



# Scratch<sup>2</sup>h 2050 session Plans



# Scratch 2050 Session Plans

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# Session plan Module 0 : Setting up a coding club



## Objectives:

- Get a common understanding of what a coding club is
- Get to know each other
- Reflect on aspirations and coding goals
- Align on practicals and set coding club rules

## Materials:

- Powerpoint Module 0

## Duration:

- +/- 1 hour

## Timing

### Engage Phase

15'



## Teachers activities

### Introduction

Ask the learners to introduce themselves. Ask them to share:

- Name and grade
- Their motivation
- What they expect from this coding club

**Suggestion:** take note of the expectations of the learners for later use.

### Why coding?

Use the slide to illustrate why coding is important. Maybe use some elements that the learners highlighted in the introduction activity.

Explain what the coding club is and the principles. Use the slides in the PowerPoint of module 1.

### Coding club goals

Ask the learners: What do you want to achieve after 12 weeks of coding?

- encourage the learners to write at least 3 things down
- It can help to give the instruction to complete this sentence: "After 12 weeks of coding I want to know/have/learned/understand/make..."
- Write the most common goals on a big poster/blackboard/wall

## Learners activities

- The learners take turns in introducing themselves
- The learners reflect on their aspirations and motivation.

- The learners reflect and brainstorm on their personal coding goals.

## Competences

Communication and reflection skills.



## Timing

## Teachers activities

## Learners activities

## Competences

**Where and When**

Discuss with the learners where and when the coding club will take place. Listen to the input of the learners and check if everyone agrees.

**Representative**

Discuss who will be the representative of the coding club. Explain that the tasks of the representative will be:

- facilitate the communication between club members and teachers.
- help in organising club activities

If there are many volunteers you can do a voting or rotate the function over different learners.

**Club rules**

In two groups, let the learners brainstorm for rules that will allow the club to function well. Give some examples such as being on time, being gentle with the computers,...

**Suggestions:**

- You can suggest to complete this sentence: "In order for our coding club to function well we all..."
- Write the most common rules on a big poster

**Structure**

End this session by explaining the structure of every coding club. Now you are ready to start module 1-2!

Have fun!

- The learners agree on the time and dates of the coding club sessions.

- The learners agree on the chosen representative

- The learners discuss and brainstorm the coding club rules.
- The learners understand why club rules are important.

# Session plan module 1-2: Getting started with Scratch



## Objectives:


- Understand key principles of coding.
- Introduction to Scratch
- Develop the concept of computational creation through Scratch programming.
- Develop communication skills, critical thinking, problem solving, collaboration, and creativity skills .

## Materials:

- Computers and internet
- Powerpoint Module 1
- Scratch cards (digital or printed)

## Duration:

- +/- 2hours

Timing	Teachers activities	Learners activities	Competences
<p><b>Engage Phase</b> 20'</p> 	<ul style="list-style-type: none"> <li>• Ask the learners what you can use coding for. Ask for keywords. Write them down in a wordcloud. Place related keywords together.</li> <li>• <b>Suggestions</b> <ul style="list-style-type: none"> <li>◦ Use <a href="#">Mentimeter</a>, a Word doc, a big paper or blackboard to make the wordcloud</li> <li>◦ Show this <a href="#">aftermovie</a> of the exposure day at Zorabots to link coding to the world of work.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• The learners will think about what coding is.</li> <li>• The learners have an understanding about what coding is</li> <li>• Learners think about what they can use coding for (make games, develop websites, calculations, make video`s, apps, robots...)</li> </ul>	<p>Critical thinking, brainstorming and communication skills.</p>

## Exploration Phase 20'



### Shoe Robot (Unplugged Activity)

Unplugged activities help students understand the basics of coding without touching a digital device themselves.

In the "Shoe Robot" activity, students practice their skills to construct a code with a well-thought-out sequence. In this activity, as a facilitator, you are a robot and you are 'programmed' by the students, the programmers. The goal of the programmers is to make the robot successfully put on his shoe.

