Co-funded by the
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Training Programme

Introduction to programing. Creating our virtual world in VR and AR

MY VIRTUAL WORLD

DAY1

About lectures

Rimantė

- For 5 years Primary and Secondary School **IT Teacher**
- In 2019 among **TOP 3** of Lithuania's Most Innovative Mathematics and IT Teachers
- 2019-2020 gave lectures for Lithuanian primary teachers on **IT integration in lessons**
- For 4 years Sourcery for Kids **Mentor** (Programming academy for 7-12 age kids)
- For 2 years **Organiser** of the children's camp "Informiko akademija“ (Programming summer camp for 7-12 age kids)

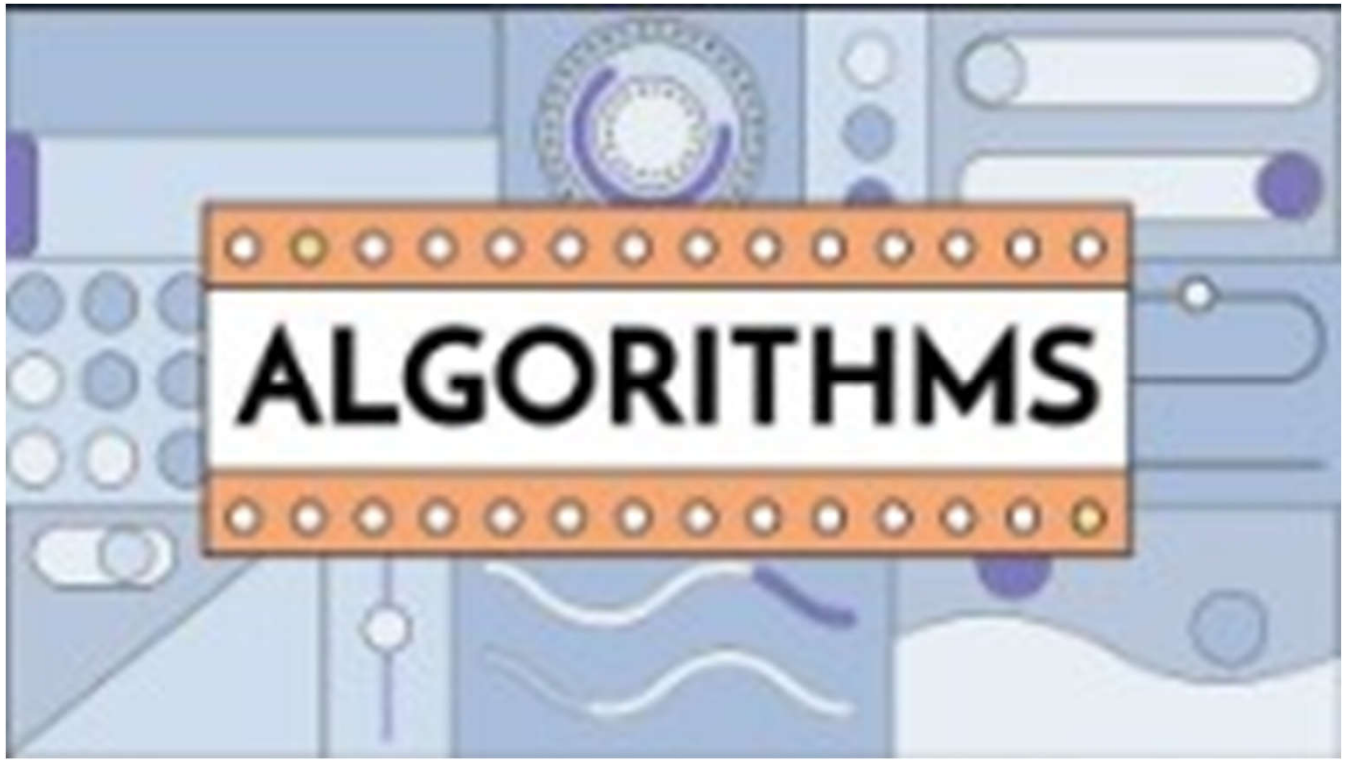
Neringa

- For 8 years **Coordinator** of educational international projects and **Technician** in international projects in PI “eMundus”
- For 4 years **Researcher and Academic Assistant** in Informatics Faculty of Kaunas University of Technology
- For 3 years Sourcery for Kids **Mentor** (Programming academy for 7-12 age kids)
- For 2 years **Organiser** of the children's camp "Informiko akademija“ (Programming summer camp for 7-12 age kids)

COURSE STRUCTURE

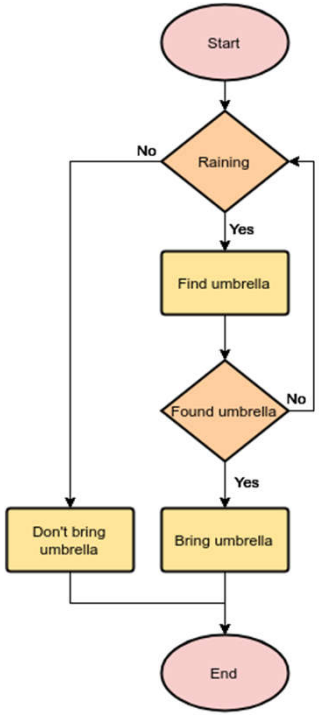
	DAY 1	DAY 2	DAY 3	DAY 4	DAY 5
30 min **Theory**	**Basics of programming. How simply explain what is programming and algorithms for kids?**	**Virtual and augmented reality. History and VR, AR in our life**	**Equipment and tools for discovering and presenting 3D in the classroom**	**What is 3D modelling? 2D vs. 3D**	**CoSpaces Teachers account opportunities, class management**
30 min **Demonstration according instructions of Practice part**	**Introduction to CoSpaces** **Project 1:** **My virtual world** Competencies: navigation in the system, language, programming	**Project 2:** **Tell your story** Competencies: creativity, language, writing, programming Subject: native language, English, IT	**Project3:** **Can you count?** Competencies: counting, writing, Math, programming Subject: any subject, useful for flipped class method, English, IT	**Introduction to TinkerCAD** **Project 4:** **My geometric hero** Competencies: creativity, counting, modelling, Math, Geometry Subject: any subject, Math, English, IT	**Project 5: The Maze** Competencies: counting, programming Subject: English, IT
10 min	Assessment (Kahoot)				
10 min	Break				
60 min **Developing the projects Consultations**	Participants individually developing the project example according the script/instructions and consultations.				
10 min	Feedback (fill the form)				

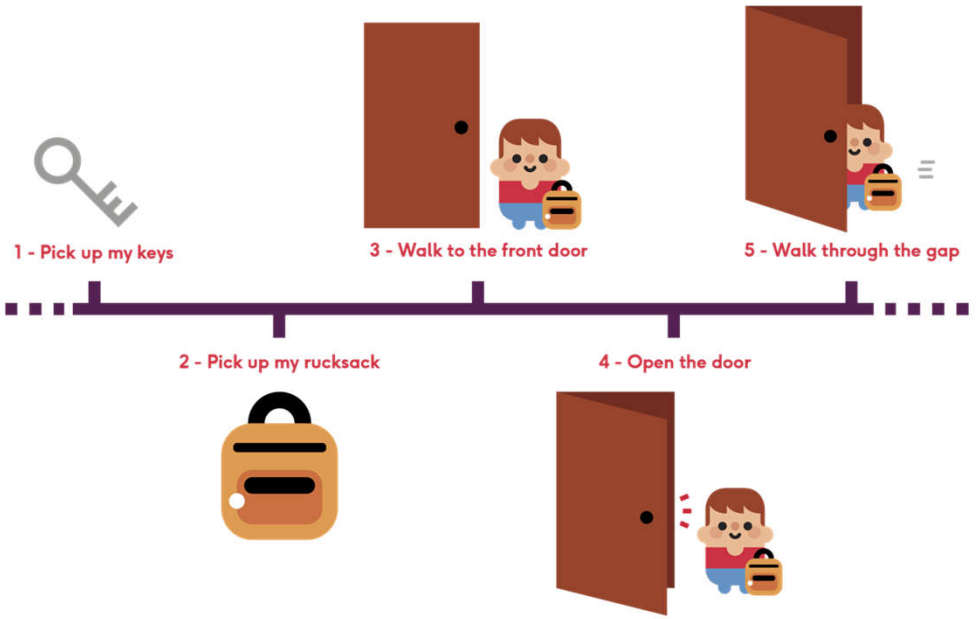
WHAT IS AN ALGORITHM?



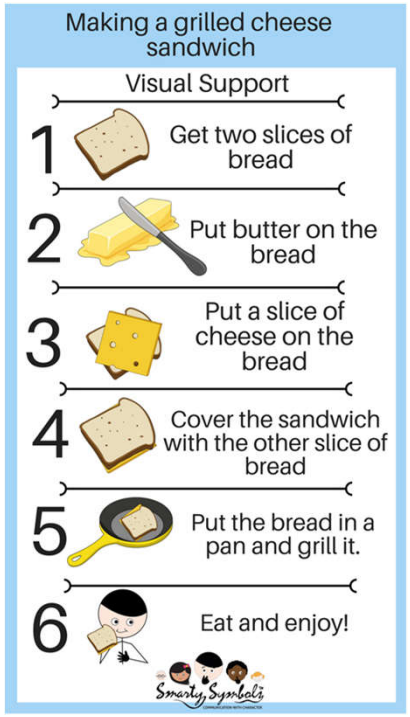
https://www.youtube.com/watch?v=kM9ASKAni_s

EXAMPLE OF ALGORITHMS





EXAMPLE OF ALGORITHMS IN REAL LIFE



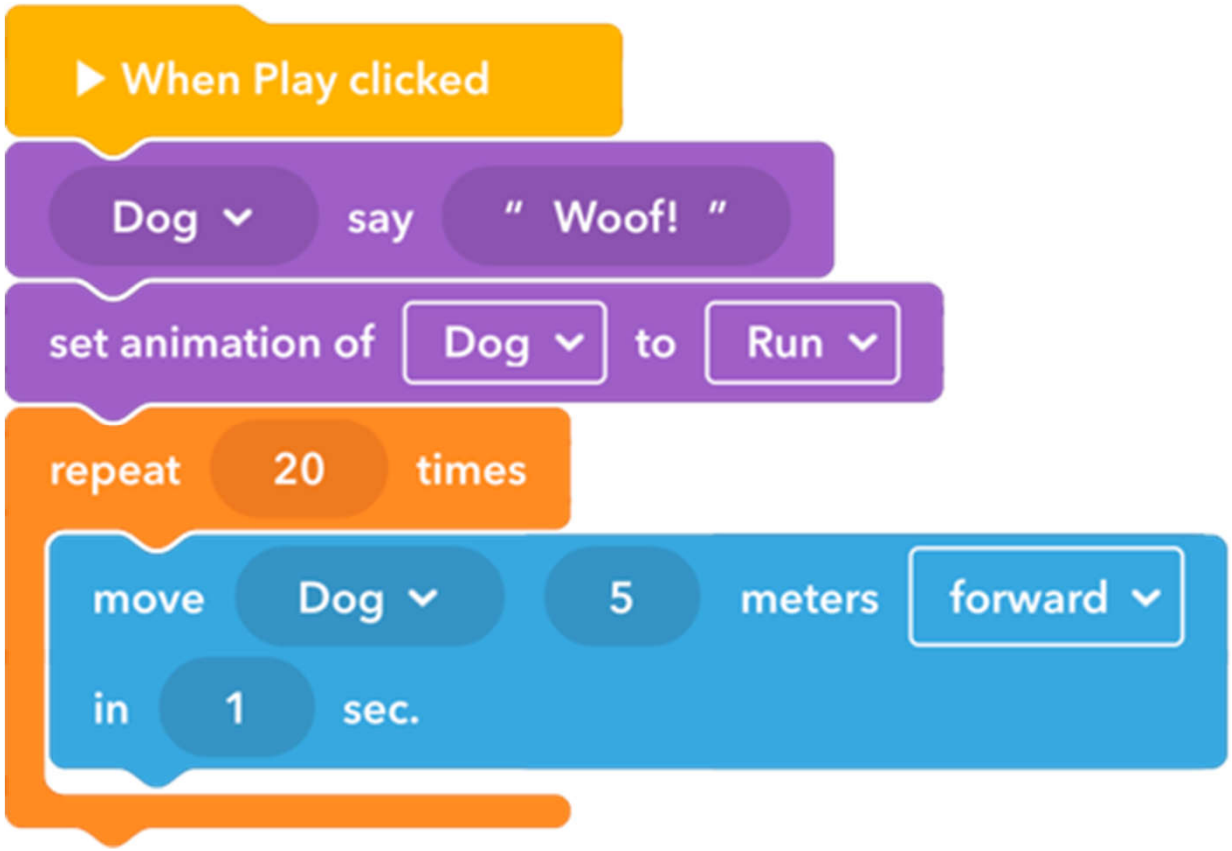
PROGRAMING LANGUAGE

CODE. WHAT PROGRAMERS DO

```java
import java.util.*;
class matrix{
    public static void main (String args[]) {
        Scanner sc = new Scanner (System.in);
        int num[][]=new int[3][3];
        for (int i=0;i<num.length;i++) {
            for (int j=0;j<num.length;j++) {
                num[i][j]=sc.nextInt();
            }
        }

        for (int i=0;i<num.length;i++) {
            for (int j=0;j<num.length;j++) {
                System.out.print (num[i][j]+" ");
            }
            System.out.println();
        }
    }
}
```

