

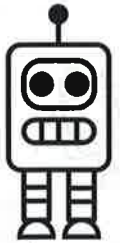
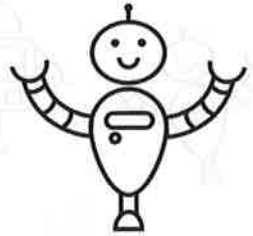
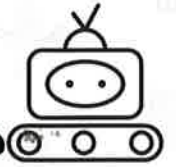
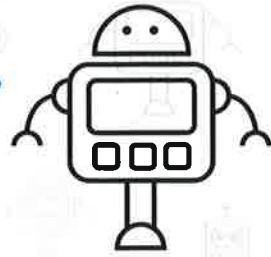
Amazing engineers



complubot

JERÓNIMO CARDONA

2E

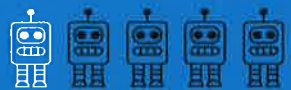


TRUE TRUE



EDUCATIONAL  
ROBOTICS  
WORKBOOK

LEVEL

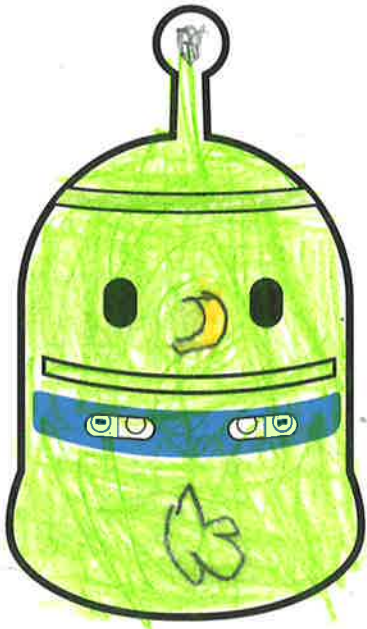


3

The land  
of Music

[www.complubot.com](http://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, which 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: Luis

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.



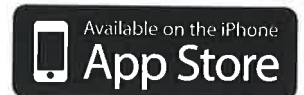
**TILT MOTION** - Programming tilting to True True.

**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.



## What we are going to learn in this workbook

In this workbook, we will learn to program True True. We will use movement cards, repetition cards, musical notes and numbers.

In addition, you will discover new ways to control True True from your tablet and compose your own songs.



**REPEAT START** - Start repeating (loop).



**REPEAT END** - End of repeating (loop).



These cards have two functions:

**NUMBER** - Number of times to be repeated.

**NOTE** - Musical note that will be played.



**TILT MOTION** - Tilt True True to program your movements.



**HAND DIRECTION** - Turns the opposite way to the hand.



## TRUEBOT MUSIC CARD APP

Use your tablet or mobile to compose music.

# Travel to the land of Music!

True True has started an incredible journey: he has gone to the country where Music is made. There he met Valentin the dancer, who will teach him how to dance to the rhythm. Prepare your feet to follow him!

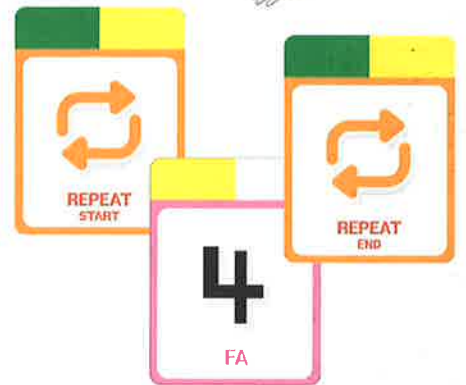
Prepare True True.

Use costume 1 to disguise True True as a great dancer. Place it on the table for these activities.



## Activity 1. Repeat with me.

Use the REPEAT START and REPEAT END cards and a NUMBER card for True True to repeat the movements that Valentin teaches you.



Experiment and respond:



How many times does True True move forward? two



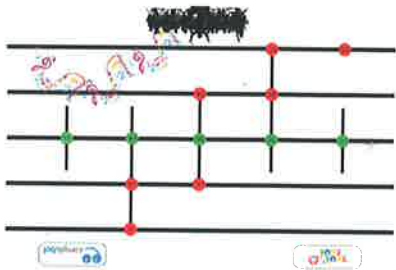
How many times does True True move backward? three

## Activity 2. Follow Valentin.

Remember that the **GRID** card is used to follow lines and find where the roads cross.



Join the **REPEAT START**, **REPEAT END** and **NUMBER** cards, to repeat Valentin's movements on a line.



Use costume 1 and the board on page 11 for the following activities.



