

## Coordinator Notes:

### Module 6.1: Computers and Coding – Computer Talk

In this Module, students begin to explore computer science, programming and coding.

Students gain an understanding of how computers work, and the use of programs to instruct computers how to complete certain tasks.

The binary computer language is introduced with the ‘Computer Talk’ activity in which students experiment and explore binary.

The session ends with the ‘Program your Teacher’ Challenge which is a computer-free coding activity.

#### **Session Length:**

This Module can be presented in different session durations per your needs.

Lesson plans are provided for:

- A 120 minute session, or, 2 x 60 minute sessions
- 45 minute, 75 minute, and 90 minute sessions

#### **Technology:**

**PowerPoint:** If you do not have access to a data projector and cannot display the PowerPoint presentation, we recommend that you print the most important slides before the session, and either enlarge them onto cardboard to use in place of slides, or create a booklet that students can share in small groups.

The most important slides have been included as a ‘Reduced Slides’ PowerPoint file, and an easily printable pdf version of these slides is also provided. If you choose this option, we recommend that you still read and use the slide notes included in the full PowerPoint for the session.

The session can be conducted without slides all together, but they offer visual aid in explanation of scientific concepts. We recommend at the very least that instructions for each experiment are printed for the students.

**Videos links:** The suggested links to online videos within the session can be helpful with explanation. Notes have been included in the slides if there is an essential component to a video which the facilitator should discuss or demonstrate, if the video cannot be played.

**\*Please read the Module 6 Risk Assessment before proceeding with the activity\***

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## Module 6.1: Computers and Coding – Computer Talk

### Overview

We use computers every day, but how do they work and know what to do? This Module explores the language of computers, introducing simple coding concepts and computational thinking.

Encourage students to take part, share ideas and have a go. Reassure students that coding is something we can learn – just like learning another language other than the one we speak at home. Coding takes time to master!

### Content overview:

Concept / Activity	Session Duration (minutes)			
	120	90	75	45
Computer Fact or Fiction – what do we know about computers? Ice-breaking activity.	*	*	*	*
What is a computer? What do we use them for?	*	*	*	*
Parts of a computer: Hardware, Software, Input, Output	*	*	*	*
Computer Programs	*	*	*	*
Binary Code: Introduction to ones and zeros	*	*	*	-
Coding in Binary: Alphabet / letters, decimal numbers	*	*	*	-
Human and Computer Languages, a comparison.	*	*	*	*
Key parts of a computer code: LINES, LOOPS, BLOCKS, IF STATEMENTS	*	*	*	*
Introduction to writing simple instructions in code: e.g. picking up a pencil, walking forwards	*	*	*	*
Challenge 6.1: Program Your Robot Challenge. Writing code to navigate a human ‘robot’ through a physical maze.	*	*	*	*

**Slides:**

PowerPoint Slides are available to support the delivery of this module. Slides explain concepts visually, and include short, engaging videos relevant to the topic. A full list of slides and recommended inclusions for each session duration are provided in the table below. Appropriate slides are also noted in lesson plans for each duration.

