Learn to Code with Matatalab

Hi! I am MatataBot

Meet Your New Friend!

This is MatataBot. He's a *robot*, and he's trying to get back to his Command Tower. With this pack, you can help him on his journey!

What's a robot?

A robot is a 'smart' machine controlled by a computer!

What can MatataBot do?

He can do lots of things – if you tell him how!

How can I tell MatataBot what to do, then?

You can tell him what to do by giving him special instructions that he can understand, called *code*. Writing instructions for a computer-controlled device like **MatataBot** is called *coding*.
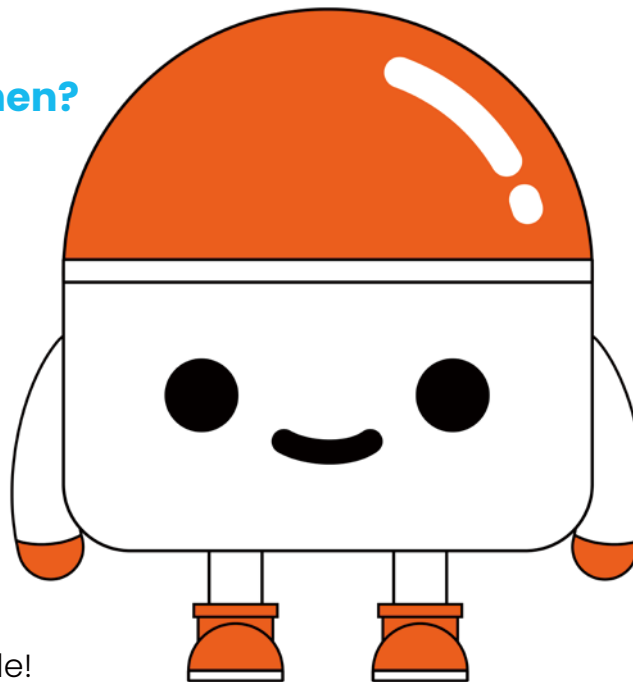
Is coding complicated?

It *can* be – but the ideas behind it are quite simple!

How can I learn about coding?

Read this pack and try out the cool activities inside! Each one will teach you new commands that you can use to solve puzzles for **MatataBot**.

> Are you ready to get started? Good!

ABOUT **Matatalab**

Matatalab is a technology education company that creates innovative STEAM solutions to teach coding in a fun way! **The Matatalab coding sets** introduce kids to coding – they come with a real **MatataBot**, plastic coding blocks, a command board with command tower, story and game books and accessories. Your **MatataBot** will carry out the instructions placed on the command board!

This pack was created as an introduction to **Matatalab**. You can have fun playing with the cut-out counters and coding blocks and trying out activities that will teach you the basics of coding!

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How to use this pack

It has everything you need to start coding with Matatalab!

You can print out your counters on thin card or stick them onto cardboard!

THIS PACK INCLUDES

→ **4 MatataBot counters** and **56 Coding Blocks** to cut out

→ **1 Command Board** to cut out

→ **9 Activities** to do

→ **Glossary** of coding terms

→ **Solutions** to the activities

HOW TO USE IT:

1. Cut out the **MatataBot counters** and **Coding Blocks** on page 4. They will be used to do the activities in this pack!

2. Cut out the **Command Board** on page 5. You place the **Coding Blocks** on this board to give **MatataBot** commands.

3. Each activity has a set of instructions, telling you what you need to get **MatataBot** to do.

4. Choose your **Coding Blocks** and place them on the **Command Board**. Then, move your **MatataBot counter** so that he follows the commands you have given him.

CODING **QUIZ**

DID YOU KNOW?

Coding is also used to give instructions to many devices that are controlled by electronic chips called *microprocessors*.

Tick the devices that use microprocessors!

