ROBOMATION
MAKE THINGS ALIVE

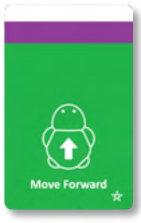
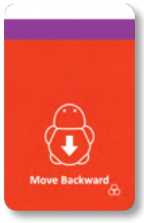
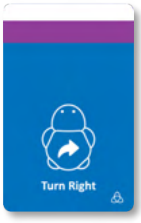
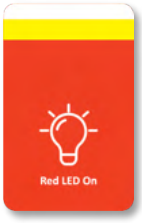
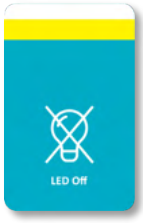
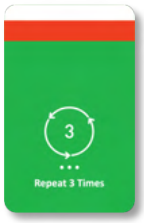
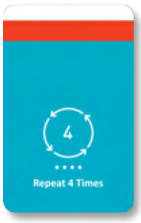
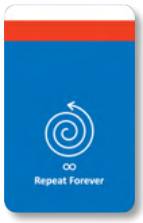
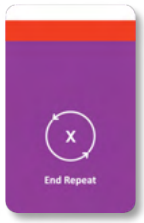
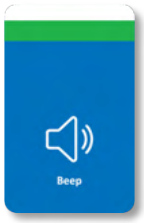
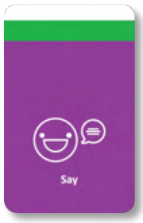
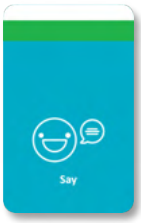
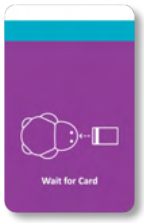
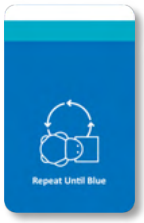
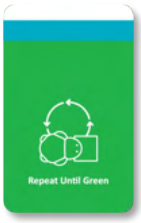
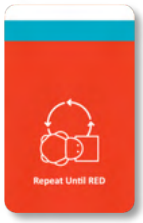
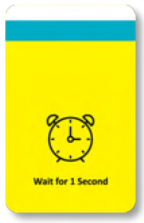
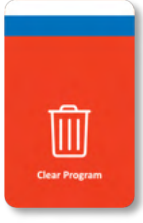
Turtle

Turtle 24-Type Coding Card

(This manual is subject to change or update.)

Card Composition

Sorted according to the colour of band at the top of the card.

Band Color	Card				
Motion	 Move forward	 Move backward	 Turn right	 Turn left	
LED	 Blue LED On	 Green LED On	 Red LED On	 LED Off	
Repeatation	 Repeat 2 times	 Repeat 3 times	 Repeat 4 times	 Repeat Forever	 End Repeat
Sound	 Beep	 Say	 Say	 Say	
Conditional Command	 Wait for Card	 Repeat until Blue	 Repeat until Green	 Repeat until Red	 Wait for 1 Second
Program Command	 Call Function	 Clear Program			

Entering Card Coding Mode

(1) Turn the robot's power on.

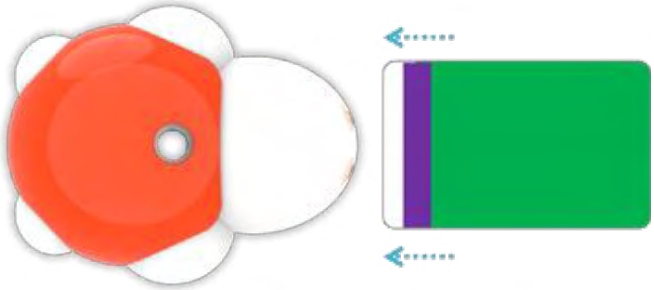
(2) The robot's head LED will change to rainbow colours.

(3) Press and hold the Back button for over 3 seconds.

(4) When you hear a beep sound and the head LED changes to white, you have successfully entered Card Coding Mode.

Recognising Coding Cards

(1) Place the card on the floor with the coloured stripe facing downwards, aligning it with the colour sensor under the robot's head.



(2) The robot will make a beep sound, and the head LED will illuminate with the same colour as the recognised card.

(3) Once the card is recognised, remove it, and the head LED will return to white. Repeat the process for the next card.

(4) After recognising all the cards, briefly press the Back button, and the robot will move according to the recognised card sequence.

(5) To delete commands, press and hold the Back button in Card Coding Mode. The head LED will turn red, and you will hear a beep sound. This will delete the previously inputted card commands. Once the head LED returns to white, you can input new card commands.

(6) Without deleting the code, if you input additional command cards, they will be added to the previously written code.