Set True True over **DO** facing **RE**.  
Experiment and respond:



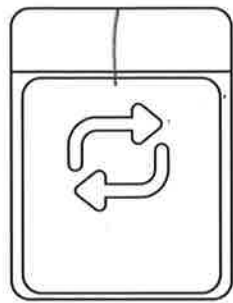
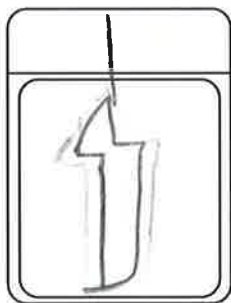
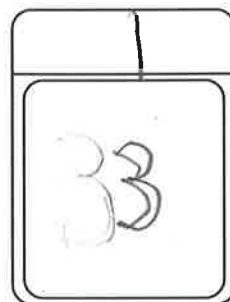
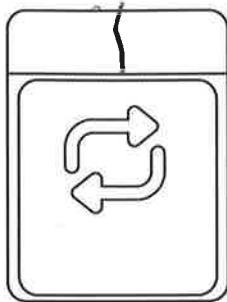
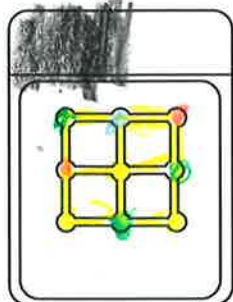
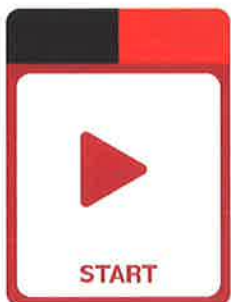
On which note does True True end? Green ml



On which note does True True end? Green ml

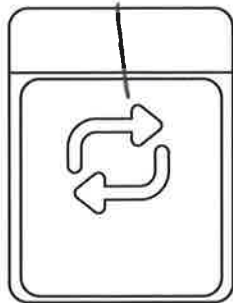
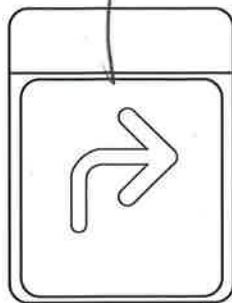
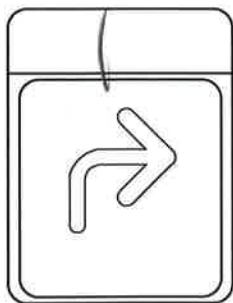
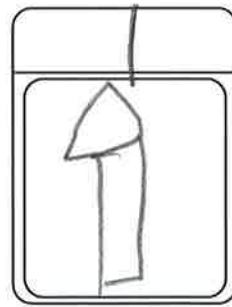
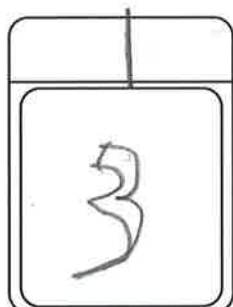
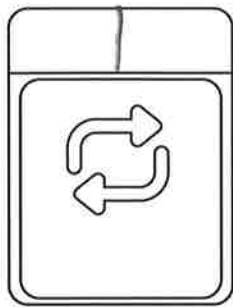
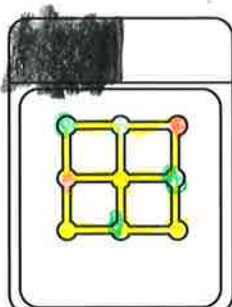
### Challenge 3

Place True True over **DO** and move forward to **FA**.



### Challenge 4

Place True True on **DO**. Move forward to **RE** and turn 2 times to the right to turn around. Repeat this sequence 3 times.





### Challenge 5

Place True True on **DO**. Move forward to **MI** and turn 2 times to the right to turn around.

Repeat this sequence 3 times.




### Challenge 6

Place True True on **DO**. Go to **RE** and turn once to the left.

Repeat this sequence 2 times to get to **MI**.






### Challenge 7

Place True True on **MI**. Go to **FA** and turn once to the left. Repeat this sequence 3 times to get to **RE**.






### Challenge 8

Place True True on **MI**. Go to **FA** and turn once to the left. Repeat this sequence 4 times to return to **MI**.




### Challenge 7

Place True True on **MI** . Go to **FA** and turn once to the left. Repeat this sequence 3 times to get to **RE** .