Put off your shoe. Then explain to the students that you are a robot and want to put on your shoe. However, you are not programmed to do that. The students are the programmers or engineers and have to make an instruction or code that you can follow.

Critical thinking, collaboration, computational, problem solving skills



Timing	Teachers activities	Learners activities	Competences
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Divide the learners in 2 groups. Give them a few minutes to discuss and write down what they think is the right instruction to make a robot put on his/her shoe. Then they can tell you the code and you, as a robot, carry out their commands.

**Warning:** a robot takes everything very literally. When the students instruct you to pick up the shoe, pick it up upside down. When they tell you to put your foot in it, do it in the wrong direction (or to the wrong foot). Make lots of "mistakes" so they understand how accurate programming is.

**Example:** <https://www.youtube.com/watch?v=2zVpWu1i5qM>

Ask your students what the conclusion is of this exercise.

- The learners discuss and write down the instructions to make a robot put on a shoe.
- When they are ready one learner reads the instruction to the robot.
- the learners understand the key principles of coding
- learners make a conclusion of this exercise:

Ask your students what the **conclusion** is of this exercise. It can be something like this:

- Computers are not clever, but they are very obedient. They will do exactly what you tell them to do.
- Coding is the art of instructing a computer what to do.
- Programming languages are used to communicate to a computer what you want it to do.
- Coding involves feeding the computer step-by-step commands.
- ...

**Demonstration**

**Phase**

20'



**Demonstration of Scratch**

Show your students what Scratch is before you dive into it. You can use the PowerPoint of module 1 and/or share your own screen to showcase some moves in Scratch. You can also show an introductory YouTube video. There are plenty you can use, for example <http://bit.ly/intro-scratch>.

Ask the learners to observe. Maybe you can ask **some questions:**

- What did you see? Does it look difficult?
- (in case you showed a project of yourself) how did it work? What did I do?
- do you see similarities with the shoe robot?

- The learners observe the demonstration and take notes of the following questions :
  - What did you see? Does it look difficult?
  - (in case you showed a project of yourself) how did it work? What did I do?
  - do you see similarities with the shoe robot?

Critical thinking and communication skills



## Timing

### Experimenting Phase

50'



## Teachers activities

Now your students are ready to start coding in the most fun way possible: by playing and experimenting.

Divide the learners in groups (2-3 learners). Hand out the set of **Scratch starter cards**, each containing a simple code such as moving with the keyboard arrows, moving with a mouse, changing the color of a character, and so on. Challenge your students to try out as many cards as possible. You can download the cards here:

<https://resources.scratch.mit.edu/www/cards/en/scratch-cards-all.pdf>

### How to facilitate this experimenting phase:

- Walk around and help the students by asking questions to get them to the right answer.
- Let groups help each other. Eg: the 'faster' groups can assist the 'slower' ones.
- After some time, encourage the groups to experiment (outside the starter cards)
- See a great idea? Ask the creator to share with others.

## Learners activities

- The learners play around and experiment with Scratch. They can do this individually or in groups
- The learners use the Scratch starter cards to explore functionalities.

## Competences

collaboration, creativity  
computational, problem solving,  
coding skills

### Reflection Phase

10'



Ask the learners what they have discovered today and what they would like to do in the next coding club.

### Guiding questions:

- What do you like the best about the project you made?
- What did you learn?
- What was the hardest part?
- What would you like to improve still?
- What do you expect from this club?

- The learners share and reflect on the first coding club session.
- The learners express their aspirations for the next coding club session.

Reflection, communication skills



# Session plan module 3 - 4 - Stories and animations



## Objectives:

- Making animations and stories with Scratch
- Use computational concepts in storytelling
- Explore computational creation
- Develop communication skills, critical thinking, problem solving, collaboration, and creativity skills.