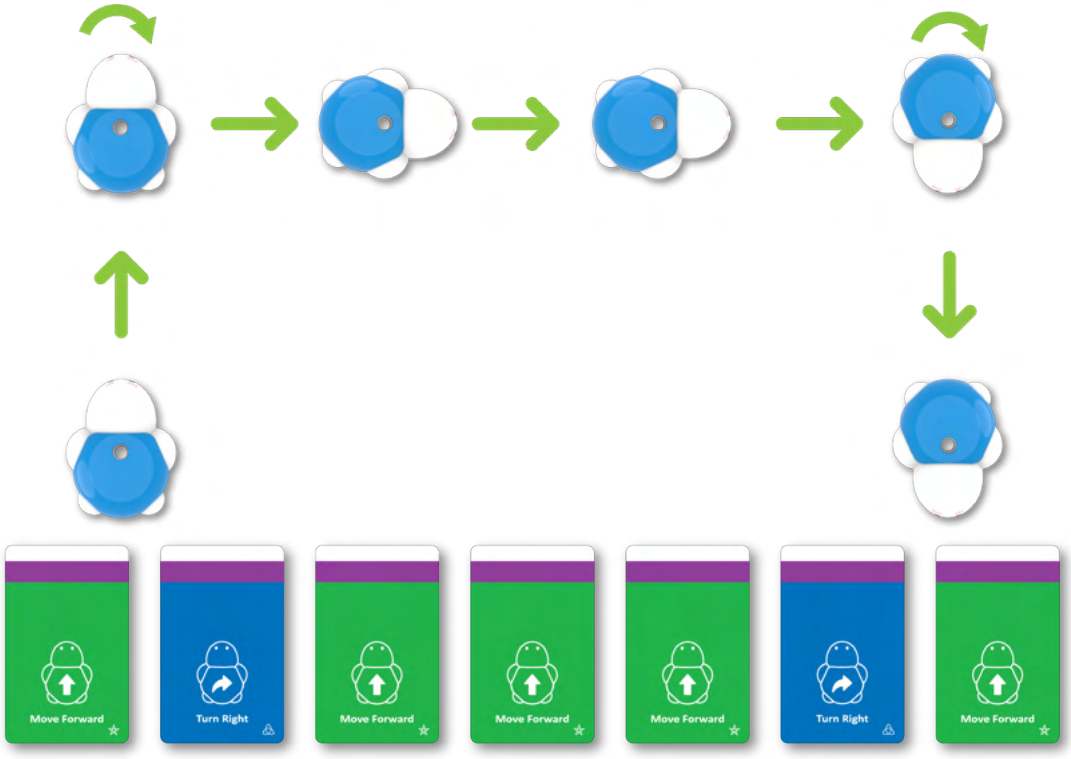
Important Note:

- You can recognise up to 32 cards as commands. If you attempt to recognise more than 32 cards, the robot will sound an alarm siren, and the head LED will turn red.

- If the cards are not recognised properly, perform the calibration process. The calibration method is explained in the following section.

Utilising Card Coding:

(1) Place the coding cards in the order of the desired commands for the robot's movement.



(2) Execute Card Coding to let the robot recognise the coding cards in the specified sequence.

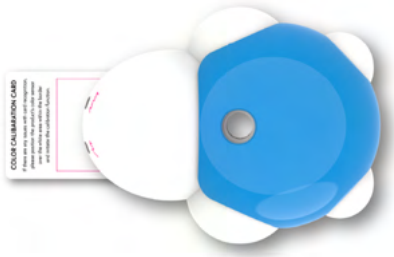
(3) After inputting the commands, observe the robot's movement by pressing the Back button and debug the programme to complete it.

(4) By arranging cards, you can explore patterns in your code or discover efficient algorithmic methods, allowing for programming learning opportunities.

Calibration

(1) Turn the robot's power on.

(2) The robot's head LED will change to rainbow colours.



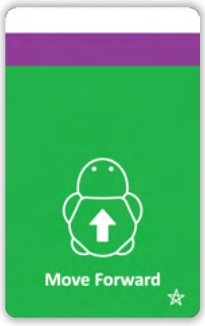
(3) Place the Turtle Robot on white paper to be used for calibration.

(4) Double-click the Back Button.

(5) The calibration process will begin with blinking green lights.

(6) Once the process is complete, a red light will turn on with a beep.

How to Use Each Card

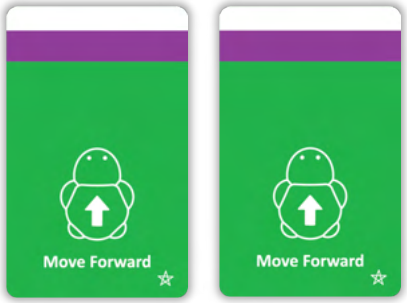
Move Forward	

- The Turtle robot moves forward 12cm.
- Using this, we can measure lengths that are multiples of 12cm. After inserting the Turtle-specific colour pen into the pen holder and placing the Turtle on the paper, let's code and measure the length.

	1 time	2 times	3 times	4 times	5 times
Length	12cm	24cm	36cm	48cm	60cm

Example

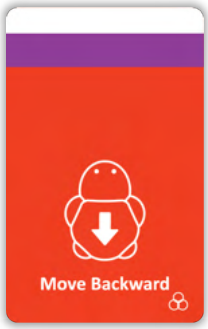
How should code to make the Turtle robot move 24cm?



We input the card twice consecutively, then click the turtle button once, and the robot moves forwards 2 times (24cm).
In this way, let's operate it 3, 4, and 5 times to check if the length is correct.
(The robot's movement distance may not be accurate due to the robot's hardware characteristics, usage environment, physical environment, and cumulative errors.)

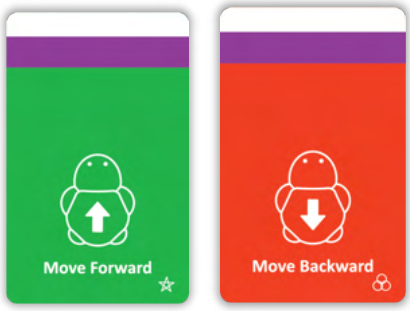
If you need to perform the same action more than twice, you can use the "Repeat" card.
You can find out how to use the "Repeat" card in the following section.