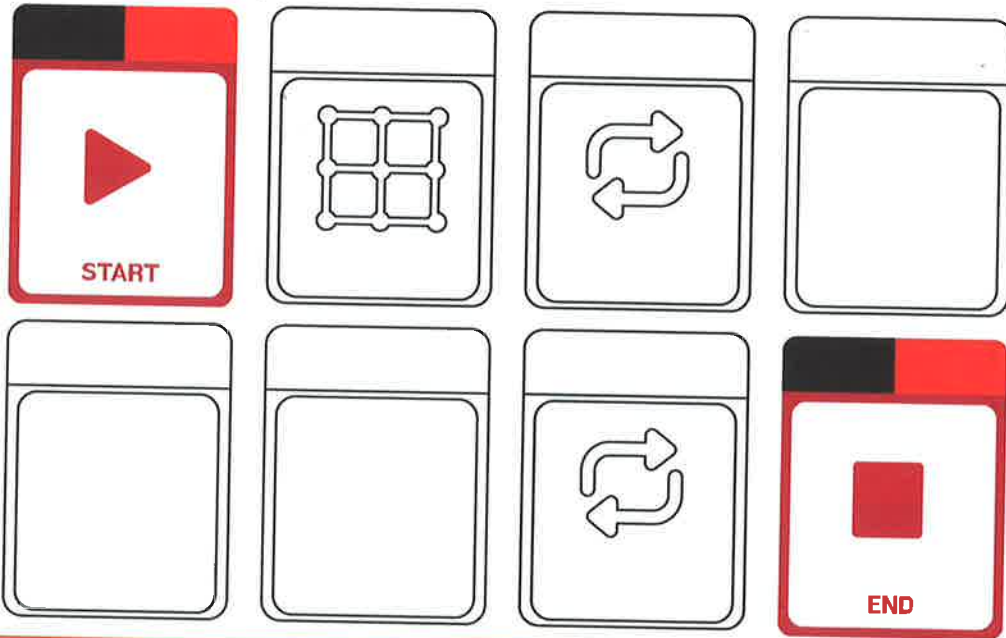

### Challenge 8

Place True True on **MI** . Go to **FA** and turn once to the left. Repeat this sequence 4 times to return to **MI** .



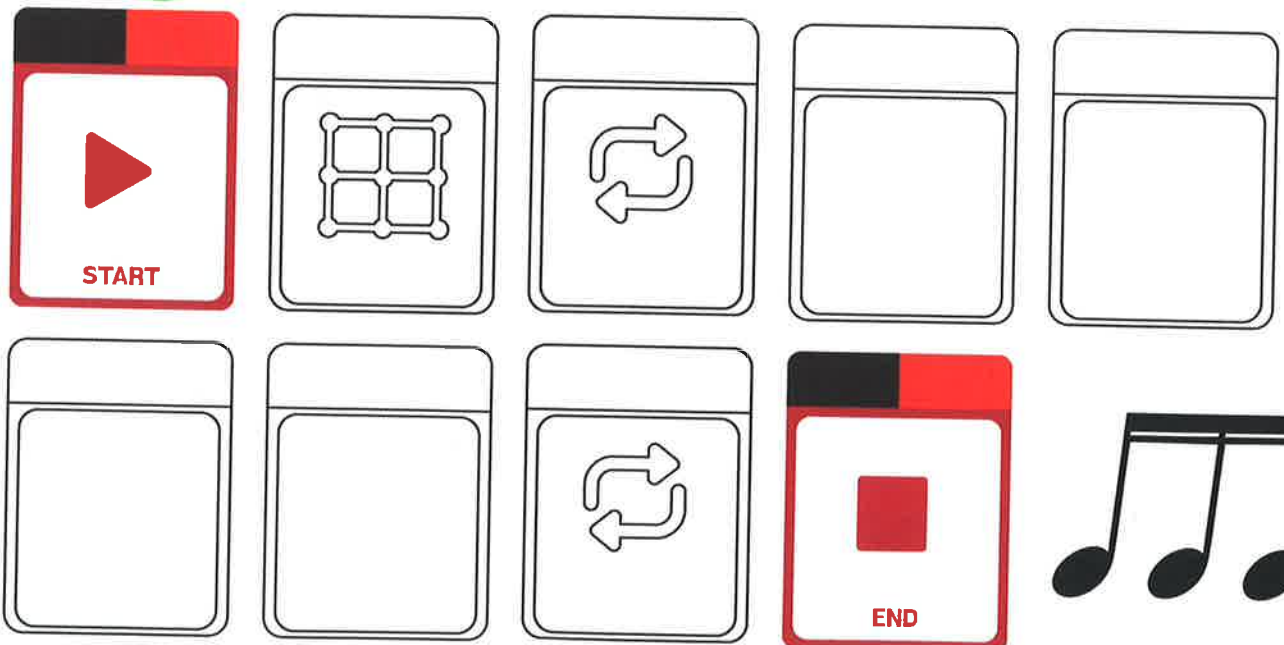

### Challenge 9

Place True True on **MI**. Go to **FA** and turn once to the left. Repeat this sequence 8 times to make two full turns.

