

Spotlighted unit

Details on a specific unit of work at the school.

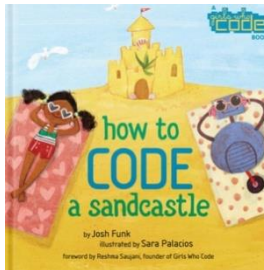



Digital Technologies case studies project

Level 5-6 **Title / theme** Coding and Robotics – Lego WeDo 2.0

Summary / intention
 Students learn about coding and Robotics by building and programming Lego robots.
 Students learn to use their Chromebooks to produce documents that include text, photos and screenshots.
 Students learn to work online by accessing, completing and uploading tasks using Google Classroom.

Strands addressed Digital Systems Data and information Creating digital solutions

Session	Activity summary	Learning intention	Success criteria	Key resources	Assessment statement
1	<p><i>Activity One</i></p> <ul style="list-style-type: none"> Read "How to Code a Sandcastle" Discuss how the code (algorithm) is the set of instructions that tells the robot what to do. Discuss small problems (abstraction) sequences, loops (iteration) and if then else statements (branching). Look through and discuss the flow chart. <p><i>Activity Two</i></p> <ul style="list-style-type: none"> In the sandpit, students work in pairs giving each other instructions to build a sandcastle. 	<p>We are learning that:</p> <ul style="list-style-type: none"> robots need to be given instructions in code big problems need to be broken down into smaller problems (abstraction) code is a set of sequenced instructions (algorithm) code can include loops and branching 	<p>We can create and follow a set of verbal instructions to build a sandcastle.</p>	<p>eBook How to Code a Sandcastle</p> 	<p>Students are beginning to develop an understanding of how programming is used to provide instructions to robots.</p> 

2

How to make a jam sandwich

- In pairs go through the steps to write a set of instructions to make a jam sandwich.
- Start by dividing the problem into smaller problems – make a flow chart
- Can you add in any loops?
- Can you add in any if, then, else statements?
- Test your instructions on the teacher
- Modify your instructions
- Swap your instructions with different pair and watch to see if they can use your algorithm to successfully make a jam sandwich

We are learning that:

- robots need to be given instructions in code
- big problems need to be broken down into smaller problems (abstraction)
- code is a set of sequenced instructions (algorithm)
- code can include loops and branching

We can write and follow a set of instructions to make a jam sandwich.




Students are learning that programs need to be specific and sequential.






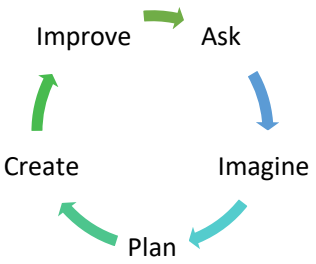

- Bread
- Jam
- Plates and knives
- Paper towel


Computational Thinking

- Decompose – Break down into smaller parts
- Abstract – Conceptualise (remove unimportant details) & explain ideas
- Think Algorithmically (code) – solve problems one step at a time
- Evaluate – Improve and debug
- Generalise – Recognise patterns