If you insert additional cards after completing the action, the new action will be added to the previous code.
If you want to reset the action, press and hold the turtle button for more than 3 seconds to delete the program, or use the "Clear Program" card to delete it.
You can find out how to use the "Clear Program" card in the following section.

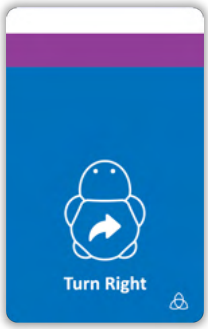
Move Backward	
• The Turtle robot moves backwards 12cm.	

Example

Try writing the code using the "Move Backward" card to move forwards 12cm and then return to the starting position.

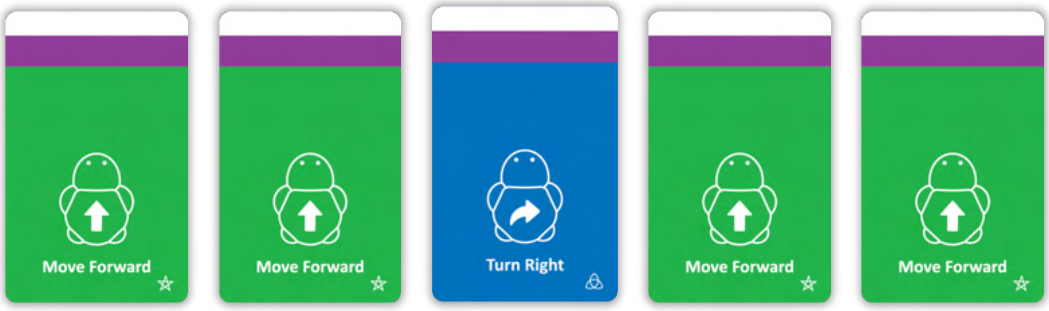


In the card coding mode, after entering the "Move Forward" card and the "Move Backward" card in order, click the Turtle button once, and the Turtle robot will move forwards 12cm and then move backwards 12cm.

Turn Right	
• The Turtle robot rotates 90 degrees to the right from its current position.	

Example

Code the Turtle robot to move forward 24cm, then rotate to the right and move forward another 24cm.



Turn Left	
• The Turtle robot rotates 90 degrees to the left from its current position.	

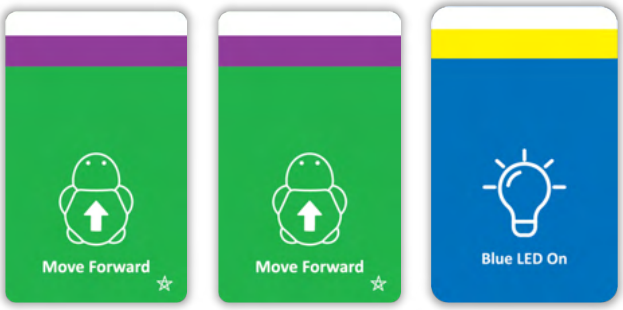
Example

Insert a pen into the Turtle robot and code it to create a 12cm square.

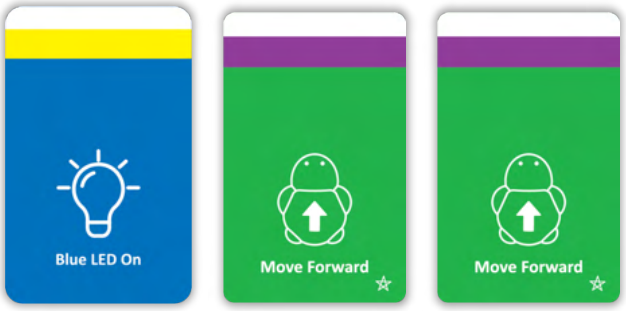
Blue LED On	
• Turn on the Turtle robot's head LED in blue. • All actions will keep the LED on until another LED control command is input and executed.	

Example

Assume there is an obstacle 24cm ahead, code the Turtle robot to move forward 24cm, stop, and turn on the blue LED.



If you change the order of the code as follows, how will the turtle robot move?

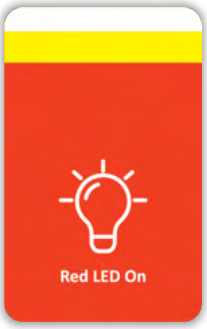


Most likely, the turtle robot will keep the head LED in blue while moving forward 24cm.

Green LED On	
• Turn on the Turtle robot's head LED in green. • All actions will keep the LED on until another LED control command is input and executed.	

Example

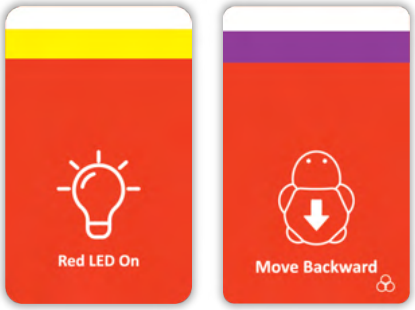
The head LED traffic light of the turtle robot has changed from red to green. Code the turtle robot to move forward 12cm while the head LED is green.

Red LED On	
• Turn on the Turtle robot's head LED in red. • All actions will keep the LED on until another LED control command is input and executed.	

Example

Code the turtle robot so that the head LED can be turned on in blue, green, and red colours.

Code the turtle robot to move forward 12cm, then rotate to the right and move forward another 12cm, then rotate to the left and move backward 12cm, and finally, rotate to the right and move backward 12cm to return to the starting position. You can code it in a way that turns on the LED in green when moving forward, in red when moving backward, and in blue when rotating.