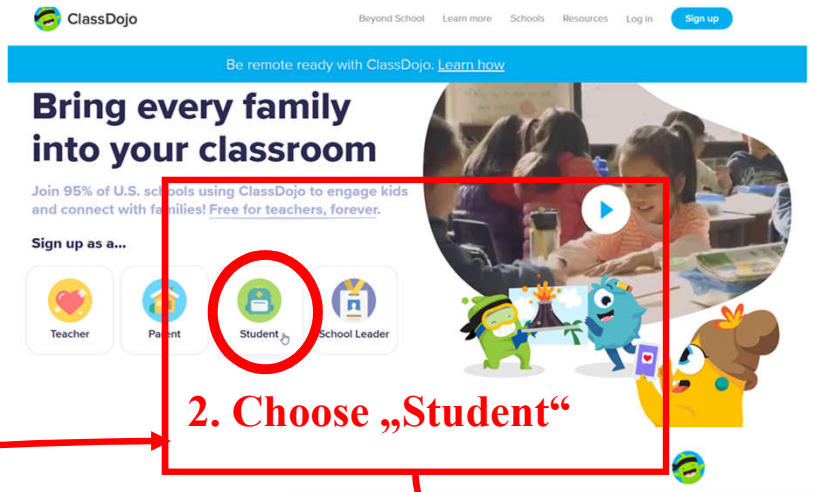
CODING WITH CHILDREN



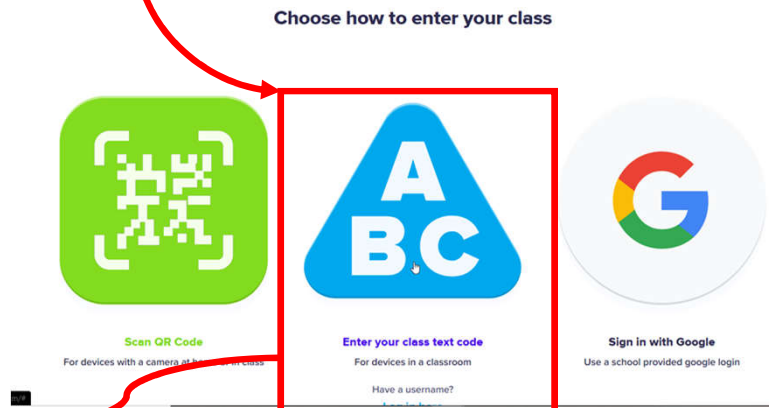
- All week training slides, instructions, videos
- Sharing your projects
- Asking questions and discussions (in English or national language)
- Answering the learners (help each other and discover together)
- Asking lecturers by private message (in English or national language)

1. Enter

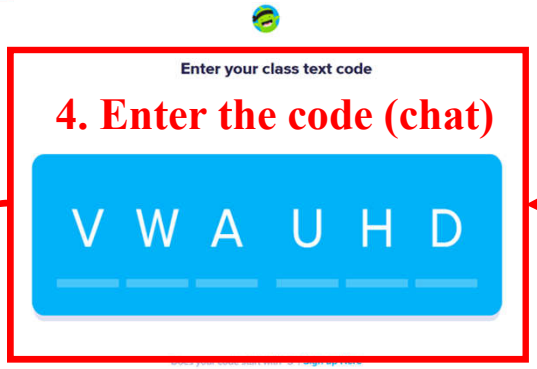
CLASSDOJO.com



2. Choose „Student“



3. Choose „Enter your class text code“



4. Enter the code (chat)

5. Choose your name

DAY 1. 1nd Project “Introduction to the CoSpace”.

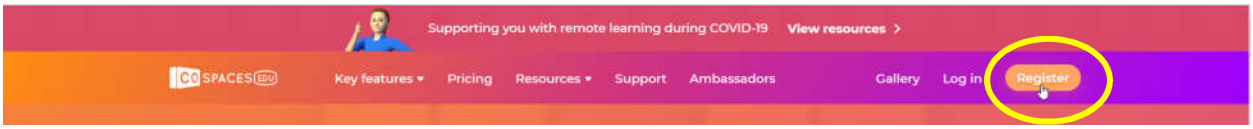
During this session you will perform 2 practical tasks, during which:

- You will create an account of CoSpaces.
- You will get acquainted with the environment with CoSpaces.
- You will learn to move the character, change the background.

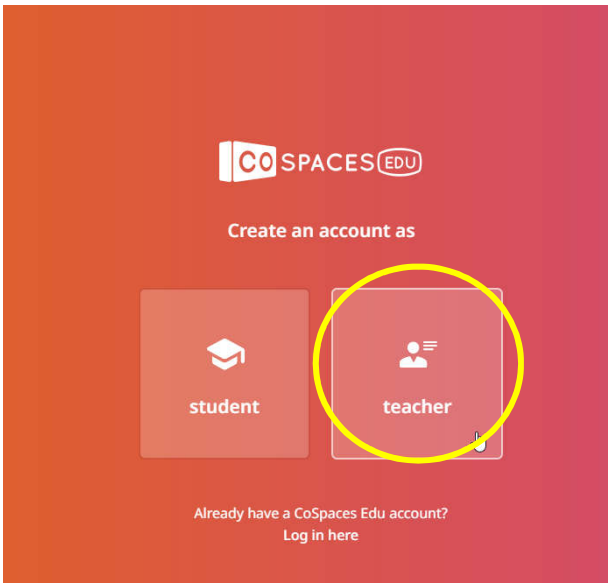
Task 1. Create an account

Step 1. Open the CoSpace page in the browser. Link: https://cospaces.io/edu/

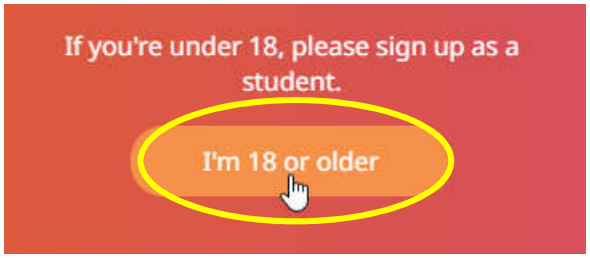
Step 2. Click the "**Register**" button.



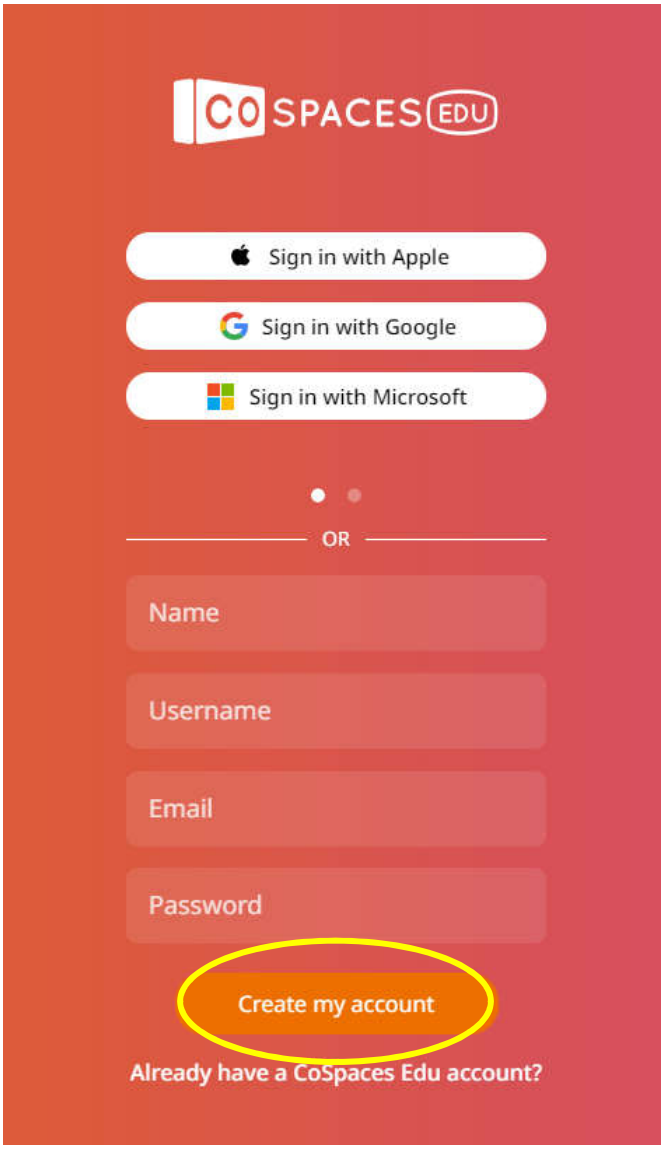
Step 3. Select the "**Teacher**" button.



Step 4. Agree that you are over 18 years old.



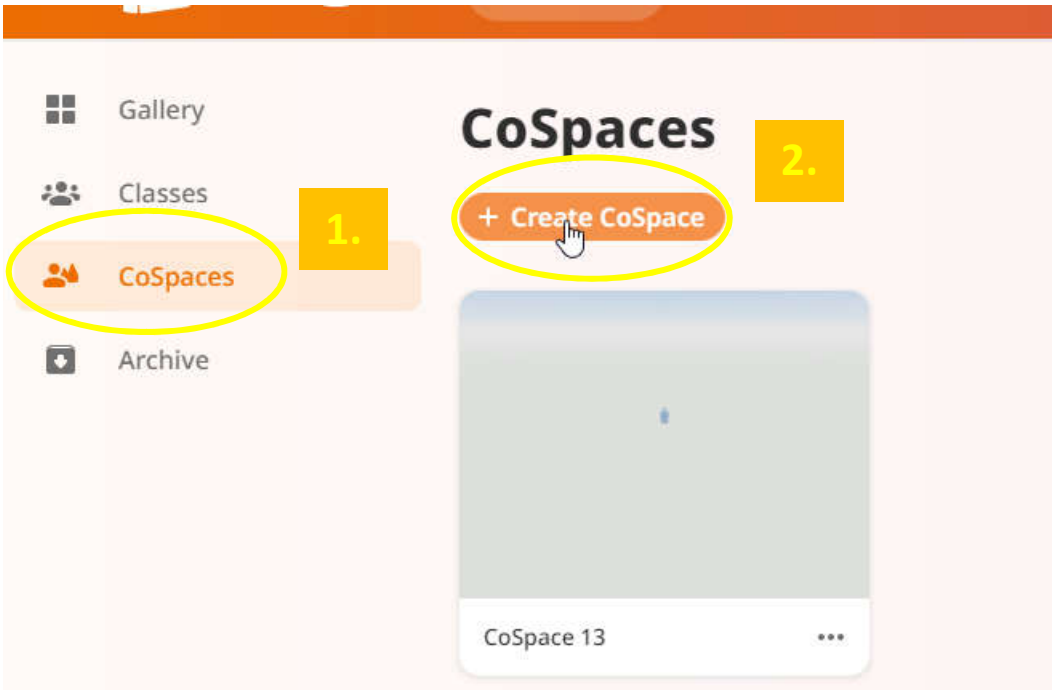
Step 5. Create an account. Enter your name, login name, e-mail and the desired password and click the "**Create my account**" button.



