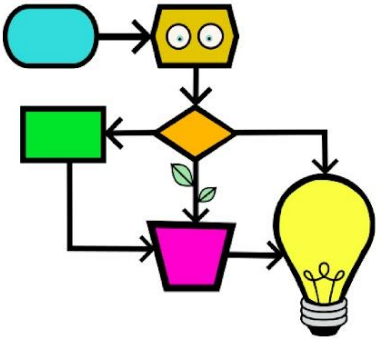
CTprimED

Use CT in a project
Make X



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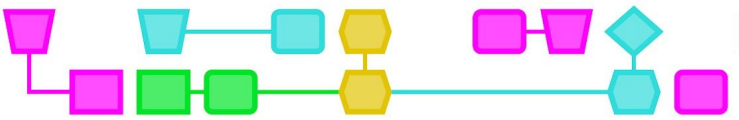


Summary
This lesson format allows you to set up your own Computational Thinking (CT) lesson to fit the curriculum, such as, for example, for the final presentation of a project, a summary of a chapter, or a stand-alone project/assignment on a particular topic. In Make X, you will find a format, several ideas, and tips to easily come up with a CT lesson yourself. In addition, we have developed two examples of a Make X lesson: Make a mini light show with the micro:bit and Make a mini light show.

About Make X:
With Make X, you can pay additional attention to CT without having to set aside separate time for it in the curriculum. You can find the format on page 3. Below are a number of ideas to help you set up the “X” of Make X:

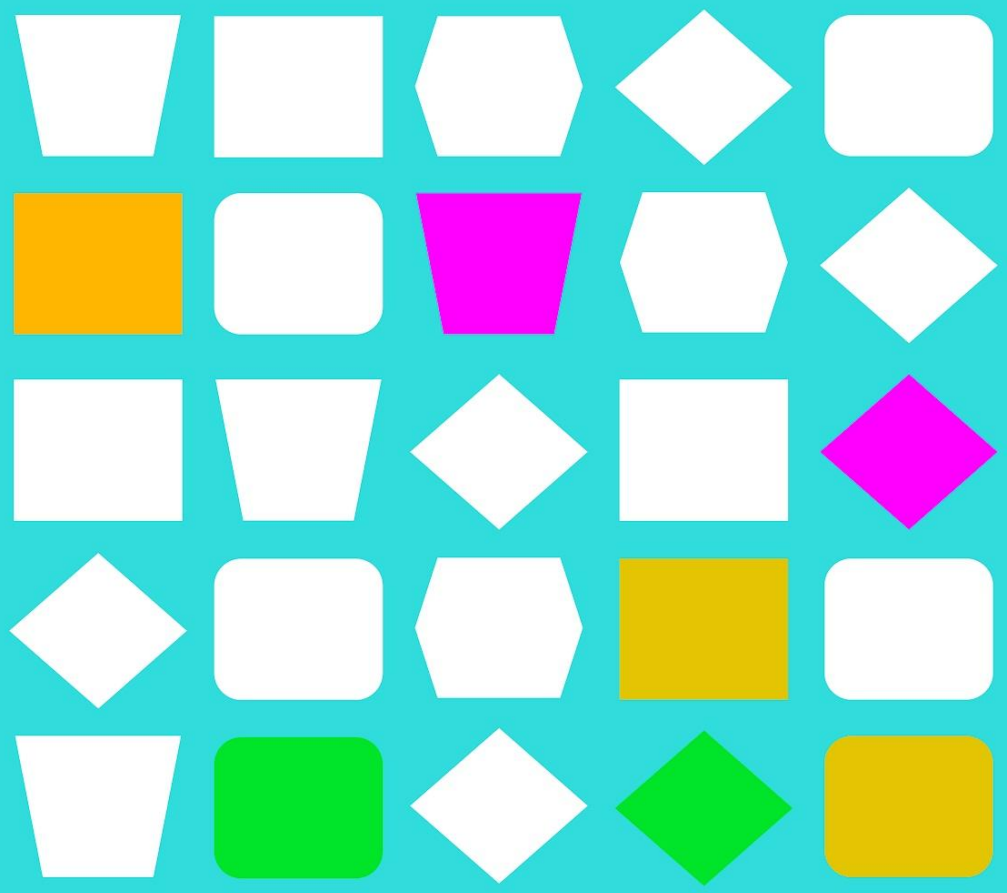
Integrating CT in your lessons:

- Final presentation of projects
    - Get students to create a different type of final presentation, such as, for example, a cartoon in the program Scratch, a flipchart book or a Tik Tok video.
- As a substitute for explanation:
    - Maths: have students create a calculator on the micro:bit.
    - Spelling: have students create a game to explain spelling to children from another group.
    - Language: have students create their own code language, write an essay in the form of a comic strip in Scratch, or use the micro:bit to create a game to teach words.