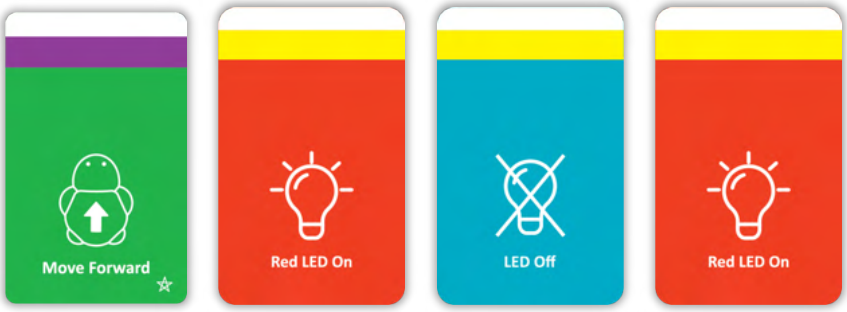

Red LED On
Move Backward

LED Off	
• Turn off the head LED of the turtle robot, which is lit in various colours.	

Example

A danger has been detected 12cm ahead. Code the turtle robot to move forward 12cm, then stop and turn on the red LED twice and off to make it blink.

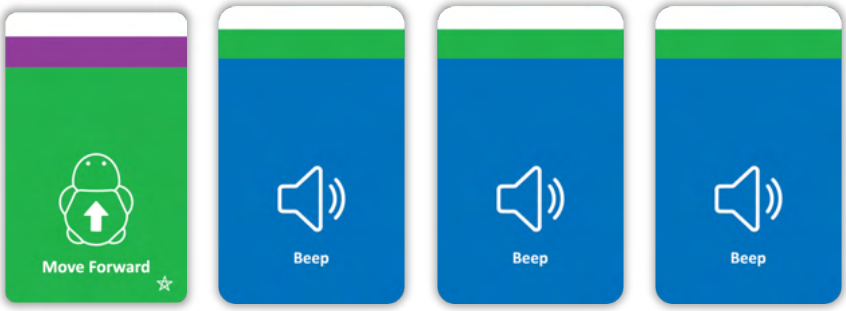
In the above example, try not entering the last "LED Off" card and see if the behaviour changes.



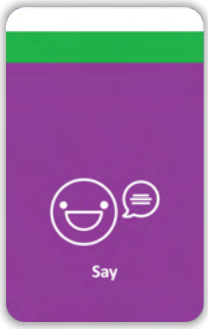
Beep	
• The Turtle robot emits a Beep sound once.	

Example

A danger has been detected 12cm ahead. Code the Turtle robot to move forward 12cm, then stop and emit a Beep sound three times.

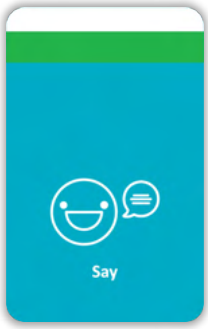


Code the Turtle robot to draw a 12cm square and return to the starting position, making a Beep sound when rotating.

Say	
• The Turtle robot plays the sound specified in the violet card. In unplugged mode, the robot sound will play.	

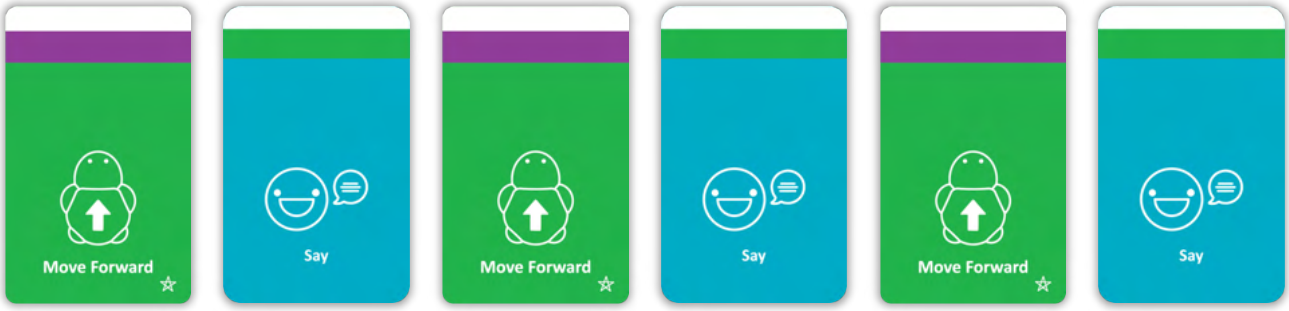
Example

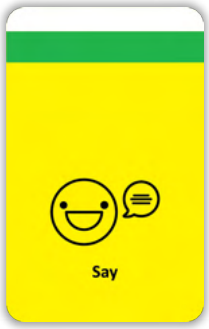
The Turtle robot dances, shaking its head right and left while making robot sounds.

Say	
• The Turtle robot plays the sound specified in the Cyan card. In unplugged mode, the engine sound will play.	