<b>PowerPoint Presentation: 'M 6.1 - Master Slides 120 minute Session Duration'</b>		<b>Session Duration (minutes)</b>			
<b>Slide</b>	<b>Content</b>	<b>120</b>	<b>90</b>	<b>75</b>	<b>45</b>
<b>1</b>	Introductory title page for Module 6.1	*	*	*	*
<b>2</b>	Prompt slide: Computer Fact or Fiction game	*	*	*	*
<b>3</b>	Prompt slide: What is a computer?	*	*	*	*
<b>4</b>	Prompt slide: Parts of a computer	*	*	*	-
<b>5</b>	Prompt slide: Computer Programs and Coding	*	*	*	*
<b>6</b>	Overview: Binary Code	*	*	*	-
<b>7</b>	Overview: Bits and Bytes	*	*	*	-
<b>8</b>	Binary Alphabet	*	*	*	-
<b>9</b>	Prompt slide: writing words / spelling in Binary	*	*	*	-
<b>10</b>	Binary numbers and decimal numbers	*	*	-	-
<b>11</b>	Overview: Human languages and Computer Languages	*	*	*	*
<b>12</b>	Outline: Key parts of code: LINES, LOOPS, BLOCKS, IF STATEMENTS	*	*	*	*
<b>13</b>	Coding example: Picking up a pencil.	*	-	-	*
<b>14</b>	Video: Exact Instructions for making a sandwich	*	*	*	-
<b>15</b>	Introductory slide 1 for Challenge 6.1 "Program Your Robot"	*	*	*	*
<b>16</b>	Introductory slide 2 for Challenge 6.1 "Program Your Robot"	*	*	*	*
<b>17</b>	Coding example for "walking" and introduction for repetition	*	*	*	*
<b>18</b>	Challenge Rules overview	*	*	*	*
<b>19</b>	Challenge Scoring overview	*	*	*	*
<b>20</b>	Session references	*	*	*	*

## Module 6.1 Computers and Coding – Computer Talk

### Lesson Plan

120 minute session or 2 x 60 minute sessions

**High Tech:** Use PowerPoint Presentation 'M6.1 - Master Slides'

**Low Tech:** Print PowerPoint 'M6.1 - Reduced Slides for Printing'. Use slide notes from the ENTIRE 120 minute presentation, adapting discussion to cover omitted slides.

#### Key Learning Area

Maths, Computer Science, Digital Technology

#### Topic

Coding and Programming

Timing	Running Time (hh:mm)	Procedure	Materials
<b>3 min</b>	00:03	<b>Lesson Introduction</b> Welcome! Fact or fiction game. Activity 6.1.1.	M6.1 PowerPoint (Slides 1-2) Coordinator Notes for Activity 6.1.1
<b>5 min</b>	00:08	<b>Body of Lesson (Lesson 1, 2 x 60 minute sessions)</b> Discuss what makes a computer, hardware, software. Introduce concept of programming as instructions.	M6.1 PowerPoint (Slides 3-5)
<b>2 min</b>	00:10	Introduce Binary Code	M6.1 PowerPoint (Slides 6-8)
<b>10 min</b>	00:20	Undertake Activity 6.1.2. Hand out worksheets and support students to write their names using binary code.	M6.1 PowerPoint (Slides 8-9) Activity sheet 6.1.2
<b>10 min</b>	00:30	Undertake Activity 6.1.3. Assist students to convert their binary names to beads and string onto a necklace.	M6.1 PowerPoint (Slides 8-9) Activity sheet 6.1.2 Coloured beads, string, tape, scissors
<b>2 min</b>	00:32	Discuss using Binary Code to write decimal numbers.	M6.1 PowerPoint (Slide 10)
<b>3 min</b>	00:35	Introduce coding languages and key parts of codes	M6.1 PowerPoint (Slides 11,12)

<b>5 min</b>	00:40	Take turns trying to follow the code to pick up a pencil. Discuss flaws, improvements.	M6.1 PowerPoint (Slides 13)
<b>8 min</b>	00:48	Watch the Josh Gaines Video. If video is unable to be played, the coordinator should watch prior to the session, and discuss with students.	M6.1 PowerPoint (Slide 14)
<b>(Break for 2 x 60 minute sessions)</b>			
<b>(Lesson 2, 2 x 60 minute sessions)</b>			
<b>2 min</b>	00:02/ 01:02	Introduce the Challenge.	PowerPoint M6.1 (Slides 15-19)
<b>2 min</b>	00:04/ 01:04	Form into groups of 2 – 4 students.	PRE-SET MAZE!
<b>2 min</b>	00:06/ 01:06	Show students the maze to be solved.	Obstacles, scrap paper, pencils and pens
<b>14 min</b>	00:20/ 01:20	Support students to start to write their code. Robots may trail the maze to test distances, turns, and find obstacles to be avoided.	
<b>10 min</b>	00:30/ 01:30	Program Pre-test, assist all groups to run the maze.	Score sheet 6.1
<b>10 min</b>	00:40/ 01:40	Program Refining. Assist groups to edit and change their code to achieve higher points in the final test, or make it further through the maze. Adapt maze / add obstacles if the pre-testing was highly successful, to add complexity for the final test.	
<b>15 min</b>	00:55/ 01:55	Final Testing, assist all groups to run the maze.	Score sheet 6.1
<b>5 min</b>	01:00/ 02:00	<b>Lesson Conclusion</b> Pack up and discussion.	

