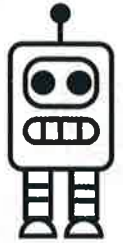
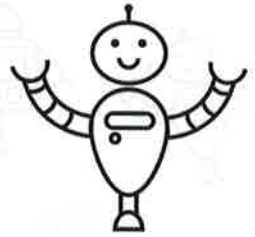
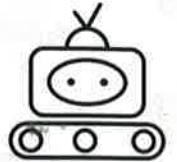
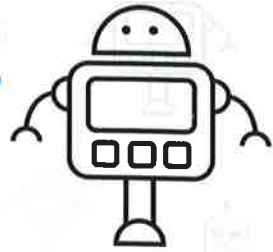


Amazing engineers



Juan Luis Sa Teixeira
complubot

(ZE)

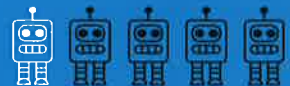


TRUE TRUE



EDUCATIONAL
ROBOTICS
WORKBOOK

LEVEL

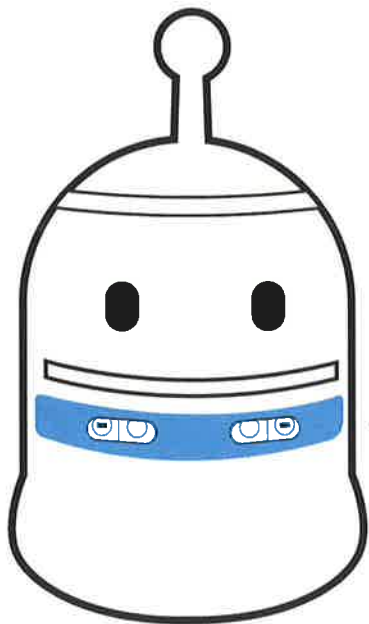


2

Explorers of
the Earth

www.complubot.com

Who is True True?



Hi, I'm True True!

I am your new robot friend with whom you will learn **robotics** in a very fun way!

I have senses like you that help me to know my surroundings. They are called **sensors**.

I love eating cards. You can use them to tell me what you want me to do and **program me**.

I also have a great time disguising myself. We will design my costumes!

Choose a name for me: _____

We are going to have many great adventures together!



Programming modes



True True can be programmed in three ways:

BASIC CARDS - Programming movements and turns.



GRID - Movement following a grid.

LINE TRACING - Movement following a line.



TILT MOTION - Programming tilting to True True.

HAND DIRECTION - Movement controlled by hand.



DIGITAL SCREEN - Movement on the screen of your tablet.

APP - Programming from tablet or mobile.



SCRATCH - PC programming with the Scratch platform.

2 - Explorers of the Earth

What we are going to learn in this workbook

In this workbook, we will learn how to program True True. We will use the **basic movement cards** and new **music cards, lights and sensors**.

In addition, you will discover how to control True True from your tablet:



LED LIGHT - Illuminate with various colours.



MELODY - Play a melody.



LINE TRACING - Move along a line.



HAND FOLLOWING - Move following a hand.



TRUEBOT CONTROLLER APP

Use your tablet or mobile to control True True.

Let's go and visit an allotment!

Farmers get up early to look after the vegetables in their allotment. Margarita, an expert farmer, needs you to help her collect what she's grown.

However, bear in mind that

Margarita does not hear very well!



Use the board on page 11 for the following activities.

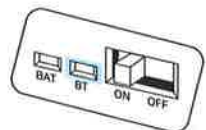


Activity 1. Help Margarita.

Use the LED LIGHT card so that True True warns Margarita with a light when she has picked a vegetable.



1st Turn on True True and place it on the board.



2nd Insert the **START** card.



3rd Insert the **MOVE FORWARD** card.



4th Insert the **LED LIGHT** card.



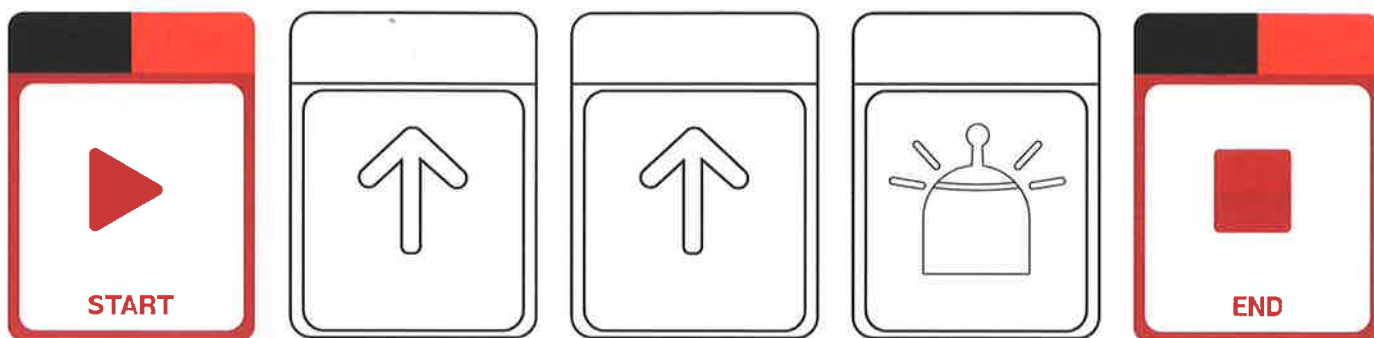
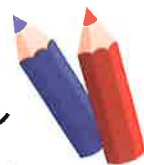
5th To finish insert the **END** card.



Challenge 1

Place True True at number ② facing the tomatoes and move forward to the tomatoes. Warn Margarita with a light when you pick them up.

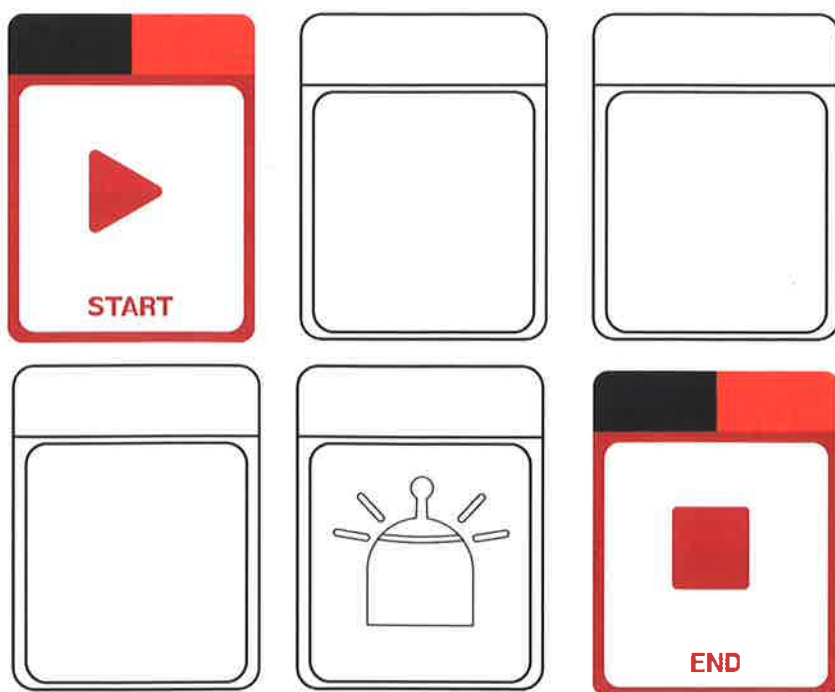
Colour the blank cards and program True True.