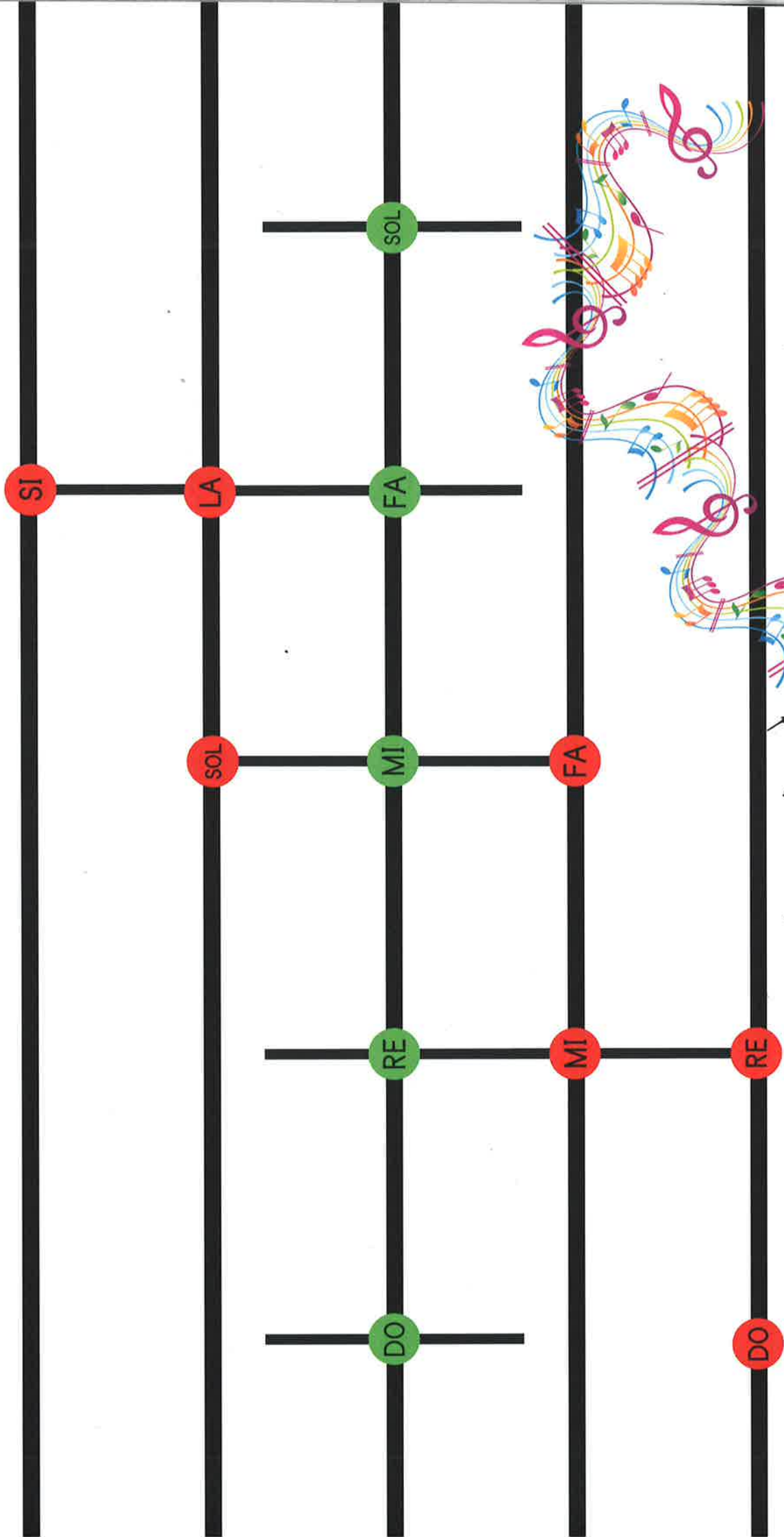


### Challenge 10

Place True True on **SI**. Go to **FA** and turn once to the right. Repeat this sequence 2 times to get to **RE**.







# Learn with Valentina.

Valentina the dancer wants to show you the musical notes. Learn with her to compose your own melodies!



Prepare True True.

Use costume 2 to disguise True True as a music star. Put it on the table for these activities.

## Activity 3. True True wants to compose.

Use the MELODY card for True True to play musical notes. Each note is programmed with the NUMBER card, which indicates the NOTE that will be played.



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



What happened? What notes were played?

Two horizontal lines for writing the answer.

### Challenge 11

Play this melody:

SOL MI DO



Five rectangular boxes for musical notation. The first and last boxes contain a drawing of a bell with musical notes. The middle three boxes are empty.

### Challenge 12

Play this melody and choose the last note:

DO MI SOL \_\_\_



Six rectangular boxes for musical notation. The first and last boxes contain a drawing of a bell with musical notes. The middle four boxes are empty.

### Challenge 13

If you put the same note twice, its duration lengthens. Play this melody:

DO DO RE RE



Six rectangular boxes for musical notation. The first and last boxes contain a drawing of a bell with musical notes. The middle four boxes are empty.





### Challenge 14

Play this melody:

SOL FA MI RE DO




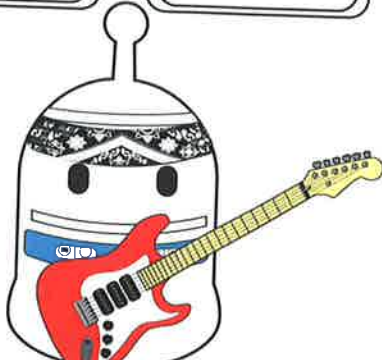



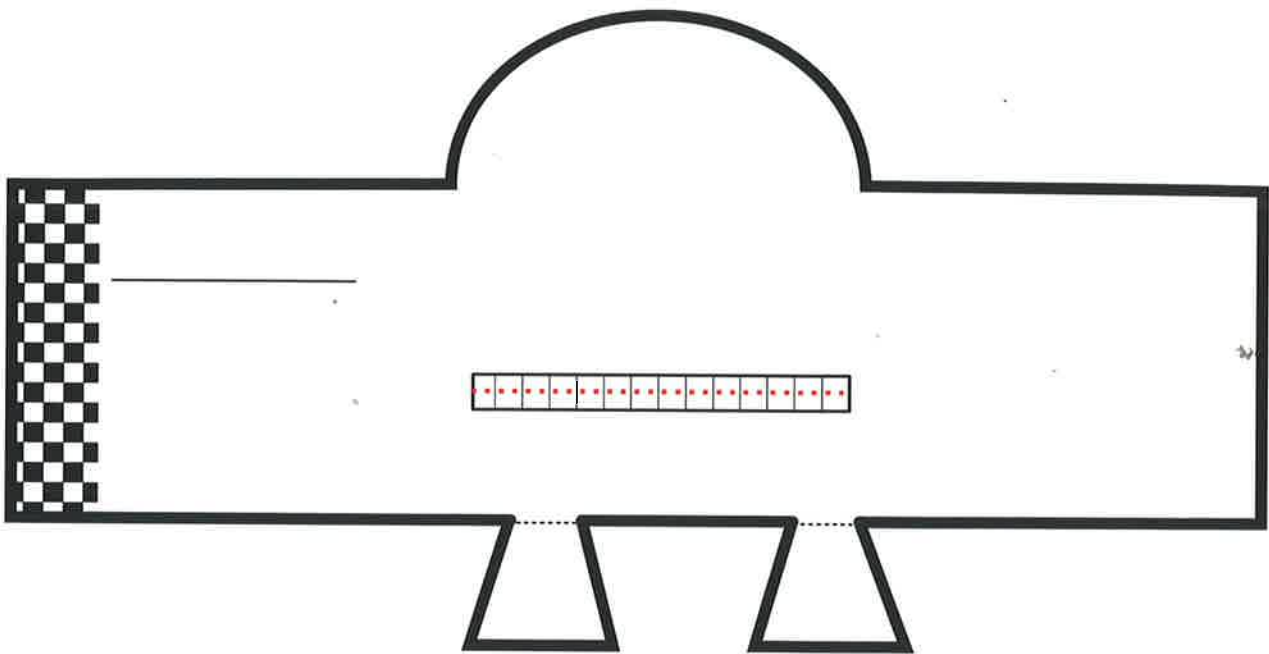
### Challenge 15

Play this melody:

SOL FA SOL FA SOL FA

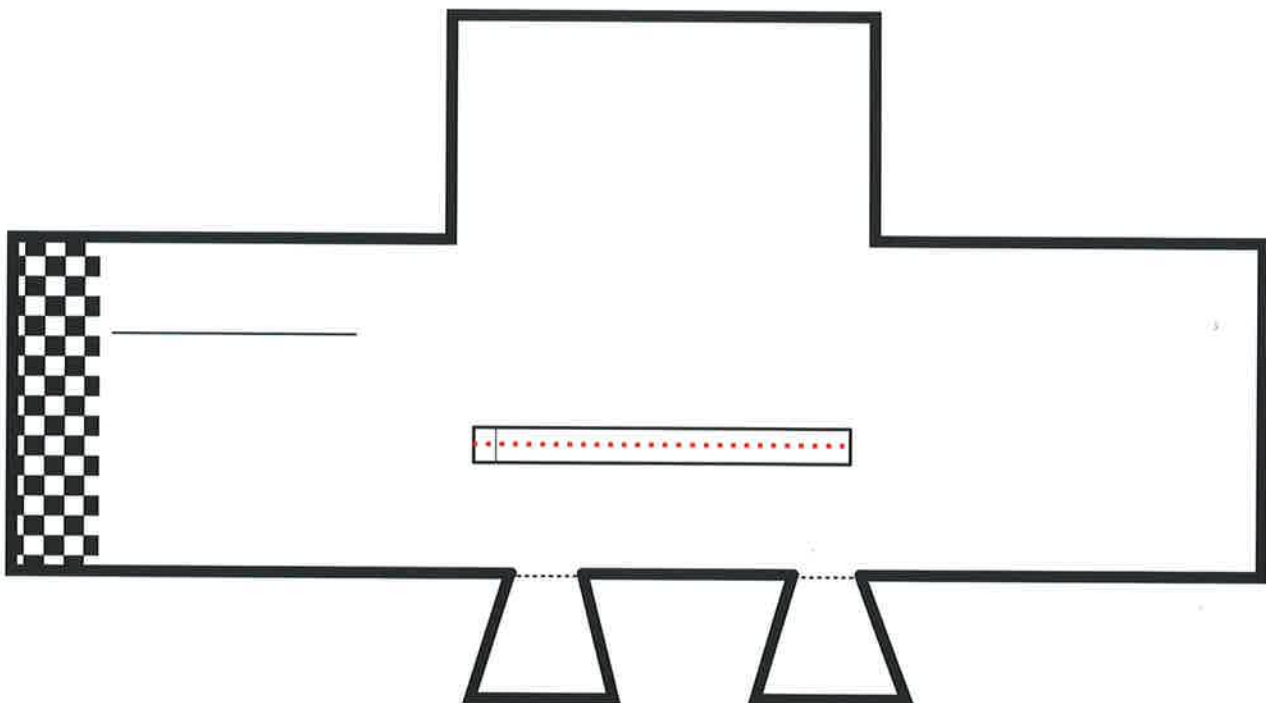




Costume 1 - True True dancer.

