Loti-Bot Across the Curriculum

Get the most out of your Loti-Bot robots by using them to support learning across the curriculum. An exciting way to use coding and computational thinking in different situations.

This collection of lessons showcases just a few of the ways that you can use Loti-Bot across the curriculum, but as you explore with the children, you will be sure to discover many other options too. Students will enjoy Loti-Bot supporting them with learning in other subjects whilst using and applying their computing skills. For instance, Loti-Bot has accurate drawing capabilities and so is an ideal assistant for exploring shape in maths or patterns in art.

Use the computer lessons with Loti-Bot first to become confident with the robot and then practise the skills learnt by using Loti-Bot in other curriculum areas through activities such as these suggestions.

This unit has been written with the skills of students **aged 8-11** in mind but can easily be adapted for younger or less confident students or for those who are older or more experienced. Within the plans, there are also suggestions to make each lesson 'more accessible' or to 'add a challenge' if you wish with your own class.

Resourcing

- For each activity, it would be ideal to have at least one Loti-Bot per group of children. However, if this is not always possible, groups can view their output via the app so can practise before testing on a Loti-Bot when one becomes available.
- You will need tablets with the Loti-Bot app installed.
- To model the coding and to show students what the app can do, it is best if you can mirror your tablet to the Interactive Whiteboard, either directly or via a web extension. If not, you can show the tablet under a visualiser or simply go round the groups to demonstrate.

Guess the Shape

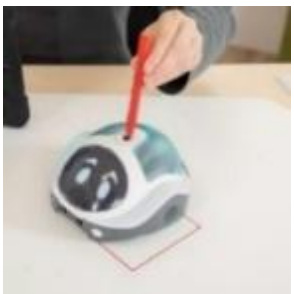
Use Loti-Bot to support mathematical learning about the properties of different 2D shapes.

This lesson can be simplified and taught in one session or could be taught over several lessons depending on the children's prior knowledge and skill level.

Skills and Learning	**Resources**
Students will: - Identify and describe the properties of different 2D shapes including sides and angles. - Draw a range of 2D shapes by programming Loti-Bot.	- Loti-Bot (ideally one robot for every 3 to 4 pupils) - Tablet(s) with Loti-Bot app installed - Berol fine line pens - Large paper - Various 2D shapes for children to look at - Guess the shape algorithms (sample code for drawing different shapes)

Key Vocabulary and Questions	**Assessment Opportunities**
names of different 2D shapes, sides (e.g. triangle, square, pentagon), corners (vertices), angles, right angle, horizontal, vertical, diagonal, parallel and perpendicular lines, quadrilaterals. - Can you name different types of 2D shapes? - Can you identify the shape drawn? How do you know? - What are the key properties of the shapes?	- Assess children's knowledge of 2D shapes as they program Loti-Bot to draw them. - Can children use mathematical language when coding and/or describing the shapes? - Ask students to classify and compare the shapes drawn.

Introduce	Explain that today we are going to be learning about 2D shapes and their properties using Loti-Bot. To begin, have a class discussion about the following: - **What is a 2D shape?** - **What 2D shapes can you name?** - **Can you name the properties of any of these 2D shapes?** Before introducing Loti-Bot, play a quick game in which children are asked to identify and describe different 2D shapes. For example, 'Call the Shape Shop,' where the caller gives clues for the shape they want, and the shopkeeper guesses the shape using their knowledge of the properties to find it in their shop.

Learn and Explore	**Loti-Bot** Introduce Loti-Bot - our robotic shape assistant for today. Explain to the children that using their shape knowledge and the capability of Loti-Bot's pen holder, they will program the robot to draw 2D shapes. Ask the children if they can think of what Loti-Bot needs to draw a shape. - *An **algorithm** (set of instructions).* Discuss algorithms and how they are used to guide a robot's movements. How can we apply this to drawing a shape with Loti-Bot? **Time to Explore** Look at some 2D shapes. Start with simple shapes such as a square, triangle, or rectangle. Ask children to work in small groups and write down the properties of each of the shapes selected, such as: - Number of sides and corners - Length of sides - Angles of the corners **Guess the Shape** Explain to the children that we have a selection of ready-made prompt cards for algorithms to create shapes but unfortunately, the names of the shapes on the prompt cards have been missed off/mixed up. Can the children review the code, add the commands onto the Loti-Bot app and predict what shape is going to be drawn from Loti-Bots movements? Ask the children to explain their reasoning using their knowledge of the properties of shapes using mathematical language. **Programming Shapes** Next, children will use the properties of shapes they identified previously to plan the steps needed for Loti-Bot to be able to draw each shape. Start by modelling a square with the whole class. What angles will we be programming into Loti-Bot? *90°/right angles*. You could include loops for your algorithm.  Begin with simple shapes and for those ready for the next step, challenge them with programming different quadrilaterals or triangles of various sizes e.g. an equilateral triangle requires 60° angles.