## Activity 6.1.1: Fantastic Computer Facts!

### Method:

1. Ask all students to stand up.
2. Read out the facts listed below and ask students to decide if they are true or false.
3. If students believe it is true, they put their hands on their heads. If they believe it is false they put their hands on their hips.
4. Announce if the fact is true or false. Those students who guessed correctly stay standing, everyone else sits down.
5. Repeat till there is only one student standing or you run out of facts!

### Fact #1:

Only about 10% of the world's currency is physical money, the rest only exists on computers..... **TRUE**

### Fact#2:

There are more than 5000 new computer viruses are released every month..... **TRUE**

### Fact #3:

An average person normally blinks 20 times a minute, but when using a computer he/she blinks 30 times a minute..... **FALSE**

*Correct Fact:* An average person normally blinks 20 times a minute, but when using a computer he/she blinks only 7 times a minute.

### Fact #4:

HP (Hewlett Packard), Microsoft and Apple have one very interesting thing in common – they were all started in a garage..... **TRUE**

### Fact #5:

The first ever hard disk drive was made in 1979, and could hold only 1GB (gigabyte) of data..... **FALSE**

*Correct Fact:* The first ever hard disk drive was made in 1979, and could hold only 5MB (megabytes) of data.

*Facts sourced from:* <http://www.incrediblelab.com/interesting-computer-facts/>





### Activity 6.1.3: Binary Necklaces

**Aim:** Create a necklace to spell your first name in binary code.

**Materials:**

- Beads (3 colours)
- String
- Tape
- Scissors

**Instructions:**

1. Cut the string to the desired length for a necklace. Remember to leave a little extra length to tie the knot.
2. Put a piece of tape across one end of the string and fold it over on itself. This will keep the beads from falling off.
3. Choose one colour bead to represent the zeros and another colour to represent the ones.
4. You may like to choose a third colour to use as a spacer between each letter (each byte).
5. Use the binary alphabet code to place the beads in the order for each letter.
6. When all your beads are on, carefully remove the tape and tie the two ends together in a double knot!

## Challenge M6.1 – Disaster Proofing Challenge

### Scoring:

A scoring mechanism is included so that the element of ‘competition’ may challenge all students to participate to their fullest. You may remove the scoring system all together if it does not work with your group of students.

- When scoring it is important to only announce who the winning team is- so there will be no ‘losers’ or last place.
- It is important to highlight the good strategies of each team.
- Consider asking how the students might approach the task differently if asked to do it again, or how they might teach the same things they learned during the club to a younger student.
- If you choose not to use a scoring system then you should modify the slides that make reference to a ‘score.’