Colour in a True True outfit to dance with Valentina. Use all the colours and embellishments that you like the most.

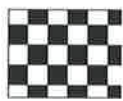


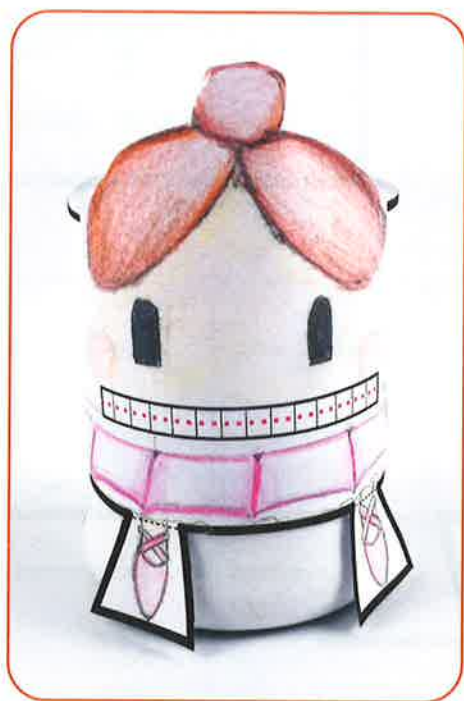
Costume 2 - True True music star.

Colour in everything True True needs to play a song. Add the instruments and the accessories you want.

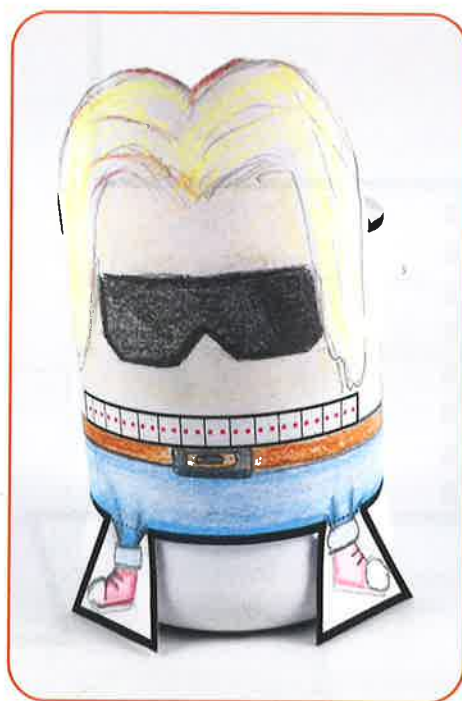
## Instructions to assemble the costumes

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

- Write the name of your True True on the two costumes.
- - Cut them out along the solid line.
- ..... - Cut along the line of red dots with a puncher.  
This will be True True's mouth.
- - Fold them 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 dancer



True True  
music star



# Activity 4. A great concert!




Compose your own songs and interpret them together with other True Trues. You can form the True True Great Orchestra conducted by Valentina!


Remember to write down the ones you like the most.



Title: \_\_\_\_\_

 MELODY					

Title: \_\_\_\_\_

 MELODY					

## What is this instrument?

True True wants to know about all the musical instruments. Its friend Truedivarius makes them and will teach it the most famous ones.



## Prepare True True.

Use costume 2. Write the missing letters on the board on page 21 and use it in the following activities.

## Activity 5. How many instruments!

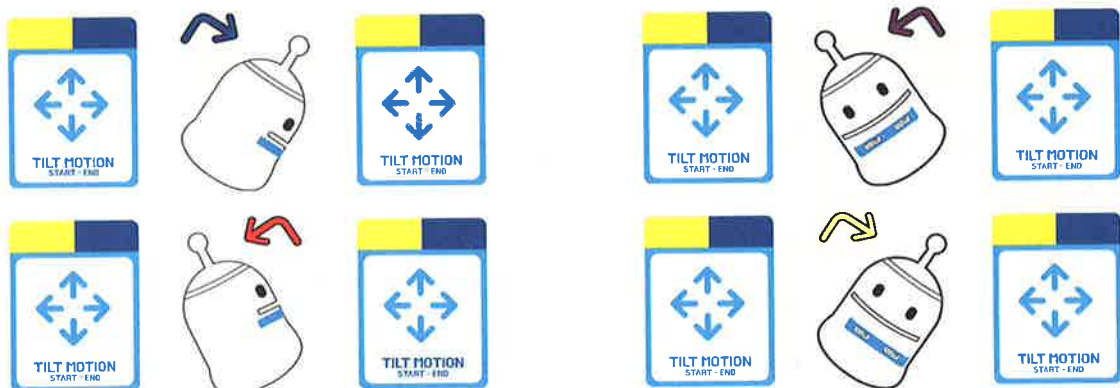
The **TILT MOTION** card is used to program True True by tilting it so that it moves in the direction in which it is tilted.