	Debugging Children will need to check and 'debug' their algorithm for any errors. For example, if they have programmed Loti-Bot to turn the wrong way. If time (or more practise is needed), provide children with pre-written algorithms containing bugs (errors) e.g. missing steps, wrong directions. Can the children use their knowledge of shape to identify and correct the errors collaboratively. Once debugged, check the corrected algorithms to see if Loti-Bot now draws the shapes accurately.

Make it accessible	Add a challenge
Use prompt cards with pre-written codes to support pupils in drawing shapes before identifying them. Start with simple regular shapes such as squares and rectangles.	Challenge pupils to create their own algorithms for different and more complex 2D shapes. They may want to move on to explore increasing length of sides, etc. Encourage creativity and experimentation.

Review and Reflect	**Gather the class together and discuss their experiences with the Loti-Bot:** - What have we learned today about shapes? - How has Loti-Bot helped you with your mathematics learning? **Ask the children to use their knowledge to discuss the following:** - Can you draw a circle with Loti-Bot? - Discuss how easy it would be. - Would it be accurate and match the properties of a circle? Explain your answer.

Loti-Bot at the Olympics

Take Loti-Bot to the Olympic Games to learn about different sporting events, angles and movement.

Skills and Learning	Resources
Students will: - Identify right, acute and obtuse angles in different sport poses. - Order angles and begin to use a protractor to measure angles in degrees. - Use directional language and knowledge of angles to move and turn Loti-Bot.	- Loti-Bot robots - Tablet(s) with Loti-Bot app - Berol fine line pens - Large paper - Protractor - Olympic events pictures - PE equipment

Key Vocabulary and Questions	Assessment Opportunities
angles, degrees, right-angles, acute, obtuse, Olympics, sporting event names (such as javelin, long jump, etc.) - Is the angle bigger or smaller than a right-angle? -What angle is being shown in this picture? -Can you demonstrate these angles physically using your body?	-Assess children's understanding of angles and angle measurements.

Introduce	In today's session we will be learning about angles and how angles are important when playing sports. Loti-Bot will be helping us! Ask children: - Can you think of examples of when angles are important? *For example, what would happen if we threw a Javelin with our hand angled towards the floor?* Discuss angles in real situations like in PE. Use pictures of athletes in the Olympic Games and explore the angles and positions of arms and legs. Introduce key terms- right-angles, acute, obtuse.

Learn and Explore	**Learning about Angles and Using a Protractor** Look at examples of different angles and discuss how they are measured in degrees. Demonstrate how to use a protractor to measure angles. Practise measuring angles. Identify angles that are less than or greater than a right-angle (acute or obtuse). **Learn about Loti-Bot and the App** Using the Loti-Bot App, model and teach students how to program specific angles e.g. 90°, 45°, 180° and then allow them to explore with creating programs for other angles. Think about: which sports in the Olympic games would these angles be the best for. Children should use a protractor to measure and check the angles and identify whether they are right-angles, acute, or obtuse angles. **Time to Explore** Set up an Olympic Loti-Bot course which children will navigate Loti-Bot around. Depending on the children's stage in their learning, this could be a simple track with different angles to follow or a more complex route with additional events to visit. Program Loti-Bot to move around the Olympic Course and participate in the events. Children will need to measure the angles correctly with a protractor to program Loti-Bot. Loti-Bot also has customisable speeds using Level 2 of the App. You can choose slow, medium or fast. Bring in speed and time to your learning and use these different speeds and a stopwatch to time Loti-Bot completing the Olympic Course. **PE Lessons** Take your learning into a PE lesson by exploring different Olympic events such as sprint, hurdles, long jump. Practise these different techniques and take photographs of the movements. Use Loti-Bot to explore the angles in these pictures. Which movements (angles) are the most or least effective for each activity? Why is this?