### Suggested scoring:

<u>Line of code*</u>	<u>-5 per line</u>
<u>Obstacles hit</u>	<u>-10 per hit</u>
<u>Robot makes it to halfway point</u>	<u>+150</u>
<u>Robot escapes complete maze</u>	<u>+250</u>
<u>Teamwork Bonus</u>	<u>+20</u>

\*Note: One line of code is an instruction/ set of instructions contained within brackets [ ]  
e.g. REPEAT x10:

[Lift left leg >Move left foot forwards>Place left foot down>Lift right leg >Move right foot forwards >Place right foot down]

### Scoring Notes:

- A ‘line of code’ in this activity is considered as one instruction. Look at slides 16 and 18 for an example.
- Encourage students to ensure each instruction is placed between brackets [ ].
- Each line of code is worth - 5 points. Therefore, the longer the program the fewer points. This encourages students to think about using repeats or even giving a set of instructions a name as a “block”.
- If you place low lying objects in the maze, such as books, keep in mind these can be stepped over or shuffled past. The students’ program must give direct instructions on how to pass each object. Points are deducted if obstacles are hit. Each time will be worth -10 points.

**Activity Notes:**

- Before students arrive set up the maze. This will give them a visual motivator for the challenge. You may choose to use chairs, tables, boxes, toys etc. as obstacles or walls, and / or use masking tape to create maze walls.
- When the “robots” are undertaking the students’ programs, ensure that any prior knowledge of terms like ‘walk’ are disregarded. In this activity robots are to act like a computer – having no base understanding. All actions you complete to get through the maze need to be specifically given to you by the students’ program.
- To give students a clearer understanding, before proceeding with the challenge, ask a student to explain to you how to get to the door. The student will probably tell you to walk forward to the door. Do not react to this instruction, tell them you don’t know how to walk and need to be instructed. Continue this till the student is giving you exact details like those listed on slide 16. This highlights to the students that computers, and you in this case, need direct and exact instructions to be able to complete a task.
- Ensure each group gets a score for the pre-test and final test of their program. The combined total will be their final score.
- IF ALL/MOST TEAMS PASS THE MAZE EASILY IN THE PRE-TEST, MAKE THE MAZE HARDER! ASK TEAMS TO ALTER THEIR PROGRAM FOR THE FINAL TEST.

**Suggested Maze Arrangement**

Set up your venue with furniture from within the space. If you are using a sports hall or other venue with minimal furniture you may need to bring along some portable tables and chairs for use in the maze. You could also use masking tape instead of furniture!

Your maze does not need to look exactly like the one on the next page. If you find the students get through the activity very quickly, rearrange your maze or add more obstacles to make it harder, then ask the students to write a new program. Note that only the low lying objects can be stepped over, and this can only be done if specifically instructed to by the code.



## Challenge 6.1: Score Sheet

<b>Team / Robot Name:</b>					
<b>Pre-Test</b>			<b>Final Test</b>		
<b>Component</b>	<b>Points</b>		<b>Component</b>	<b>Points</b>	
<b>Lines of Code</b> (-5/line)			<b>Lines of Code</b> (-5/line)		
<b>Obstacles Hit</b> (-10/hit)	Tally:	Points:	<b>Obstacles Hit</b> (-10/hit)	Tally:	Points:
<b>Robot escapes to halfway point</b> (150 points)			<b>Teacher escapes to halfway point</b> (150 points)		
<b>Robot escapes complete maze</b> (250 points)			<b>Teacher escapes complete maze</b> (250 points)		
<b>Team Work Bonus</b> (20 points)			<b>Team Work Bonus</b> (20 points)		
<b>Sub-total</b>			<b>Sub-total</b>		
<b>Grand Total</b> (add the two sub-totals):					

<b>Team / Robot Name:</b>					
<b>Pre-Test</b>			<b>Final Test</b>		
<b>Component</b>	<b>Points</b>		<b>Component</b>	<b>Points</b>	
<b>Lines of Code</b> (-5/line)			<b>Lines of Code</b> (-5/line)		
<b>Obstacles Hit</b> (-10/hit)	Tally:	Points:	<b>Obstacles Hit</b> (-10/hit)	Tally:	Points:
<b>Robot escapes to halfway point</b> (150 points)			<b>Teacher escapes to halfway point</b> (150 points)		
<b>Robot escapes complete maze</b> (250 points)			<b>Teacher escapes complete maze</b> (250 points)		
<b>Team Work Bonus</b> (20 points)			<b>Team Work Bonus</b> (20 points)		
<b>Sub-total</b>			<b>Sub-total</b>		
<b>Grand Total</b> (add the two sub-totals):					