Each sense makes a sound and illuminates True True with a different colour.



Experiment and respond on the next page.

Notice that you do not need to use the **START** and **END** cards.



### 3 - The land of Music

What colour illuminates True True at each inclination?  
What movement does True True do?



Colour: \_\_\_\_\_

Movement: \_\_\_\_\_



Colour: \_\_\_\_\_

Movement: \_\_\_\_\_



Colour: \_\_\_\_\_

Movement: \_\_\_\_\_



Colour: \_\_\_\_\_

Movement: \_\_\_\_\_

With the **TILT** card, you can program several movements in a row.

Experiment with this program and respond.



How many times has True True moved forward?

\_\_\_\_\_

### Challenge 16

Place True True on the **harp** facing the piano and reach the **violin**.

Draw how you've tipped True True to get there. Colour over with the colour which illuminates each movement.



	Colour	Colour	Colour	

### Challenge 17

Place True True in the **triangle** facing the tambourine and reach the **trumpet**.

Draw how you've tipped True True to get there. Colour over with the colour which illuminates each movement.



	Colour	Colour	Colour	



STRING



Violi\_



\_uitar



Piam\_



\_arp

PERCUSSION



Triangl\_



Tambourin\_



\_ylophone



\_rums

WIND



\_armonica



\_umpet



Flut\_



\_ccordion

I want to know more!

True True has just met Elisa, a great expert in the history of music. She will teach you everything she knows.



Prepare True True.

Use the board on page 23 for the following activities.

### Activity 6. How much Elisa knows!

The **HAND DIRECTION** card is used to tell True True which side you want it to turn to during a program.

To tell it, place your hand on the opposite side to which it must turn.



Experiment with this program twice, each time, place your hand each time on one side, and circle the correct option.



When I place my hand to the **left**, True True turns to the right/left.

When I place my hand to the **right**, True True turns to the right/left.