Example

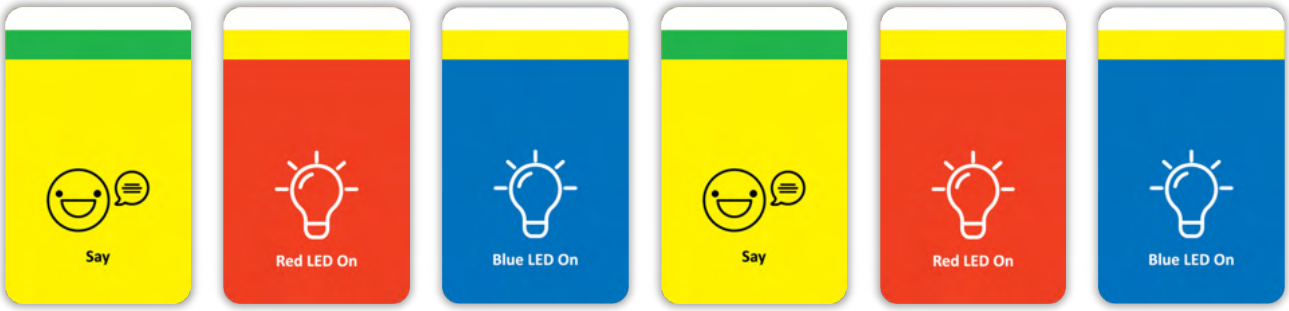
Code the turtle robot to move forward 36cm while making engine sounds. (Code it to make engine sounds every time it moves 12cm.)



Say	
• The Turtle robot plays the sound specified in the yellow card. In unplugged mode, the siren sound will play.	

Example

Code the turtle robot to become a police turtle robot that sounds the siren and brightens the LED. After coding, discuss with friends how they coded it.



Call Function	
• Create a new function or modify an existing function. • When executing the entered function, use the 'Call Function' card.	

Enter the Function Code

Turn on the power switch

Press and hold it.
(Card coding mode)

Double-click it

Function code standby

When the head LED turns on in a dim white color with a Beep Beep sound, it enters the function code input waiting state.
In this state, all previously saved function codes are deleted.

Input function code

Now, enter the function command cards in order.
Up to 16 function code command cards are possible.
If you enter more than 17 times, the head LED will turn red with a siren sound.

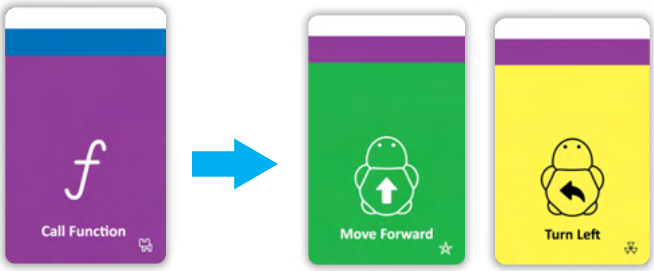
Click

Once the function code input is complete, click the button once, and the head LED will turn bright white again, entering the card coding mode.

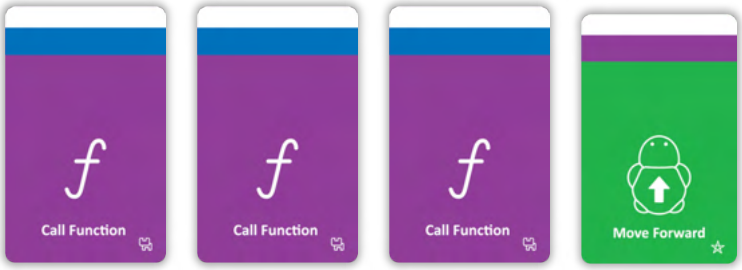
Example

Try creating a code to draw a 12cm square with a pen.

Let's make a repeating section into a function.
Function



The code using the function will look like this.

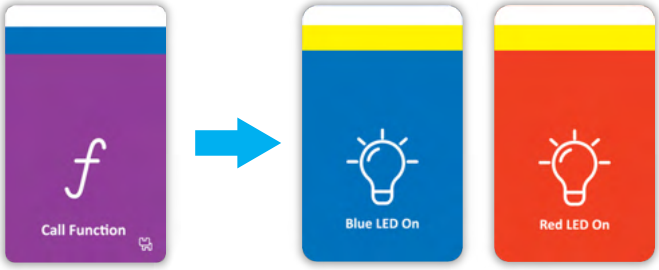


Example

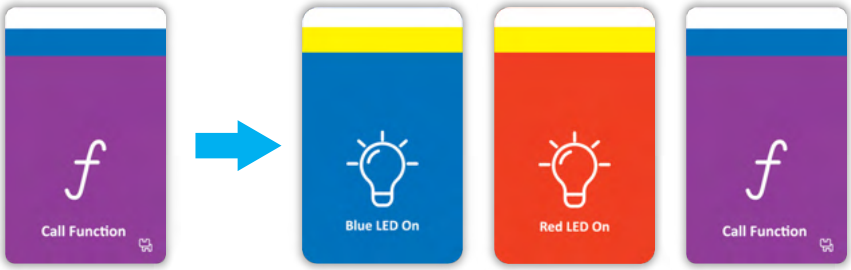
Let's create coding that repeats infinitely using the function code.

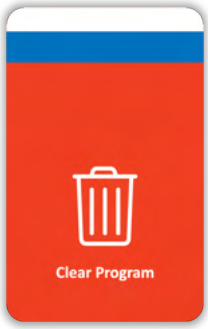
When using the "Call Function" card at the end of the function code, the function call will repeat indefinitely.

Let's learn the coding for making a police robot.



Shall we add the 'Call Function' card at the end? And let's see how it moves by executing the function.



Clear Program	
• This card is used to delete all previous coding of the turtle robot. • However, the data entered in the function will not be deleted.	

Program deletion method 1:

Press and hold the equal button for more than 3 seconds in the card coding mode, and with a Ch-Ch-Ch sound, the head LED will turn red, and all previous programs will be deleted.

