

Getting started

Map and Fieldwork - Local Area Humanities/Geography/Social Studies	Session 1: Data collection and privacy	Digital Competence Framework	Session 2: Making a map - MATHS Mapping out playground into quadrilaterals, Map Scale
<p>Humanities: Enquiry, Exploration and Investigation</p> <ul style="list-style-type: none"> Participate in enquiries. Use appropriate methods to gather information related to my enquiries and interpret the info obtained in the context of the enquiry question. <p>Humanities: Natural World</p> <ul style="list-style-type: none"> Locate and give simple explanations for the distinctive features of places, spaces and landforms in my locality and in Wales, as well as in the wider world. 	<p>Science and Technology: Computing</p> <ul style="list-style-type: none"> Explain the importance of securing the technology I use and protecting the integrity of my data. Explain how my data is used by services, which can help me make more informed decisions when using technology. Explain how data is stored and processed. <p>Health and Well-being: Making Decisions</p> <ul style="list-style-type: none"> Identify and assess risks, and I take steps to reduce them. Recognise that my decisions can have impact now/in the future. 	<ul style="list-style-type: none"> Describe strategies for creating /keeping passwords private. Give reasons why someone should only share information with people they choose to and can trust. Explain that if they are not sure or feel pressured then they should tell a trusted adult. Describe how connected devices can collect and share anyone's information with others. 	<p>Maths: Geometry and Measurement</p> <ul style="list-style-type: none"> Explore and consolidate my understanding of the properties of two-dimensional shapes to include the number of sides and symmetry.

Comparing surface temperatures

Map and Fieldwork - Local Area Humanities/Geography/Social Studies	Design/make/evaluate product to solve a problem Design and Technology/ Science and Technology - Problem Solving	Session 1: Introduction Decide on 4 playground locations to take readings	Session 3: Fieldwork Each group goes to each location in order above and takes repeated temperature readings 60 seconds apart until they get 3 the same	Session 4: Data analysis Collate and analyse the data collected. Calculate average temperature for each location. OPTIONAL EXTENSION: use data to make graphs
<p>Humanities: Enquiry, Exploration & Investigation</p> <ul style="list-style-type: none"> I have had opportunities to participate in enquiries. Use appropriate methods to gather information related to my enquiries and I am able to interpret info obtained in context of the enquiry question. 	<p>Science and Technology: Design Thinking and Engineering</p> <ul style="list-style-type: none"> Use design thinking to test/refine design decisions. Combine component parts, materials and processes to achieve functionality apply my knowledge and skills when making design decisions to produce specific outcomes. 	<p>Session 1: Introduction</p> <p>Decide on 4 playground locations to take readings</p> <ul style="list-style-type: none"> on natural surface in shade/sunlight on synthetic surface in shade/sunlight <p>Science and Technology: Matter</p> <ul style="list-style-type: none"> Recognise that changes in materials affect their properties and uses under different conditions. <p>Science and Technology: Forces and Energy</p> <ul style="list-style-type: none"> Explain how the properties of sound and light will affect how they are experienced. Explain that energy can be transferred <p>Science and Technology: Being Curious</p> <ul style="list-style-type: none"> Identify questions that can be investigated scientifically, suggest suitable inquiry methods. 	<p>Session 3: Fieldwork</p> <p>Each group goes to each location in order above and takes repeated temperature readings 60 seconds apart until they get 3 the same</p> <p>Science and Technology: Being Curious</p> <ul style="list-style-type: none"> Suggest suitable methods of inquiry. Evaluate methods to suggest improvements. 	<p>Session 4: Data analysis</p> <p>Collate and analyse the data collected. Calculate average temperature for each location. OPTIONAL EXTENSION: use data to make graphs</p> <p>Maths: Statistics</p> <ul style="list-style-type: none"> Represent information by creating a variety of appropriate charts, including tally charts, frequency tables, bar/line graphs. Find and use mean of a simple set of data. <p>Science and Technology: Computation</p> <ul style="list-style-type: none"> Effectively store/manipulate data to produce and give a visual form to useful information. <p>Science and Technology: Being Curious</p> <ul style="list-style-type: none"> Suggest conclusions as a result of inquiries.

Session 3: Optional coding

Writing a program for the micro:bit - introduce how code works / optional coding session - teacher to model how to use the code

Digital Competence: Data and Computational Thinking

- Create and refine algorithms and flowcharts to solve problems, making use of features such as loops, Boolean values and formulae.
- Understand the importance of the order of statements within algorithms.

Science and Tech: Computation

- Explain and debug algorithms.
- Use sensors and actuators in systems that gather and process data about the systems' environment.