Challenge 2

Place True True at number ② facing the tomatoes and ending with the peppers. Warn Margarita with a light when you pick them up.

Colour the blank cards and program True True.



Lorenzo takes care of the garden next to Margarita's. He also needs you to help him collect his vegetables. Bear in mind that Lorenzo does not see very well!

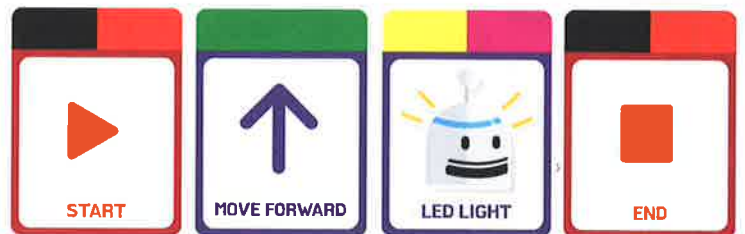
Activity 2. Help Lorenzo.

Use the MELODY card for True True to warn Lorenzo with a melody when he has picked a vegetable.



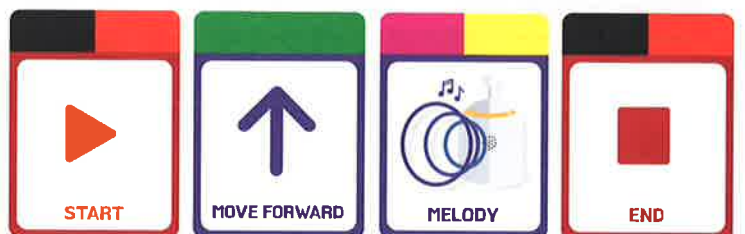
Experiment and circle the correct option:

1st Try these cards:



True True warns Margarita/Lorenzo with a light.

2nd Try these cards:



True True warns Margarita/Lorenzo with a melody.

Challenge 3

Place True True at number ② facing the tomatoes and finishing at the aubergines. Warn Lorenzo with a tune that you have picked them up. Colour the blank cards and program True True.

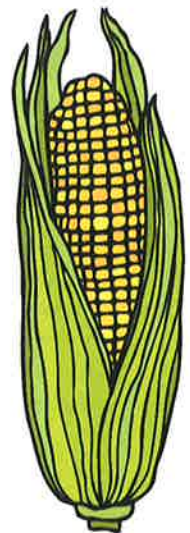


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Challenge 4

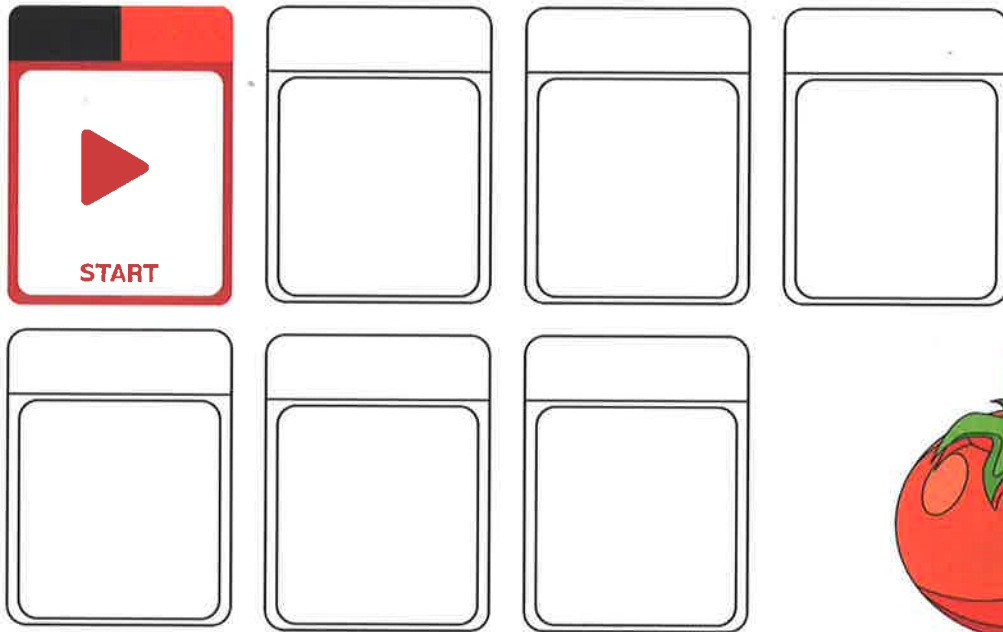
Place True True at number ③ facing the tomatoes and finish at the **corn** without stepping on the peppers. Warn Lorenzo that you picked them.