Make it accessible	Add a challenge
Keep to learning about right-angles and identify right-angles in Olympic pictures/athletic moves. Make a right-angle finder to help.	Use knowledge of angles to name them and work out how many degrees they think they are.

Review and Reflect	How did the children find programming angles with Loti-Bot? Think about real-world scenarios where accurate angle measurements are needed e.g. in construction or navigation.

Getting Creative

Explore artistic approaches with Loti-Bot and use the pen holder to create a one-of-a-kind Loti-Bot masterpiece!

Skills and Learning	Resources
Students will: - Investigate, explore and evaluate different artistic techniques. - Use techniques of pattern, line, shape, form and space and look at work of great artists, architects and designers. - Use Loti-Bot to draw shapes and create patterns.	- Loti-Bot (ideally one robot for every 3 to 4 pupils) - Tablet(s) with Loti-Bot app installed - Berol fine line pens - Large paper - Kandinsky pictures or other artists work that use shapes and lines - Art materials (optional)

Key Vocabulary and Questions	Assessment Opportunities
artwork, creative, line, pattern, position, shape, program -Which techniques are used in the artwork? -Can you identify any shapes, lines or symmetry used in the picture? -Could we create artwork like this by programming Loti-Bot?	-When looking at pieces of work by different artists, can the children identify where they have used lines, shapes or other artistic techniques? -Can the children talk about the effect these techniques have on the work? - Can the children talk about their own piece of art and explain their choices?

Introduce	Gather the class together and ask the following question: - Do you think technology can be used to create art? Consider as part of this discussion the different techniques used by artists such as shapes, line, form, tessellation, reflection, position etc. Can the children think of any artists that use some of these techniques? Share some examples with the children, for example, Kandinsky, Mondrian, Matisse etc. Explain that today, we are going to use programming in a creative way to create our very own piece of art.

Learn and Explore	**Observation** Print out different works of art that include certain techniques such as lines, shapes and symmetry etc for the children to get inspiration and ideas from. Ask the children to think about what they would like to include in their Loti-Bot artwork? **Loti-Bot** Look at Loti-Bot's programming interface. Practise programming Loti-Bot to draw the different things they would like to include in their artwork e.g. lines, different shapes, tessellation and different positions/orientations, symmetry etc. Encourage children to share the programs that are most effective for recreating different techniques. **Time to Explore** Ask children to choose a picture created by one of the artists discussed. Can they use their programming skills they have just practised to have a go at recreating elements of it? Have mini discussions throughout to discuss and reflect on their findings. Encourage children to annotate their work discussing their thoughts and feelings. **Getting Creative** After the children have practised recreating one of the pictures (or sections of it), they will now work on planning and then creating their very own Loti-Bot masterpiece. This could be done in pairs or small groups. They may need to break down the challenge into smaller chunks to help. As a next step from this lesson, children could then experiment with colour and shading within their design.

Make it accessible	Add a challenge
- Work in groups so that individuals can support one another. Some children could control the app while others plan the movement. - Give pre-made prompt cards for the programming of shapes that children can combine for their masterpiece.	Children may wish to extend their programming to include more complex programs for patterns and shapes.

Review and Reflect	Give children time to reflect and evaluate on their artwork and that of others too, for example: - How does the art make you feel? - What do you like about the art? - Which artist inspired you and why? How did you use this inspiration when creating your piece of artwork? - What have you learnt about creativity? Can technology be creative?

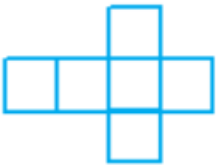
Package It Up

Explore the nets of different 3D shapes and use Loti-Bot to create the packaging for your next project!