- ☐ Computers
- ☐ Vacuum cleaners
- ☐ Tablets
- ☐ Cars
- ☐ Bikes
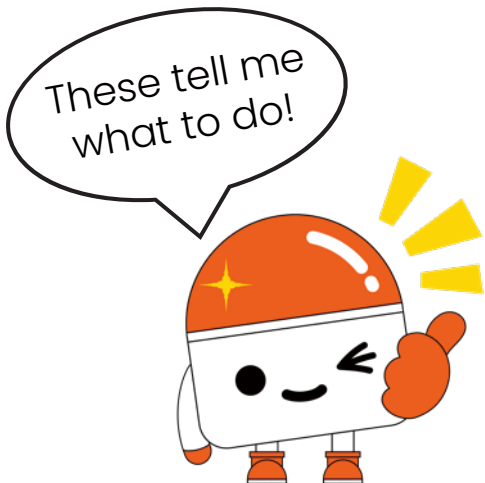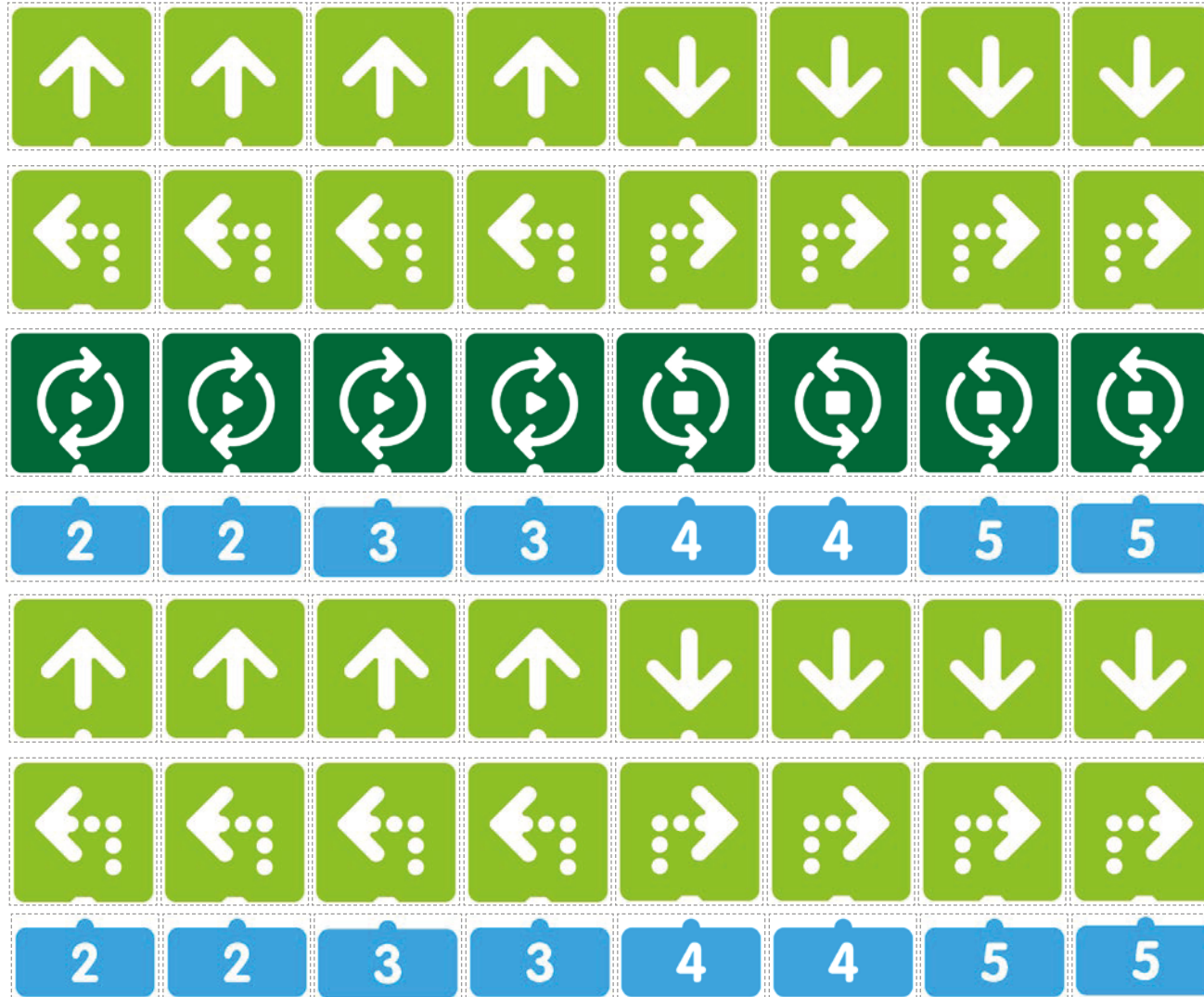- ☐ Mobile phones
- ☐ Washing machines
- ☐ Fridges

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Counters and Coding Blocks

Here are your MatataBot counters – and the Coding Blocks you will use to control him. Print them and cut them out!

CUT OUT PAGE!

CODING BLOCK GUIDE

- ⬆ Move Forward
- ⬇ Move Backward
- ⬅ Left Turn 90º
- ➡ Right Turn 90º
- 🔁 Loop Begins
- 🔁 Loop Ends
- **2** Parameters

These tell me what to do!

MATATABOT COUNTERS

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Your Command Board

CUT OUT PAGE!

You will need this Command Board to do the activities in this pack – it's where you put the Coding Blocks you use to control MatataBot!

MY COMMAND BOARD

CODING ALERT!

Did you notice that some boxes are different sizes? **Rows 1, 3 and 5** are for the **green Coding Blocks** and **rows 2, 4 and 6** are for the smaller **blue Parameter Blocks**!

Let's have fun while learning to code!

CODING QUIZ

DID YOU KNOW?

Computers use a numbering system called *binary* to store information. In binary, there are only *two* digits – do you know which ones they are?

- ☐ 0
- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5

Playing with MatataBot!

Here's how you use the MatataBot counters, Coding Blocks and Command Board to do the activities in this pack. Each activity page has a new mission for MatataBot to carry out. As you do each activity, you will learn how to give MatataBot new commands!

1. Put your **Command Board** and **Coding Blocks** next to the activity page. You will need them!

2. There is a **Play Area** on the activity page. This is like a little game board, and your **MatataBot counter** will move around on it.

3. Put a **MatataBot counter** on the **Play Area**, on the spot marked with an **X**. Make sure the little arrow on the counter is pointing in the same direction as the arrow on the **X** square. This shows the direction that **MatataBot** should be facing.

4. Now it's time to give **MatataBot** his instructions! You do this by placing **Coding Blocks** on the **Command Board**, going from left to right. Rows 1, 3 and 5 are for the large green **Coding Blocks** and rows 2, 4 and 6 are for the blue **Parameter Coding Blocks**.

5. When you have filled up a row with **Coding Blocks**, you can put more on the next row down.

6. When you have put all of the **Coding Blocks** you need on the **Command Board**, it's time to move **MatataBot**! Go through the **Coding Blocks** on the **Command Board** one at a time and move the **MatataBot counter** on the **Play Area**, getting him to follow what the **Coding Blocks** tell him to do.