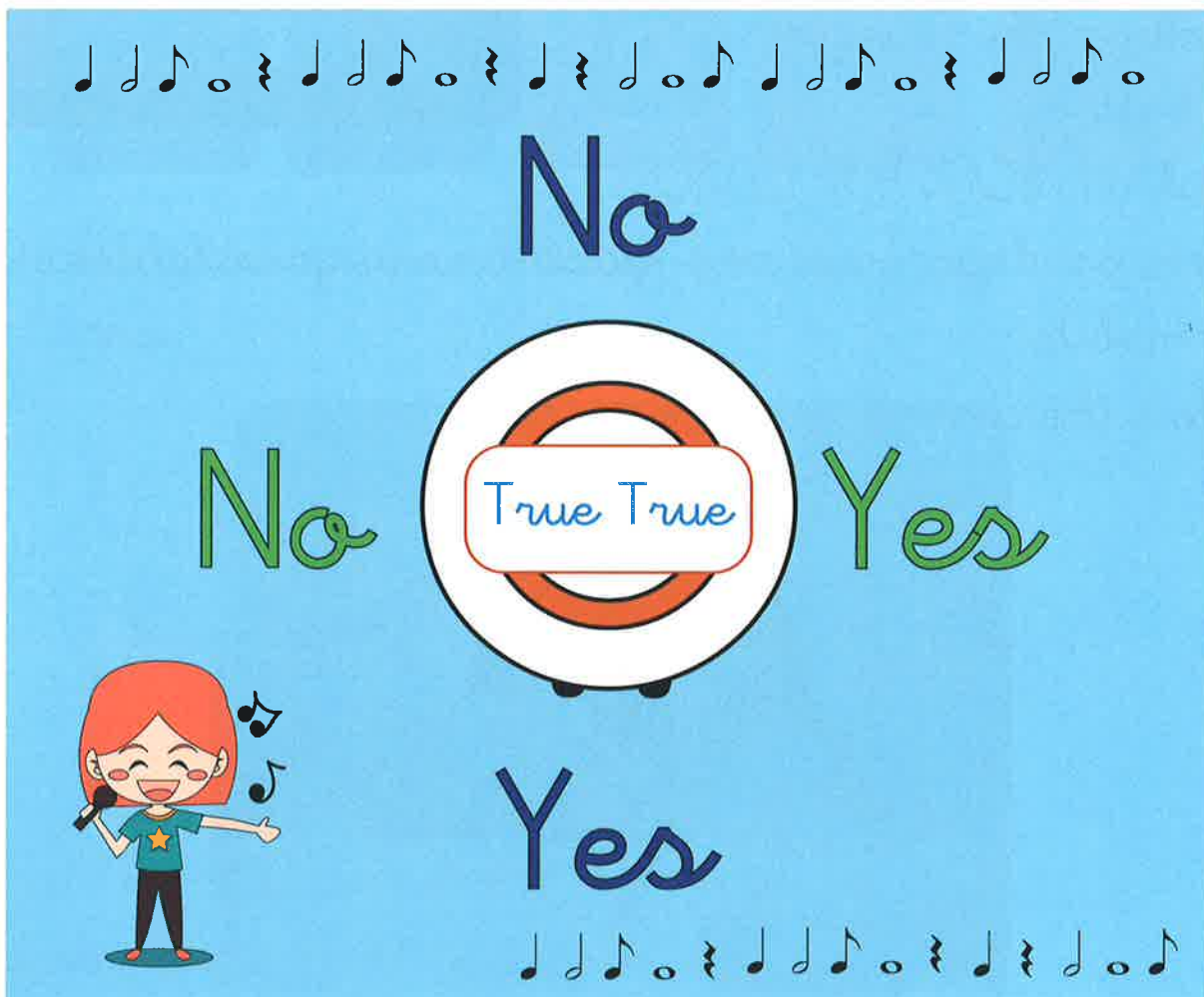
### 3 - The land of Music

Try this program and answer the following questions with True True.

To answer, place True True in the centre of the board. Send it to YES or NO using your hand.



- 1 - Is the harp a string instrument?
- 2 - Was Mozart a famous composer?
- 3 - Is the violin bigger than the guitar?
- 4 - Is the triangle a percussion instrument?
- 5 - Is the trumpet a percussion instrument?








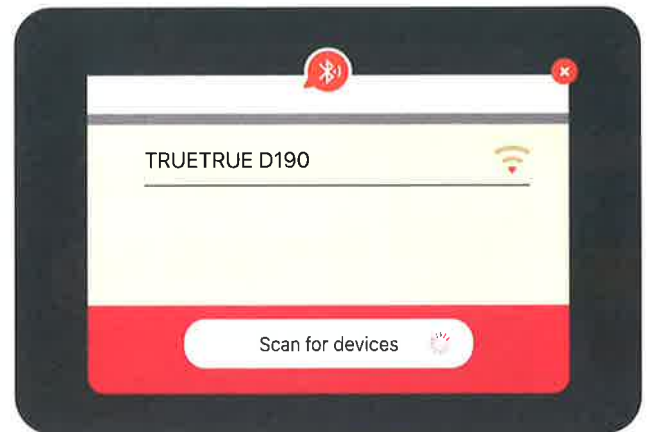
## TRUEBOT MUSIC CARD APP

*Discover how to compose your own songs on your tablet or mobile.*

TRUEBOT MUSIC CARD APP is an application for True True to play the songs that you compose.

To start composing you must connect to True True:

- Open the TRUEBOT MUSIC CARD 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.





## How is a song composed?

To compose a song you must drag the blocks of notes, silences or repetitions to the lower area of the screen.

To do this, follow these steps:

- Choose the musical note you want it to play and the place to put it.



- Click on the note and drag it to the programming area.



- Click on the PLAY button.



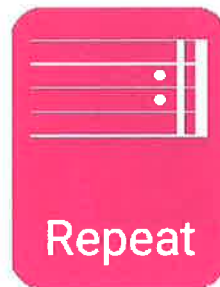
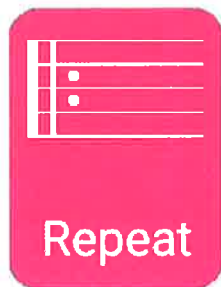
## Can I change the duration or speed of my song?

You can choose among *many options* when composing your song. The most important ones are:

- Include a **silence** by dragging the **REST** block. There are five durations to choose from. You will find it on the right-hand side of the musical notes.



- **Repeat** the whole song or a part of it. Use the **REPEAT** start and end blocks.



- Modify the **speed** at which your song plays.

There are three options:

- **SLOW**: slow pace.
- **MEDIUM**: average rhythm.
- **FAST**: fast pace.



- **Delete** the entire score to start a new one. You can do this by clicking on the rubbish bin.

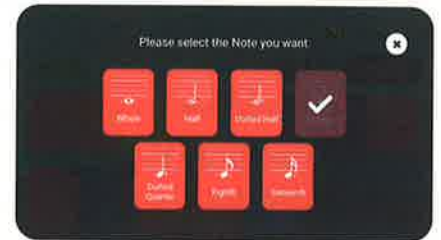


## Can I add several notes with different durations?

You can choose how long each note of your song will last.

First add a note to the programming area. Keep your finger pressed on it.

When you let go, the seven options will appear from which you can choose the duration of the note:



WHOLE: *whole* note.



HALF: *half* note.



DOTTED HALF: *dotted half* note.



QUARTER: *quarter* note.



DOTTED QUARTER: *dotted quarter* note.



EIGHTH: *quaver* note.



SIXTEENTH: *semiquaver* note.

# What have we learnt?

Write what each card used in this workbook is for.



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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



Amazing engineers  
True True III  
The land of Music

