry, exploration and investigation inspire curiosity about the world, its past, present and future.

Our natural world is diverse and dynamic, influenced by processes and human actions.

Expressive Art: Creating combines skills and knowledge, drawing on the senses, inspiration and imagination.

Literacy: I can listen to and respond to others with questions and comments which focus on reasons, implications and next steps.

I can express issues and ideas clearly using area of learning and experience/discipline-specific vocabulary and examples.

I can listen to others' ideas/presentations, and understand that they may have a different perspective to my own, in order to respond appropriately.

I can use techniques to remember the main points of presentations, e.g. make notes, summarising, reviewing.

I can listen in order to show agreement and disagreement in collaborative discussion and situations

Numeracy: Financial Literacy: I can make comparisons between prices and understand which is best value for money

Digital Competence:

Producing - I can adjust keywords and search techniques to find relevant information.

Producing:I can use software tools to enhance the outcomes for specific audiences.

Creating Digital Content: I can use a range of software to select, produce and edit a range of multimedia components for a purpose, such as: Text/images, presentation

Collaboration: I can work with others to create an online collaborative project for a specific purpose, sharing and appropriately setting permissions for other group members

WMS1 & Explaining their thinking either verbally or in written form: Pupils will explain meaning verbally during presentations in the Dragon's Den session. In preparation for this, they will have made notes in a written form.

Prior Learning: Pupils have completed a unit of work thinking about and comparing Wales and South Africa. This will be the last lesson in the unit.

Inquiry Type(s): Research

Problem Solving

Common Misconceptions: Food comes in a tin / bag. Some children are unaware of the journey their food goes on to their plate.

Inquiry Question(s) / Big Idea: Sustainable Farming and Farming in the Future

Practical Learning Opportunities…. Exploration and experience of the world through inquiry, including fieldwork, investigating environments indoors and outdoors in a safe and systematic way:

Introduction to sustainable farming by a trip to Xplore Science Discovery Centre, Wrexham.

Watch BBC Link.

Research sustainable farming in Wales and South Africa.

Introduce the question just because we can, should we with BBC link to robotic/AI tractors.

Work in groups to design a futuristic tractor incorporating AI technology. Pupils will create an advertisement and present in front of the class in a dragons' Den' style pitch. The tractor should aim to solve some of the issues farmers are currently facing. Provide pupils with a template of the pitch if needed.
After presentations, provide constructive feedback to each group, highlighting strengths and areas for improvement.

Relate learning to new relevant, real world context / Local Links:

Guest Speaker: Invite a local farmer or agricultural expert to talk to the class about sustainable farming.

Gareth Wyn Jones from Penmaenmawr zoom chat

Trip to Xplore! Science Centre, Wrexham: Pupils complete a workshop about the future of farming.

Just because we can, does that mean we should? Scientific evidence, ethical implications and impact of science and technology on sustainability and the environment:

AI Tractors in Wales: https://www.bbc.co.uk/news/uk-wales-67414903
https://www.gllm.ac.uk/news/coleg-glynllifon-trialling-robot-tractor

How to develop Science Vocabulary: Sustainability, farming, environment, transport, pollution, greenhouse gases, agriculture, soil health, water conservation, biodiversity, conservation, food security, crop rotation, composting, natural fertilisers, tractors, robots, AI, crop monitoring, AI based crop monitoring, autonomous navigation, smart irrigation, fuel, eco friendly power

Resources: Devices to research, Tinkercad to design, presentations however pupils choose: Adobe Spark, slides, i-movie

https://www.nfu-cymru.org.uk/hot-topics/nfu-education/

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https://www.deeside.com/welsh-government-announce-delay-to-sustainable-farming-scheme/

https://www.foodafactoflife.org.uk/7-11-years/

Why farming matters: https://www.countrysideclassroom.org.uk/resources

Farming fortnight: https://www.countrysideclassroom.org.uk/resources/1774

Be Safe!

- Internet safety

Careers/Work-related Experiences (CWRE) / Developing a range of partnerships and engaging with science and technology professionals and experts (STEM Ambassadors) / comparing past and present (and future):

Research current farmer issues in Wales and South Africa.

How are farmers in Wales making farming Sustainable?

Citizen Science:

Progression: Pupils will begin by researching sustainable farming in Wales and South Africa and discover any issues the farmers there are currently facing. They will work in groups to produce an advertisement in a Dragons Den style pitch. Feedback will be given to pupils on their presentations of their design.

Assessment Opportunities (TAPS?):

Did pupils: Give an introduction to their tractor?

Describe key features and benefits?

Describe how AI technology is used?

Explain why their tractor is innovative and future-ready?

Provide constructive feedback to each group, highlighting strengths and areas for improvement.

Next Steps: Pupils could write a reflection from their presentations, thinking about what they learned from the task and how they think technology will shape the future of farming. Pupils could research a specific AI technology used in agriculture and present their findings to the class. Pupils could think about how other AI technology could help to solve real world problems. End of topic