7. Each activity will teach you about new **Coding Blocks** and how to use them, so pay attention! Now turn the page – let's start coding!
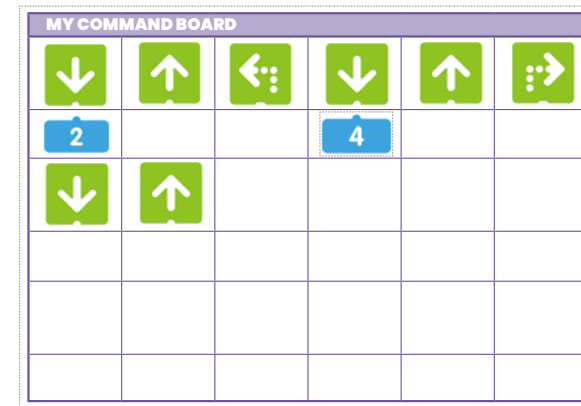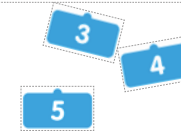
MY COMMAND BOARD

Command board
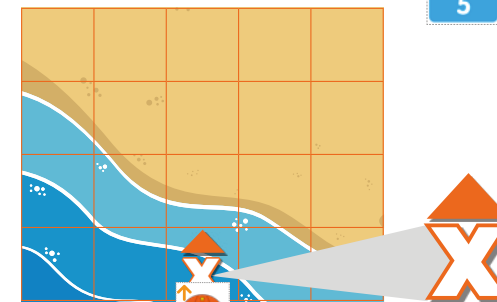
The big green Coding Blocks go on rows 1, 3 and 5.

Smaller blue Parameter Blocks for rows 2, 4 and 6.

Play area

The X

MatataBot Counters

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ACTIVITY 1: Your First Command

This is the first part of MatataBot's adventure – and you will tell him what to do!

WHAT'S GOING ON? **MatataBot** has washed up on a desert island, and he needs a nice healthy snack. Luckily, there is a slice of watermelon nearby! YUM! But can you help him reach it?

HOW TO GET THERE:

1. Put your **MatataBot counter** on the space marked with an **X**. Make sure the arrow on his counter is pointing in the same direction as the arrow above the **X**!

2. To get him to move, you need to use a **Move Forward Coding Block** ⬆. This tells him to move forward one square!

3. Place a **Move Forward Coding Block** on the first space on your **Command Board**. To make **MatataBot** follow this command, move him forward one square in the **play area**.

4. Great! He is closer – but the watermelon is still two steps away!

5. How many more **Move Forward Coding Blocks** do you need to add to the **Command Board** to make **MatataBot** reach the watermelon? Put them on the **Command Board** and then move your **MatataBot counter** to follow these instructions.
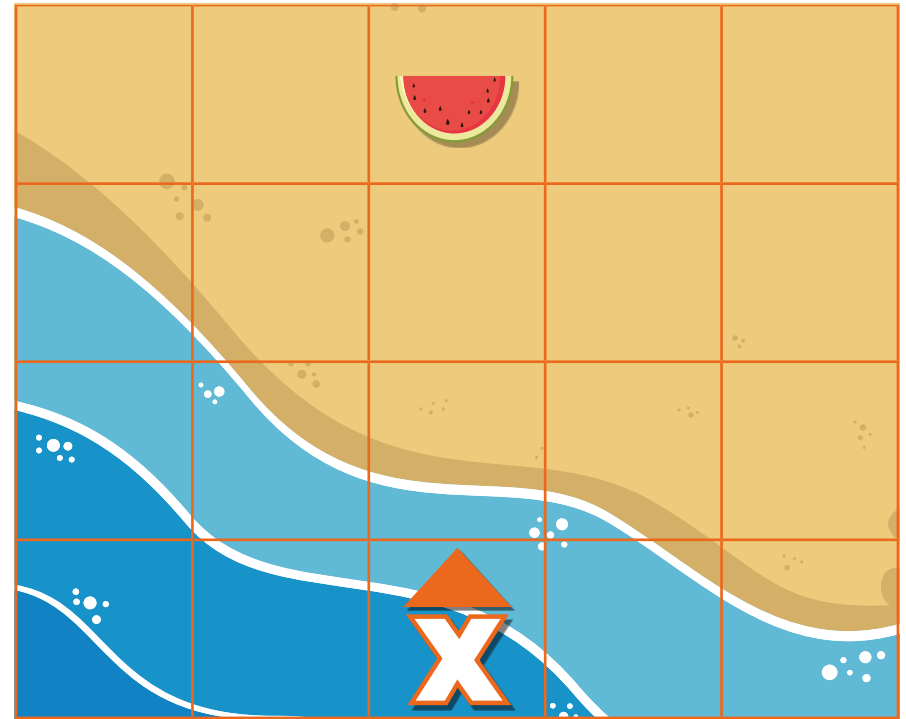
Well done! He has reached the watermelon!

Write in the total number of Move Forward Command Blocks you used to reach your goal!

The **Coding Blocks** in this pack also include a **Move Backward** command – but don't need to use it yet!

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ACTIVITY 2: Taking Turns

See if you can help MatataBot get to the battery – by making a turn!