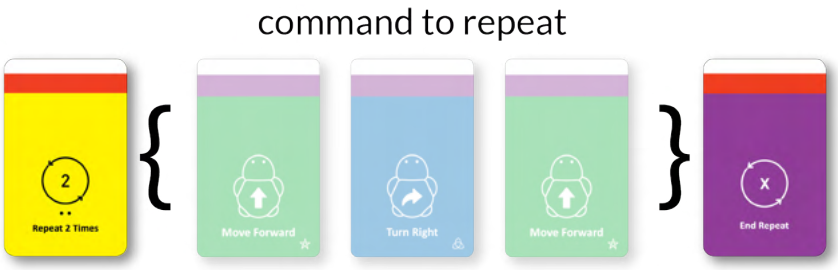
Program deletion method 2:

In the card coding mode, enter the 'Clear Program' card, and all data will be deleted.

Repeat 2 times	
• This command card repeats the command between this card and the 'End Repeat' card twice.	

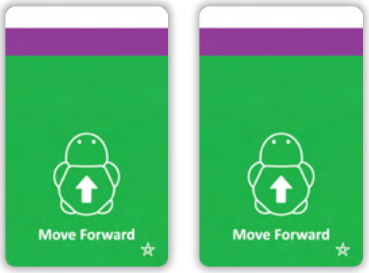
How to execute a repeat card:

To use the repeat card, insert the code you want to repeat between the "Repeat ~ times" card or "Repeat Until ~" card and the "End Repeat" card.

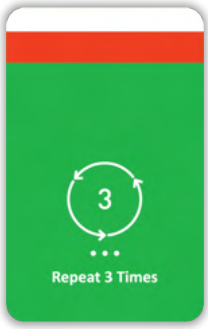


Example

Let's create a code for the turtle robot to move 24cm forward.



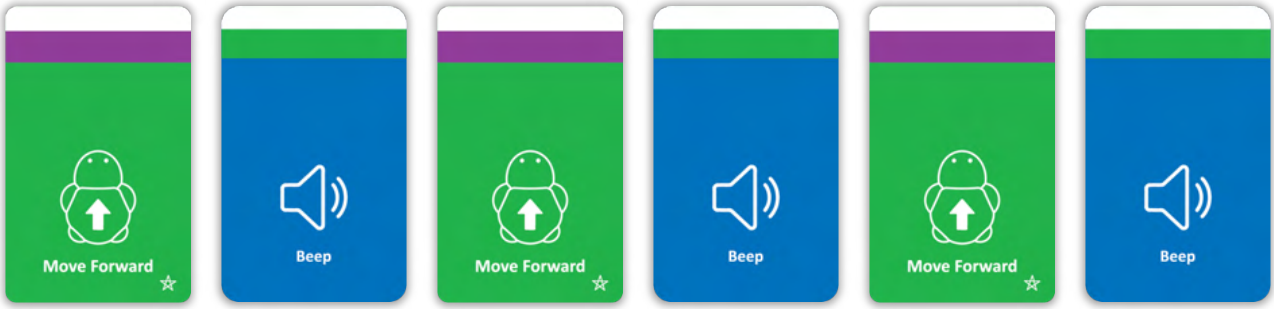
Use the repeat card to create the code.
Note: You cannot use the repeat card when writing the function code.

Repeat 3 times	

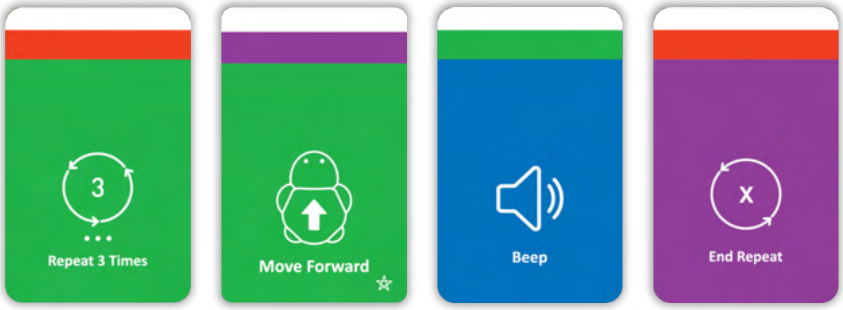
- This command card repeats the commands between this card and the 'End Repeat' card three times.

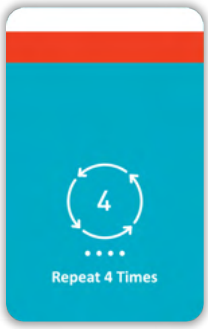
Example

Let's create a code for the turtle robot to move 36cm forward and make a beep sound each time it moves forward.



Use the repeat card to create the code.

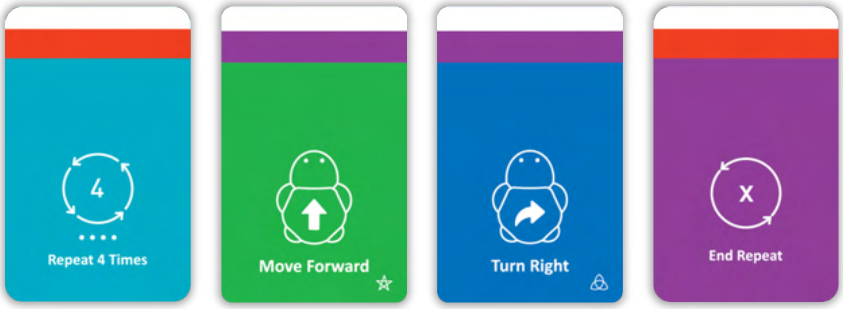


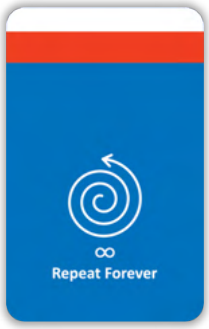
Repeat 4 times	
• This command card repeats the commands between this card and the 'End Repeat' card four times.	

