WebQuest

Nº2: Computational Thinking

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# Introduction

## Description

This lesson is based around computational thinking and will encourage students to talk about how problem solving thinking is developing and influencing our everyday lives. To introduce the topic there is a brainstorming for students using Mentimeter (<https://www.menti.com/>). To be followed by watching a short video on the topic. After defining *Computational Thinking* an example, which was shown in the video, will be analysed.

Task 1 makes students learn the vocabulary connected to the topic.

Task 2 gets students to think about what problems there are in our everyday lives and if they can be solved by modern technology. They do brainstorming in groups.

Task 3 asks them to think about the products that can solve these problems.

Task 4 encourages students to design their own products in teams and present their designs to the class. This task can be flexible depending on the age and level of the class.

## Purpose of the activity

The purpose of the activity is to make students aware of the meaning of *Computational Thinking,* learn new vocabulary and practise speaking skills. Furthermore, the discussions point students towards algorithmical and problem-solving thinking skills. The activities show students the benefits of computational thinking in everyday life.

## Expected outcomes

During the activity, students:

* will learn about computational thinking and its role in our everyday life
* will use critical thinking to to point out the problems
* will create and design products

# 

# Timeline

## Duration: 90 min

| 0’ - 5’ | Introduction |
| --- | --- |
| 5’ - 15’ | Explaining of Activity 1 |
|  | Activity 1 (Brainstorming) |
|  | Review of Activity 1 |
| 15’ - 30’ | Explaining of Activity 2 |
|  | Activity 2 (Key vocabulary) |
| 30’- 45’  45’-60’  60’-90’ | Review of Activity 2  Explaining of Activity 3  Activity 3 (Discussion)  Review of Activity 3  Explaining of Activity 4  Activity 4 (Analysing an example)  Review of Activity 4  Explaining of Activity 5  Activity 5 (Critical thinking / Designing Products)  Review of Activity 5 |
|  |  |
|  |  |

## Tasks

## Student task 1

The first discussion is about **Computational Thinking**. The short introduction is about its meaning and importance.

### Student subtask 1 (app. 10 min)

Students start with brainstorming for **words** they associate with computational thinking. Mentimeter ([**www.menti.com**](http://www.menti.com)) is used to collect the ideas. For the review of the activity the results are shared with the class.

### Student subtask 2 (app. 15 min)

Students are divided into groups. They watch a video and fill [a worksheet](https://docs.google.com/document/d/1JdE6XjjrnmXBqS3lv2_PjjxXQlIC0o6N/edit#)  about four key techniques to Computational Thinking and define them. Answers from students around the class are elicited. The definitions are shown on board.

### Review of Task 1 (app. 10 min)

Students play Kahoot! to revise the topic.

## Student task 2

The second discussion is about **the subject fields and examples of computational thinking.**

### Student subtask 1 (app. 15 min)

Students brainstorm for different subject fields which need computational thinking (1 minute). The ideas are elicited in the class.

A statement if **Computational Thinking Will Be Vital For The Future Job Market**. Each group discusses and then debates whether they agree or disagree. Students can use computers and the Internet in search of information.

### Student subtask 2 (app. 15 min)

Students work in groups. They are given [Worksheet](https://docs.google.com/document/d/1JdE6XjjrnmXBqS3lv2_PjjxXQlIC0o6N/edit#heading=h.lckf3rfzumv0) 3. Students decide which of the examples given are and which are not the examples of computational thinking. The answers are checked.

## Student task 3

Student subtask 1 (app. 15 min)

Students brainstorm what complex problems we have in our everyday lives. They choose one problem to create a solution.

### Student subtask 2 (app. 15 min)

Students think and prepare a presentation of a product which can help to solve the problem. They think of its aim, who it is for, how to use it and how it looks. The posters are presented to the class.

# Process

## Material needed

### Provided by the teacher

* Powerpoint presentation on [Computational Thinking](https://docs.google.com/presentation/d/17VHEgeXfXZOBng1JU3o-9UUh4lOK0MGIwXM_Ex9pt-w/edit#slide=id.p)
* A video: <https://www.youtube.com/watch?v=mUXo-S7gzds>
* Kahoot! game: <https://play.kahoot.it/v2/lobby?quizId=d8d0635d-4491-4834-87b9-fab69456af52>
* Worksheets:
  + 4 cornerstones of computational thinking
  + Mindmap of different fields of computational thinking
  + Examples of computational thinking
  + Problems and products
* Material or equipment
  + tablets/computers with internet access
  + Posters, markers

### Provided by the student

* Mobile phones

## Methodology / Methodologies

A presentation on [Computational Thinking](https://docs.google.com/presentation/d/17VHEgeXfXZOBng1JU3o-9UUh4lOK0MGIwXM_Ex9pt-w/edit#slide=id.p) supports the whole process.

### Methodology 1

Brainstorming. Mentimetre ([www.menti.com](http://www.menti.com)) is used to elicit the words connected to answer the question *What is computational thinking*.

### Methodology 2

**A video** [“Best of Digital Literacy + Computational Thinking for Children”](https://www.youtube.com/watch?v=mUXo-S7gzds) is shown and analysed. [**Worksheet 1**](https://docs.google.com/document/d/1JdE6XjjrnmXBqS3lv2_PjjxXQlIC0o6N/edit#) is filled and checked. Key vocabulary is elicited using a question-answer method. [**Kahoot! game**](https://play.kahoot.it/v2/lobby?quizId=d8d0635d-4491-4834-87b9-fab69456af52) summarises the topic.