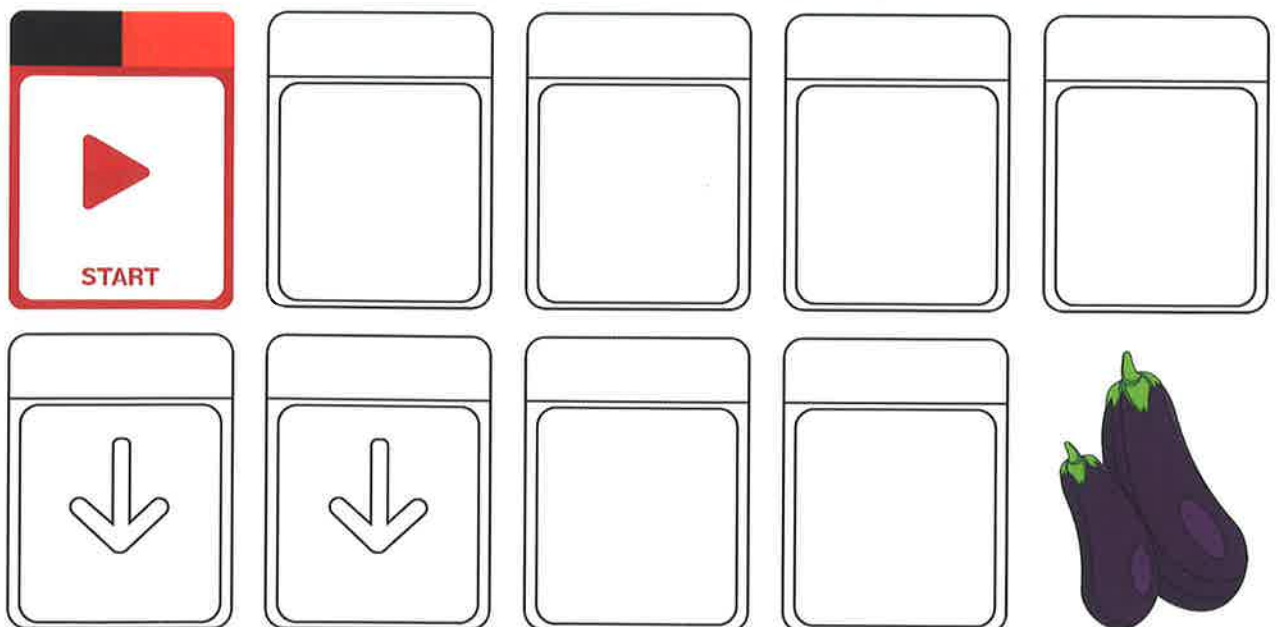
Challenge 5

Place True True on number ① facing the tomatoes and ending at the **tomatoes**. Warm Lorenzo when you start moving and Margarita when you pick them.



Challenge 6

Place True True on ② facing the tomatoes and collect the **corn** and **aubergines**. Warm Lorenzo when you start moving and Margarita when you pick them:



Challenge 7



Place True True on **2** facing the tomatoes and pick the **onions**. Warm Margarita every time you take a step, and when you pick them.

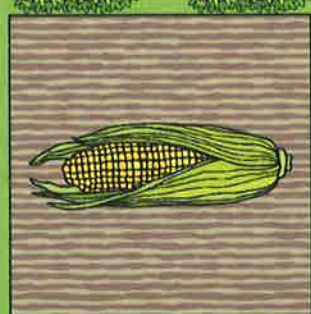
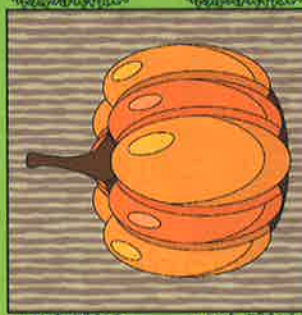
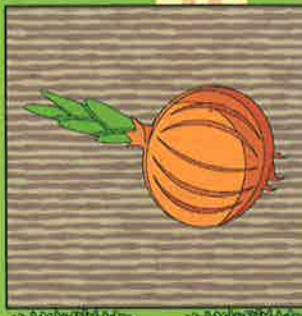
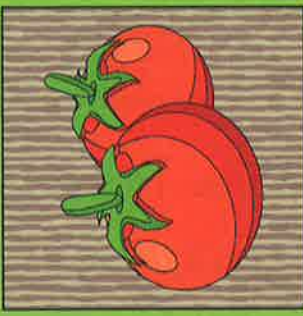
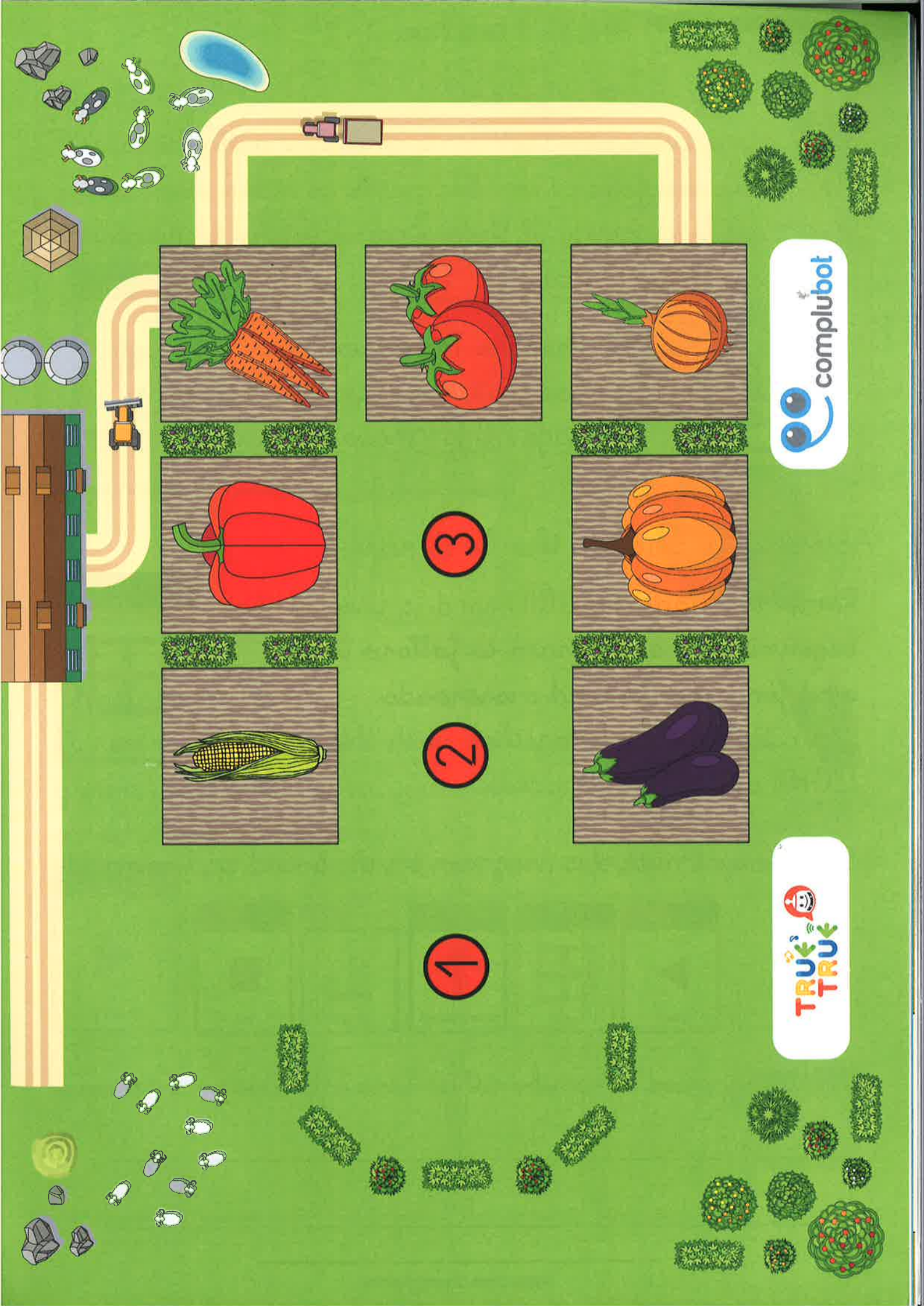


Challenge 8



Place True True on **3** facing the tomatoes and collect the **pumpkins** and **carrots**. Tell Margarita when you pick them.





