

Now you\_  
Draw your robot:

### 1\_Data

Name your robot. The name can be numbers, letters, any key on the keyboard (+, \_, #, ...), for example: "Robo\_Me"

A name of numbers, letters or any key on the keyboard (+, \_, #, ...) is called a **string**. Strings are always put in quotation marks (" ").

Now you_ Name your robot:  " "
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There are different types of data:

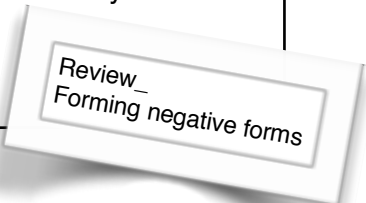
- numbers,
- strings and
- **Boolean variables.**

You have already gotten to know numbers and strings. Boolean variables are data, which have one of two possible values - they can be either true or false).

Describe your robot.

for example	true	false
My robot has two arms.		
My robot has arms <i>and</i> legs.		
My robot has arms <i>or</i> legs.		
My robot <i>doesn't have</i> a green nose.		

Now you_ - Create <u>Boolean variables</u> : Write down 5 statements, which are true or false about your robot. - Extra_challenge: use <i>and/or/doesn't have/isn't ...</i> - Let a partner find out which statements are true.
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Statement	true	false



## 2\_Computational Thinking

Every big task can be made into smaller ones; this means: one big problem really is many little problems. To solve a problem, computers follow many little steps. If computers have solved a difficult problem, they can help other computers with similar problems, too.  
This is how a computer thinks; this is called computational thinking.

The only way to learn something new is to try and make mistakes!

## 3\_Programming

Making difficult problems, events or tasks into smaller ones.  
This is called: **decomposition**.

A list of small steps to finish a difficult task is called an **algorithm**.

Writing this list of smaller steps is called **programming** or **coding**.  
The people who write these lists are **programmers**.

The computer has to follow every step; it cannot leave out any steps. The steps have to be in a specific order.

This specific order is called a **sequence**.

Programming an algorithm could look like this, for example:

Task: performing Queen's "We will rock you"

Things you need: hands, thighs

Steps:

Step 1: when the music starts playing, clap your hands on your thighs;

Step 2: clap your hands on your thighs;

Step 3: clap your hands;

Step 4: if the music continues, then go back to step 1; if the music stops, then stop performing.

Now you\_  
Decompose a dance choreography. Program an algorithm.

Task:

Things you need:

Steps:

Step 1:

...

useful vocabulary for 'dancing':

verbs: to bend, to clap, to dab, to drag, to freeze, to glide, to lift, to move, to play the air guitar, to push, to put up, to roll, to shimmy, to slide, to shuffle, to step out, to take one step, to tap, to twist, to wave, ...

directions: backward, forward, to the front, sideways, on the spot, turn, 90 degrees to the left, ...

bodyparts: head, shoulders, elbows, fingers, hips, knees, legs, toes, ...

Now you\_  
Get up. Get together with a partner. Dance!

One of you is the programmer; one of you is the robot.  
The programmer reads out his/her dance sequences of his/her algorithm.  
The robot completes this difficult task, following your programmer's algorithm. Make mistakes, if the steps are not clear enough.

Change roles.

#### 4a Programming: loops

In a **loop** the computer does a sequence of steps again and again; it **repeats** the step(s) until one specific piece of the difficult task is finished. For example, let's take a closer look at steps 1-2:

“Step 1: clap your hands on your thighs;

Step 2: clap your hands on your thighs;“

The loop can look like this:

*Step 1: “repeat twice: clap your hands on your thighs;“*

In the programming tool ‘Scratch’ the loop looks like this:



Now you\_  
Go through your algorithm and program loops, if possible.

#### 4b\_Programming: selection

If there are different conditions, and also different options for the computer to react, this is called a **selection**. For example, let's take a closer look at step 4:

*“Step 4: if the music continues, then go back to step 1; if the music stops, then stop performing.”*

There are two conditions:

condition 1: “the music continues“

condition 2: “the music stops“

There are two options to react:

option 1: “go back to step 1“

option 2: “stop performing“

one condition matches one option:

condition 1 matches option 1;

condition 2 matches option 2.

If condition 1 happens, then option 1 follows.

If condition 2 happens, then option 2 follows.

If “the music continues“, then “go back to step 1“.

If “the music stops“, then “stop performing“.

A selection puts together the conditions, and options for the computer to react in one conditional sentence, using: if, then, or else.

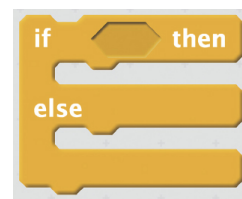
The selection for step 4 can look like this:

*Step 4: **if** the music continues, **then** go back to step 1; **or else**: stop performing.*

*or*

*Step 4: **if** the music has stopped, **then** stop performing; **or else**: go back to step 1.*

In the programming tool ‘Scratch’ the selection looks like this:






Now you\_

Go through your algorithm and program a selection, if possible.

Review\_  
conditional sentences 1  
present perfect

Extra\_Now you\_  
Put together dances of two or more robots. Write new algorithms.

Extra\_Now you\_  
For more information on coding basics visit: <https://candy.codes>  
Visit <https://scratch.mit.edu> or <https://scratch.mit.edu/pathways/hiphop/> to program your dance moves.

description	link	QR code
video "Candy and coding" - further information about programming basics:	<a href="https://candy.codes">https://candy.codes</a>	
First steps in programming with the program 'Scratch':	<a href="https://scratch.mit.edu">https://scratch.mit.edu</a>	
First steps in programming hip hop dance moves with the program 'Scratch':	<a href="https://scratch.mit.edu/pathways/hiphop/">https://scratch.mit.edu/pathways/hiphop/</a>	





Define the following vocabulary for your robot.

vocabulary	English definition
data	
string	
Boolean variables	
decomposition	
algorithm	
programming	
sequence	
selection	
loop	