Investigating biodiversity

Map/Fieldwork - Local Area Humanities/Geography/Social Studies	Design/make/evaluate product to solve a problem Design and Technology/Technology/Science and Technology Problem Solving	Session 1: Introduction - SCIENCE Recap classification of living things knowledge. Explain how to identify and log different plant and animal species	Session 2: Fieldwork SCIENCE Capture data on different species of plants and animals outdoors using the micro:bit - not just playground as this data is not submitted to ONS	Session 4: Data analysis Collate and analyse data collected. Calculate average number of plant/animal species recorded. OPTIONAL EXTENSION: display data in different ways
<p>Humanities: Enquiry, Exploration and Investigation</p> <ul style="list-style-type: none"> Participate in enquiries. Use appropriate methods to gather information related to my enquiries and I am able to interpret info obtained in context of the enquiry question. 	<p>Science and Technology: Design Thinking/Engineering</p> <ul style="list-style-type: none"> Use design thinking to test/refine design decisions. Combine component parts, materials and processes to achieve functionality. Apply my knowledge and skills when making design decisions to produce specific outcomes. 	<p>Science and Technology: World Around Us</p> <ul style="list-style-type: none"> Describe the features of organisms. <p>Science and Tech: Being Curious</p> <ul style="list-style-type: none"> Identify questions that can be investigated scientifically and suggest suitable methods of inquiry. 	<p>Science and Technology: World Around Us</p> <ul style="list-style-type: none"> Describe the features of organisms. <p>Science and Tech: Being Curious</p> <ul style="list-style-type: none"> Identify questions that can be investigated scientifically and suggest suitable methods of inquiry. Evaluate methods to suggest improvements. 	<p>Session 4: Data analysis</p> <p>Collate and analyse data collected. Calculate average number of plant/animal species recorded. OPTIONAL EXTENSION: display data in different ways</p> <p>Maths: Statistics</p> <ul style="list-style-type: none"> Represent information by creating variety of appropriate charts of increasing complexity, including tally charts, frequency tables, bar/line graphs. Find and use the mean of a simple set of data. Recognise how anomalies affect the mean. <p>Science and Technology: Computation</p> <ul style="list-style-type: none"> Effectively store and manipulate data to produce and give a visual form to useful information. <p>Science and Technology: Being Curious</p> <ul style="list-style-type: none"> Suggest conclusions as a result of inquiries.
<p>Session 3: Optional coding:</p> <p>Writing a program for the micro:bit - introduce how code works / optional coding session - teacher to model how to use the code</p>				

Digital Competence: Data and Computational Thinking

- Create and refine algorithms and flowcharts to solve problems, making use of features such as loops, Boolean values and formulae.
- Understand the importance of the order of statements within algorithms.

Science and Tech: Computation

- Explain and debug algorithms.
- Use sensors and actuators in systems that gather and process data about the systems' environment.

Measuring area

Map and Fieldwork - Local Area Humanities/Geography/Social Studies/	Design/make/evaluate product to solve a problem Design Technology/Technology/ Science and Technology Problem Solving	Session 1: Introduction - MATHS Mapping out playground into quadrilaterals	Session 3: Fieldwork - MATHS Take a micro:bit distance measurement as they 'march' 10m, use micro:bits to measure playground	Session 4: Data analysis - MATHS Calculate area using a calculator (convert to m, find area of each shape, find total area, get class average) <i>OPTIONAL: calculate ratio of natural: synthetic space</i>
Humanities: Enquiry, exploration, investigation <ul style="list-style-type: none"> Participate in enquiries. Use appropriate methods to gather information related to enquiries. Interpret the info obtained. 	Science and Technology: design thinking/ engineering <ul style="list-style-type: none"> Use design thinking to test/refine design decisions Combine component parts, materials and processes to achieve functionality. Apply my knowledge and skills when making design decisions in order to produce specific outcomes. 	Maths: geometry and measurement <ul style="list-style-type: none"> Explore and consolidate my understanding of the properties of two-dimensional shapes to include the number of sides and symmetry. 	Maths: geometry and measurement <ul style="list-style-type: none"> Estimate and measure length using appropriate standard units. Convert between standard units, including applying my understanding of place value to convert between metric units. 	Maths: geometry and measurement <ul style="list-style-type: none"> Use efficient methods for finding the perimeter and area of two-dimensional shapes. Maths: algebra <ul style="list-style-type: none"> Model problems, using expressions and equations with symbols/words to represent unknown values.
Session 2: Optional coding: Writing a program for the micro:bit – introduce how code works / optional coding session – teacher to model how to use the code				
Digital Competence: Data and Computational Thinking <ul style="list-style-type: none"> Create and refine algorithms and flowcharts to solve problems, making use of features such as loops, Boolean values and formulae. Understand the importance of the order of statements within algorithms. 		Science and Technology: Computation <ul style="list-style-type: none"> Explain and debug algorithms. Use sensors and actuators in systems that gather and process data about the systems' environment. 		