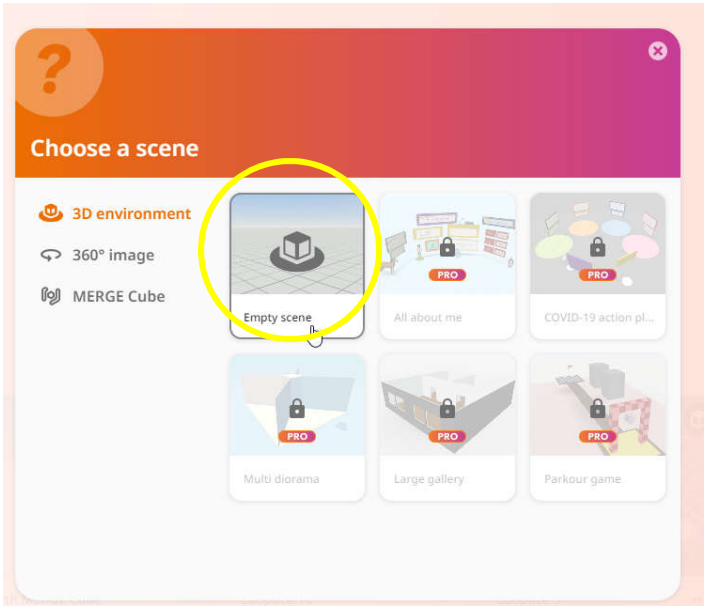
Task 2. Create the 1st Project "My Virtual World"

The project must have at least 3 characters with different animations and backgrounds.

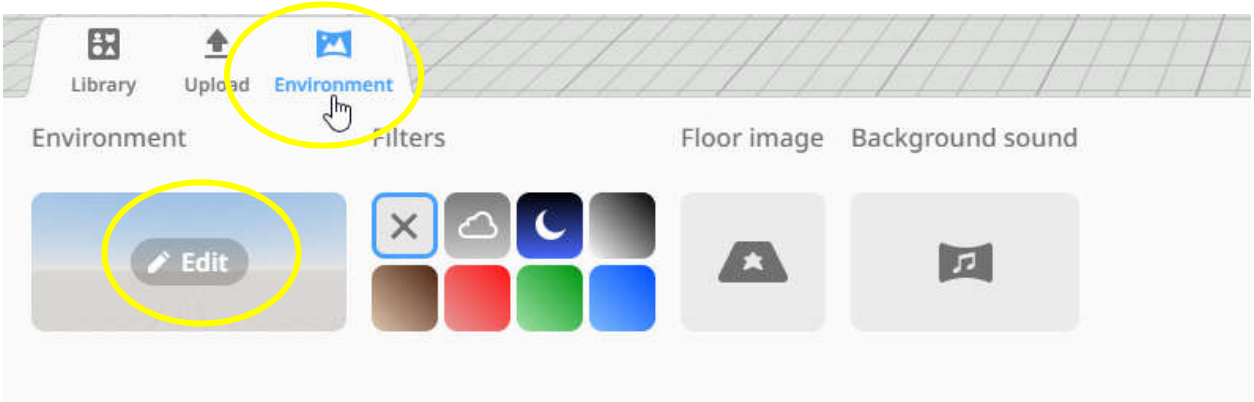
Step 1. Select the „**CoSpaces**“ button on the left and press the „+ **Create CoSpace**“ button



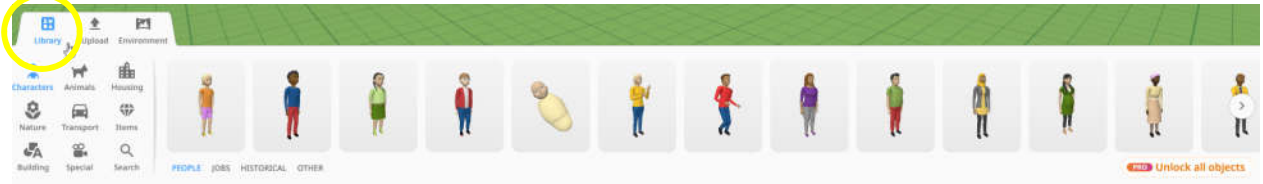
Step 2. Press the „**Empty scene**“ button.



Step 3. At the bottom, click the "**Environment**" button, then click the "**Edit**" button and select the background you like.



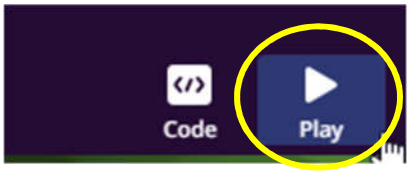
Step 4. At the bottom, click on the "Library" button and select the characters you like from the library. Click on them and drag them to the virtual environment that you chose.



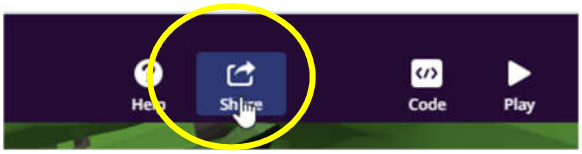
Step 5. You can adjust, rotate, raise, decrease or increase the character.

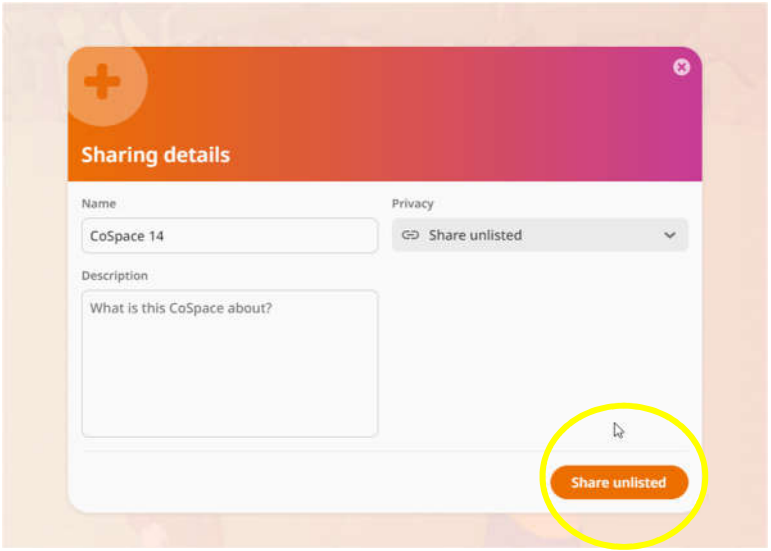
Step 6. You provide animation to your uploaded characters. Right-click on the character, select the "**Animation"** button, click on it to select the desired animation.

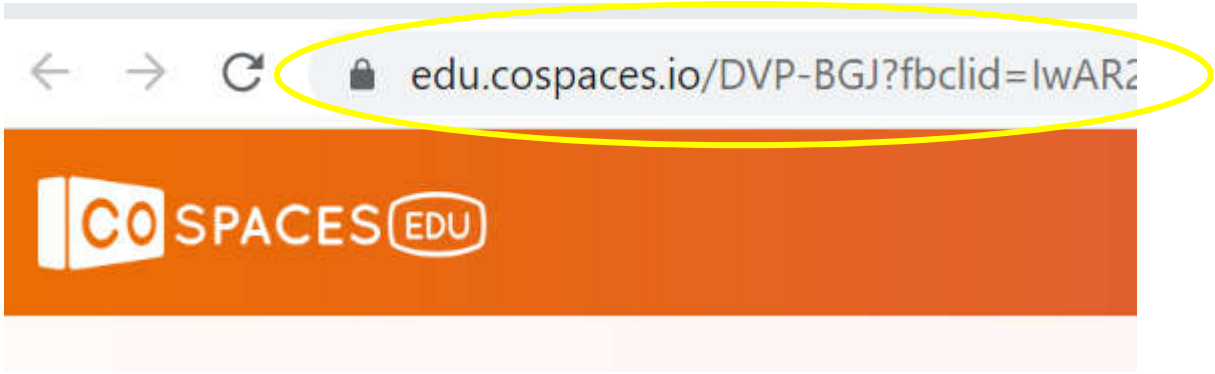
Step 7. Develop your virtual world at your own discretion, try different animation, add more characters and try your project (“Play” button on the top right corner).



Step 8. Share a project link. “**Share**” button at the top right corner. In the table that appears, give the project a Name (“**Name**”), you can provide a Description (“**Description**”), and click “**Share unlisted**”. Then copy the project link (website address) and place it according to the lecturer's instructions.


Code
Play


Sharing details
Name
CoSpace 14
Privacy
Share unlisted
Description
What is this CoSpace about?
Share unlisted


edu.cospaces.io/DVP-BGJ?fbclid=IwAR2
COSPACES EDU

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Training Programme

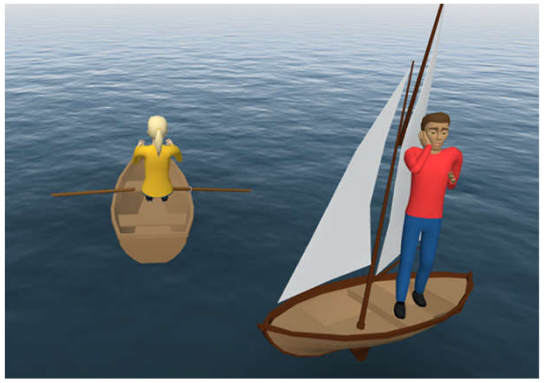
Introduction to programing. Creating our virtual world in Virtual Reality and Augmented Reality

TELL YOUR STORY

DAY 2

WHAT WE DID YESTERDAY?

Our first virtual world



VIRTUAL REALITY

What are the associations?

VIRTUAL REALITY

- **Virtual reality (VR)**, the use of computer modeling and simulation that enables a person to interact with an artificial three-dimensional (3D) visual or other sensory environment.

VIRTUAL REALITY LESSONS

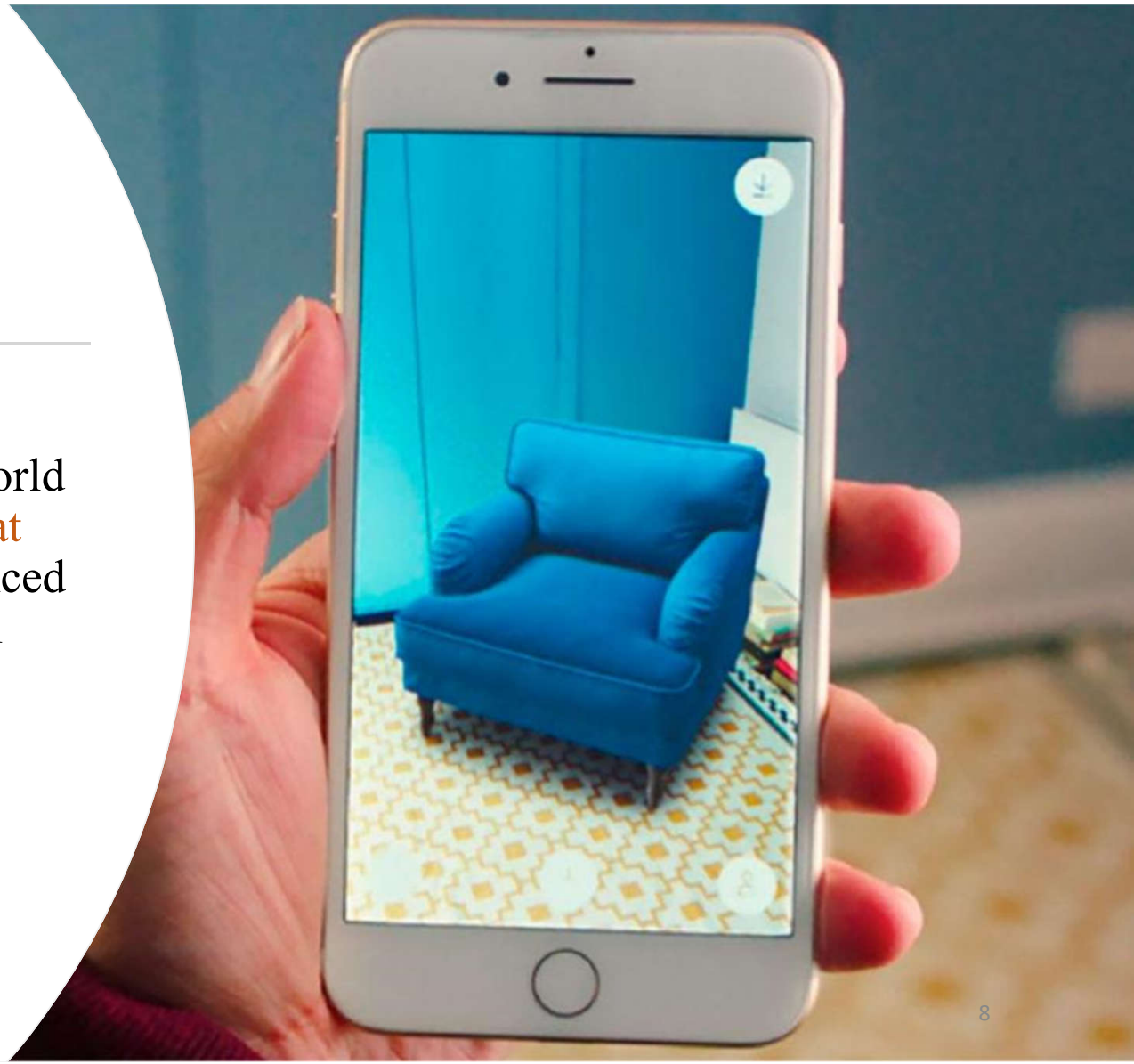
- Math (counting, Geometry, etc.)
- Biology (body structure, animals, etc.)
- Geography (world map, Solar System, etc.)
- Chemistry (virtual lab, etc.)
- Language
- History (architecture, virtual toursin museums)
- STEAM
- Other lessons

AUGMENTED REALITY

What are the associations?