### Methodology 3

First students fill in a mindmap ([Worksheet 2](https://docs.google.com/document/d/1JdE6XjjrnmXBqS3lv2_PjjxXQlIC0o6N/edit#)). Then they have a discussion “Where is Computational Thinking needed”. A statement “Computational Thinking will be vital for the future job market” is discussed and reasons given.

### Methodology 4

Illustrative examples of computational thinking are given to the students ([Worksheet 3](https://docs.google.com/document/d/1JdE6XjjrnmXBqS3lv2_PjjxXQlIC0o6N/edit#heading=h.6op6j663wb4y)). Students decide which of them are and which are not good examples. Students give one example by themselves.

### Methodology 5

Students brainstorm for complex problems in our everyday lives. They think of different products which are invented to solve them. Students create and design their own product. The products are presented to the class.

## Activities

### Activity 1

* **Related to task nº:** 1
* **Division in groups:** No
* **Estimated duration:**10 min
* **Material needed:** presentation on Computational Thinking, mobile phones

**Description:**

Students start with brainstorming for **words** they associate with computational thinking. Mentimeter ([**www.menti.com**](http://www.menti.com)) is used to collect the ideas. For the review of the activity the results are shared with the class.

### Activity 2

* **Related to task nº:** 1
* **Division in groups:** Yes
* **Estimated duration:** 15 min
* **Material needed:** a video, Worksheet 1, Kahoot! game

**Description:**

Students are divided into groups. They watch a video and fill [a worksheet](https://docs.google.com/document/d/1JdE6XjjrnmXBqS3lv2_PjjxXQlIC0o6N/edit#)  about four key techniques to Computational Thinking and define them. Answers from students around the class are elicited. The definitions are shown on board. Students play Kahoot! to revise the topic.

### 

### Activity 3

* **Related to task nº:** 2
* **Division in groups:** Yes
* **Estimated duration:** 15 min
* **Material needed:** apresentation on Computational Thinking, Worksheet 2

**Description:**

Students brainstorm for different subject fields which need computational thinking (1 minute). The ideas are elicited in the class.

Next a statement if **Computational Thinking Will Be Vital For The Future Job Market**. Each group discusses and then debates whether they agree or disagree. Students can use computers and the Internet in search of information if needed.

### Activity 4

* **Related to task nº:** 2
* **Division in groups:** Yes
* **Estimated duration:** 15 min
* **Material needed:** apresentation on Computational Thinking, Worksheet 3

**Description:**

Students work in groups. They are given Worksheet 3. Students decide which of the examples given are and which are not the examples of computational thinking. The answers are checked. They give examples by themselves, too.

### Activity 5

* **Related to task nº:** 3
* **Division in groups:** Yes
* **Estimated duration:** 15 min
* **Material needed:** apresentation on Computational Thinking, Worksheet 4, posters and markers

**Description:**

Students brainstorm what complex problems we have in our everyday lives. They choose one problem to create a solution.

Students think and prepare a presentation of a product which can help to solve the problem. They think of its aim, who it is for, how to use it and how it looks. The posters are presented to the class.

# Resources

### Resource 1

* + **Type**: A presentation on Computational Thinking
  + **Related to task nº**: 1, 2, 3
  + **Source**: URL <https://docs.google.com/presentation/d/17VHEgeXfXZOBng1JU3o-9UUh4lOK0MGIwXM_Ex9pt-w/edit#slide=id.g1183f463560_0_48>

### Resource 2

* + **Type**: A video
  + **Related to task nº**: 1
  + **Source:** URL <https://www.youtube.com/watch?v=mUXo-S7gzds>

### Resource 3

* + **Type**: Kahoot! game
  + **Related to task nº**: 1
  + **Source:** URL <https://play.kahoot.it/v2/lobby?quizId=d8d0635d-4491-4834-87b9-fab69456af52>

### 

### Resource 4

* + **Type**: Worksheets
  + **Related to task nº**: 2,3
  + **Source:** URL<https://docs.google.com/document/d/1JdE6XjjrnmXBqS3lv2_PjjxXQlIC0o6N/edit#heading=h.6op6j663wb4y>

# Evaluation

## Evaluation 1

* **Related to task nº:** 1
* **Type:** Oral/ written
* **Evaluation system:** passed/ not passed
* **Description of grading scale:** Taking actively part of the activity, and discussions, filling in a worksheet.

## Evaluation 2

* **Related to task nº:** 1
* **Type:** Written
* **Evaluation system:** points grade
* **Description of grading scale:** Students play Kahoot! game individually or in pairs. Getting at least half of the points means that the student has passed the task.

## Evaluation 3

* **Related to task nº:** 2
* **Type:** Written/Oral
* **Evaluation system:** passed/not passed
* **Description of grading scale:**Taking actively part of the activity, and discussions, filling in worksheets, giving examples.

## Evaluation 3

* **Related to task nº:** 3
* **Type:** Written/Oral
* **Evaluation system:** passed/ not passed
* **Description of grading scale:** Taking actively part of the activity, presenting a poster (clear, easy to follow, illustrating the idea).

## 

# Conclusion

## Acquired outcomes

Students will be able to:

* Define computational thinking
* Understand how computational thinking is a part of our everyday lives
* Use problem solving thinking to solve a complex problem.
* Present their ideas to public (public speaking skills)

## Problems faced

Internet connection, lack of technical devices.

## Improval proposal

To be defined.