<b>Module 6.1 Computers and Coding – Computer Talk</b> <b>Lesson Plan</b> <b>90 minute session</b>			
<b>High Tech:</b> Use PowerPoint Presentation 'M6.1 - Master Slides'. Hide slide 13. <b>Low Tech:</b> Print PowerPoint 'M6.1 - Reduced Slides for Printing'. Use slide notes from the ENTIRE 90 minute presentation, adapting discussion to cover omitted slides.			
<b>Key Learning Area</b> Maths, Computer Science, Digital Technology			<b>Topic</b> Coding and Programming
Timing	Running Time (hh:mm)	Procedure	Materials
<b>3 min</b>	00:03	<b>Lesson Introduction</b> Welcome! Fact or fiction game. Activity 6.1.1.	M6.1 PowerPoint (Slides 1-2) Coordinator Notes for Activity 6.1.1
<b>5 min</b>	00:08	<b>Body of Lesson</b> Discuss what makes a computer, hardware, software. Introduce concept of programming as instructions.	M6.1 PowerPoint (Slides 3-5)
<b>2 min</b>	00:10	Introduce Binary Code	M6.1 PowerPoint (Slides 6-8)
<b>10 min</b>	00:20	Undertake Activity 6.1.2. Hand out worksheets and support students to write their names using binary code.	M6.1 PowerPoint (Slides 8-9) Activity sheet 6.1.2
<b>10 min</b>	00:30	Undertake Activity 6.1.3. Assist students to convert their binary names to beads and string onto a necklace.	M6.1 PowerPoint (Slides 8-9) Activity sheet 6.1.2 Coloured beads, string, tape, scissors
<b>2 min</b>	00:32	Discuss using Binary Code to write decimal numbers.	M6.1 PowerPoint (Slide 10)
<b>3 min</b>	00:35	Introduce coding languages and key parts of codes	M6.1 PowerPoint (Slides 11,12)

<b>8 min</b>	00:43	Watch the Josh Gaines Video. If video is unable to be played, the coordinator should watch prior to the session, and discuss with students.	M6.1 PowerPoint (Slide 14)
<b>2 min</b>	00:45	Introduce the Challenge.	PowerPoint M6.1 (Slides 15-19)  PRE-SET MAZE!  Obstacles, scrap paper, pencils and pens  Score sheet 6.1  Score sheet 6.1
<b>2 min</b>	00:47	Form into groups of 2 – 4 students.	
<b>2 min</b>	00:49	Show students the maze to be solved.	
<b>11 min</b>	01:00	Support students to start to write their code. Robots may trail the maze to test distances, turns, and find obstacles to be avoided.	
<b>10 min</b>	01:10	Program Pre-test, assist all groups to run the maze.	
<b>5 min</b>	01:15	Program Refining. Assist groups to edit and change their code to achieve higher points in the final test, or make it further through the maze. Adapt maze / add obstacles if the pre-testing was highly successful, to add complexity for the final test.	
<b>10 min</b>	01:25	Final Testing, assist all groups to run the maze.	
<b>5 min</b>	01:30	<b>Lesson Conclusion</b> Pack up and discussion.	