<p><i>Activity sequence</i> Students will work in pairs to complete the Lego WeDo 2 starter projects. After each project they will individually create an A4 Google Doc about their project and upload it to Google Classroom.</p>	<p><i>Report - Google Docs</i> Each report should include:</p> <ul style="list-style-type: none"> • Heading • Name/Grade • A photo of you • A photo of your project • Screenshot of program • Two sentences describing project 	<p><i>Resources</i></p> <ul style="list-style-type: none"> • iPads x 24 • WeDo 2.0 iPad App • WeDo 2.0 Chromebook App • WeDo 2.0 Kits x 12 • WeDo 2.0 Teacher Guides 	<p><i>Preparation</i></p> <ul style="list-style-type: none"> • Charge batteries • Check Wedo2 App is installed on ChromeBooks and is working 
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Session	Activity summary	Learning intention	Success criteria	Key resources	Assessment statement
3	<p><i>Getting Started Project: Milo, the Science Rover</i></p> <ul style="list-style-type: none"> • Build the Lego model • Connect the Smarthub to your device • Program your model • Take a picture of your model and a screenshot of your program. 	<p>We are learning to:</p> <ul style="list-style-type: none"> • make the motor to turn for a set amount of time • make the motor turn in a specific direction 	<p>We have made a science rover that demonstrates how scientists and engineers can explore places where humans can't visit.</p>	<ul style="list-style-type: none"> • iPads x 24 • WeDo 2.0 iPad App • WeDo 2.0 Kits x 12 • WeDo 2.0 Teacher Guides 	<p>Students are learning to follow instructions to build a Lego robot. Students are learning/revising basic block programming.</p> 
4	<p><i>Getting Started Project: Milo's Motion Sensor</i></p> <ul style="list-style-type: none"> • Build the Lego model • Explore ways to use the Motion Sensor • Program your model • Take a picture of your model and a screenshot of your program. 	<p>We are learning to build and code using a motion sensor.</p>	<p>We have built a science rover that use the motion sensor to detect the presence of a special plant.</p>	<ul style="list-style-type: none"> • iPads x 24 • WeDo 2.0 iPad App • WeDo 2.0 Kits x 12 • WeDo 2.0 Teacher Guides 	<p>Students are learning to use a sensor to alter the robot's actions.</p> 

<p>5</p>	<p><i>Getting Started Project: Milo's Tilt Sensor</i></p> <ul style="list-style-type: none"> • Build the Lego model • Explore ways to use the Tilt Sensor • Program your model • Take a picture of your model and a screenshot of your program. 	<p>We are learning to build and code using a tilt sensor.</p>	<p>We have built a science rover that can use the Tilt Sensor to send a message back to base.</p>	<ul style="list-style-type: none"> • iPads x 24 • WeDo 2.0 iPad App • WeDo 2.0 Kits x 12 • WeDo 2.0 Teacher Guides 	<p>Students are learning to use a sensor to alter the robot's actions.</p> 
<p>6</p>	<p><i>Assessment Activity: Moving Marbles (Pairs)</i></p> <p>Can you create a Lego robot that can move twenty marbles from one place to another?</p> <p>Discuss the design process and possible timelines. Remind students that it is a cycle (ask – imagine – plan – create - improve-)</p> <p>Provide students with the opportunity to Design, build and program their robot.</p>	<p>We are learning to:</p> <ul style="list-style-type: none"> • design and build a robot • program our robot to move <p><i>Design process</i></p> 	<p>We have made a robot that can move twenty marbles.</p>	<ul style="list-style-type: none"> • iPads x 24 • WeDo 2.0 iPad App • WeDo 2.0 Kits x 12 • WeDo 2.0 Teacher Guides • extra Lego • marbles 	<p>Students are using their developing building and programming knowledge to create and program a robot.</p> <p>Students are using the design process to guide their activities.</p> 

7	<p><i>Computational Thinking Activity: Moon Base</i></p> <ul style="list-style-type: none"> • Build your Lego model • Program your model • Take photos and screenshots • Write your report and hand it in via Google Classroom 	We are learning to build and code Lego robots.	I have built and programmed a robot that can assemble a base on the moon.	<ul style="list-style-type: none"> • iPads x 24 • WeDo 2.0 iPad App • WeDo 2.0 Kits x 12 • WeDo 2.0 Teacher Guides 	<p>Students are writing and editing block code to control the movement of their robot.</p> 
8	<p><i>Computational Thinking Activity: Volcano Alert</i></p> <ul style="list-style-type: none"> • Build your Lego model • Program your model • Take photos and screenshots • Write your report and hand it in via Google Classroom 	We are learning to build and code Lego robots.	I have built and programmed a robot that can monitor volcanic activity.	<ul style="list-style-type: none"> • iPads x 24 • WeDo 2.0 iPad App • WeDo 2.0 Kits x 12 • WeDo 2.0 Teacher Guides 	<p>Students are experimenting with writing code where their robot acts in response to input from a sensor.</p> 