Skills and Learning	Resources
Students will: - Recognise, describe and build 3D shapes including making nets. - Design and plan different packaging by creating the correct 3D shape net using Loti-Bot.	- Loti-Bot (ideally one robot for every 3 to 4 pupils) - Tablet(s) with Loti-Bot app - Berol fine line pens and large paper - 3D shapes or 3D shape mat. - Range of different packages - 3D shape nets

Key Vocabulary and Questions	Assessment Opportunities
Names of 3D shapes, faces, edges, vertices, nets. -Can you identify how many faces, edges and vertices there are in these 3D shapes? - Which shape will this net make? - Would the object fit into the packaging?	-Observe and review pupil's ability to create 3D shapes and nets before turning them into packaging.

Introduce	Explain that today we are exploring nets and 3D shapes using Loti-Bot, our robotic shape and packaging assistant. **What are 3D Shapes? What features do 3D shapes have?** Look at a selection of 3D shapes (this could be on the 3D shape mat). - What is the shape called? - Can you describe the properties of the shape (number of edges, faces, vertices, and types of angles each shape has). **How do we use nets to create 3D shapes?** Begin by revealing a box of parcels you might receive on a special occasion. Use the packages and 3D shape mat to talk about what the nets might look like. What 2D shapes do you think will be included in the nets?

Learn and Explore	**Exploring Shape Nets** Explore nets of 3D shapes by deconstructing different packages e.g. cereal boxes etc to find the net. Use paper cut outs of different nets and discuss how each one corresponds to a specific 3D shape. Demonstrate how to fold the nets to recreate the 3D shapes. In groups, pupils work together to match nets with the shapes or vice versa. **Programming Loti-Bot** Demonstrate how to program Loti-Bot to move along the edges of a net, start with a cube. Insert a pen into Loti-Bot's pen holder and use the App to program the robot to draw a shape net for a cube.  Once Loti-Bot has drawn the net, ask the children to cut it out to create the cube. Does it fold correctly? If not and if there are any errors, look back and debug the program before testing again. **Time to Explore** Consider - do presents always come in square boxes or do they come in different sizes and shapes? Why is this? You could talk about size of object, design features to catch attention or sustainability (not wasting materials). Review the different nets for a range of 3D shapes. Set children a challenge to plan and create a new shape of packaging by programming Loti-Bot. Again, they will need to check – does it fold to make their intended 3D shape? If not, can they debug their program?

Make it accessible	Add a challenge
Use 3D shape nets and allow the children to build the shapes first so that they can see how they make up the shapes. Use these as templates to help program Loti-Bot.	Try making nets to make other 3D shapes such as pyramids, triangular prisms.

Review and Reflect	Gather the class together and reflect on what they have learnt. - Which 3D shape was the easiest net to create and why? Look at 3D shapes all around us, in buildings, packages in supermarkets, around the classroom. Think about how these objects would look in nets.

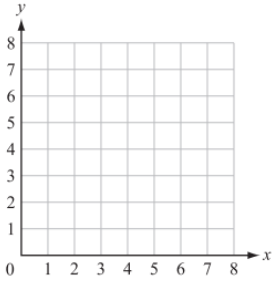
Loti-Bot's Great Adventure

Learn about coordinates and maps by navigating Loti-Bot on a worldwide adventure.

Skills and Learning	Resources
Students will: - Identify, describe and represent the position of a shape using coordinates on two/four quandrants grid. - Plot coordinates correctly on a grid. - Locate world countries on a world map. - Program Loti-Bot on a grid using coordinates.	- Loti-Bot (ideally one robot for every 3 to 4 pupils) - Tablet(s) with Loti-Bot app - Berol fine line pens - Large paper - Compass - World map (with coordinates) - Blank grid mat

Key Vocabulary and Questions	Assessment Opportunities
co-ordinates, X and Y axis, maps, grid references, physical and human features, landmarks, directional vocabulary. - Can you find the coordinates of point X on the grid? - Program Loti-Bot to move to (3,2) What is on this square?	-Review children's ability to plot and later translate coordinates using Loti-Bot.

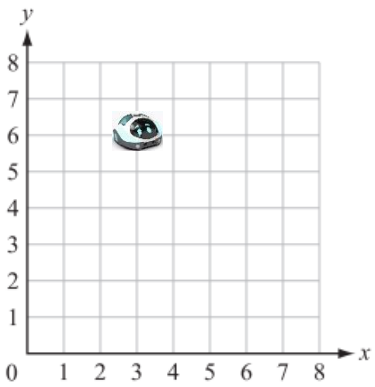
Introduce	Gather the class together and discuss how coordinates are used in navigation, maps and games. Introduce coordinate system - X axis and Y axis. - Have the children ever seen or used coordinates before? Show the children different examples of where co-ordinates are used, such as on maps. Explain that today, Loti-Bot will be helping us to explore and learn about coordinates.