## Materials:

- Computers
- Internet
- PowerPoint module 2

## Duration:

- +/- 2,5 hours

## Timing

### Engage Phase

20'



## Teachers activities

- Ask the learners what their **favorite animation movie** is and open up a class discussion:
  - What makes your favorite movie a good movie?
  - What do your favorite movies have in common?
  - What characteristics make up an animation movie?
  - How are animation movies developed?

## Learners activities

- The learners understand the characteristics of an animated story (different characters, storyline...) and realize that coding is needed to make animated stories.
- Learners realize they can use Scratch for developing an animated story.

## Competences

Critical thinking, brainstorming and communication skills.

### Demonstration Phase

20'



Show your students how they can use Scratch for developing an animated story. You can do that by using the PowerPoint of module 2 and by showing an example of an animated video (you can find them on the Explore page of Scratch).

Ask the learners to observe. Maybe you can ask **some questions**:

- What did you see? Does it look difficult?
- (in case you showed an example) how did it work?

- The learners observe the demonstration and take notes of the following questions :
  - What did you see? Does it look difficult?
  - (in case you showed an example) how did it work? What did I do?

Critical thinking and communication skills





## Timing

### Experimenting

#### Phase

40'



## Teachers activities

### Story with 10 blocks

Give students time to create a project with only these 10 Scratch blocks: go to, glide, say, show, hide, set size to, play sound until done, when this sprite clicked, wait, and repeat. Remind students to use each block at least once in their project and encourage them to experiment with different sprites, costumes, or backdrops.

#### How to facilitate this experimenting phase:

- Walk around and help the students by asking questions to get them to the right answer.
- Let groups help each other. Eg: the 'faster' groups can assist the 'slower' ones.
- See a great idea? Ask the creator to share with others

After some time wrap up the exercise. **Ask the learners:**

- What was difficult about being able to use only 10 blocks?
- What was easy about being able to use only 10 blocks?
- How did it make you think of things differently?

The conclusion could be that it is surprising how much one can do with just 10 blocks! Take this opportunity to encourage different ideas and celebrate creativity by inviting a few students to present their projects in front of the class

## Learners activities

Learners create (individually or in pairs/groups) a project using only these 10 blocks. They can use them once, twice, or multiple times, but each block should be used at least once.

Learners reflect on the exercise:

- What was difficult about being able to use only 10 blocks?
- What was easy about being able to use only 10 blocks?
- How did it make you think of things differently?

## Competences

collaboration, creativity  
computational, problem solving,  
coding skills, communication skills



Timing	Teachers activities	Learners activities	Competences
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**Experimenting Phase**

50'



**Animation video with at least 10 sprites**

Let the learners create an animated story with at least 10 sprites.

Encourage the students to:

- brainstorm ideas with a neighbor
- sketch the story/ animation outline/ideas on paper first
- experiment with different blocks and costumes
- try adding sound to their project.

When the learners are ready invite them to share their projects to a '**feedback group**'. A feedback group is a small group of learners who share ideas and projects-in-progress with one another in order to get feedback and suggestions for further development. Divide students in smaller groups of 3 - 4 people. In these feedback groups, ask the learners to take turns sharing their animated story project. Encourage students to record notes, feedback, and suggestions.

Learners create (individually or in pairs/groups) an animated video with at least 10 sprites.

When done learners show their project in their feedback group. Let learners gather feedback by having their feedback group members respond to the following questions:

- What is something that doesn't work or could be improved?
- What is something that is confusing or could be done differently?
- What is something that works well or you really like about the project?

collaboration, creativity  
computational, problem solving,  
coding skills, communication  
skills, feedback skills

**Reflection Phase**

20'



Ask the learners what they have discovered today and what they would like to do in the next coding club.

**Guiding questions:**

- What do you like the best about the project you made?
- What did you learn?
- What was the hardest part?
- What would you like to improve still? Was the feedback group useful?
- Was it difficult or easy to give/receive feedback? Why(not)?
- What do you expect from this club?

- The learners share and reflect on the coding club session.
- The learners express their aspirations for the next coding club session.