WHAT'S GOING ON? **MatataBot** has been moving around a lot, and he is running out of power! Oh, wait! He has just spotted a fully charged battery a few squares away, but he needs to turn to reach it. Can you help him?
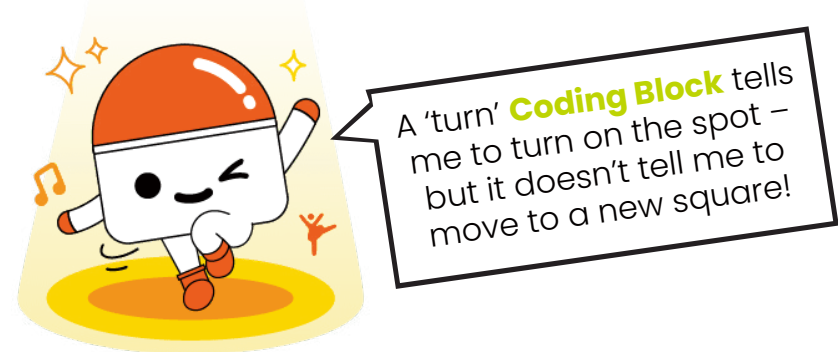
HOW TO GET THERE:

1. Put a **MatataBot counter** on the space marked with an **X**. Make sure the arrow on the counter is pointing in the same direction as the arrow above the **X** in the **play area**.

2. You need to use **Move Forward Coding Blocks** and a **Right Turn 90° Coding Block**. They tell him to *move forward one square at a time* and *turn to the right*.

3. Can you work out how many **Move Forward** and **Right Turn 90° Coding Blocks** you will need? Place them in the right order on your **Command Board** and then move your **MatataBot counter** to follow them.

HINT: You might be able to get him there in more than one way!

You got it! MatataBot is recharged and full of energy again!

Write in how many Coding Blocks you used to get MatataBot to the battery!

A 'turn' **Coding Block** tells me to turn on the spot – but it doesn't tell me to move to a new square!

ACTIVITY 3: One Good Turn Deserves Another!

When you do coding, you sometimes have to come up with clever ways to overcome problems. This puzzle will test your brain!

WHAT'S GOING ON? It's really hot on the island, and **MatataBot** has started overheating! If only he could get to the ice cream and cool down! Can you work out how to move him to the ice cream before it melts?

HOW TO GET THERE:

1. Put your **MatataBot counter** on the space marked with an **X**. Make sure the arrow on his counter is pointing forward like the arrow above the **X** on the **play area**.

2. In this activity, the challenge is to get **MatataBot** to the ice cream by using **Move Forward Coding Blocks** and **Left Turn 90° Coding Blocks**!

3. Remember that the **Coding Blocks** tell him to turn left or move forward one square.

4. Work out how many **Move Forward** and **Left Turn 90° Coding Blocks** you will need and place them in the right order on your **Command Board**.

EXTRA CHALLENGE: Can you get to the seashell, too?

MatataBot has cooled down! You can rest for a bit!

Write in how many Left Turn 90° Coding Blocks you used to reach the ice cream!

ACTIVITY 4: Setting Parameters

When you are coding commands for MatataBot, you can get him to repeat an action several times by using special Parameter Coding Blocks.

WHAT'S GOING ON? It's time to have some fun at the beach! **MatataBot** needs to move around and collect the beach ball, sunglasses and flippers – in that order! You will tell him how to do this, using **Parameter Coding Blocks!**

HOW TO GET THERE:

1. Put **MatataBot** on the space marked with an **X**. Make sure the arrow on his counter is pointing the same way as the arrow by the **X**!

2. You *could* use lots of **Move Forward Coding Blocks** to move him....

3. ...but the best way to get **MatataBot** to repeat an action is by using **Parameter Coding Blocks**. They are blue and half the height of the other ones: `2` `3` `4` `5` (You will also use **Left Turn 90° Coding Blocks**.)

4. You use **Parameter Coding Blocks** by putting them underneath other **Coding Blocks** on the **Command Board**. The number on a **Parameter Coding Block** tells **MatataBot** how many times to repeat the action on the **Coding Block** above it! **For example:** ↑ ↑ = ↑₂

5. Plan out your moves with the **Parameter Coding Blocks** on the **Command Board** and then get **MatataBot** moving!

   MatataBot has all of his gear for summer fun. Well done!

ACTIVITY 5: Coding Challenge

Using Parameter Blocks is a good way to make your code shorter, simpler and easier to understand!

WHAT'S GOING ON? MatataBot wants to take a picture so he will remember his island adventure – but his camera is in a maze! Below are a set of **Coding Blocks** that will get him to his camera. Your challenge is to make the code shorter and simpler, using **Parameter Coding Blocks**.

HOW TO GET THERE:

1. Put your **MatataBot counter** on the space marked with an **X**. The arrow is pointing to the right - so your counter should, too!

2. The **Coding Blocks** that tell **MatataBot** how to get to the camera are below – but your job is to make the code simpler by using **Parameter Coding Blocks** to repeat actions – just like you learned on the previous page!

⬆ ⬆ ⬅ ⬆ ⬆ ⬆ ⬆ ⬆ ⬅ ⬆

3. Put your simplified commands (and the right **Parameter Coding Blocks**) on your **Command Board**, then move the **MatataBot counter** to follow them!

You did it! You are amazing!