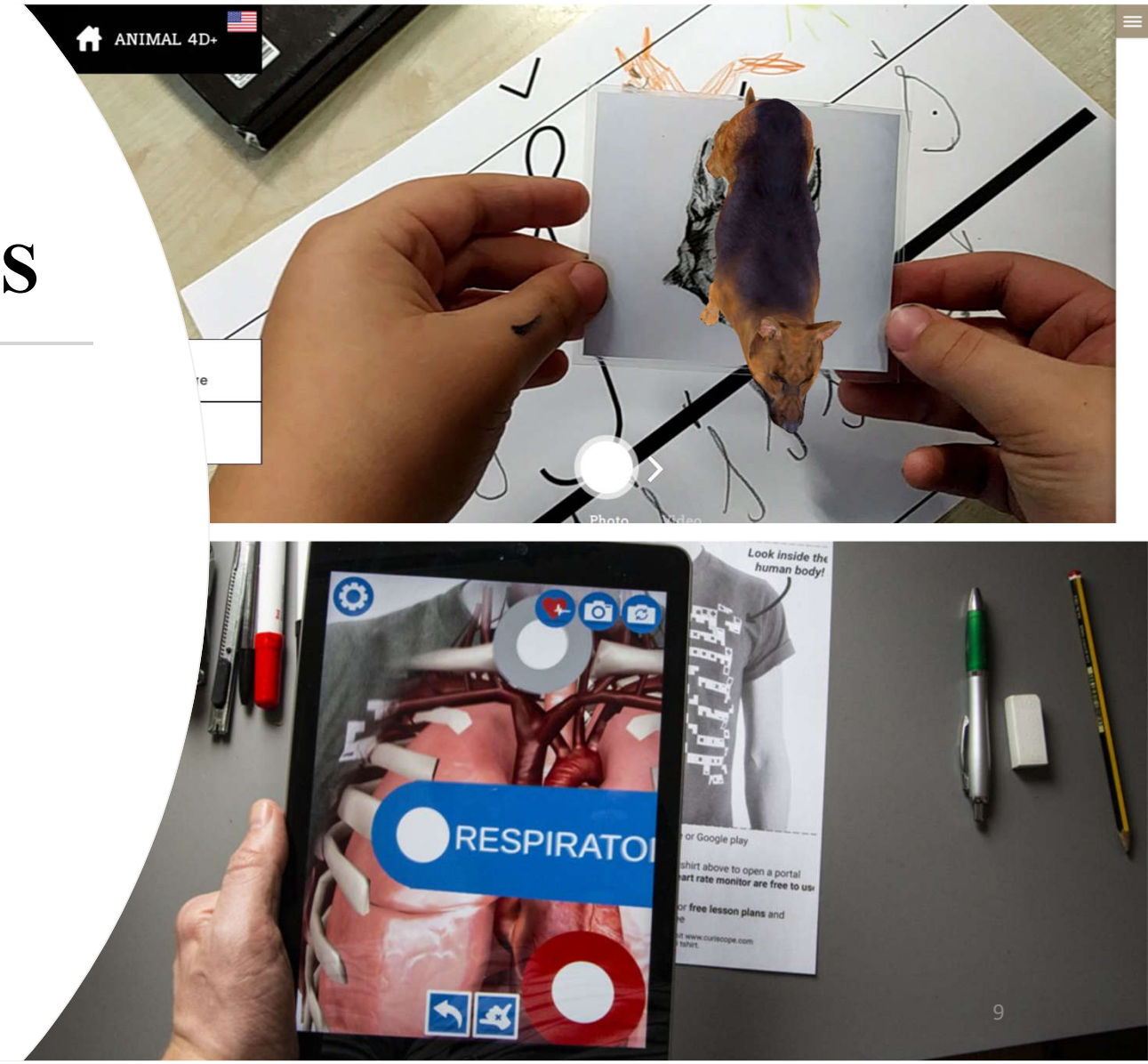
AUGMENTED REALITY

- **Augmented reality** (**AR**) is an interactive experience of a real-world environment where the objects that appear in the real world are enhanced by computer-generated perceptual information, sometimes across multiple sensory modalities, including visual, auditory, haptic (touching), somatosensory and olfactory (smelling).



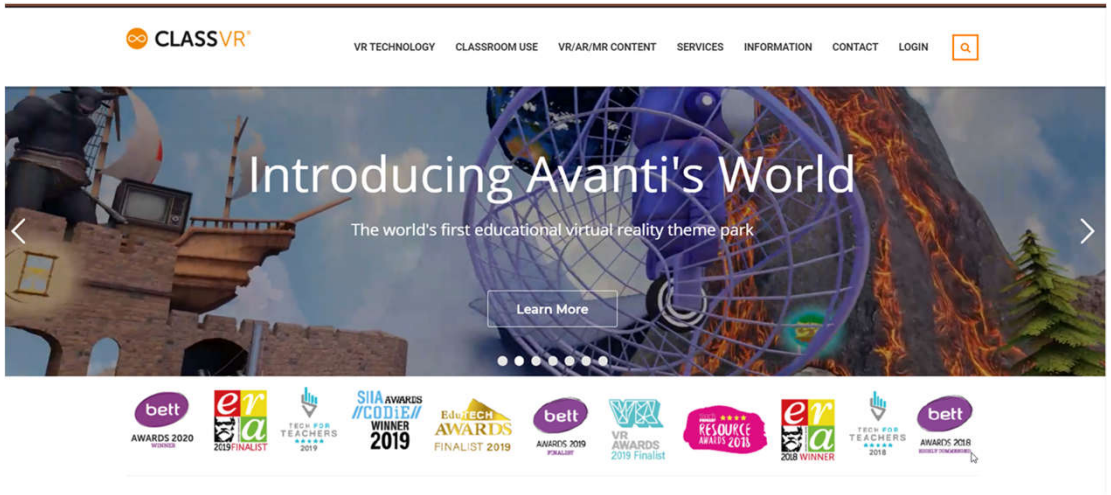
AUGMENTED REALITY LESSONS

- Math
- Biology
- Geography
- Chemistry
- Language
- History
- STEAM
- Other lessons