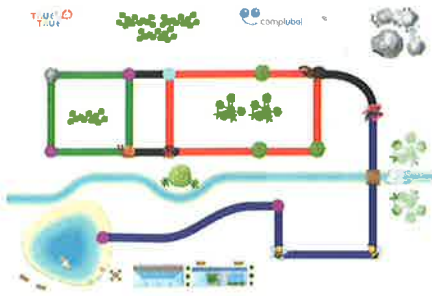
3

2

1

Let's explore the forest!

In the forest we can see many animals and plants. There we can follow marked paths to make sure we don't get lost. Many of them end up in the same place as where they started.



Prepare True True.

Use costume 1 and the board on page 10 for these activities.

Activity 3. Choose the best path.

Remember that the **GRID** card is used at the beginning of a program to follow lines and find marks and crossroads.

You can also use it together with the LED LIGHT and MELODY cards.



Experiment with this program on the board and respond.

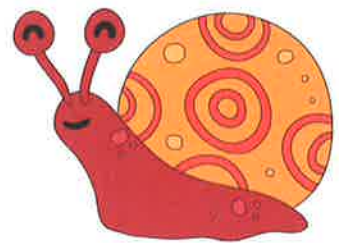
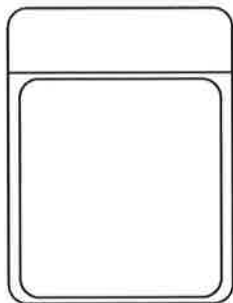
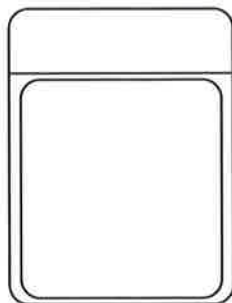
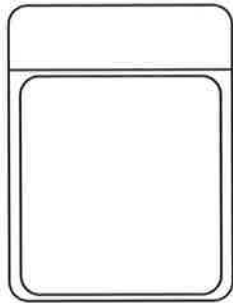
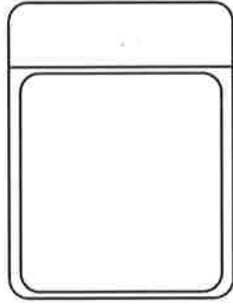
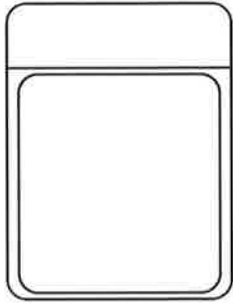
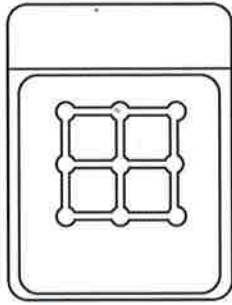


What happened? Describe what True True does on its way.

Challenge 9



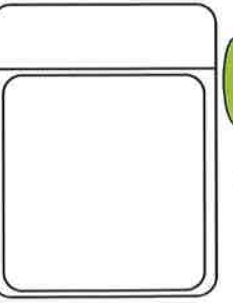
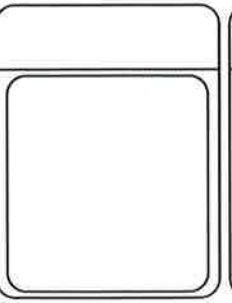
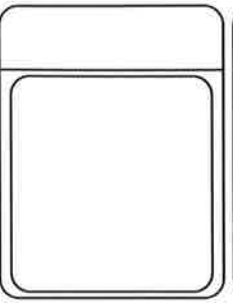
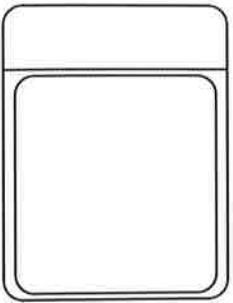
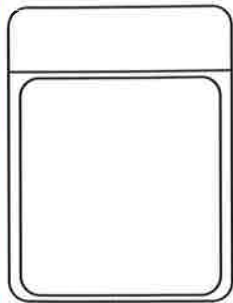
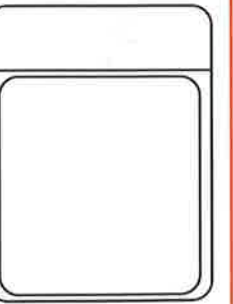
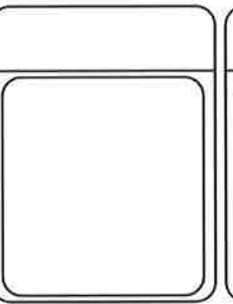
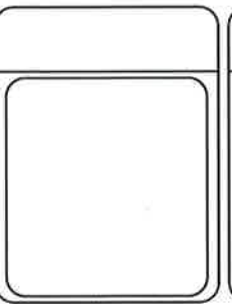
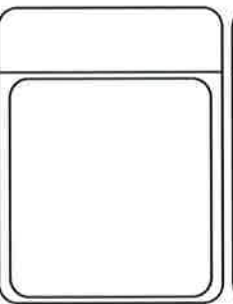
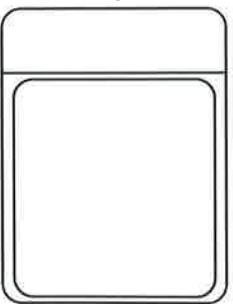
Place True True on the rock at the beginning of the green path. Get it to the snail and warm you, using the LED LIGHT card.