How many Coding Blocks did you use?
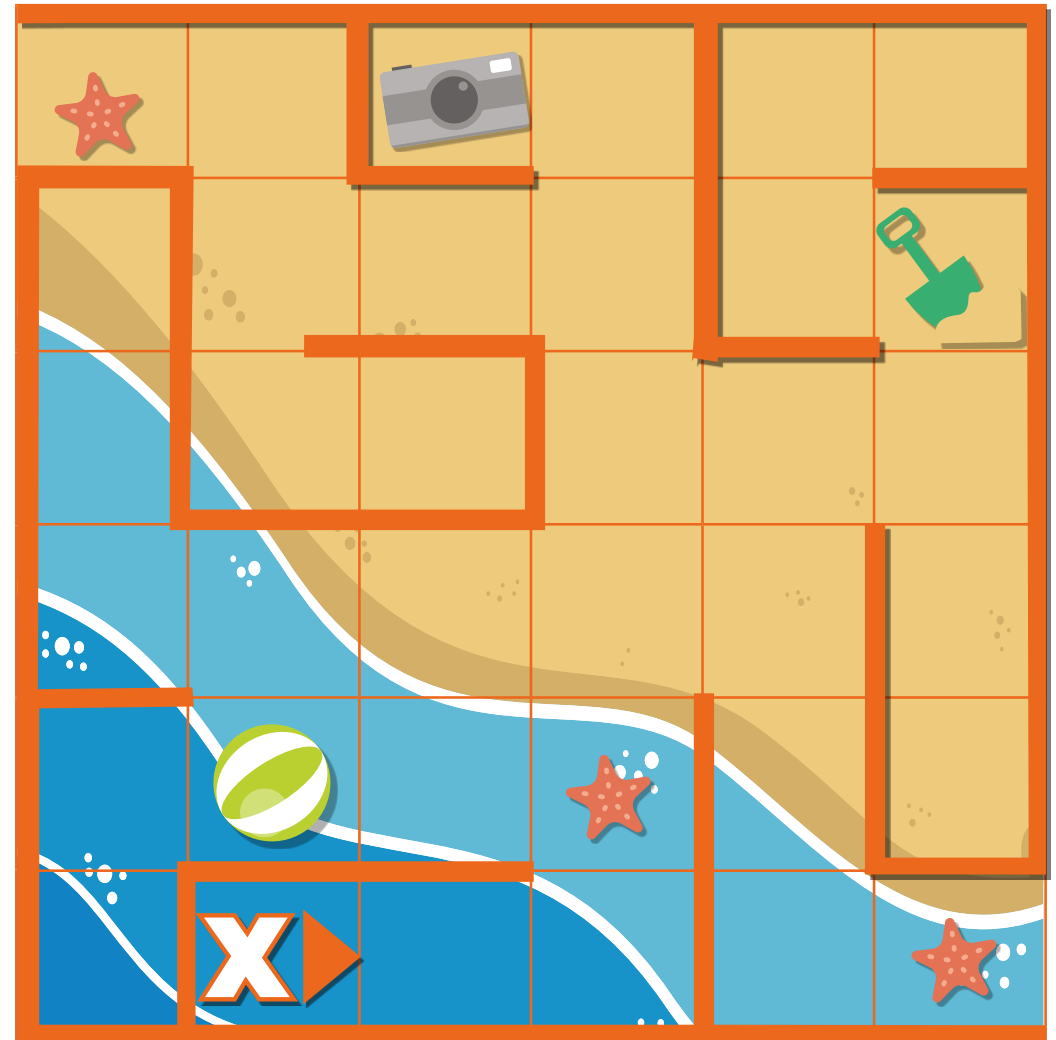
LEARNING ABOUT LOOPS

You learned how to repeat a command with parameters. But did you know that you can also repeat *more than one command*? To do that, you need *loops*!

WHAT ARE THEY? Loops are used to repeat a set of actions. To create loops, you will use the **Loop Begins Coding Block** and the **Loop Ends Coding Block**.

HOW LOOPS WORK:

When **MatataBot** follows instructions in a loop, he does the actions after the **Loop Begins Coding Block**, one after the other. When he gets to the **Loop Ends Coding Block**, he goes back to the **Loop Begins Coding Block** piece and follows the instructions that follow it again. Once **MatataBot** has repeated the loop the number of times shown on the **Parameter Coding Block** underneath the **Loop Begins Coding Block**, he moves on to the next command after the **Loop Ends Coding Block**.

WHAT A LOOP LOOKS LIKE:

HERE'S HOW TO USE THEM ON THE COMMAND BOARD:

1. To start a loop, put down a **Loop Begins Coding Block**.

2. Underneath it, put a **Parameter Coding Block** showing the number of times the loop should be repeated.

3. Then put down the **Coding Blocks** for the actions you want **MatataBot** to repeat.

4. Finally, put the **Loop Ends Coding Block** on the **Command Board** to end the loop.

5. Can you remember all of this and use it for **MatataBot's** next challenge?
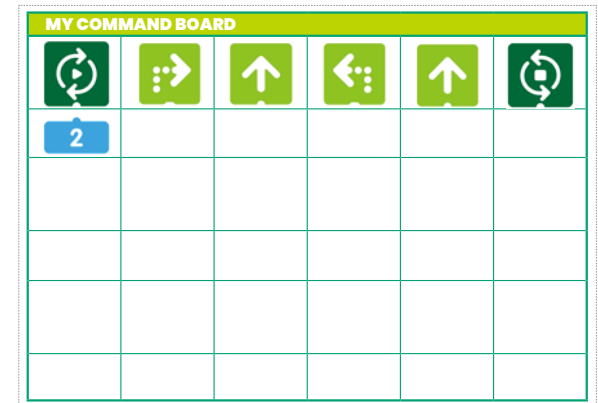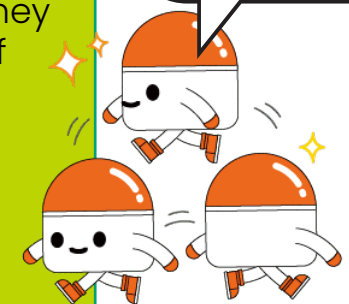
CODING **QUIZ**

LOOPS ARE USEFUL!

Loops are handy when coding – but they are also common elsewhere! Which of these things would count as loops?

☐ The Earth going around the Sun
☐ Hands going around on a clock
☐ Going to school and back

Can you think of another example?

Loops can be used to create really cool and interesting code!