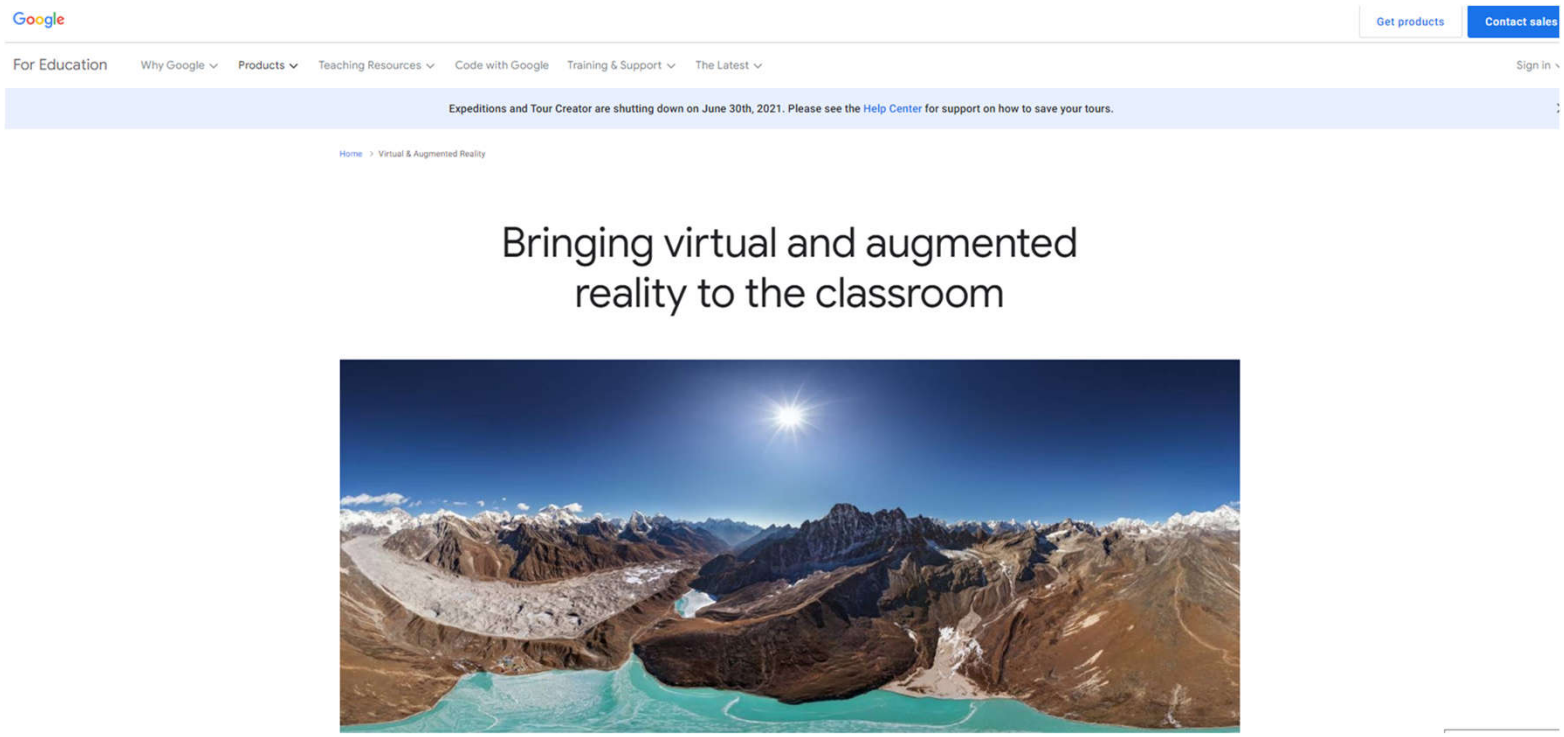
PROGRAM „CLASSVR“

https://www.classvr.com/



PROGRAM „GOOGLE VR“

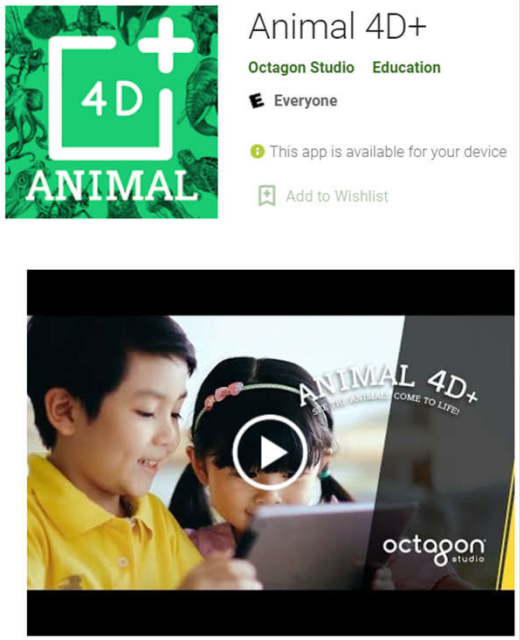
https://edu.google.com/products/vr-ar/

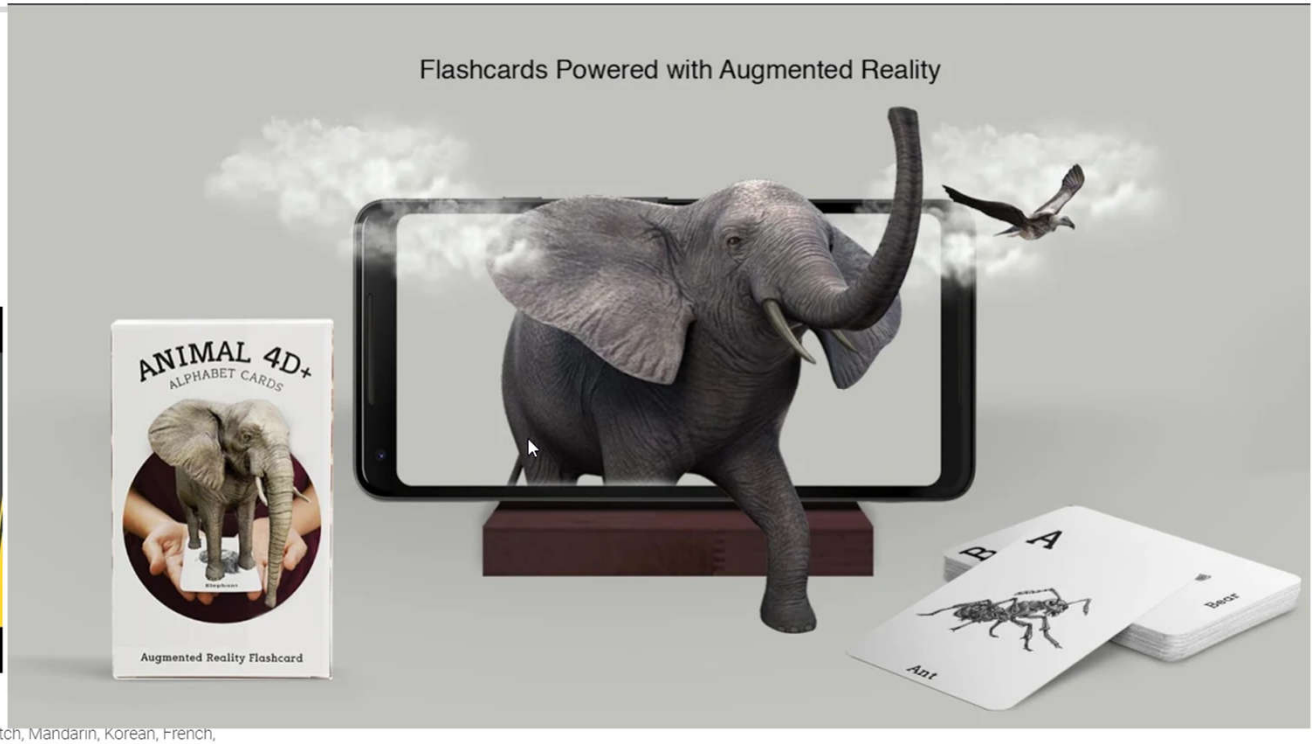


PROGRAM „ANIMAL 4D+“

Android app

iOs app

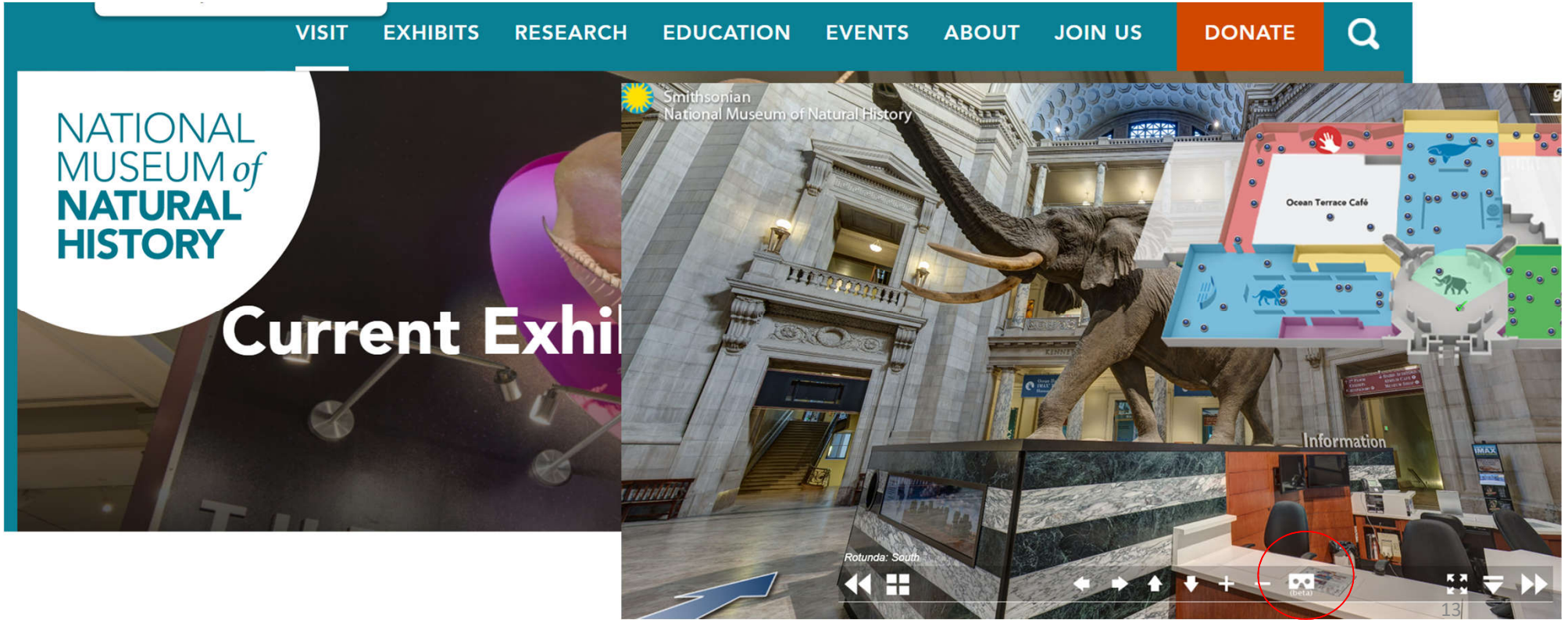




- Multi languages: English, Spanish, Turkish, Japanese, Bahasa, Dutch, Mandarin, Korean, French, Ukrainian, Russian

Museums

https://naturalhistory.si.edu/visit/virtual-tour/current-exhibits



PROGRAM „CoSpaces“

https://cospaces.io/edu/

DAY 2. 2nd Project „Tell Your Story“

During this session you will complete 1 practical task, during which:

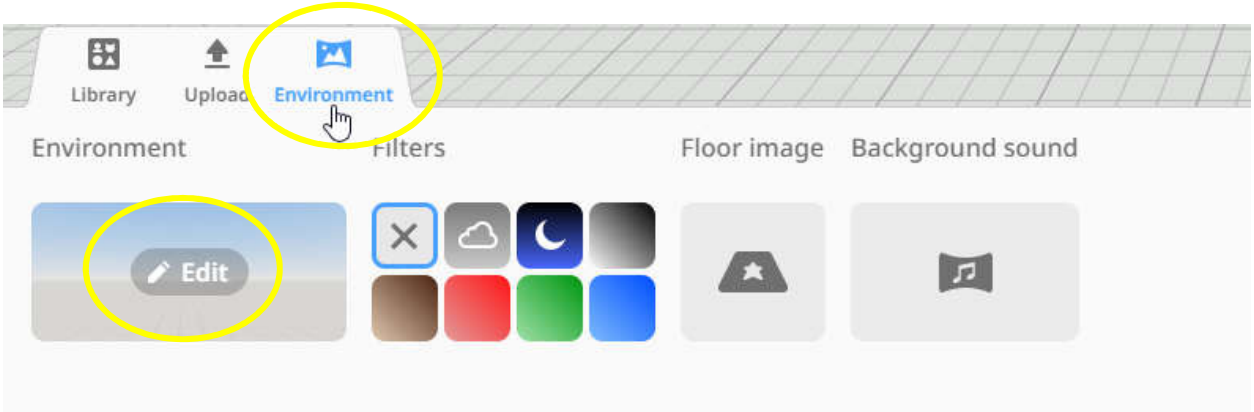
- You will remember the steps learned during our first meeting: how to create a project, upload actors, etc.
- You will get acquainted with the concept of algorithm.
- You will learn to program a dialogue between two actors.

Task 1. Dialog of two actors

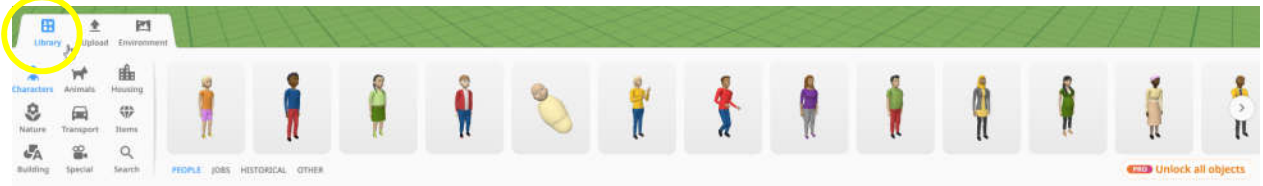
Create a dialogue between two characters, with at least 5 sentences for each character.

Step 1. Sign with CoSpace account and create a project.

Step 2. At the bottom, click the "**Environment**" button, then click the "**Edit**" button and select the background you like.

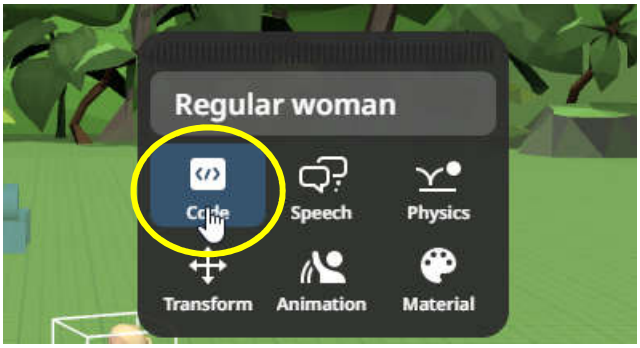


Step 3. At the bottom, click on the "**Library**" button and select 2 characters you like from the library. Click on them and drag to the window at the top, into your virtual environment.

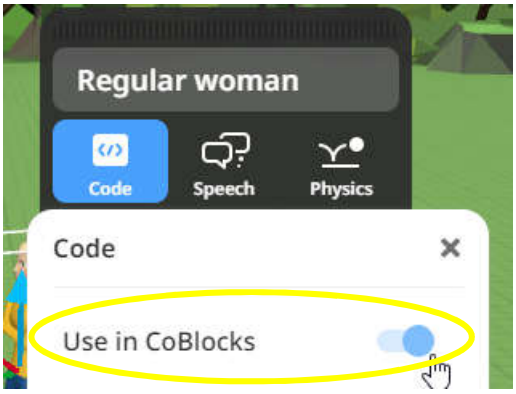


Step 4. You can adjust your character: rotate, raise/lower, decrease or increase. Try these functions.

Step 5. Enable programming features for your uploaded characters. Right-click on the character, select the "**Code**" button.

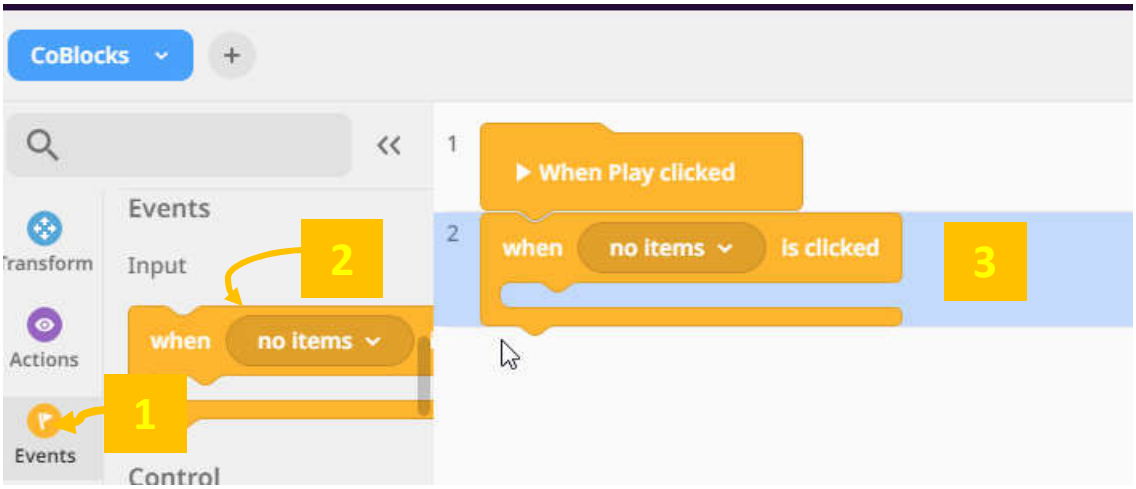


Step 6. After selecting the "**Code**" button, click on "**Use in CoBlocks**".