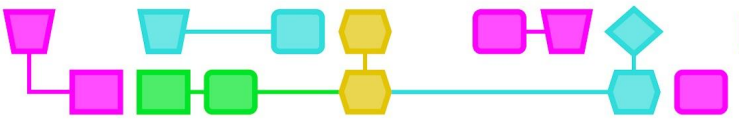
How do you use CT in a stand-alone project/assignment?

- As a creative assignment
    - Get students to use interactive tools like Scratch, Lego Spike, and Lego WeDo to create art, such as, for example, an interactive artwork, story, or landscape.
    - To show you how to design a creative assignment, we have created two example lessons: make a mini light show with the micro:bit and create a mini light show.

See appendix 2 for more examples of ''X''.



Appendices



Appendix 1: Format Make X

Summary:
In this Make X lesson, you as the teacher have decided what the 'X' will actually be, but the students get to think of the terms themselves. Specifically, the students use CT concepts like Abstraction and Decomposition when thinking about the components of a task and deciding what they want as terms.

Students first receive an introduction to what 'X' means and then get to work experimenting and exploring. They can either work individually or in groups using materials or ideas to shape 'X'. After that, the terms for 'X' are established with the class. Students make a plan for 'X' and get to work. After this, they present 'X' to the class.

Learning Objectives:

- Dependent on the activity.
- Students can use CT while performing 'X'.
- Students can set the terms for 'X' with the class

Online/offline: Dependent on the activity.

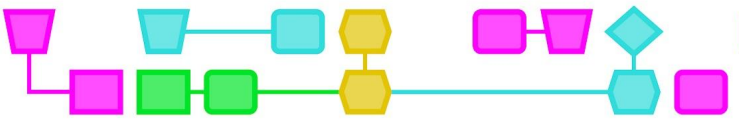
Computational Thinking skills: Dependent on the activity.

General skills: Collaboration, creativity.

Materials:
The materials needed depend on 'X' as an activity. If students need to use a certain type of material/resource, then you can collect it and have it ready. Alternatively, you can also let students decide what kind of materials they want to use for the assignment. You can do this by teaching them the first part: 'Experiment and terms (35 min)' around a week prior to the second part 'Making ‘X’ and presenting (40 min). You can then also have students gather materials from home.

Preparation:
The preparation is dependent on the activity.

The time schedule in this lesson description is an estimate of the minimum time needed for each part – this can either be shortened or extended as needed.



Part 1: Experimentation and terms (35 min)

Introduction (5 min):
Explain to the students what the task is and what they are going to make, but then inform them that they get to decide the terms. Explain by that terms you mean the specific requirements that "X" must meet. For example, when making a presentation, think about using a piece of music or showing a video. First, they are going to experiment and research how they want to design 'X,' in order for them to get a good idea of 'X'.

Experiment and research (20 min):
Divide the class into groups of 2-4 students. Students are able to spend 20 minutes experimenting with the available materials and/or discussing amongst themselves what they would like to make. If you have allowed the students to collect materials on their own, then they can also now create a materials list for their "X" ideas.

Set the terms (10 min):
Tell the students that they are now going to determine the terms of 'X' in the class. Ask the students what terms they can think of and the have them list them one at a time.

Once most of the class has shown that they agree with the term, then you can write it on the board. In the end, make sure there is a clear (and short) list of terms for the students.

Questions to get the students started:

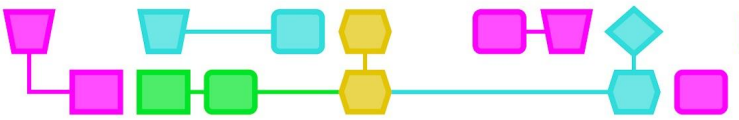
- What materials should be used?
- How long should "X" take?
- What will you end up presenting?

Part 2: Making ‘X’ and presenting (40 min)

Making and executing a plan (20 min):
Tell the students that it is important for them to discuss in advance how they are going to execute 'X'. Once they have come up with a reasonable plan, they can then get started on making 'X'. To support the students in this process, you can walk around and help them think through solutions to any problems they encounter.

Presenting 'X' (15 min):
Ask the students to sit down and reflect on how it went. For example, what did they enjoy doing and what problems did they run into? Then, one by one, call the groups forward to present 'X'. Ask how they went about it and why they did it in this way? Also ask them what aspect of the process they are proud of?

Closing (5 min):
Discuss the assignment and how the process of defining the terms went. Ask them what they thought of the lesson. Finally, have the students clean up and discuss afterwards.



