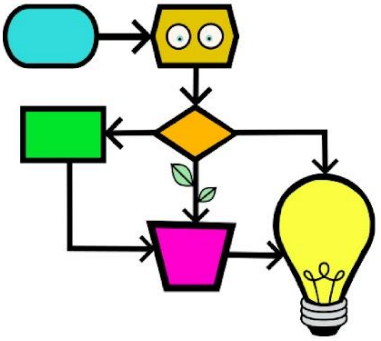
# CTprimED

# Tinkering with CT- Say it with cardboard



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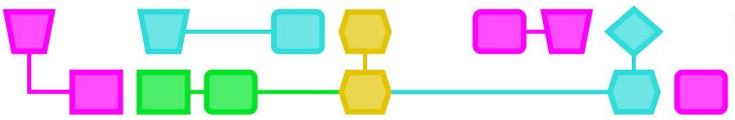


**Summary:**
The students make a piece of art via which they will send a message. It is up to the students exactly what message they want to convey; it can be an emotion like being happy or angry, a warning, or something completely different. The activity is developed with the purpose of getting students to try coding in a very low threshold way. The students can use a micro:bit as part of their artwork. A micro:bit is a small computer with an LED display and two buttons. The micro:bit can be programmed using Scratch or MakeCode.

**Target group**: 6-12 (students need to know how to use MakeCode)

**Duration:** 60-120 minutes (For the online version: depending on if the students know how to use micro:bit and MakeCode)

**Learning goals:**

- Be able to convey a message to others in a creative way.
- Go through the steps to get from an idea to a product. Making, trying out and discovering is central in this process.

**Online/offline:** This activity can be done either online or offline; in the lesson description you can find tips to do this lesson offline.

**Computational Thinking:**

- General skills: creativity, critical thinking, cooperation, planning
- CT foundations: Algorithm, Decomposition, Abstraction
- CT concepts**:** program, function, loop, code

**Particulars:** For the online version, it is helpful if students already know the micro:bit and Make code. For an introduction to the micro:bit, see the Extra Micro:bit instructions.

**Materials:**

- Cardboard
- Paper
- Skewer or popsicle sticks
- Paper tape
- Glue
- Scissors
- Paperclips
- Felt pens
- Split pins
- Rubber bands thick/thin
- One ball of string
- Recycled cardboard boxes
- Crafting materials of your choice
- LEDs 1,6-2,4 V
- Alligator clips or power cables

*Online only:*

- Computer with a USB output and internet connection
- Micro:bit (+ cable and batteries)

**Preparation:**

Prepare the room: make sure there are enough tables and chairs available for the students and arrange them in a way that promotes collaboration. Place at least two material tables in different locations in the room, so the students have to cross the room to reach the materials. Place (if possible) multiple pairs of students at each table so they can see what others are making and discuss amongst themselves. Create an example (see photos in the appendix).

# Say it with cardboard

**Introduction (5 min):**
Introduce the materials and explain what the students are going to make. The prompt to start this activity is:

- Offline: Create an (art)work that sends a message, using the light and other available materials.
- Online: Create an (art)work that sends a message, using the micro:bit and other available materials.

Explain to the students that they themselves can decide what message they want to convey: it can be an emotion like being happy or angry, a warning for danger, or something completely different. Let them think about who the receiver of the message is. It could be something political, funny, or personal, for social media or for their neighbour on the other side of their street.