Example

Insert the pen and create a code for the turtle robot to draw a 12cm square.

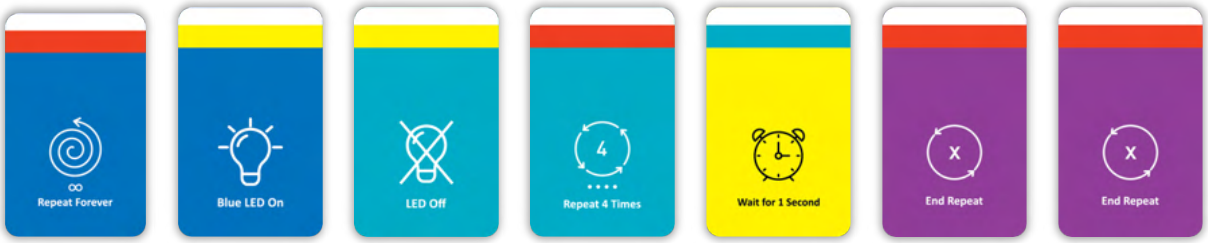
Use the repeat card to create the code.

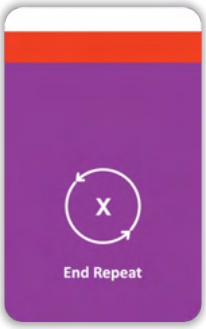


Repeat Forever	
• This command card repeats the commands between this card and the 'End Repeat' card indefinitely. • To continue the repetition, you can use the Repeat Forever card or the 'Call Function' card at the end when creating a function.	

Example

The turtle robot is blinking its eyes. Create a code to blink its eyes every 4 seconds.



End Repeat	
• This card is used with the Repeat card to create a loop.	

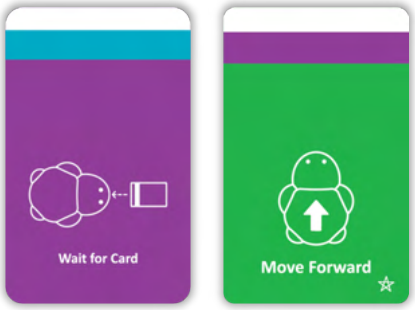
Example

Let's code it to turn the blue light on and off 24 times.

Wait for Card	
• This card performs actions after 24 random cards are input. It sequentially executes commands up to this card, then stops until a random card is input, and then proceeds with the next command after card input.	

Example

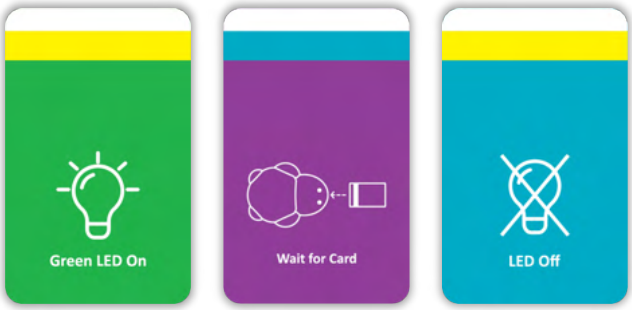
Code the turtle robot to move forward when a card is input.

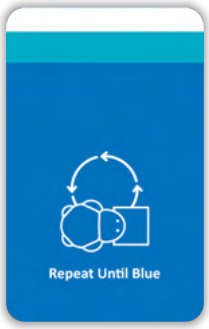


In card coding mode, after entering the cards mentioned above, when you execute (by clicking the back button once), nothing happens until a random card is input. Once a random card is input, the Turtle robot will move forward.

Example

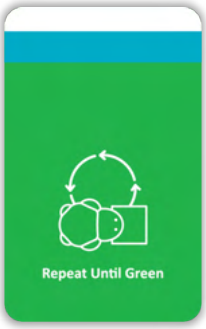
Code it to turn off the light when a card is input.



Repeat Until Blue	
• This command card repeats the commands between this card and the 'End Repeat' card until it encounters blue.	

Example

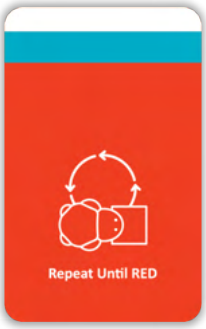
Continuously make the blue LED turn on and off when encountering blue paper.

Repeat Until Green	
• This command card repeats the commands between this card and the 'End Repeat' card until it encounters green.	