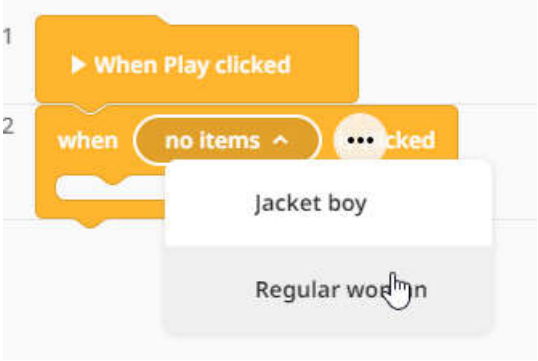


Step 7. Click the „**Code**“ button in the top right corner of the window.

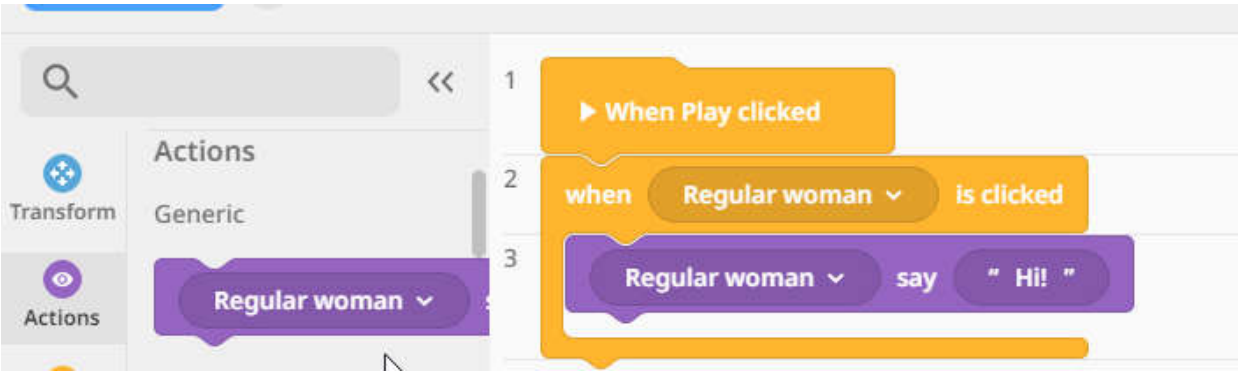
Step 8. Select the "**Events**" section and find the "**When (no items) is clicked**" block, which we place next to the "**When play clicked**" block.



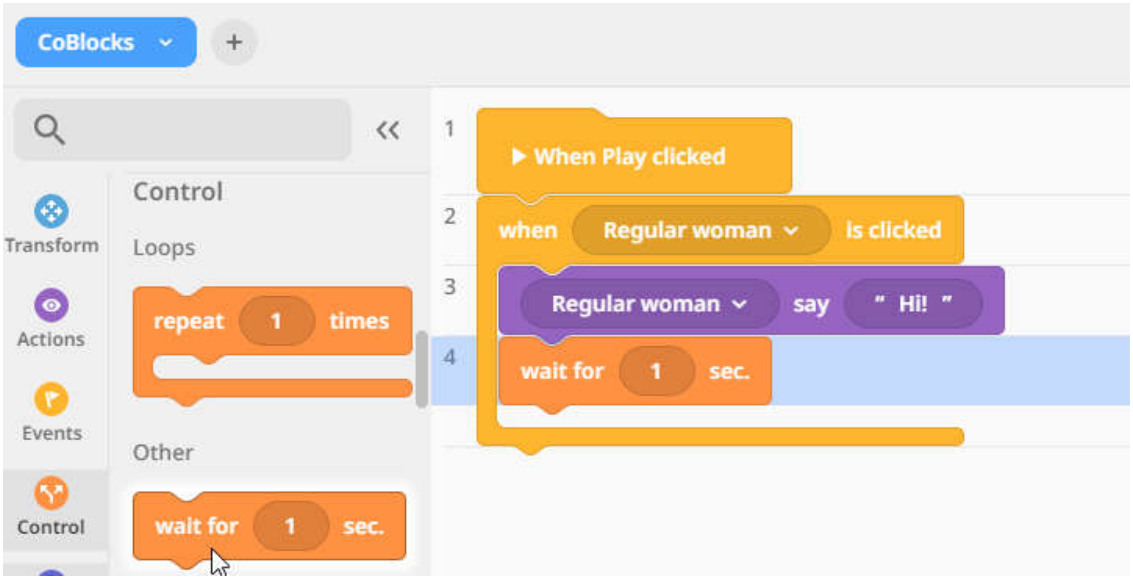
Step 9. Select the character in the "**When (no items) is clicked**" block.



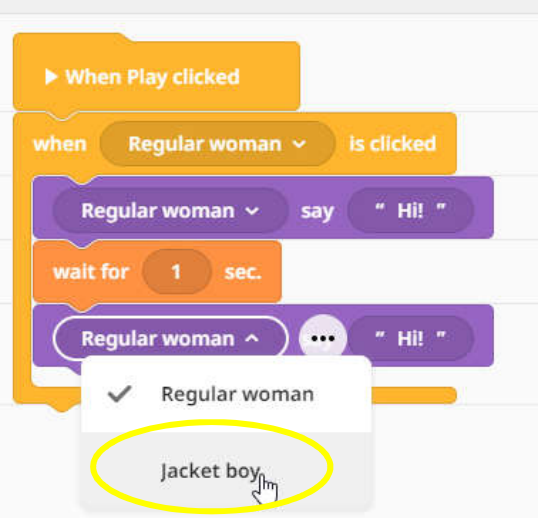
Step 10. Select the "**Actions**" section and insert the "**Say (Hi!)**" block. Instead of the "hi" text write your desired text - the first sentence of the dialog, greeting, etc.



Step 11. Select the "**Control**" section and insert the "**Wait for (1) sec.**" Block. Set the number of seconds as long as our character speaks.



Step 12. Take the „**Say**“ block again, just select another character and write for this character a text, which he/she will say.



Step 13. Complete the dialogue between the two actors using the „**Say**‘ and „**Wait**“ blocks, try your project („**Play**“ button) and share the project link.

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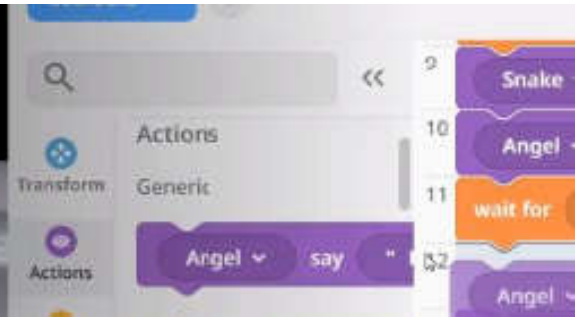
Introduction to programing. Creating our virtual world in VR and AR

CAN YOU COUNT?

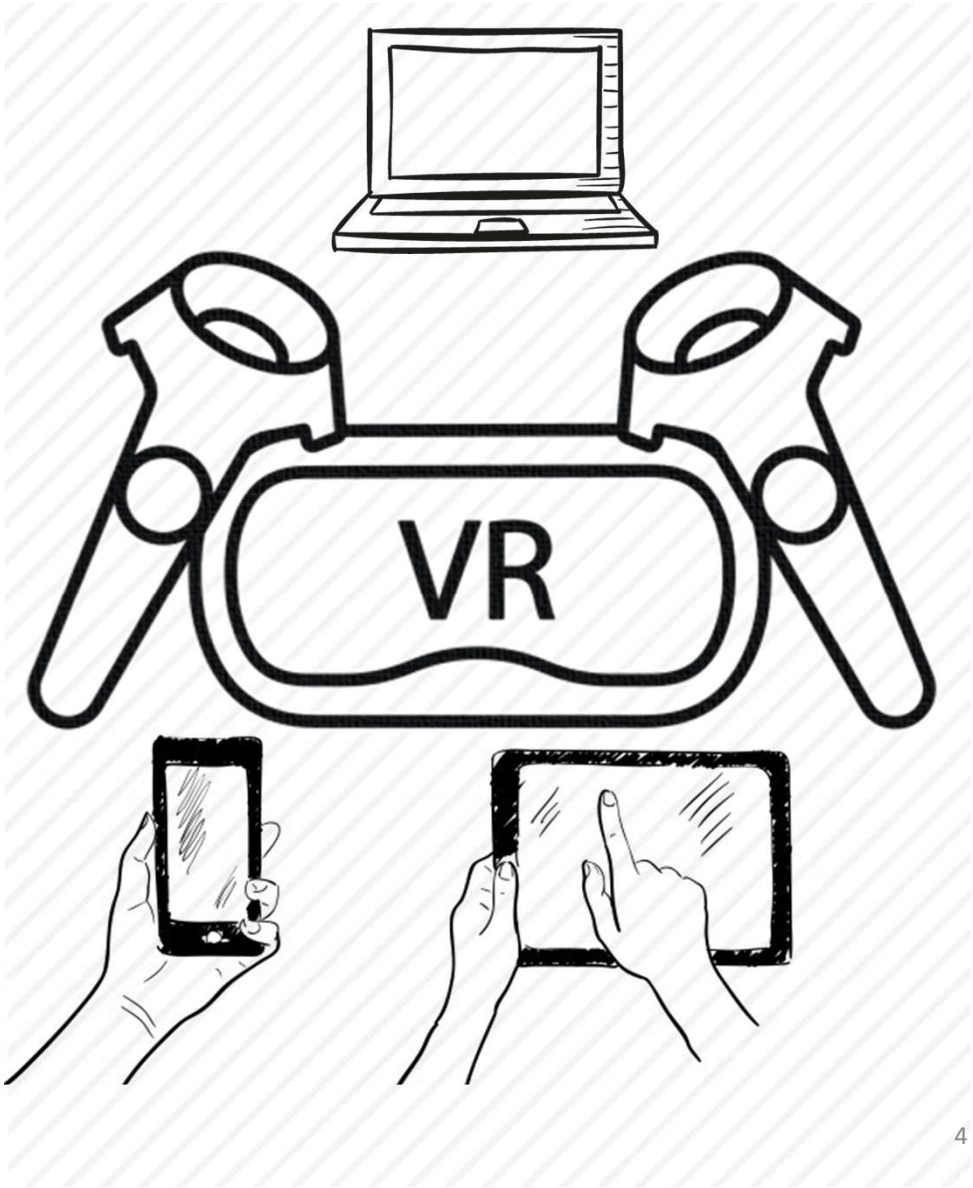
DAY 3

WHAT WE DID YESTERDAY?