Tracking our physical activity

Map/Fieldwork - Local Area Humanities/Geography/Social Studies	Design/make/evaluate product to solve a problem Design Technology/Technology/ Science and Technology Problem Solving	Session 1: Introduction Activity tracker and accelerometer. Machine Learning mode, logging movement Data privacy	Session 3: Fieldwork Discuss importance of balanced healthy lifestyle. Logging physical activity at break/lunchtime. Wearing micro:bit with activity tracker program loaded	Session 3: Data analysis Submitting data to ONS, discussing data privacy and consent for data collection. Reading line graph activity over time and identifying different activities from the shape of the graph
Humanities: Enquiry, Exploration and Investigation <ul style="list-style-type: none"> Participate in enquiries. Use appropriate methods to gather information related to my enquiries and I am able to interpret info obtained in context of the enquiry. 	Science and Technology: Design Thinking and Engineering <ul style="list-style-type: none"> Use design thinking to test/refine design decisions. Combine component parts, materials and processes to achieve functionality. 	Science and Technology: Computation <ul style="list-style-type: none"> Explain the importance of securing the technology I use and protecting the integrity of my data. Explain how my data is used by services, which can help me make more informed decisions when using technology. Describe the impacts of science and technology, past and present, in my everyday life. 	Science and Technology: Computation <ul style="list-style-type: none"> Begin to explain the importance of accurate and reliable data to ensure a desired outcome. Use sensors and actuators in systems that gather and process data about the systems' environment. 	Health and Well-being: Making Decisions <ul style="list-style-type: none"> Identify/assess risks, take steps to reduce them. Maths: Statistics <ul style="list-style-type: none"> Extract and interpret information from a range of diagrams, tables and graphs. Science and Technology: Computation <ul style="list-style-type: none"> Effectively store and manipulate data to give a visual form to useful information. Engage with scientific and technological evidence to inform my own opinions. Science and Technology: Being Curious <ul style="list-style-type: none"> Suggest conclusions as a result of enquiries.
Session 2: Transferring code: Transferring code onto the micro:bit, checking batteries – teacher to explain how it works <i>Note: in these activities pupils will be working with pre-existing algorithms rather than writing code</i>				
Digital Competence: Data and Computational Thinking <ul style="list-style-type: none"> Refine algorithms and flowcharts to solve problems Understand the importance of the order of statements within algorithms. 		Science and Technology: Computation <ul style="list-style-type: none"> Explain algorithms. Use sensors and actuators in systems that gather and process data about the systems' environment. 		

Exploring machine learning

Map/Fieldwork - Local Area Humanities/Geography/Social Studies	Design/make/evaluate product to solve a problem Design Technology/Technology/ Science and Technology Problem Solving	Session 1: Introduction Discuss importance of data Data collection/privacy	Session 2: Training a machine learning model Use micro:bit to provide data samples of physical movements to train online machine learning tool. Use graphs from model to check and test model, Identify gaps, add more data to fill any gaps	Session 3: Discussion Consolidate the idea that a program needs useful accurate data to be useful/accurate. Importance of identifying gaps in data. Inclusion - improving the model
Humanities: Enquiry, exploration, investigation <ul style="list-style-type: none"> Participate in enquiries. Use appropriate methods to gather information related to my enquiries and I am able to interpret info obtained in context of the enquiry. 	Science and technology: design thinking/engineering <ul style="list-style-type: none"> Use design thinking to test/refine decisions. Combine component parts, materials and processes to achieve functionality. Apply my knowledge and skills when making design decisions to produce specific outcomes. 	Health and Well-being: making decisions <ul style="list-style-type: none"> Identify and assess risks, and I can take steps to reduce them. 	Science and technology: being curious <ul style="list-style-type: none"> Identify questions that can be investigated scientifically, suggest suitable inquiry methods. Evaluate methods to suggest improvements. Maths: statistics <ul style="list-style-type: none"> Collect different types of data to answer a variety of questions, demonstrating an understanding of the importance of collecting relevant data. Extract and interpret information from range of diagrams, tables/graphs and recognise trends. 	Science and technology: being curious <ul style="list-style-type: none"> Suggest conclusions as a result of enquiries. Science and technology: computation <ul style="list-style-type: none"> Begin to explain importance of accurate and reliable data to ensure a desired outcome. Health and Well-being: relationships <ul style="list-style-type: none"> I respect the rights of others and I understand how these impact on myself and others.