Reflection, communication skills



# Session plan module 5 - Polygons & Flowers



## Objectives:

- Apply the computational concepts of shapes and repeat control.
- Know how to draw angles and use the pen function.
- Develop communication skills, critical thinking, problem solving, collaboration, and creativity skills.

## Materials:

- Computers
- Internet
- PowerPoint module 5

## Duration:

- +/- 2 hours

## Timing

### Engage Phase

30'



## Teachers activities

Explain to the learners that today coding session is all about creating your own sprite by drawing. To be able to draw, we need to be able to recognize polygons. Ask the students what a polygon is.

Compile a definition together with the learners. It could look like this: a polygon is a plane figure with at least three straight sides and angles. Ask the learners to sketch some of the polygons they know.

Fil in the table in in the PowerPoint. Looking at the completed table, ask the students what strikes them. If the learners don't point it out, explain that if they divide 360 by the number of sides in a polygon they would find the angle of the polygon. In this way they can draw a wide range of things with Scratch.

## Learners activities

- The learners understand what polygons are.
- The learners understand that polygons are usefull in drawing sprites in Scratch
- Learners realize they can calculate the angles of polygons .


## Competences

Critical thinking, brainstorming and communication skills.



Timing	Teachers activities	Learners activities	Competences
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**Demonstration Phase**  
20'



Show your students how they can draw angles and use the pen function in Scratch. You can do that by using the PowerPoint of module 5 and by showing an example.


Ask the learners to observe. Maybe you can ask **some questions**:

- What did you see? Does it look difficult?
- How did the game work?

- The learners observe the demonstration and take notes of the following questions :
  - What did you see? Does it look difficult?
  - How did the game work? What did I do?

collaboration, creativity  
computational, problem solving,  
coding skills, communication skills

**Experimenting Phase**  
30'




**Drawing Angles**  
Let the learners try to draw the polygons they listed in the engage phase. This requires them to know the degrees of each polygon. Remind them they can have a look at the table.

After a while encourage them to draw more complex things such as a circle and a flower.

Learners design (individually or in pairs/groups) different polygons. They discover the possibilities of drawing in Scratch

collaboration, creativity  
computational, problem solving,  
coding skills, communication skills.

**Experimenting Phase**  
30'



**Design your own Sprite**  
Let the learners design their own sprite by using pen blocks.

Encourage the learners to:

- Add a trigger (event)
- Add the "Erase all"
- Hide and show
- Change color

Learners design (individually or in pairs/groups) a sprite.

When done learners show their project in their feedback group. Let learners gather feedback by having their feedback group members respond to the following questions:

collaboration, creativity  
computational, problem solving,  
coding skills, communication skills, feedback skills

- What is something that doesn't work or could be improved?
- What is something that is confusing or could be done differently?
- What is something that works well or you really like about the project?





## Timing

## Teachers activities

## Learners activities

## Competences

When the learners are ready invite them to share their projects to a 'feedback group'. A feedback group is a small group of learners who share ideas and projects-in-progress with one another in order to get feedback and suggestions for further development. Divide students in smaller groups of 3 - 4 people. In these feedback groups, ask the learners to take turns sharing their games. Give the learners time to improve the games using the feedback.

### Reflection Phase

10'

Ask the learners what they have discovered today and what they would like to do in the next coding club.

- The learners share and reflect on the coding club session.
- The learners express their aspirations for the next coding club session.

Reflection, communication skills



#### Guiding questions:

- *What was challenging about this coding club session?*
- *What are you proud of?*
- *What was the main feedback you got from your fellow coders?*
- *What would you like to improve still?*

# Session plan module 6-7 - Games



## Objectives:

- Apply the computational concepts of conditionals, operators, and data.
- Apply the computational practices of iterating, testing, debugging, and reusing, abstracting, and modularizing by building game projects.
- Identify and use common game mechanics.
- Develop communication skills, critical thinking, problem solving, collaboration, and creativity skills.