Learn and Explore	**Learn about Coordinates** Show examples of points on a grid e.g. (2,5) Discuss how the X-coordinate represents horizontal movement and Y-coordinate represents vertical movement. The X axis is always read first. A handy way to remember is by learning the phrase, 'Along the X corridor and up the Y stairs!' - *Sometimes the X axis may be letters on a grid as well.* 

Reading Coordinates

Using a small print out picture of Loti-Bot, move Loti around the grid and ask children to identify where the robot is.

- Can they read the coordinates correctly?



You may work as a whole class or set this up in pairs for children to explore and experiment with their own grid.

Loti-Bot

Using a large world map (with a coordinate grid or drawn on), show students how to program Loti-Bot to move to specific coordinates.

- *What country has Loti-Bot arrived at?*

In pairs or a small group, play a game of Treasure Hunter. One person should secretly write down the coordinates for where they plan to hide the treasure on the map.
The other players must program Loti-Bot to move around the grid and stop where they think the treasure is hidden, naming the coordinates when they arrive. If correct, then a shape can be placed on the map and a cross drawn. When they have found the treasure, play again with someone else choosing where to hide the treasure.

World Trip

Using the map, children must choose 3 countries to visit (this can be more or less depending on the stage of learning). They need to write down the coordinates of the different countries and then plan Loti-Bot's journey to travel between each set of coordinates.
For more confident pupils, they could add in additional programmable elements as Loti-Bot travels around the world!

Make it accessible	Add a challenge
Use cards with directional instructions as prompts e.g. left, right, forwards, backwards, to help plan the correct program.	You could extend learning by introducing a four-quadrant coordinate grid.

Review and Reflect	Gather the class together and discuss their experiences – what have you learnt? Assess children's ability by playing a quick game of 'Hunt Loti-Bot'. Choose a location for Loti-Bot on a blank grid (but don't tell the class). Children then take it in turns to come, say a coordinate and place a marker, such as a counter, where they think Loti-Bot is hidden. Continue until someone lands on Loti-Bot!

Time for a Story

Retell stories with Loti-Bot taking a starring role.

Skills and Learning	Resources
Students will: - Use story structure and story language to retell stories. - Expand vocabulary and use repeated phrases. - Program Loti-Bot to sequence stories.	- Loti-Bot (ideally one robot for every 3 to 4 pupils) - Tablet(s) with Loti-Bot app - Berol fine line pens - Large paper - Stories to retell - Fairy Tale Mat (optional)

Key Vocabulary and Questions	Assessment Opportunities
traditional tales, fairy tales, retelling, story language, sequence. -What story is Loti-Bot retelling? -What language shall we use to describe this journey?	- Are children able to retell stories in the correct order and sequence? - Can children use correct vocabulary and interesting word choices? - Do children understand how to program Loti-Bot?

Introduce	Begin by reading a version of a chosen story e.g. The Three Little Pigs, with everyone joining in with the familiar refrains. Tell them that they are going to retell the story today using Loti-Bot and a story mat.

Learn and Explore	**Preparing the Story** Using a very large piece of paper, and following the 3 Little Pigs sequence, plan out a story map together (or use the Fairy Tale Mat if you have one). You can add 3D houses of straw, twigs and bricks along the route and if possible, turn Loti-Bot into the wolf, by adding ears and large teeth or why not create a full outfit shell!

Tell the Story

In groups, children will program 'Wolf' (Loti-Bot) to travel through the story, visiting each of the houses in order. Children should retell the story aloud as Loti-Bot travels around.

Program Loti-Bot to pause (WAIT) in front of each and make 4 turns as you all say the well-known refrains together – "Little pig, little pig, let me come in? Not by the hairs of my chinny chin chin…"

You could then program Loti-Bot to 'blow' the house of straw away pushing it off the mat.

Do the same for the house of twigs. For the final house made of bricks, use a weight or something similar so that Loti-Bot cannot blow it down (push it away) even when they try!