<p align="center"><b>Module 6.1 Computers and Coding – Computer Talk</b></p> <p align="center"><b>Lesson Plan</b></p> <p align="center"><b>75 minute session</b></p>			
<p><b>High Tech:</b> Use PowerPoint Presentation ‘M6.1 - Master Slides’. Hide slide 10, 13.  <b>Low Tech:</b> Print PowerPoint ‘M6.1 - Reduced Slides for Printing’. Use slide notes from the ENTIRE 75 minute presentation, adapting discussion to cover omitted slides.</p>			
<p><b>Key Learning Area</b>            Maths, Computer Science, Digital Technology</p>		<p><b>Topic</b>            Coding and Programming</p>	
Timing	Running Time (hh:mm)	Procedure	Materials
3 min	00:03	<p><b>Lesson Introduction</b>            Welcome! Fact or fiction game.            Activity 6.1.1.</p>	M6.1 PowerPoint (Slides 1-2) Coordinator Notes for Activity 6.1.1
5 min	00:08	<p><b>Body of Lesson</b>            Discuss what makes a computer, hardware, software. Introduce concept of programming as instructions.</p>	M6.1 PowerPoint (Slides 3-5)
2 min	00:10	Introduce Binary Code	M6.1 PowerPoint (Slides 6-8)
8 min	00:18	Undertake Activity 6.1.2. Hand out worksheets and support students to write their names using binary code.	M6.1 PowerPoint (Slides 8-9) Activity sheet 6.1.2
8 min	00:26	Undertake Activity 6.1.3. Assist students to convert their binary names to beads and string onto a necklace.	M6.1 PowerPoint (Slides 8-9) Activity sheet 6.1.2 Coloured beads, string, tape, scissors
3 min	00:29	Introduce coding languages and key parts of codes	M6.1 PowerPoint (Slides 11,12)
3 min	00:32	Watch the first 3 minutes of the Josh Gaines Video. If video is unable to be played, coordinator should watch prior to the session, and discuss with students.	M6.1 PowerPoint (Slide 14)



<b>2 min</b>	00:34	Introduce the Challenge.	PowerPoint M6.1 (Slides 15-19)  PRE-SET MAZE!  Obstacles, scrap paper, pencils and pens   Score sheet 6.1   Score sheet 6.1
<b>2 min</b>	00:36	Form into groups of 2 – 4 students.	
<b>2 min</b>	00:38	Show students the maze to be solved.	
<b>10 min</b>	00:48	Support students to start to write their code. Robots may trail the maze to test distances, turns, and find obstacles to be avoided.	
<b>10 min</b>	00:58	Program Pre-test, assist all groups to run the maze.	
<b>5 min</b>	01:03	Program Refining. Assist groups to edit and change their code to achieve higher points in the final test, or make it further through the maze. Adapt maze / add obstacles if the pre-testing was highly successful, to add complexity for the final test.	
<b>10 min</b>	01:13	Final Testing, assist all groups to run the maze.	
<b>2 min</b>	01:15	<b>Lesson Conclusion</b> Pack up and discussion.	

<p align="center"><b>Module 6.1 Computers and Coding – Computer Talk</b></p> <p align="center"><b>Lesson Plan</b></p> <p align="center"><b>45 minute session</b></p>			
<p><b>High Tech:</b> Use PowerPoint Presentation ‘M6.1 - Master Slides’. Hide slides 6, 7, 8, 9, 10, 14.</p> <p><b>Low Tech:</b> Print PowerPoint ‘M6.1 - Reduced Slides for Printing’. Use slide notes from the ENTIRE 45 minute presentation, adapting discussion to cover omitted slides.</p>			
<p><b>Key Learning Area</b> Maths, Computer Science, Digital Technology</p>			<p><b>Topic</b> Coding and Programming</p>
Timing	Running Time (hh:mm)	Procedure	Materials
3 min	00:03	<p><b>Lesson Introduction</b> Welcome! Fact or fiction game. Activity 6.1.1.</p>	M6.1 PowerPoint (Slides 1-2) Coordinator Notes
3 min	00:06	<p><b>Body of Lesson</b> Discuss what makes a computer, hardware, software. Introduce concept of programming as instructions.</p>	M6.1 PowerPoint (Slides 3-5)
2 min	00:08	Introduce coding languages and key parts of codes	M6.1 PowerPoint (Slides 11,12)
3 min	00:11	Take turns trying to follow the code to pick up a pencil. Discuss flaws, improvements.	M6.1 PowerPoint (Slide 13)
2 min	00:13	Introduce the Challenge.	PowerPoint M6.1 (Slides 15-19)
2 min	00:15	Form into groups of 2 – 4 students.	PRE-SET MAZE!
2 min	00:17	Show students the maze to be solved.	Obstacles, scrap paper, pencils and pens
25 min	00:42	Support students to start to write their code. Robots may trial the maze to test distances, turns, and find obstacles to be avoided. Pre-test after 5 minutes. Final test with at least 10 minutes to go.	Score sheet 6.1
2 min	00:45	<p><b>Lesson Conclusion</b> Pack up and discussion.</p>	