Challenge 10



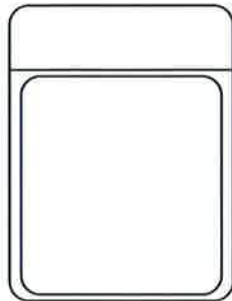
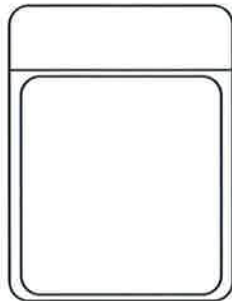
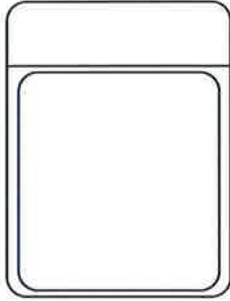
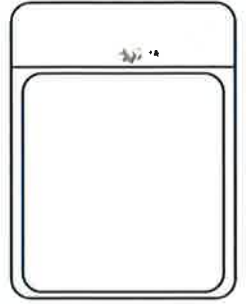
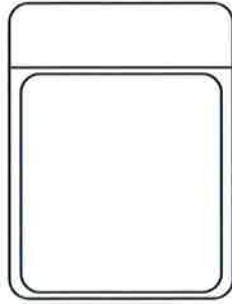
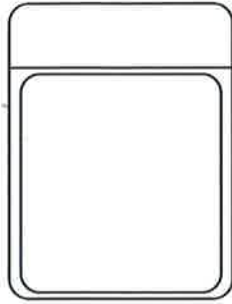
Place True True on the rock. Get it to walk the full green path and warm you with the LED LIGHT card when it finishes.



Challenge 11



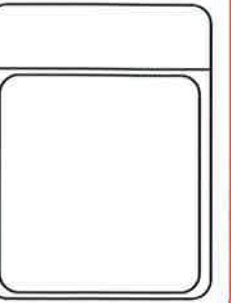
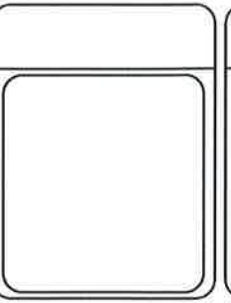
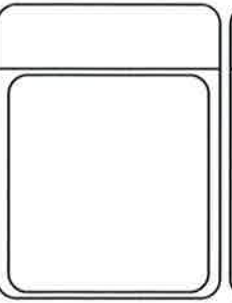
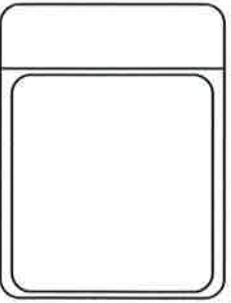
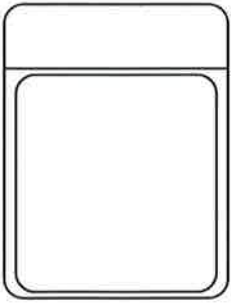
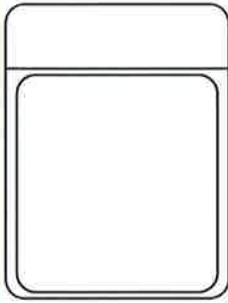
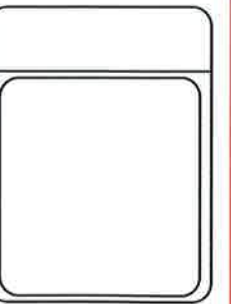
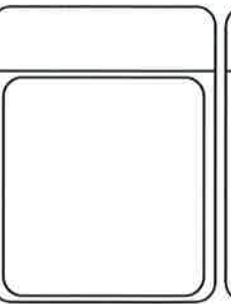
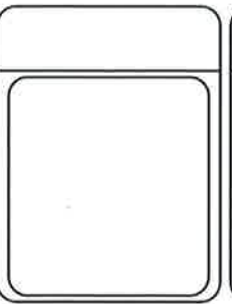
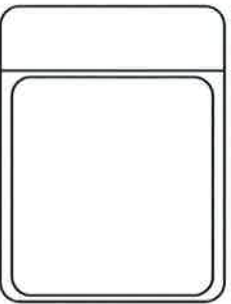
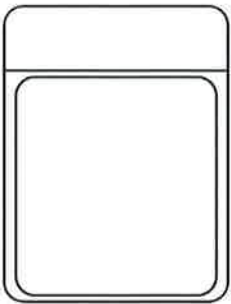
Place True True on the beetle, on the red path. Get it to walk the red path to the ladybird and warm you with the MELODY card.