Alternative Ending

As an additional challenge, children could plan and change the ending of the story. Maybe the wolf decides to leave the pigs alone, or another character comes to help. Plan the new story ending and then change the program with Loti-Bot to help retell their new story ending!

Make it accessible	Add a challenge
Make the journey as easy as needed and help with the controls, such as providing physical coding cards to plan the route.	Retell other traditional tales and fairy tales and create story mats for Loti-Bot to be programmed to move around. Children may want to write their own fairy tales, creating the journey for Loti-Bot to tell the story.

Review and Reflect

Each group can share their story with the class as Loti-Bot travels through the story map. Why not record the retellings to create a mini-Loti-Bot Fairytale TV series.

Reflect:
- What worked well?
- How would you improve your story next time?
- What are you most proud of?

Loti-Bot the Archaeologist

Learn about the past by exploring artefacts, pictures and facts with Loti-Bot.

Skills and Learning

Students will:
- Use artefacts to find clues about the past.
- Ask and answer questions about the past.
- Collaborate and work with others.
- Use and apply programming skills for a purpose.
- Share and communicate their learning with others.

Resources

- Loti-Bot (ideally one robot for every 3 to 4 pupils)
- Tablet(s) with Loti-Bot app
- Selection of artefacts, fact cards and pictures of the past linked to a chosen era of history
- (optional) Download TTS free artefact sheets

Key Vocabulary and Questions

archaeologist, artefacts, past, time and topic related vocabulary

-What can we learn about the past?
-What questions can we answer?
-yWhat was it like living in this era?

Assessment Opportunities

- Can children recall facts about the past?
- Can children use what they have learnt about the past to communicate their knowledge by creating a 'learning mat' for others to use.

Introduce

To begin, set up the Loti-Bot area as a historical discovery site with lots of pieces of information for children to find and discover about a chosen time in history that you are studying. This may include a selection of artefacts, pictures of the past, fact cards, etc.

Explain that we are going to use Loti-Bot as our travelling archaeologist today to travel around the historical site and collect information about the era. Loti-Bot will be helping us to find out about the past through observations of the artefacts and through research.

Learn and Explore

Loti-Bot the Archaeologist
Introduce Loti-Bot the archaeologist – children could design a special outfit for Loti-Bot if they wished.

Explain the task - children need to program Loti-Bot to move around the site and to travel to each of the artefacts, pictures and fact cards in turn. They will then look at, research and

collect information about that artefact to help them understand the past. This will include learning about the homes, key events, people, etc. Children should keep a record of all their Loti-Bot discoveries and any questions they have.

Consider questions such as:

- What do you think this item/artefact was used for?
- What does this artefact/picture tell you about the past and how people lived?
- How is this different to our lives now?
- Does this surprise you?

For adventurous programmers, they could add in some additional programmable features, such as Loti-Bot changing colour or making a sound when finding a new artefact.

After they have all conducted their Loti-Bot archaeology research, bring the class back together and share what they have discovered and learnt.

Loti-Bot Learning Mat

As a way to consolidate and showcase their learning, set children the challenge to create their own Loti-Bot learning mat containing images and/or facts about the time period from everything they have learnt. Other children will then be able to navigate Loti-Bot around the mat to investigate and learn about the past.

Once created, they can swap with another group to try out their mat and learn.

(some examples here for Egyptians and Vikings)

Make it accessible	Add a challenge
Limit the number of artefacts and/or amount of information given and use recordable devices to support children with accessing the information.	Add some red herrings and obstacles to the site so that Loti-Bot can be programmed to avoid them.

Review and Reflect	Ask children to share their findings and reflect on what they have learnt: - What was the most interesting thing you learnt about today? - What one fact has most surprised you today? - How did Loti-Bot help you to learn today? - Is there anything else you would like to learn about from this time period? As children learn more about the past through subsequent lessons, they could add information to their mat.

Learning Languages

Learn new words and phrases to use on an adventure around the world with Loti-Bot.