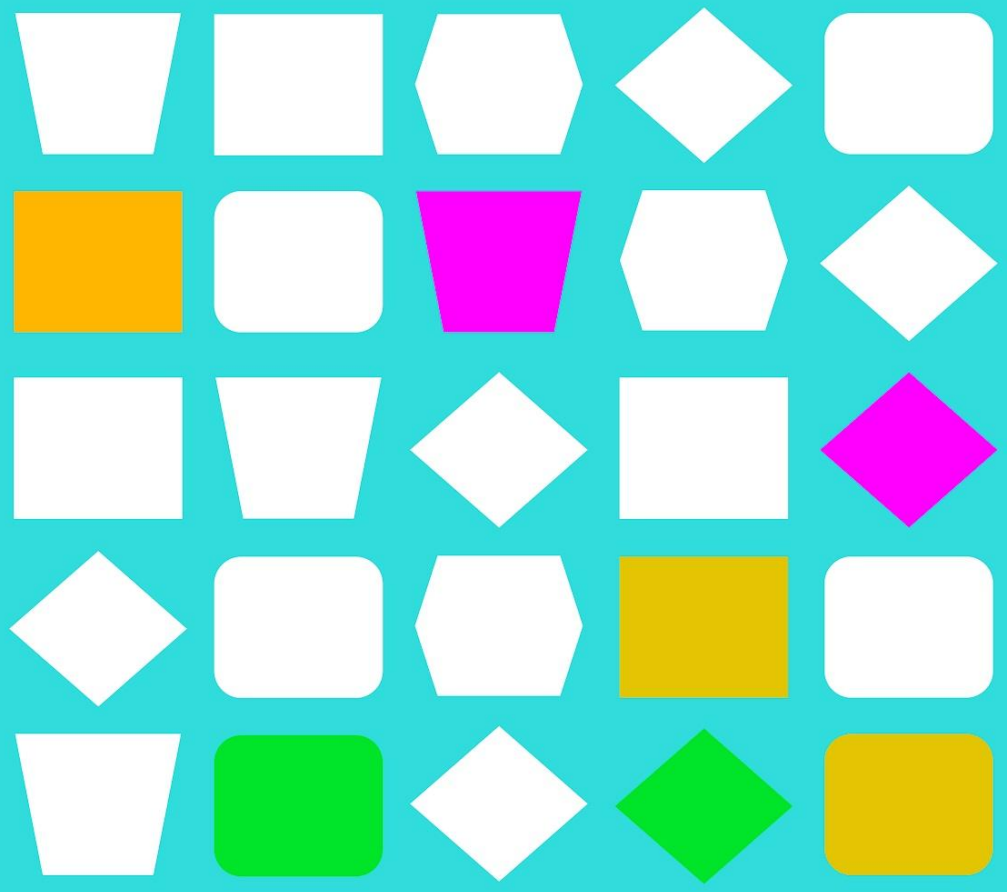
Encourage the students to use a micro:bit in their artwork. A micro:bit is a small computer with an LED display and two buttons. The micro:bit can be programmed using the website MakeCode. Depending on the group and their familiarity with the micro:bit, you can opt to give a short instruction about the micro:bit (see attachment). Provide them with some examples (make sure they vary), but be aware that the students may copy them. Try and encourage them to come up with their own ideas.

Possible adjustments depending on the target group.
- Have a discussion about what the word message means and what kind of message you could send. If you are working with non-native speakers, then this can be a really nice addition.
- Show some examples of signs, in order to explain what a message can be.

**Description of the lesson (40 min):**
The facilitator should go around the room, observe and asks the students to share their process.

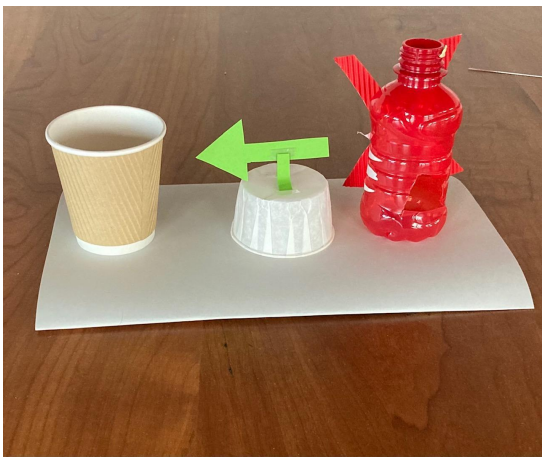
Encourage the students to experiment with the micro:bit.
For example:
- Challenge them to show an icon on the LED display
- Challenge them to program a response when button A is pressed
- Challenge them to use light in their work

**Conclusion (10 min):**
The students will show the group what they have done within a gallery walk and share their process. The facilitator should then share some of things that they observed, for each of the pairs if possible. For example: focus on scientific or technical problems they encountered during the process and how they solved these problems, the collaboration, their perseverance, or how they used materials in novel or playful ways.



# Appendix

## Appendix 1: Examples



Message: Do not use plastic, use cardboard!

Message: Be kind! (two bottles moving towards each other to hug)

# Colophon



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