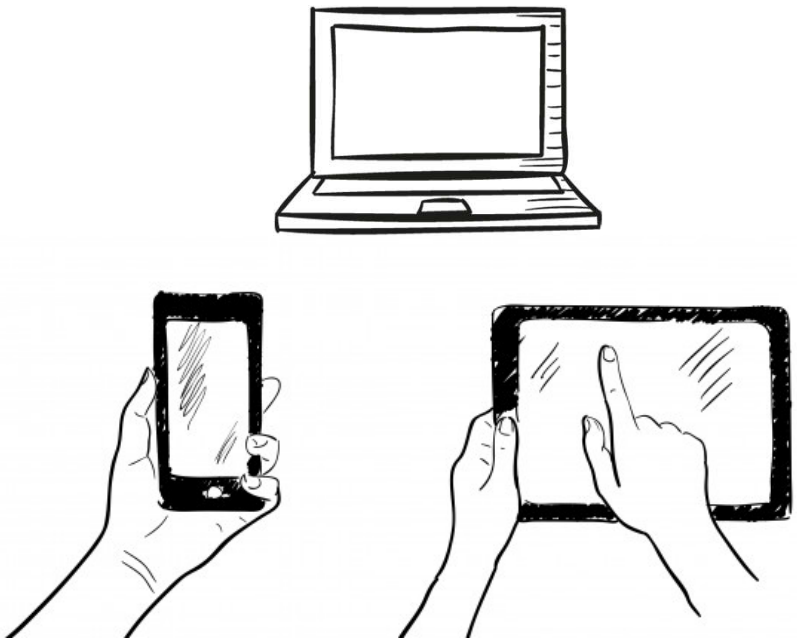
Our first virtual world



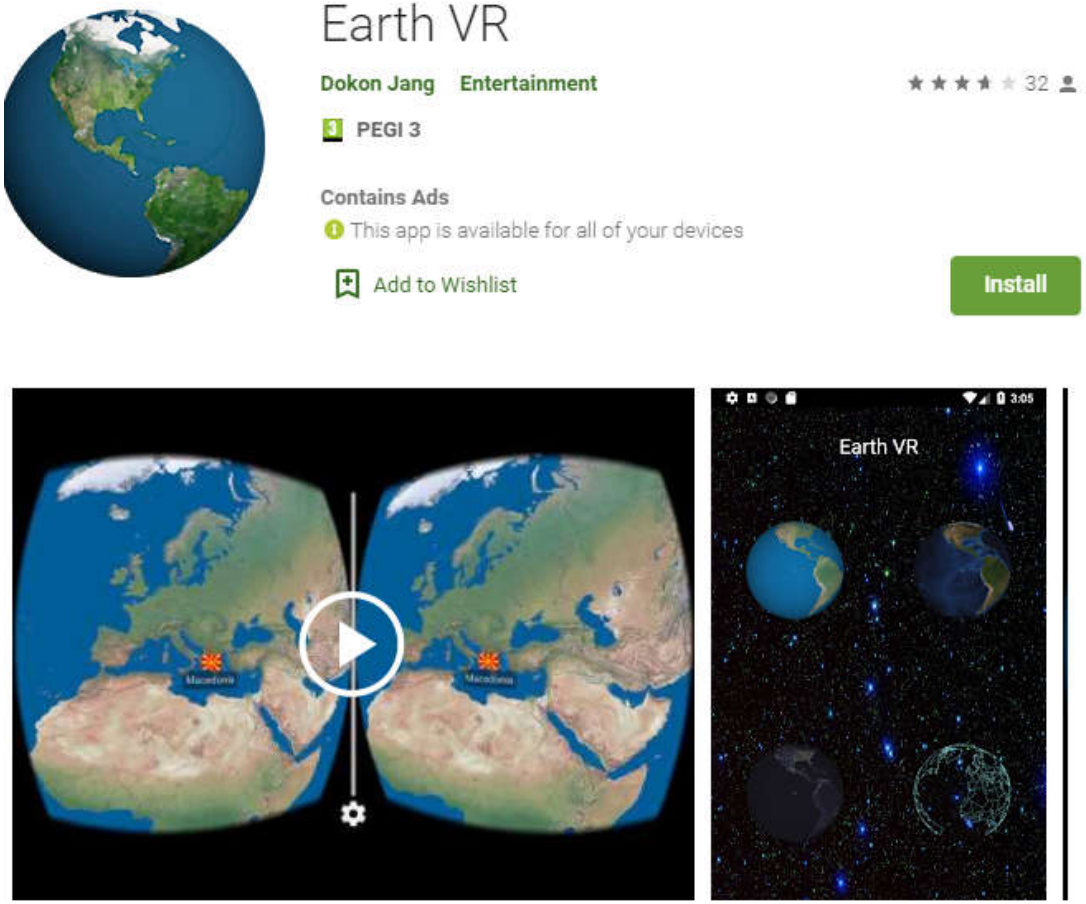
VR vs. AR Equipment and Easiness



VR vs. AR Equipment and Easiness

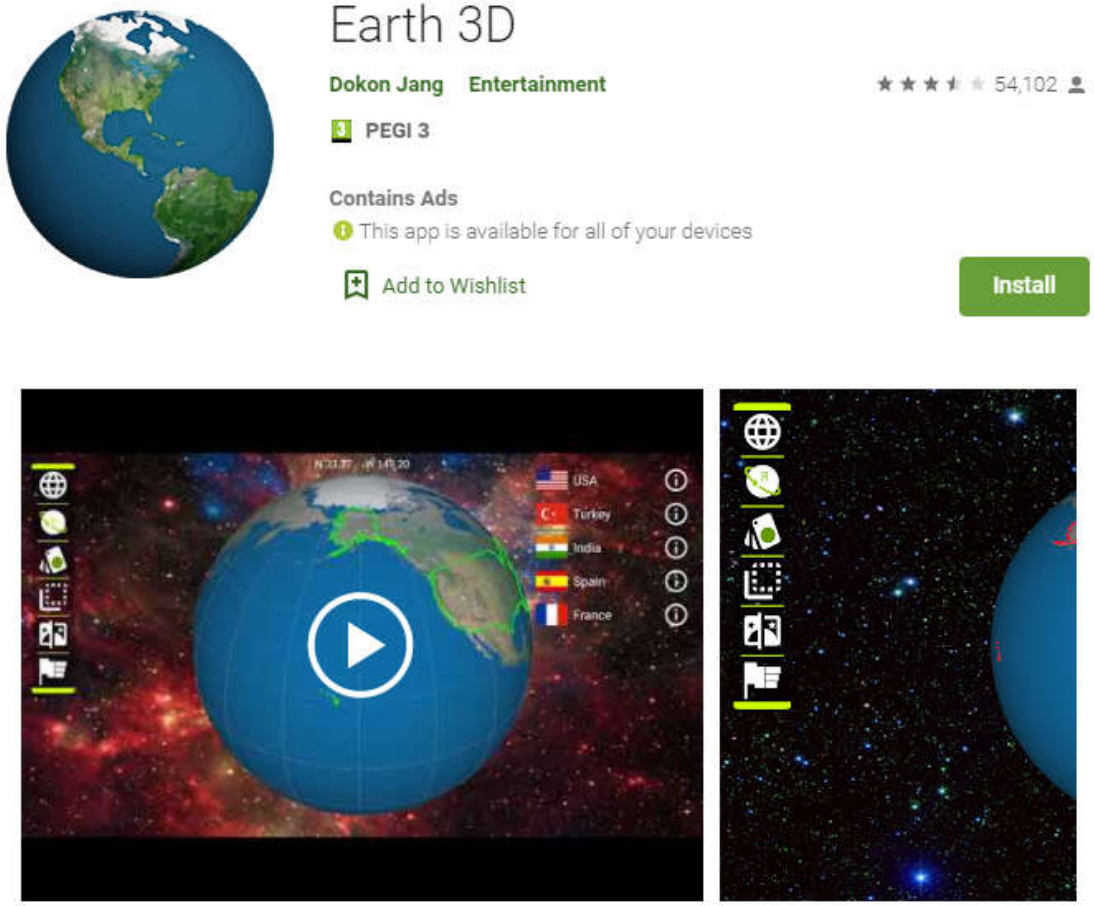


VR Programs for education



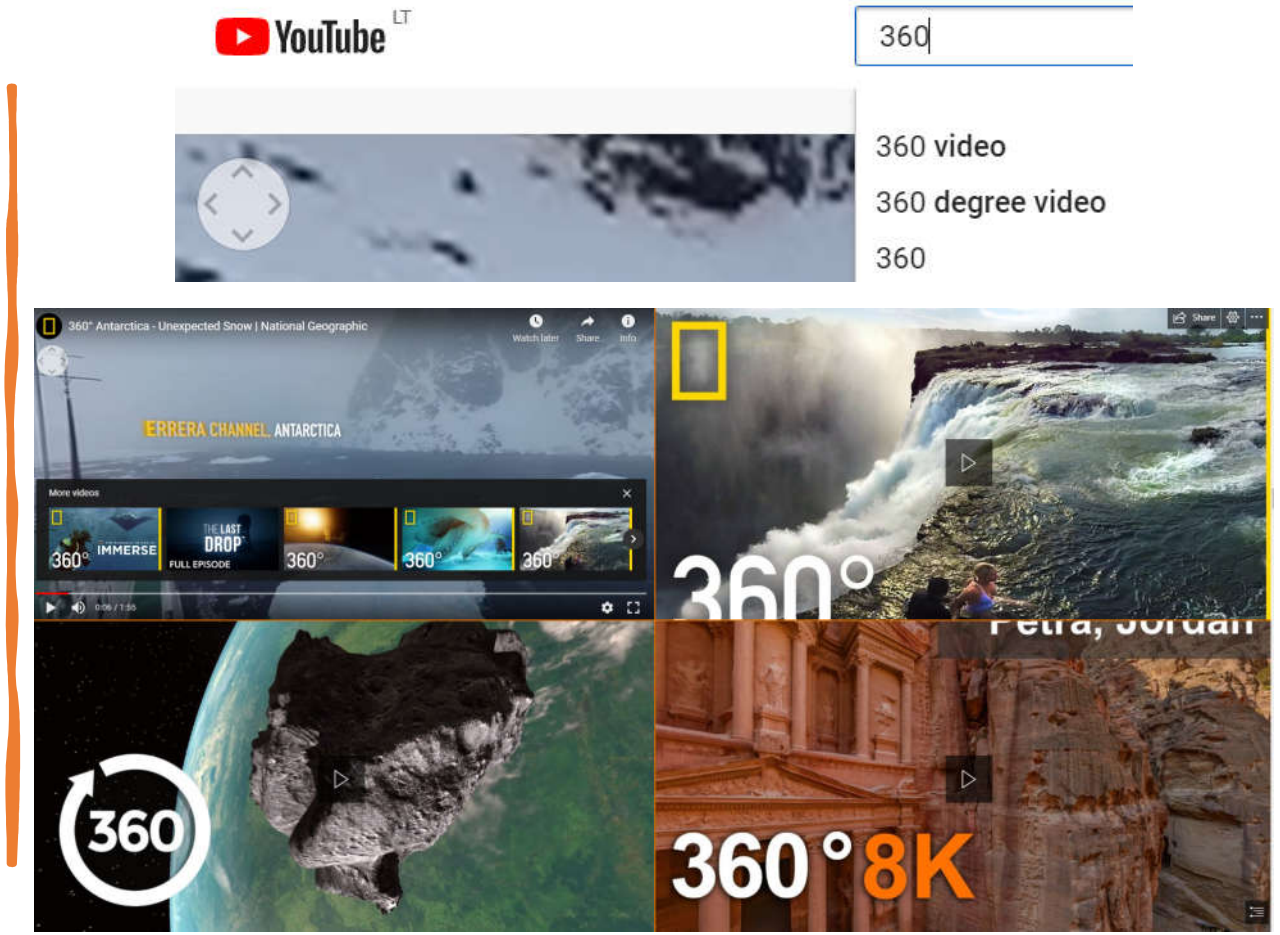
https://play.google.com/store/apps/details?id=com.jmsys.earthvr
https://www.youtube.com/watch?v=XyjUPIQQxqU&t=22s

VR Programs for education



https://play.google.com/store/apps/details?id=com.jmsys.earth3d
https://www.youtube.com/watch?v=lzEWT-yJ8Q8&t=7s

VR Programs for education



https://www.youtube.com/watch?v=XPhmpfiWEEw

Conditionals

A statements that only run under **certain conditions.**

IF it is raining outside,
THEN bring an umbrella!

IF it is sunny outside,
THEN bring sunglasses!

Conditionals

A statements that only run under certain conditions.

IF the light is red,
THEN stop!

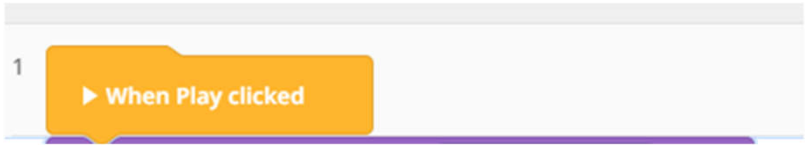
IF the light is green,
THEN go!