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ACTIVITY 6: Loop the Loop!

On the last page you learned about loops. Now you have a chance to use them!

WHAT'S GOING ON? MatataBot is playing hide-and-seek with a friendly crab and wants to look behind the palm tree! Can you code a loop that will make **MatataBot** go right around the tree so he can spot the crab?

HOW TO GET THERE:

1. Put your **MatataBot counter** on the space marked with an **X**, pointing to the right!

2. Put a **Loop Begins Coding Block** on the **Command Board** and put a **Parameter Coding Block** underneath, showing the number of times you want your loop to be repeated.

3. You will need six **Coding Blocks** to create this loop. What are they, and what order should they be in?

4. Don't forget to put a **Loop Ends Coding Block** at the end of the sequence!

5. Now move **MatataBot**, following the **Coding Blocks** you picked. Does your loop make him go around the tree?

6. **Check the answers to make sure you came up with the right code!**

Where's Mr. Crab? All those loops made me dizzy!

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Activity 7: Bug Hunting!

Sometimes you can make mistakes when creating code. When this happens, the code can confuse MatataBot or make him do something unexpected. In coding, errors are called 'bugs'!

WHAT'S GOING ON? MatataBot is looking for a place to spend the night! A friendly parrot has given him directions to a cave, but there a 'bug' in his instructions. Can you 'debug' the code by finding the mistake the parrot made?

HOW TO GET THERE:

1. Place your **MatataBot counter** on the **X**, facing in the direction of the arrow.

2. This code *should* make **MatataBot** follow the marked path all the way to the cave:

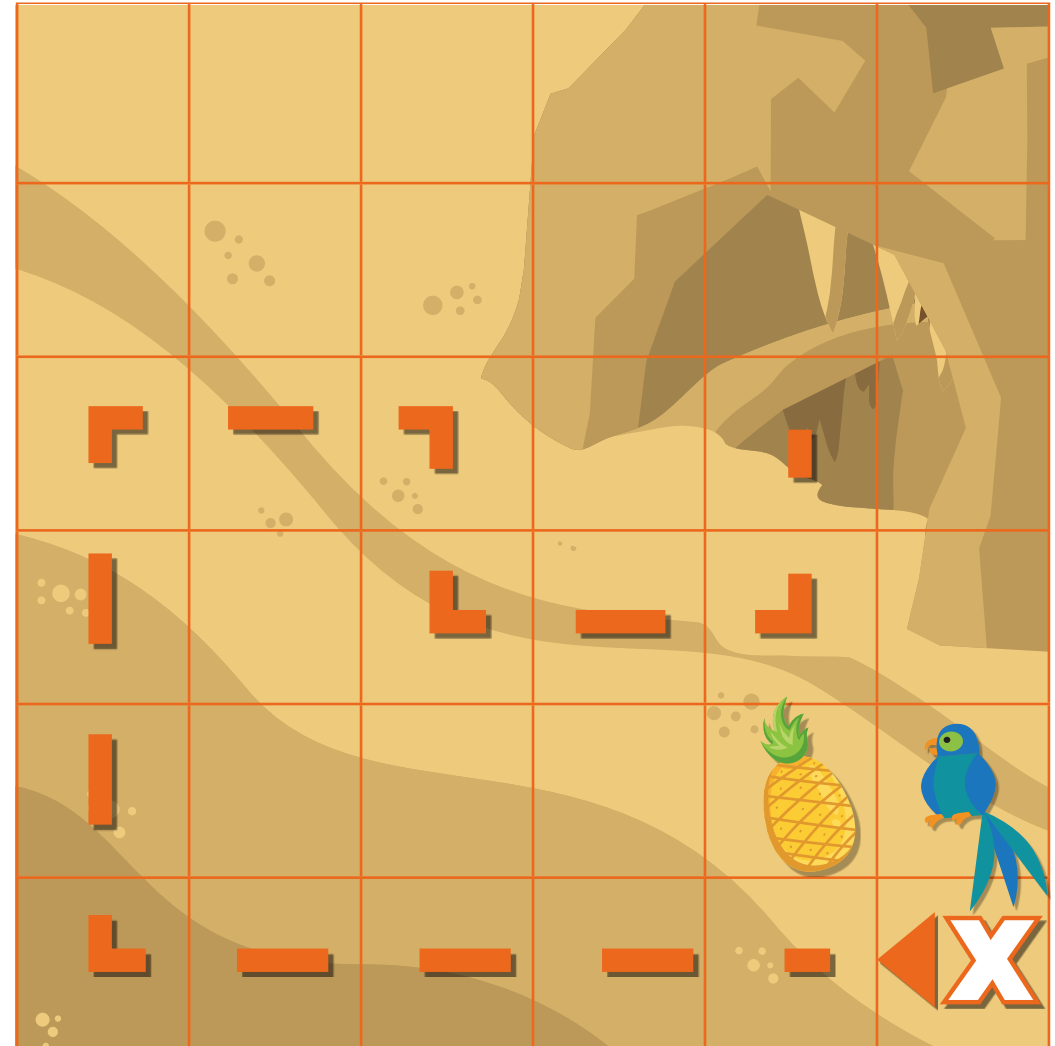↑(5) ↦ ↑(3) ↦ ↑(2) ↦ ↑ ↤ ↑(2) ↤ ↓

3. Oh no! Where did you end up by following the code?

4. Use your **Coding Blocks** to create a new set of instructions on the **Command Board** that will guide **MatataBot** along the path correctly.

5. Now move **MatataBot** all the way to the cave!

Thank you for fixing the code! Now I need a quick nap!