## Materials:

- Computers
- Internet
- PowerPoint module 6-7

## Duration:

- +/- 2,5 hours

## Timing

### Engage Phase

20'



## Teachers activities

Divide students into small groups of 2-3 people. In their small groups, ask students to generate a list of games that they enjoy playing. Give students a short time period (1-2minutes) to write down as many games as they can. Then, have students narrow down their favorites from the brain dump list.

After a few minutes, facilitate a class discussion about what characteristics make up a game and generate a class list of common game mechanics. Ask:

- What do the games have in common?
- What features of their design make them a game?

Next, ask students to imagine their dream game and write a list of design elements for that game. Invite students to share their dream game lists in their small groups to get feedback and suggestions.

## Learners activities

- The learners understand the characteristics of a game
- Learners realize they can use Scratch for developing a game.
- Learners make a list of their favorite design elements
- Learners share their dream game list in their groups to get feedback and suggestions.

## Competences

Critical thinking, brainstorming and communication skills.





Timing	Teachers activities	Learners activities	Competences
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**Demonstration**

**Phase**

20'



Show your students how they can use Scratch for developing an game and what the design process is. You can do that by using the PowerPoint of module 6-7 and by showing an example of a game such as **Maze**, **Pong**, and **Scrolling** (you can find them in the in the **Game studio**).

Ask the learners to observe. Maybe you can ask **some questions**:

- What did you see? Does it look difficult?
- How did the game work?

• The learners observe the demonstration and take notes of the following questions :

- What did you see? Does it look difficult?
- How did the game work? What did I do?

collaboration, creativity  
computational, problem solving,  
coding skills, communication skills

**Experimenting**

**Phase**

60'



**Design your Dream Game**

Let the learners create their dream game. As a first step let them first fill in the game **design template here**

You can suggest to the learners to have a look at some examples in the **Game studio** such as **Maze**, **Pong**, and **Scrolling**.

Encourage the learners to:

- Add multiple levels to their game! This can be done through the use of different backdrops and using broadcast blocks to trigger the next level.
- Add difficulty to the game by creating different levels, using a timer, or keeping score
- Use the 'make' a variable block to keep score!
- Experiment with timer blocks to add new challenges

Learners create (individually or in pairs/groups) a game. They can start building their own games or remix one of the starter projects in the Games Studio.

When done learners show their project in their feedback group. Let learners gather feedback by having their feedback group members respond to the following questions:

- What is something that doesn't work or could be improved?
- What is something that is confusing or could be done differently?
- What is something that works well or you really like about the project?

collaboration, creativity  
computational, problem solving,  
coding skills, communication  
skills, feedback skills



Timing	Teachers activities	Learners activities	Competences
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When the learners are ready invite them to share their projects to a 'feedback group'. A feedback group is a small group of learners who share ideas and projects-in-progress with one another in order to get feedback and suggestions for further development. Divide students in smaller groups of 3 - 4 people. In these feedback groups, ask the learners to take turns sharing their games. Give the learners time to improve the games using the feedback.

**Experimenting Phase**  
30'



**Game Fair**  
To celebrate and share final game creations, we recommend hosting a Game fair. Final game projects are placed in presentation mode; students walk around and play each other's games.

Half of the students stay in their seats with their projects open while the other half walks around trying out the games, asking questions, and giving feedback, then switch sides.

Learners showcase and test each others game and give feedback.

collaboration, creativity  
computational, problem solving,  
coding skills, communication  
skills, feedback skills

**Reflection Phase**  
20'



Ask the learners what they have discovered today and what they would like to do in the next coding club.

**Guiding questions:**

- *What was challenging about designing your game?*
- *What are you proud of?*
- *What was the main feedback you got from your fellow coders?*
- *What would you like to improve still?*

- The learners share and reflect on the coding club session.
- The learners express their aspirations for the next coding club session.

Reflection, communication skills



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**Belgium**  
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