Skills and Learning	Resources
Students will: - Be introduced to other cultures. - Listen and engage with words and phrases in another language, asking and answering simple questions. - Ask and answer questions using a new language. - Program Loti-Bot to explore a world map and practise another language in a fun way.	- Loti-Bot (ideally one robot for every 3 to 4 pupils) - Tablet(s) with Loti-Bot app - World map with 'fact cards' for specific 'destination' countries, such as home language, landmarks, flag facts, capital city, etc. - Language conversation prompt cards for a chosen language

Key Vocabulary and Questions	Assessment Opportunities
Key words from the chosen language such as familiar nouns and adjectives, simple greetings, simple questions and answers. - How do I say hello, goodbye and introduce myself? - What can I say about this country, and its food and landmarks? - What questions and answers can I ask about this destination?	- Can children use key phrases? - Can children introduce themselves in another language?

Introduce	Explain that today we are going to take Loti-Bot on holiday to a new country (your chosen country). While we are there we will learn and practise some key words, phrases and simple questions that we can use. - What languages do you know of that are spoken elsewhere in the world? - Do you speak any other languages? - Have you ever used another language, for example when on holiday or with friends and family?

Learn and Explore	**First Stop** Using a large world map, ask children to locate your chosen country. Recap basic programming skills for using Loti-Bot. Ask children to program Loti-Bot to travel to the chosen country.

	On the world map, place some key vocabulary cards in your chosen language needed for conversations, such as greetings, introducing yourself, saying how you are feeling, expressing simple likes and dislikes and giving and following simple directions to get to the next destination. Spend time practising these key phrases together, in pairs or small groups.  **Explore the World** Give children a list of possible destinations (planned by yourself with each country having a fact card or key information about that country). In pairs or small groups, they must program Loti-Bot to travel to new destinations around the world. When they land on a new country, one partner (or person in the group) will take the 'fact card' and take on the role of the person from that country. Another member of the group will practise the language they are learning by using the new words and phrases to find out one thing about the new country visited. They should also use the greetings to engage in a polite introductory conversation. Repeat this process as children move around the world, practising the new language and collecting facts about where they are visiting. At each destination, children will swap roles as to who is finding out or giving the facts. After visiting all the destinations, ask children to share the facts they have found out about each country. Were there any facts that surprised you the most?

Make it accessible	Add a challenge
Use recordable devices to support children so they can press and listen to a recording of the language and then repeat what has been said.	Children could be given more vocabulary to use within their conversations, or challenge them by asking them to add extra features to their programming, such as lights, sounds, etc.

Review and Reflect	Encourage children to share and reflect on their Loti-Bot journeys. Were they able to use the key words and phrases in each of the destinations they visited? Where was their favourite place on the Loti-Bot adventure?

Feelings and Emotions

Use Loti-Bot to create a dance to music with colours to express feelings and emotions.

Skills and Learning	Resources
Students will: - Recognise and name different feelings and emotions. - Reflect on the impact movement and colour can have on our emotions. - Program Loti-Bot's movement and lights to reflect different emotions.	- Loti-Bot (ideally one robot for every 3 to 4 pupils) - Tablet(s) with Loti-Bot app - Music for children to program Loti to, that can reflect different emotions through tempo, rhythm, etc.

Key Vocabulary and Questions	Assessment Opportunities
Names of emotions and moods and what they mean, such as happy, sad, angry, frightened, etc. -Can you recognise feelings/emotions? -How can music and colour help us to express our feelings and emotions?	-Are students about to recognise and name different emotions? - Are students able to program Loti-Bot with movement and colour to reflect different emotions from music?

Introduce	Explain that today, we are going to be learning about different emotions and considering how colour and music can not only affect our emotions but also help us to express them. - Have you ever used colours to represent your emotions? If so, when and how? - Are there any colours that make you feel particularly happy? Sad? Frightened? Etc. - Are there any types of music or a song that makes you feel a certain way?

Learn and Explore	**Learning about emotions** Create a list of the different emotions, such as happy, sad, angry, frightened, worried, excited, etc. If children wish to share, reflect on a time when they have felt these emotions. Assign each emotion to a different colour e.g. red for anger, blue for sadness, yellow for happiness. Discuss why they feel that certain colours reflect these different feelings and create a colour emotions chart. Note, this may be different for different people, so take the opportunity to discuss this and the reasons for the similarities and differences.