The incorrect Coding Block was:

Activity 8: MatataArt Message

Did you know that you can use code to draw pictures or letters?

WHAT'S GOING ON? **MatataBot** has to finish writing the word **HELP** on the sand to attract rescuers. He will create a line wherever he moves! Using the coding you have learned, can you guide him to draw a letter on the sand?

HOW TO GET THERE:

1. Place **MatataBot** on the **X**, pointing in the right direction.
2. Set up your **Coding Blocks** on the **Command Board** – you should tell **MatataBot** how to follow the dotted path below.

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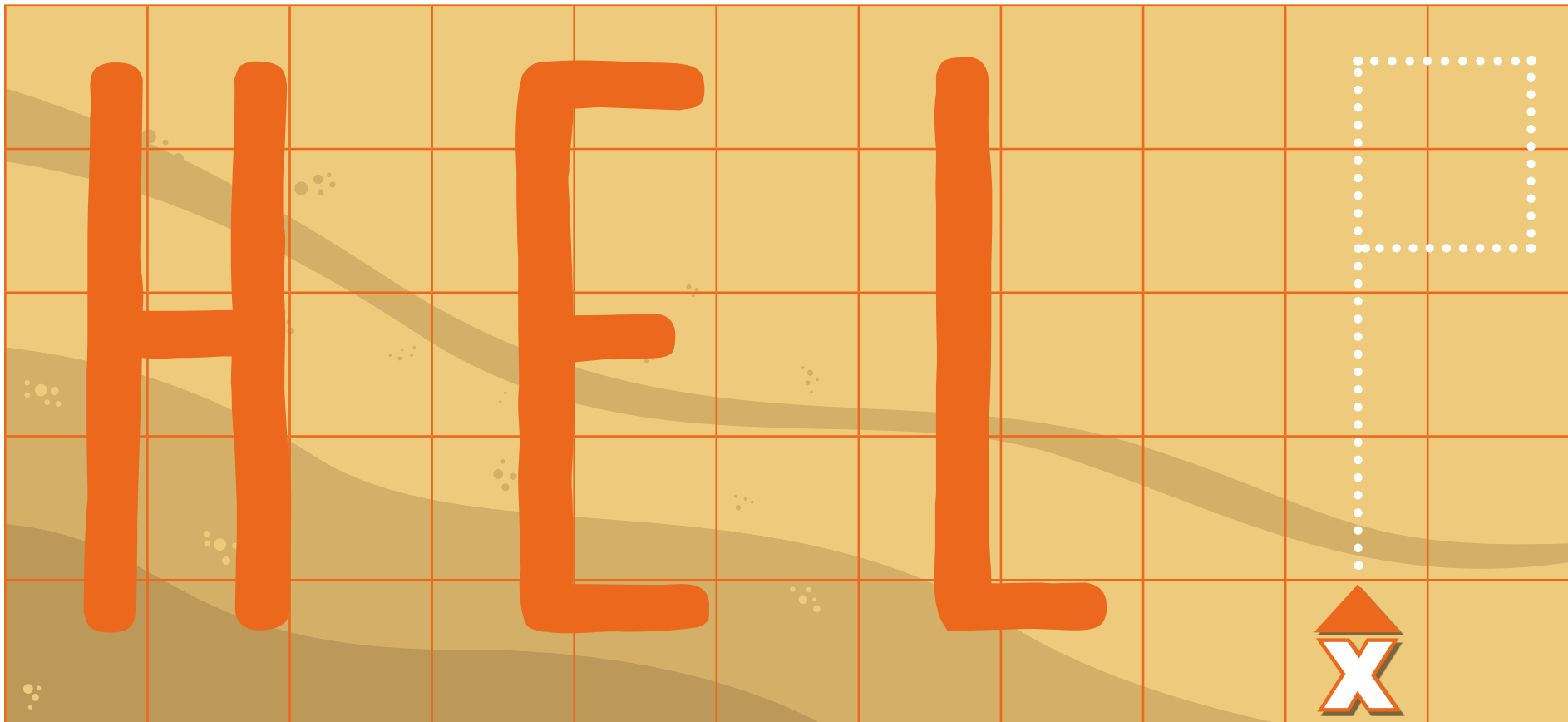
Activity 9: Ultimate Coding Challenge

Use all the coding you've learned to get MatataBot to the Command Tower so he can leave the island. Can you complete the bonus objectives and get the high score?

WHAT'S GOING ON? MatataBot wants to go back to his tower and escape from the island – but he needs your help to get there (and collect a few things along the way!) Follow the instructions below and see how many points you get...

HOW TO GET THERE:

1. Place **MatataBot** on the **X**, facing in the direction of the arrow.

2. You can't move through rocks!

3. If you create code that will get him to the tower, you get **4 points**!

4. If he gets the battery on the way, you score **1 bonus point**.

5. An ice lolly will cool him off! If he gets that, you get **2 points**.

6. If you use a loop in your code, you get **3 bonus points**. If you use TWO loops in your code, **double your total**!

You have coded your way to the tower!

Your total score is:

All About Coding: Learn the Vocabulary!

Here are some words you will need to know when learning more about coding!

Congratulations! Well done, everyone!

ALGORITHM: A set of instructions that tell a computer how to do a certain thing.

APP: Short for *application*, this is a program that is designed to do a particular job.

BLOCK: A part of a computer program.

BUG: An error or fault in computer code.

CODE: Instructions for a computer or computer-controlled device.

COMMAND: An instruction that tells a computer to do something..

CRASH: When a problem makes a device or program stop working or shut down.

DATA: Information that can be understood and used by a computer.