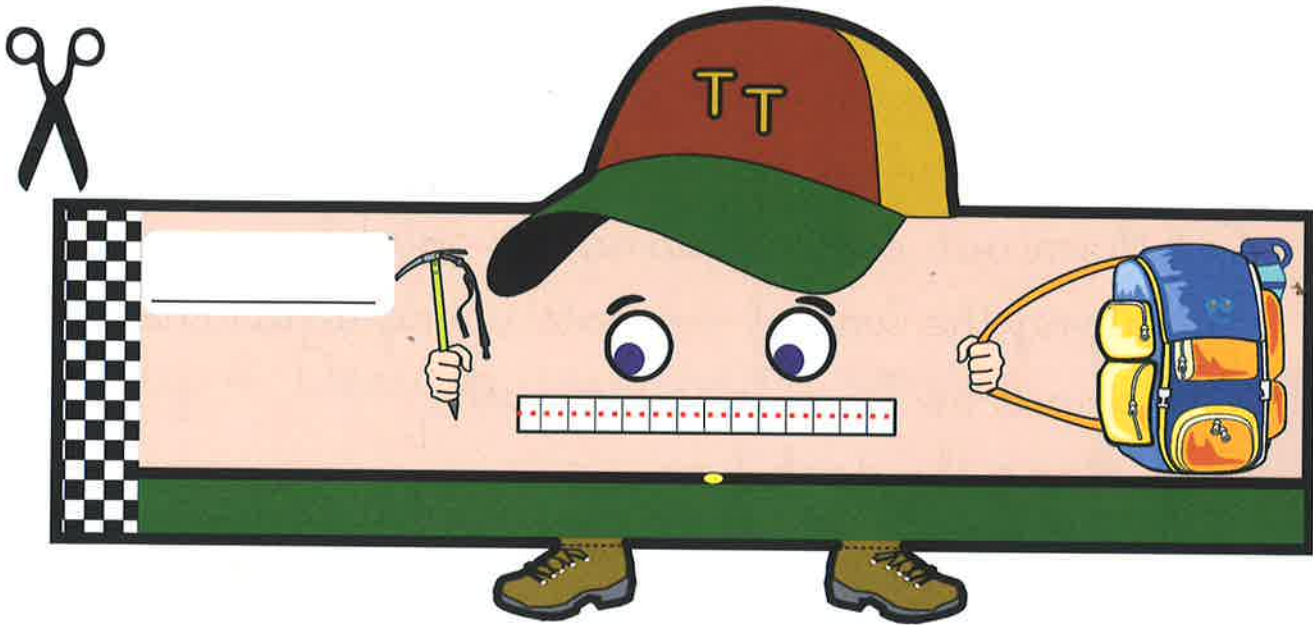


Challenge 12

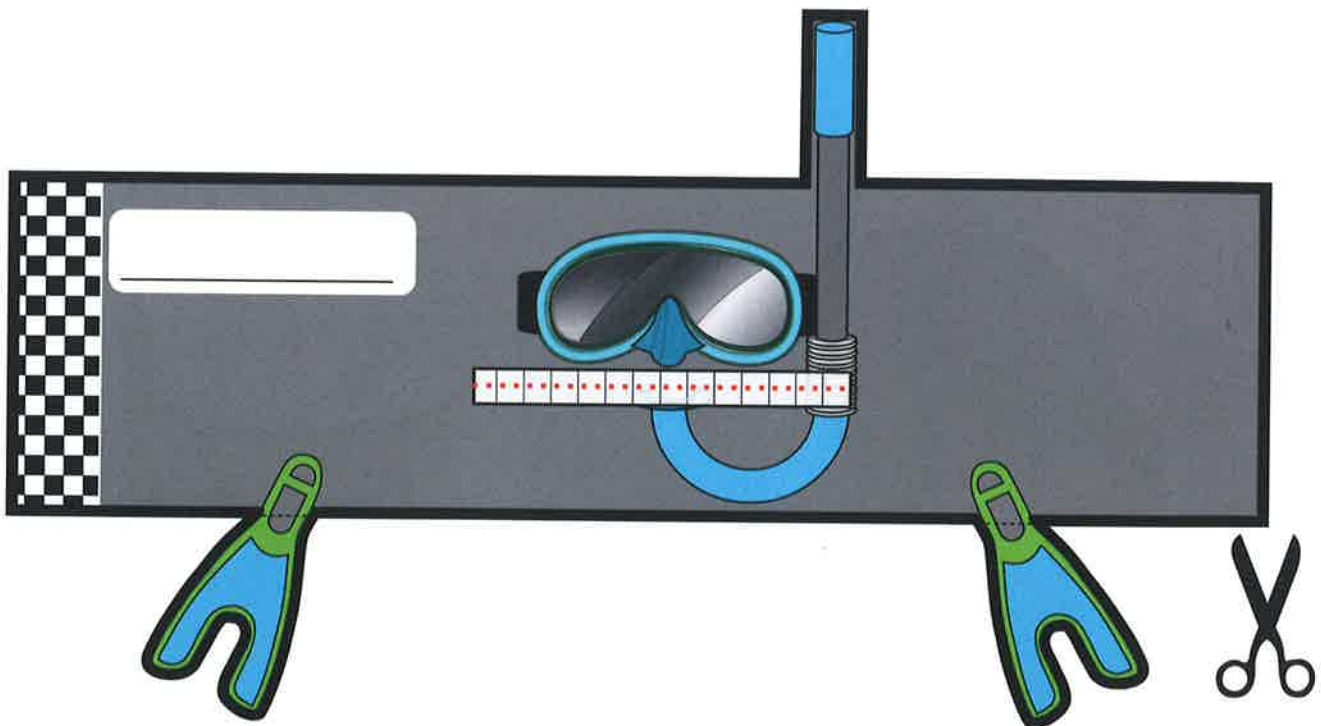


Place True True on the bridge, at the beginning of the blue path. Get it to the lake and warm you with the MELODY card every time it finds a bee.





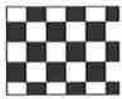
Costume 1 - True True hiker



Costume 2 - True True diver

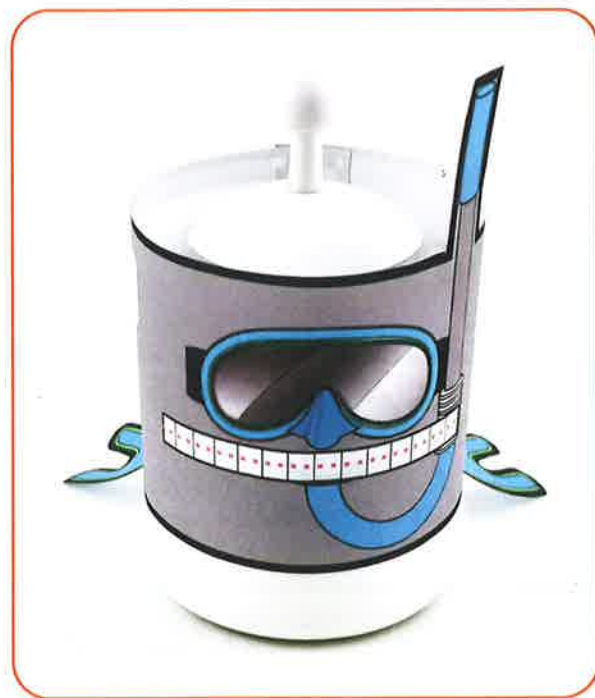
Instructions to assemble the costumes

On the previous page you have two costumes for True True:

- Put the name of your True True onto the two costumes.
- - Cut them out, cutting along the solid line.
- - Cut along the line of red dots using a puncher.
This will be True True's mouth.
- - Fold along the dash line.
-  - Add glue to the checked area and glue them into two cylinders.
- Put a costume around True True.
Make sure you place the hole for the cards over True True's mouth.



True True hiker



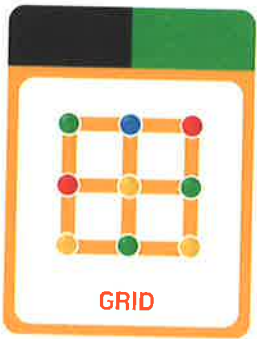
True True diver

Design your own route!