	Explain that today we will be considering how different music can affect our emotions. Play some snippets of music and ask pupils to call out/hold up a colour card to show the colour the music makes them feel: - *How did this make you feel?* - *What about the music made you feel this way? e.g. the pitch, tempo, rhythm, etc.* ***Learning with Loti-Bot*** The children will work in groups to program Loti-Bot to move with different rhythm and tempo as well as changing colour with the programmable LEDs to represent different emotions they feel when listening to a piece of music. Quickly recap and remind children how to program Loti-Bot's lights and movements from previous computing lessons. Share your chosen piece of music with the children – ideally this would have no words and contain different sections that could represent different emotions. Give children time to work with their group to create their Loti-Bot colour and movement pieces to accompany the music – encouraging collaboration and creativity. When ready, each group can share their creations in time with the music. Ask children to observe the similarities and differences in the movements and colours which reflect the different emotions and feelings of others: - Did Loti-Bots colours change at the same or different times for each group? - Were the emotions chosen by the groups the same? Discuss. - When we listen to a song, does it often contain one emotion only or more? Encourage the children to explain their thoughts. Groups to then reflect on their own choices and discuss how music and colours can make you feel in different ways.

Make it accessible	Add a challenge
Use a smaller range of emotions and colours, as well as shorter extracts of music.	Encourage children to include and reflect on more emotions with more complex movement and altering speed as well. Extend children with their vocabulary choices when discussing emotions

Review and Reflect	Create your own Loti-Bot Emotions Light Show with the dancing Loti-Bots! Reflect on the learning and reinforce the connection between coding, music and colour.

What's the temperature?

Bring Computing and Science together using Loti-Bot's temperature sensor.

Skills and Learning	Resources
Students will: - Know how temperature is a measure of how hot and cold things are. - Record temperatures accurately. - Compare temperatures and look at patterns and trends. - Program a variable (temperature).	- Loti-Bot (ideally one robot for every 3 to 4 pupils) - Tablet(s) with Loti-Bot app

Key Vocabulary and Questions	Assessment Opportunities
thermometer, temperature, sensors, information, input, output, variable - What is the temperature reading? - Can you record temperatures and talk about the temperatures in different places?	- Can children measure temperatures accurately using Loti-Bot? - Can children make and answer predictions?

Introduce	In this lesson, children will be making predictions about temperature and then using Loti-Bot to measure different temperatures. Discuss real-world examples of when we take temperature and what we use to do so, e.g. a probe, a thermometer, etc. Explain that Loti-Bot has a built-in temperature sensor, so in today's lesson we are going to be using that to take our temperature readings.

Learn and Explore	**Loti-Bot** Quickly remind children how to use Loti-Bot and the app. Recap their learning from the computing lessons and ask children if there are any aspects they need a refresh on before moving forward with the lesson. **Temperature** Model how to take and understand a temperature reading with Loti-Bot and how to create a simple program that will read the temperature.

	Experiment Ask children to predict what they think the temperature will be in 4 different parts of your school classroom/building, for example by the classroom window, outside, in a cupboard, by the door. - Which do they think will be coldest? Which will be the hottest? - Why do you think this? They should record their thoughts and plan how to test their predictions. Encourage children to think about which aspects will change and which will need to stay the same in order to conduct a fair test, for example using the same Loti-Bot throughout. Children will then need to conduct their experiment. They will program Loti-Bot to move to the different areas and take temperature readings. Children will need to identify a way to record this data, for example in a table, in a graph, etc. Encourage children to draw conclusions from the data and discuss why the readings change based on the environment Loti-Bot is in. **Programming a Variable** Extend the children's learning by asking them to program Loti-Bot to respond in different ways based on the temperature reading taken. For example, can they create a program so that if the temperature is over a certain level, Loti-Bot will change colour, make a sound and rotate?

Make it accessible	Add a challenge
Consider adding colour-coded indicators or alerts for specific temperature ranges. Assign a colour to each temperature range e.g. blue for cold, yellow for warm, red for hot.	Children should create more complex programs for Loti-Bot to respond with the temperature changes.

Review and Reflect	Reflect on the temperature data that has been collected and what conclusions we can draw from this. Consider the **real-world applications** for a robot being able to measure temperature: - When and how could this functionality be useful in the 'real-world'? - Can you suggest some examples of ways you could use this?