Appendix 2: Lesson description

Integrating CT into lessons

- Make a presentation
    - A cartoon in Scratch
    - A flipchart book
    - 'Program' a classmate to give the presentation
    - Explain a particular chapter in the book as if you were teaching babies
- Subject-specific
    - Geography: a digital explanation of landslides
    - Biology: look for patterns in nature
    - Physics: explain energy through motion
    - Topography: cook the most popular food of a specific country
    - Math: create a calculator on the micro:bit
    - Spelling: create a game to explain spelling to children from another group
    - Language: make your own code language

Using CT in a stand-alone project/assignment

- Make a painting/drawing
    - A forest landscape
    - An underwater world
    - The classroom
    - Space
- Make a plan
    - For a sweets factory
    - For a rocket launch
    - For a vegetable garden
    - For a recipe
- Make something out of a certain material
    - Something made of Styrofoam
    - Something made of cardboard
    - Something made of aluminium foil
    - Something made from a (shoe) box
- Crafting
    - A poster
    - A tree
    - An animal

Colophon

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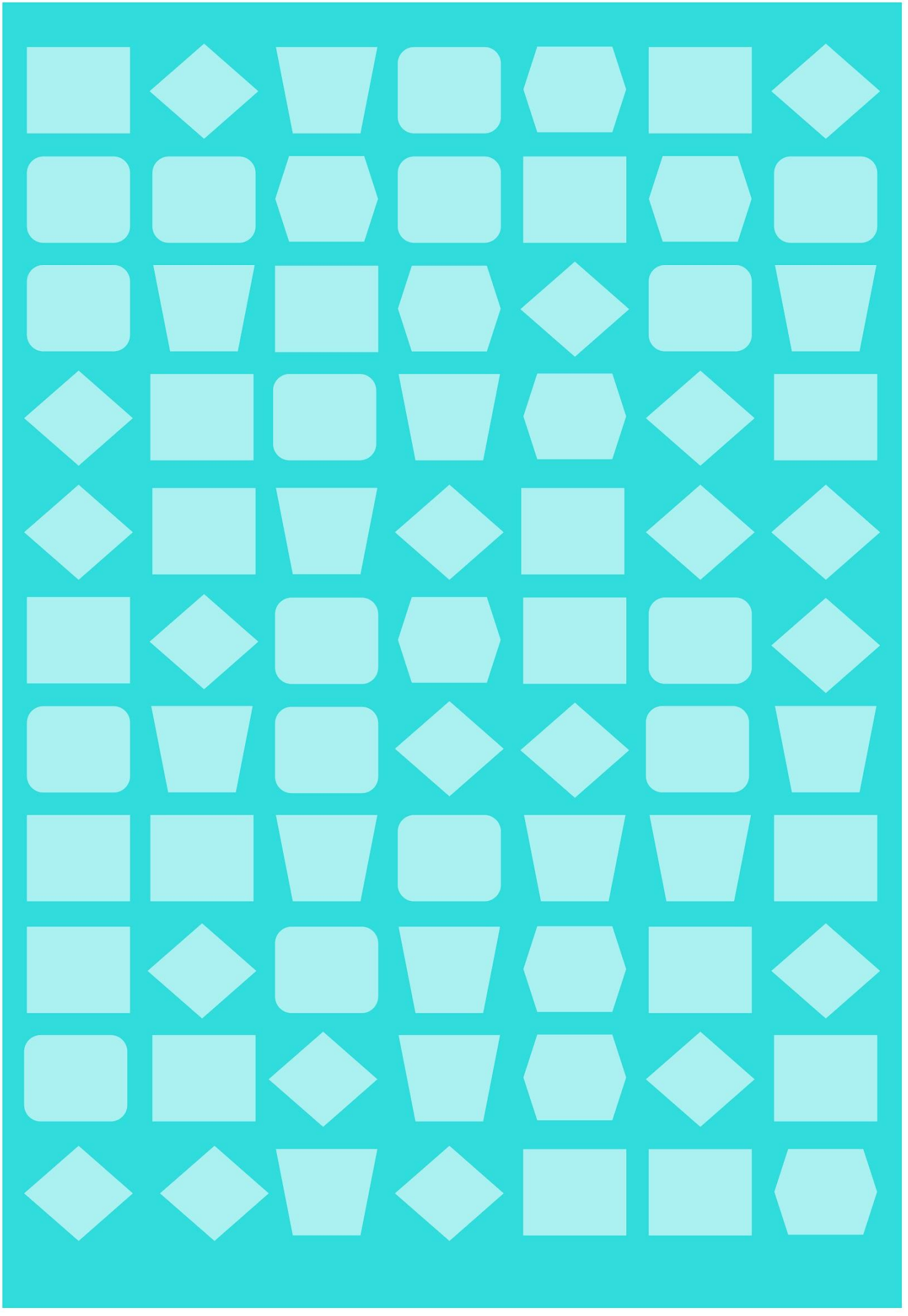
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