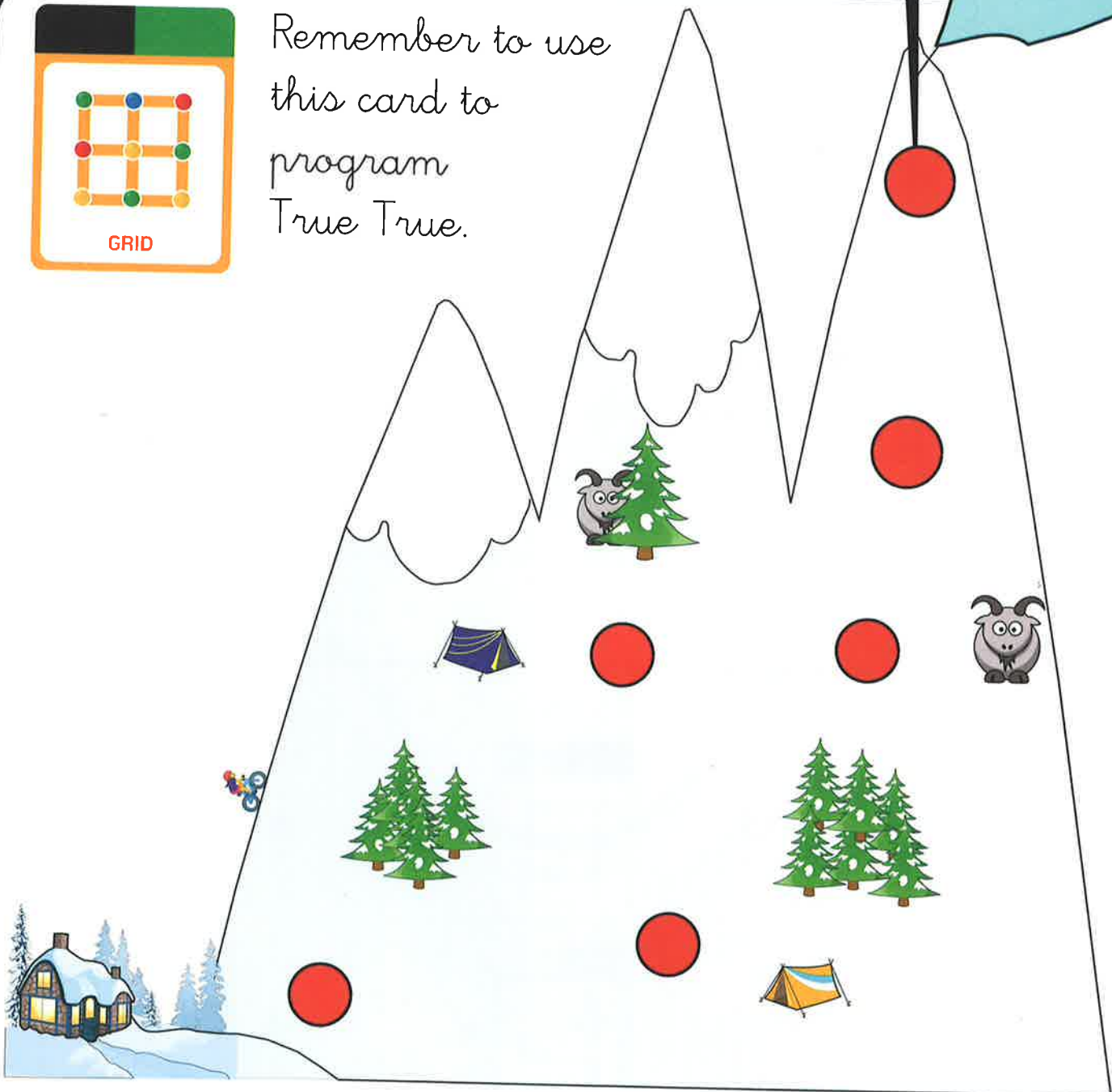
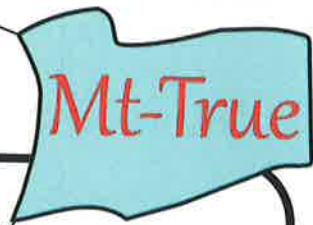
Design the best route to go up to the top of the mountain. Join the points with a thick line and avoid obstacles to get to the flag.

Remember to equip yourself with the hiker costume.

Activity 4. Design your own route.



Remember to use this card to program True True.



True True wants to take a walk near a cliff. There it can enjoy the views and the sea breeze.

Try not to get too close to the edge!



Activity 5. On the cliff.

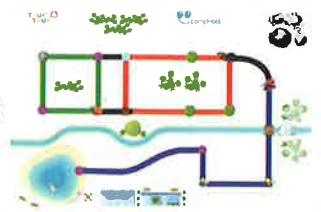
The **LINE TRACING** card is used to follow a line and distinguish the colours of the board. Use the board on the next page and the hiker costume.

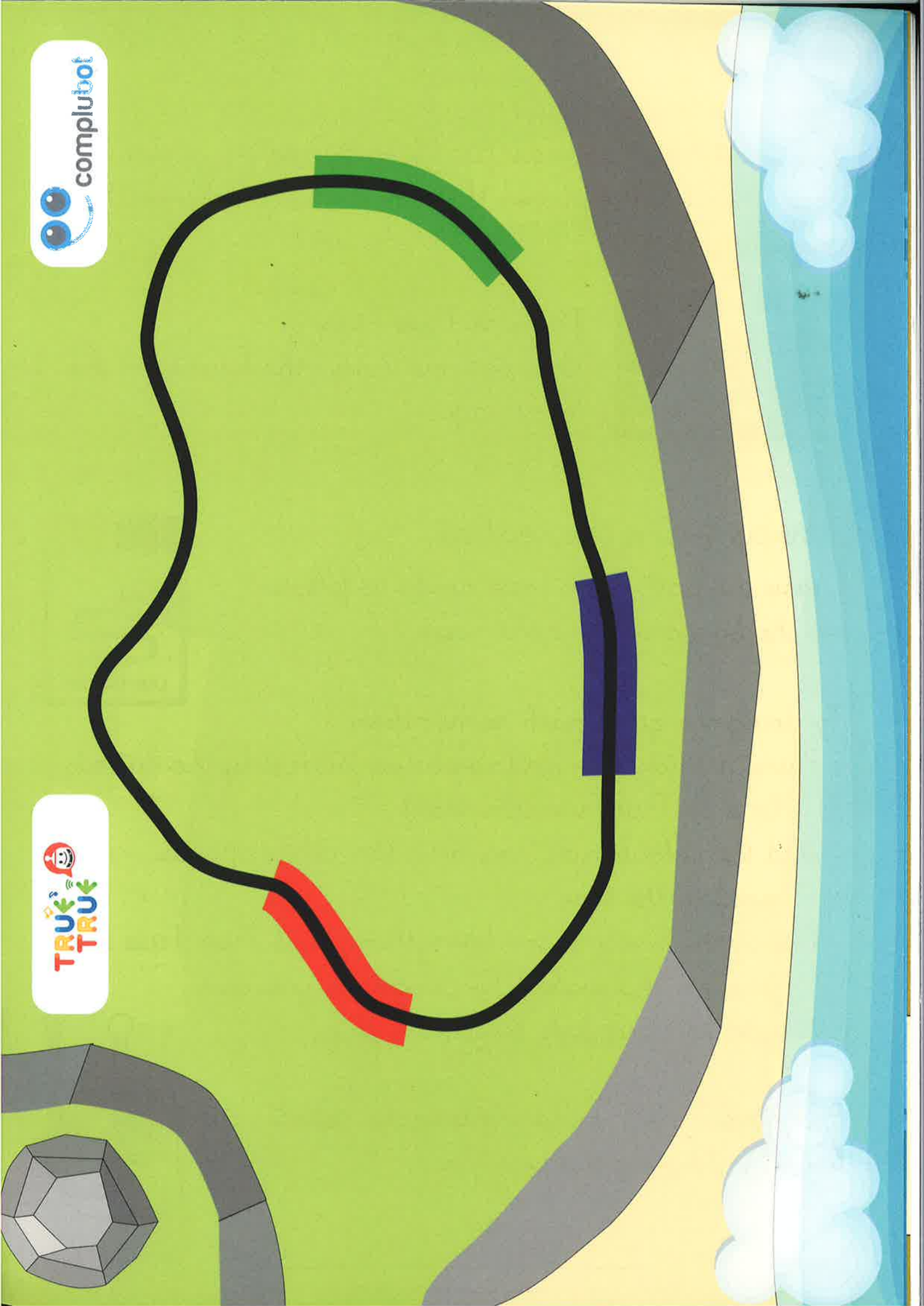


Experiment with the program and respond. Notice that you do not need to use the **START** and **END** cards.