DEBUGGING: Finding and correcting errors (or *bugs*) in code.

HARDWARE: The physical parts of a computer. *Software* (like apps and programs) runs on the hardware!

LOOP: A part of an algorithm that repeats over and over until it is told to stop.

NETWORK: A group of computers and other devices that can communicate with each other and share data.

PROGRAMMING LANGUAGE: A set of rules for giving instructions to a computer. There are many different programming languages.

SOFTWARE: The apps or programs that run on a computer.

You have rescued MatataBot and completed this pack – and learned about coding, too! Now let's build some word power!

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Answers

Check if you found the right solutions to the activities in this pack!

ACTIVITY 1: Your First Command

You should have used 3 **Move Forward Coding Blocks** to reach the watermelon!

ACTIVITY 2: Taking Turns

You should have used 5 **Coding Blocks** to reach the battery:

ACTIVITY 3: One Good Turn Deserves Another!

You need to use 2 **Left Turn 90° Coding Blocks** (and 2 **Move Forward Coding Blocks**) to get to the ice cream.

ACTIVITY 4: Setting Parameters

The simplified code is:

ACTIVITY 5: Coding Challenge

Using **Parameters**, you could get **MatataBot** to the camera using 7 **Coding Blocks**:

ACTIVITY 6: Loop the Loop!

This code will get **MatataBot** to walk all the way around the tree:

ACTIVITY 7: Bug Hunting!

The incorrect **Coding Block** was the last one – it was **Move Back** but it should have been **Move Forward**. Following the incorrect code would lead **MatataBot** to the pineapple!

ACTIVITY 8: MatataArt Message

This code would draw a 'P' on the sand:

ACTIVITY 9: Ultimate Coding Challenge

There are many ways to get to the tower, but this code will get you the high score of 20:

CODING QUIZ p03: Computers, tablets and mobile phones all use microprocessors. Many cars, washing machines and fridges do, too!

CODING QUIZ p05: Binary only uses 0s and 1s!

CODING QUIZ p12: All of them can be thought of as loops!

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Learning coding is fun!

There is a lot more to learn. This adventure with MatataBot is only the beginning!

Take part in the pilot programme and meet the real MatataBot!
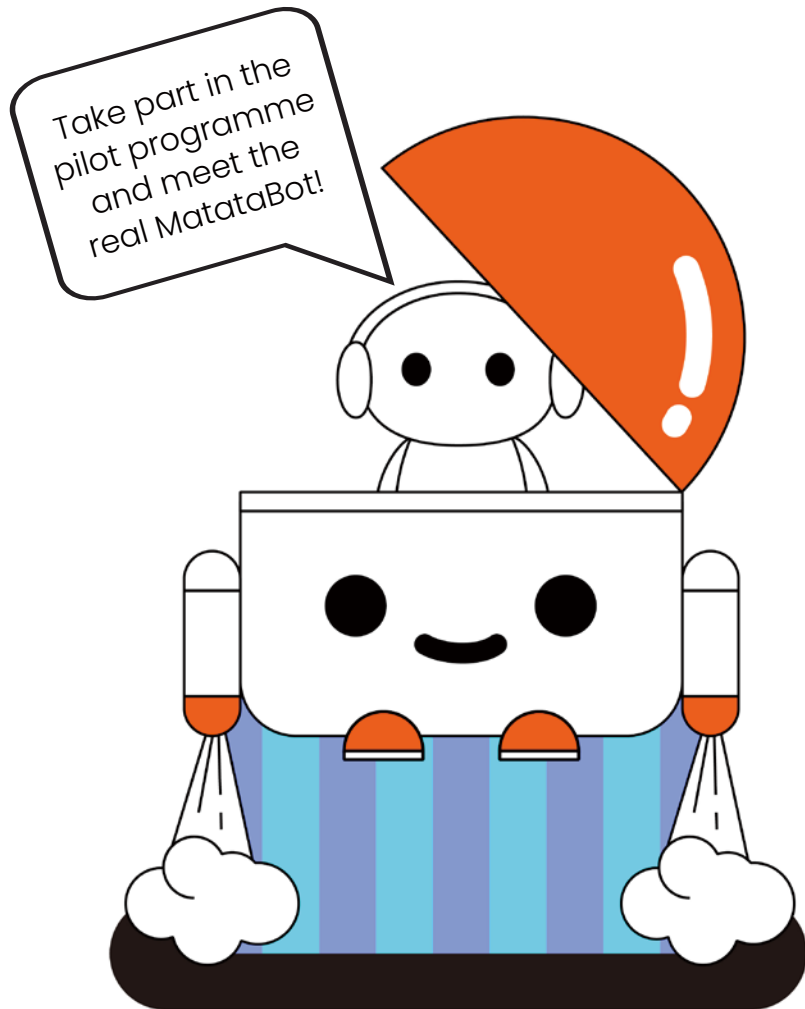
Get in touch!

We really hope that you have found this pack useful and enjoyable.

Matatalab is a technology education company that provides innovative STEAM learning experiences to families and over 8,000 educational institutions in more than 60 countries around the world, helping children develop their abilities and confidence.

We are now bringing Matatalab to you, and are looking for schools to take part in a free pilot programme.

The Matatalab Solution pilot project aims to introduce children aged 3-9 to the basic concepts of coding through hands-on gameplay.
Fun, creative and collaborative, this project encourages teachers and children to explore their imaginations and combine collaborative thinking with the playful discovery of the world of coding. You'll even get to experience Matatalab's products first hand — by getting your hands on an actual Matatalab robot!

If you are keen for your school to take part, please email us!
marketing@matatalab.com