## Module 6.1 - References

### **CSUnplugged.org**

CS Education Research Group at the University of Canterbury, NZ, Creative Commons BY-NC-SA 4.0 licence.

### **Code.org**

© Code.org, Used as per copyright agreement.

[http://csunplugged.org/wp-content/uploads/2014/12/unplugged-01-binary\\_numbers.pdf](http://csunplugged.org/wp-content/uploads/2014/12/unplugged-01-binary_numbers.pdf)

<http://www.explainthatstuff.com/howcomputerswork.html>

<https://www.youtube.com/watch?v=1sWCBgGALXE>

<http://nookkin.com/articles/computer-science/why-computers-use-binary.ndoc>

<https://studio.code.org/unplugged/unplug1.pdf>

<https://www.mathsisfun.com/binary-number-system.html>

<https://www.youtube.com/channel/UCI8AQqkapE9K6pd8aK71B7w>

## Module 6.1 - Required Materials

- Pens, pencils and writing paper are generally required every session.
- Students may like to bring a note pad to record their observations and ideas.
- A group usually refers to 2 - 4 students.

Activity	Material	Amount	Where can I find it?
All sessions	PowerPoint Slides* (digital, or printed)	1 per coordinator	Coordinator Package
All sessions	Printed PowerPoint* Slide Notes	1 per coordinator	Coordinator Package
All sessions	Printed Lesson Plan	1 per coordinator	Coordinator Package
All sessions	Printed Module 1 Risk Assessment	1	Coordinator Package
All sessions	Computer, Data Projector, Screen	1	Venue
Activity 6.1.1 Fact or Fiction All Sessions	Coordinator Notes, Fact sheet	1	Coordinator Package
Activity 6.1.2 Binary Names All sessions	Coordinator Notes, Activity sheet 6.1.2	1 per student	Coordinator Package
Activity 6.1.3 Binary Necklaces  120 minute, 2 x 60 minute, 90 minute and 75 minute sessions	Coordinator Notes, Activity sheet 6.1.2	1 per student	Coordinator Package
	String or fishing line	60 cm per student	Supermarket, hardware store
	2 sets of different coloured beads (e.g. black, white)	Allow for 60 of each colour per student	Supermarket, discount variety store, craft store
	1 set of a coloured beads (e.g. red)	Allow for 12 per student	Supermarket, discount variety store, craft store
	tape	3 rolls per session	Supermarket, hardware store
	scissors	3 sets shared during session	Supermarket, hardware store

**Required materials list continues on next page**

\* PowerPoint Slides have been provided as a Master Slide Set for a 120 minute (or 2 x 60 minute) session duration. Hide/ omit slides as noted in lesson plans for delivery of shorter session durations.

<b>Activity</b>	<b>Material</b>	<b>Amount</b>	<b>Where can I find it?</b>
Challenge 6.1 Maze  All sessions	Masking tape	2 rolls per session	Supermarket, hardware store
	Writing Paper	6 sheets per group	Supermarket, stationary store, recycled
	Obstacles	Tables, chairs, books, boxes, or use masking tape to create a maze	Venue, recycled, supermarket