What happens when True True passes over a colour?

Join each card with its board:





Explore the seabed!

The seabed is a wonderful place to explore. Join True True and discover the secrets hidden beneath the surface.



Prepare True True.

Use costume 2 and the board on the next page.

Activity 6. On the seabed.

Draw the path True True needs to follow on the board of the next page.



To design a good path remember:

- Paint a thick line and continue following the dotted line so True True can see it.
- Add the colours you want in the white spaces next to the line.
- Out of the lines, draw everything that True True can find on the seabed. For example you can add fish, starfish, a sunken ship, ...

Program True True to explore the whole board following the line.





True True has gone for a walk in the mountains and has reached a very leafy area. He is disorientated and cannot find his way back.

Guide True True and help him go home.



Activity 7. Lost in the mountains.

The **HAND FOLLOWING** card is used to guide True True using your hand.

Use the board on the next page.



Experiment with this program and respond. Notice that you do not need to use the **START** and **END** cards.

What does True True do when you put your hand to its left?

What does True True do when you put your hand to its right?

What does True True do when you put your hand in front of it?






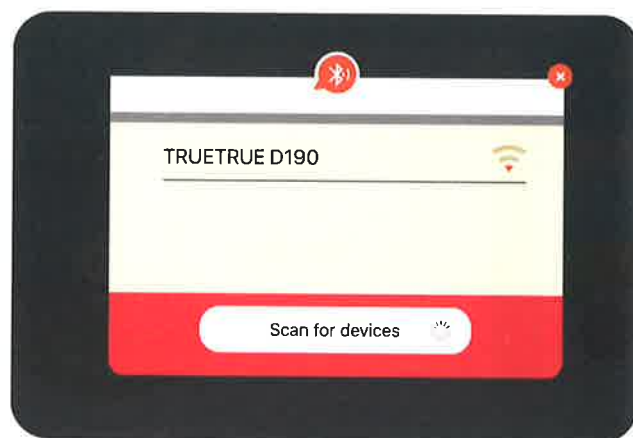
TRUEBOT CONTROLLER APP

Discover how to control True True from your tablet or mobile.

TRUEBOT CONTROLLER APP is an application for True True to move and light up as you want.

To control True True you must connect it to it:

- Open the TRUEBOT CONTROLLER APP.
- Click on the bluetooth button. 
- Click on SCAN FOR DEVICES.
- Turn on True True and place it near your tablet or mobile.
- Select the code of your True True.



There are three modes of operation:

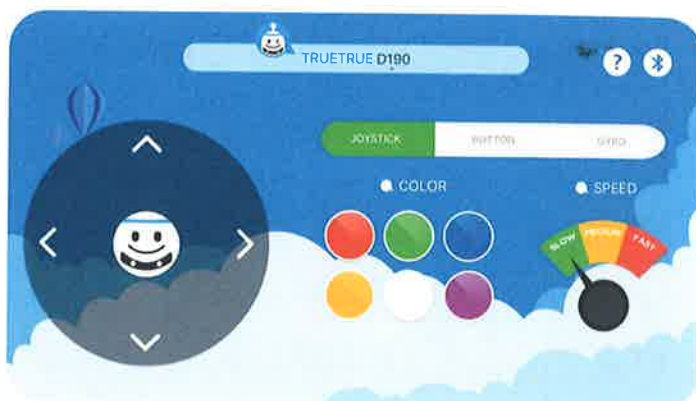
- Joystick
- Button
- Gyro

Activity 8. Joystick.

To control True True with the JOYSTICK mode, press the **arrow** of the direction you want it to go.

If you want to stop, stop pressing that arrow.

You can choose the colour that identifies your True True and the speed at which it will move.



Challenge 13

Place True True on the allotment board. Get it to move **from the corn to the aubergine** through all the vegetables at a medium speed.



Challenge 14

Place True True on the allotment board. Start with the onion and try to collect **all the vegetables** at high speed following this path.



Activity 10. Gyro.

To control True True with the GYRO mode, hold the PRESS button and tilt the mobile or tablet in the direction you want it to go in.

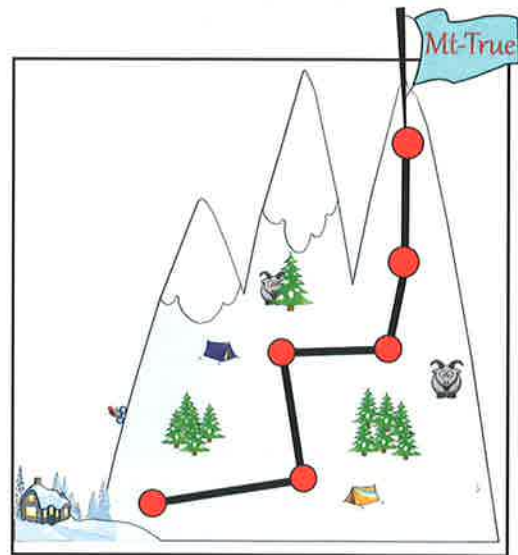
If you want to stop, stop pressing the PRESS button.

You can choose the colour that identifies your True True and the speed at which it will move.



Challenge 17

Place True True on the mountain board and disguise it as a hiker. Get it to follow the path that leads to the top as quickly as possible.



Challenge 18

Place True True on the seabed board and disguise it as a diver. Try to follow the full path without leaving the line.



What have we learnt?

Write what each card used in this workbook is for.













Amazing Engineers

In the Complubot educational robotics workbooks, you will find a number of exercises and challenges to use the main technologies and, thus, learn robotics. They are an excellent didactic material, and a great help to reinforce the technological contents dealt with in class.

They are organized in the following series:

Technology, Programming and Robotics

Computational thinking

Maker workshop

Amazing engineers



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Amazing engineers
True True II
Explorers of the Earth