Example

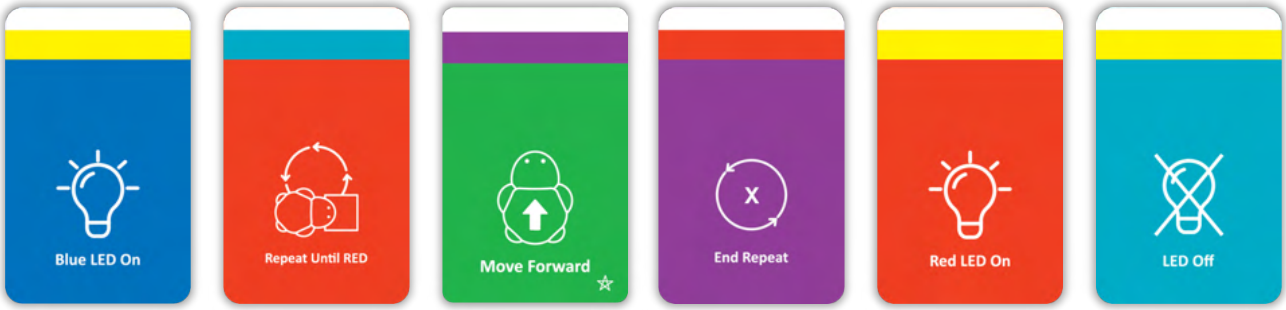
When the Turtle robot eats a green fruit, it gets excited and rotates one lap, blinking the green LED three times.

- Explanation of ‘Repeat Until Green + End Repeat’
  This code is the first one, so it performs a repeat that does nothing until green is encountered. If green is detected, it will end the repetition and proceed to the "Repeat 4 times" card.

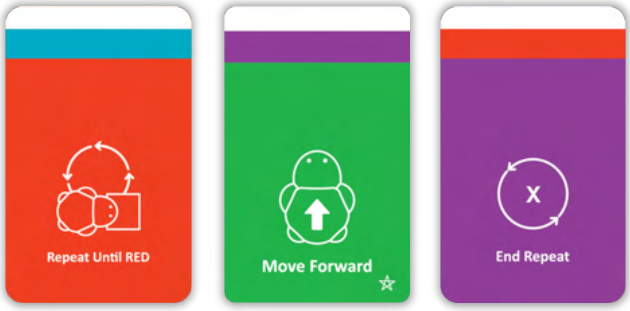
Repeat Until RED	
• This command card repeats the commands between this card and the 'End Repeat' card until it encounters red.	

Example

The Turtle robot turns on the blue headlights, moves forward, and when it encounters a red area, it turns on the red LED, turns it off, and stops.



- Note on 'Repeat Until ~'
  In the case of repeating until a specific color is encountered, it recognizes the color after the previous action is completed.

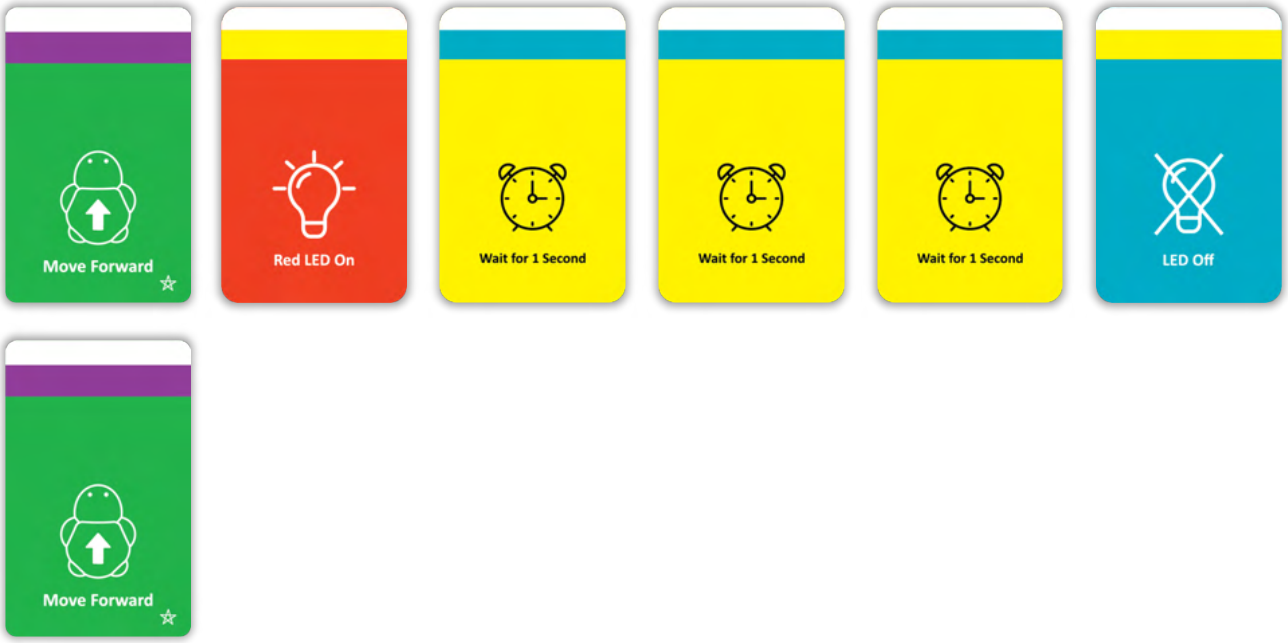


In a code like "Repeat Until Red - Move forward - End Repeat," it doesn't immediately stop when encountering red during forward movement. Instead, if the forward movement stops when encountering a red color, it stops repeating at that point.

Wait for 1 Second	
• This card pauses for 1 second between the previous and subsequent actions without doing anything.	

Example

Let's code the turtle robot to move forward 12cm, wait for 3 seconds when it encounters a red light, and then move forward 12cm again.
(Note: When inserting turning the LED on and off, it takes some time to perform the action, so it takes more than 3 seconds until the next action.)



Example

Let's create the sound of applause to cheer.