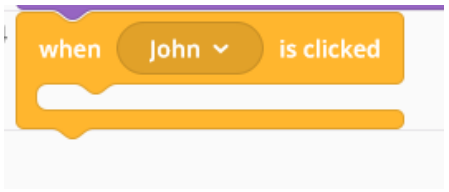
EXAMPLE of code in PYTHON programming language

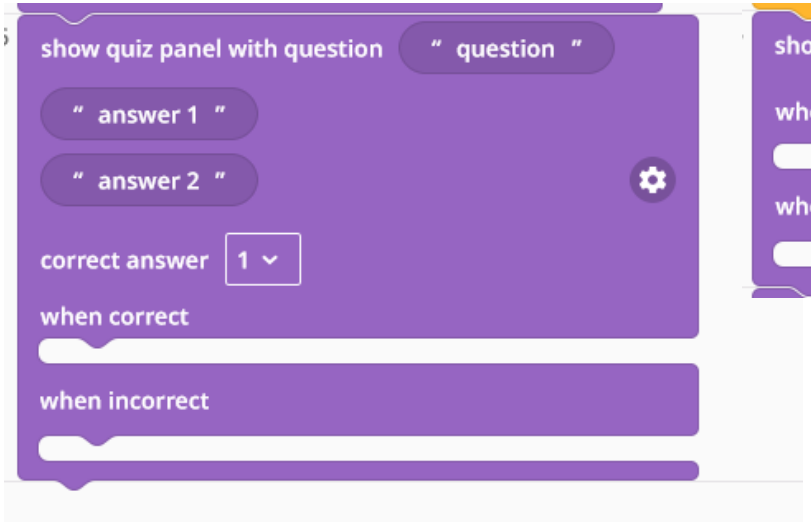
program.py

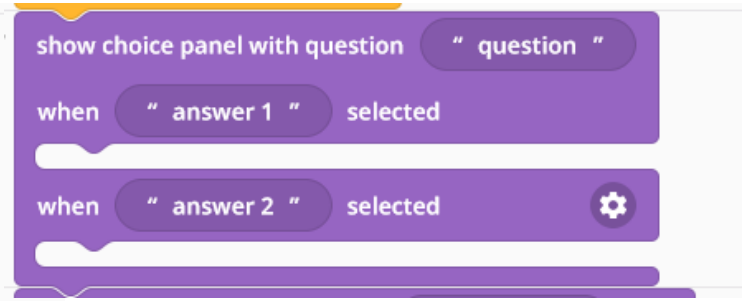
```
1 answer = input('Is it raining? ')
2 if answer == 'yes':
3   print('Take an umbrella!')
4 else:
5   print('Put on a hat!')
```

Example in CoSpaces

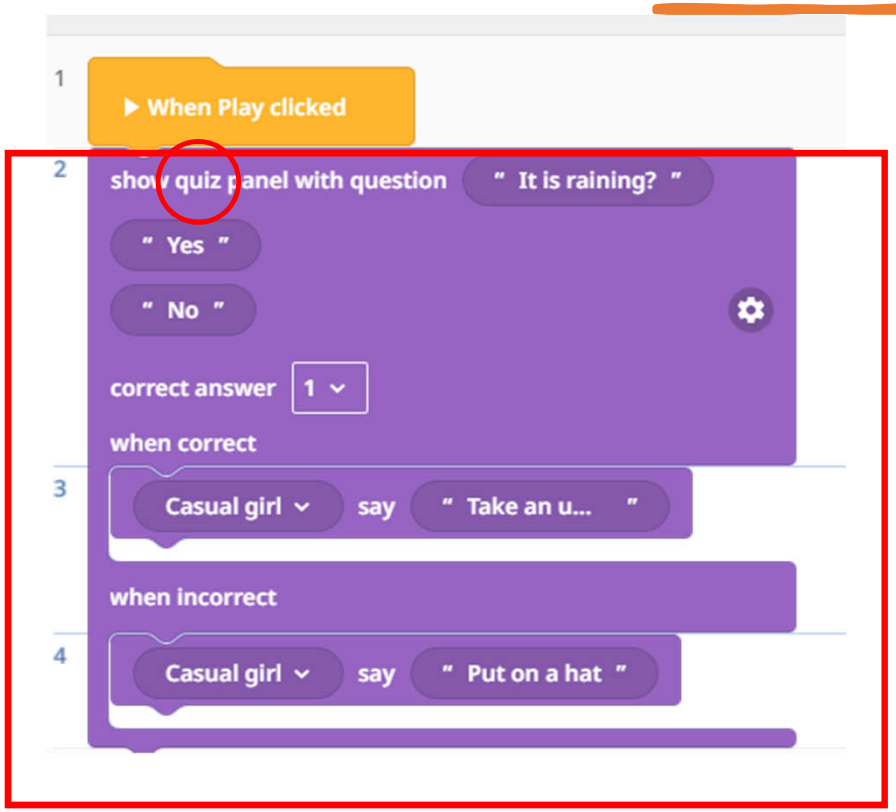








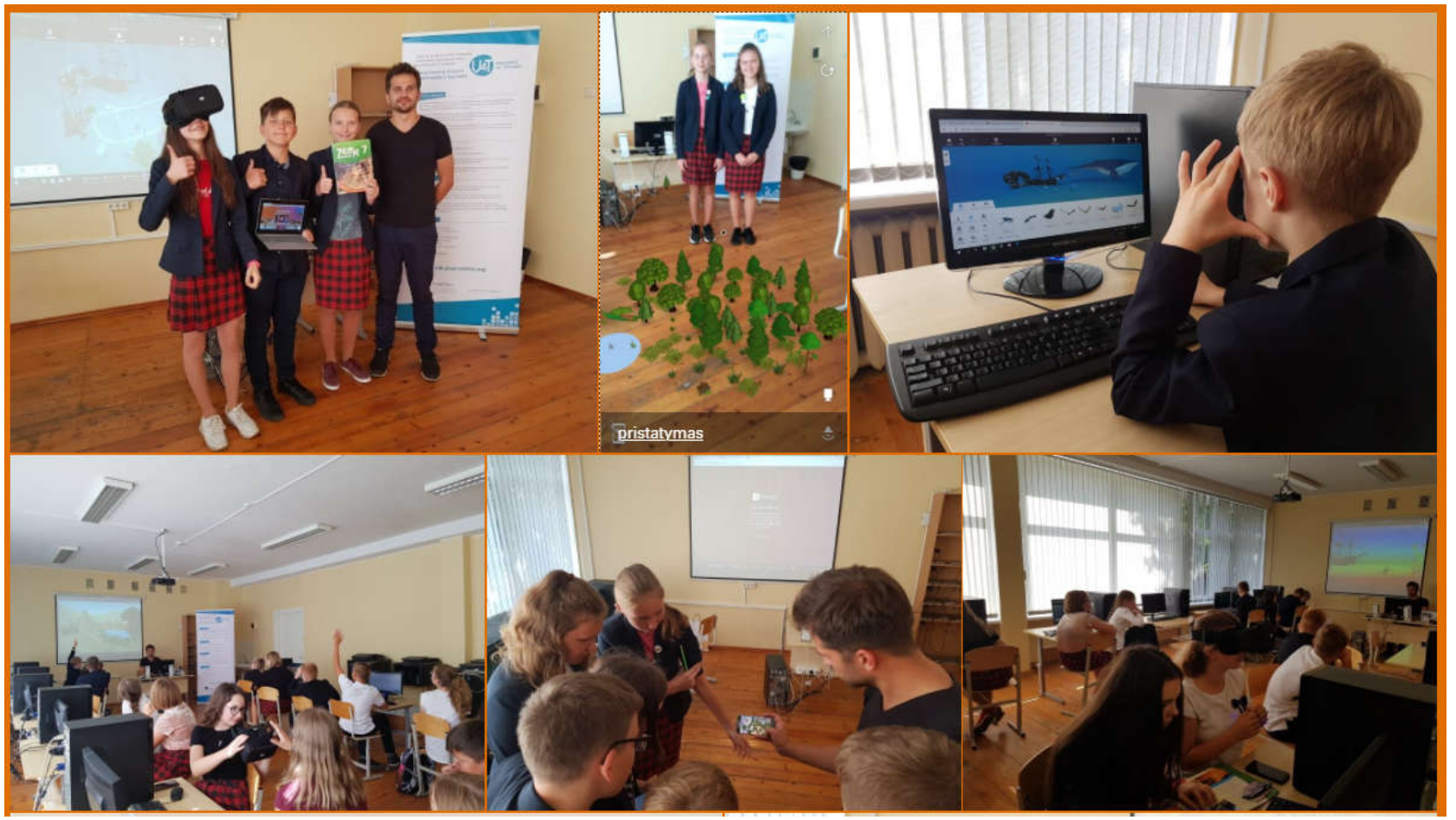
Example in CoSpaces



VIDEOGAMES FOR TEACHERS

Co-funded by the Erasmus+ Programme of the European Union

http://v4t.pixel-online.org/



CoCpaces App

https://play.google.com/store/apps/details?id=delightex.cospaces.edu&hl=en&gl=US

DAY 3. 3nd Project „Can you count?“

During this session you will complete 1 practical task, during which:

- You will remember our first and second training content.
- You will get acquainted with the concept of conditions.
- You will learn to program a quizz.

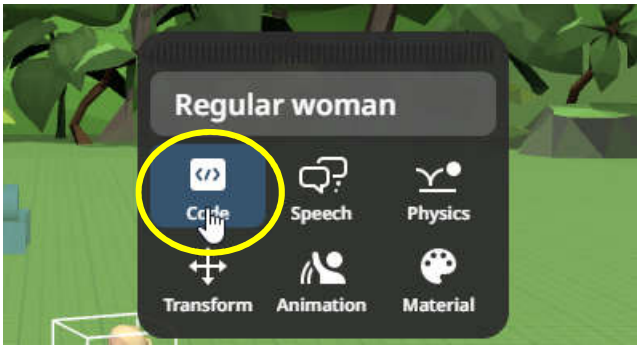
Task 1. Quiz

Create a quiz with at least 5 questions.

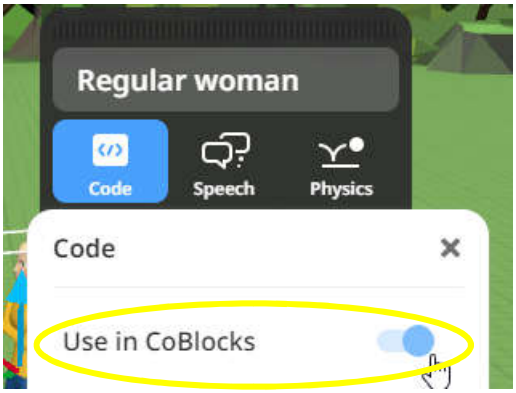
Step 1. Sign in to a CoSpace account and start a project.

Step 2. Choose the character and the background (Library, Environment).

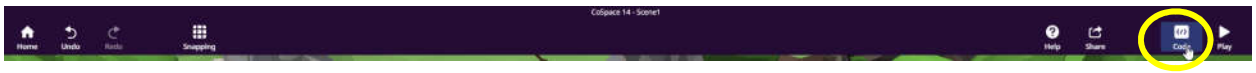
Step 3. Enable programming functions for our uploaded character. Right-click on the character, select the "**Code**" button.



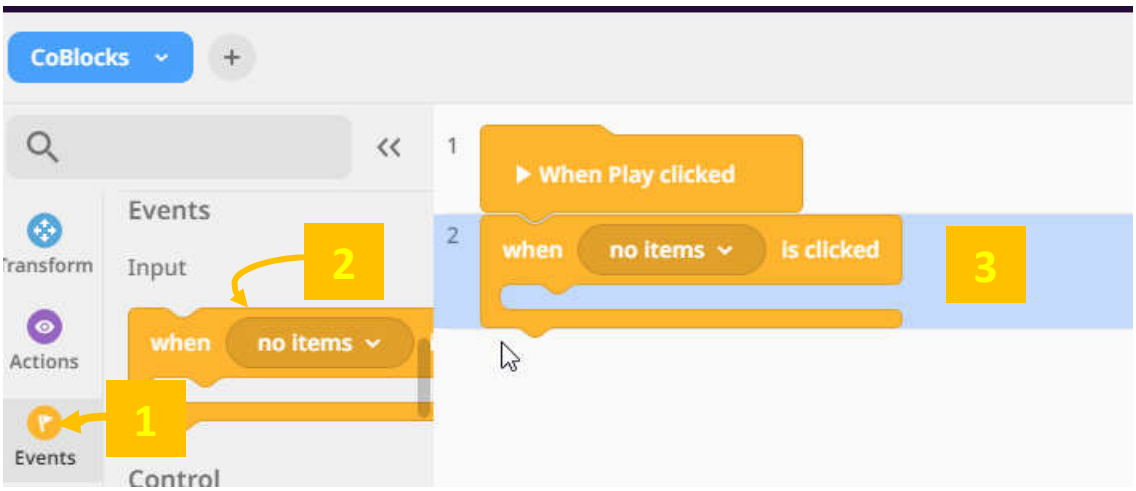
Step 4. After selecting the "**Code**" button, click on "**Use in CoBlocks**".



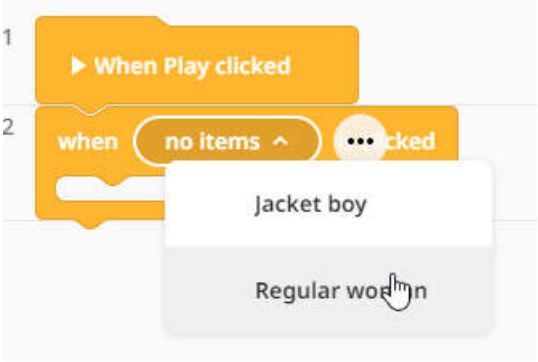
Step 5. Click the Code button in the top right corner of the program.



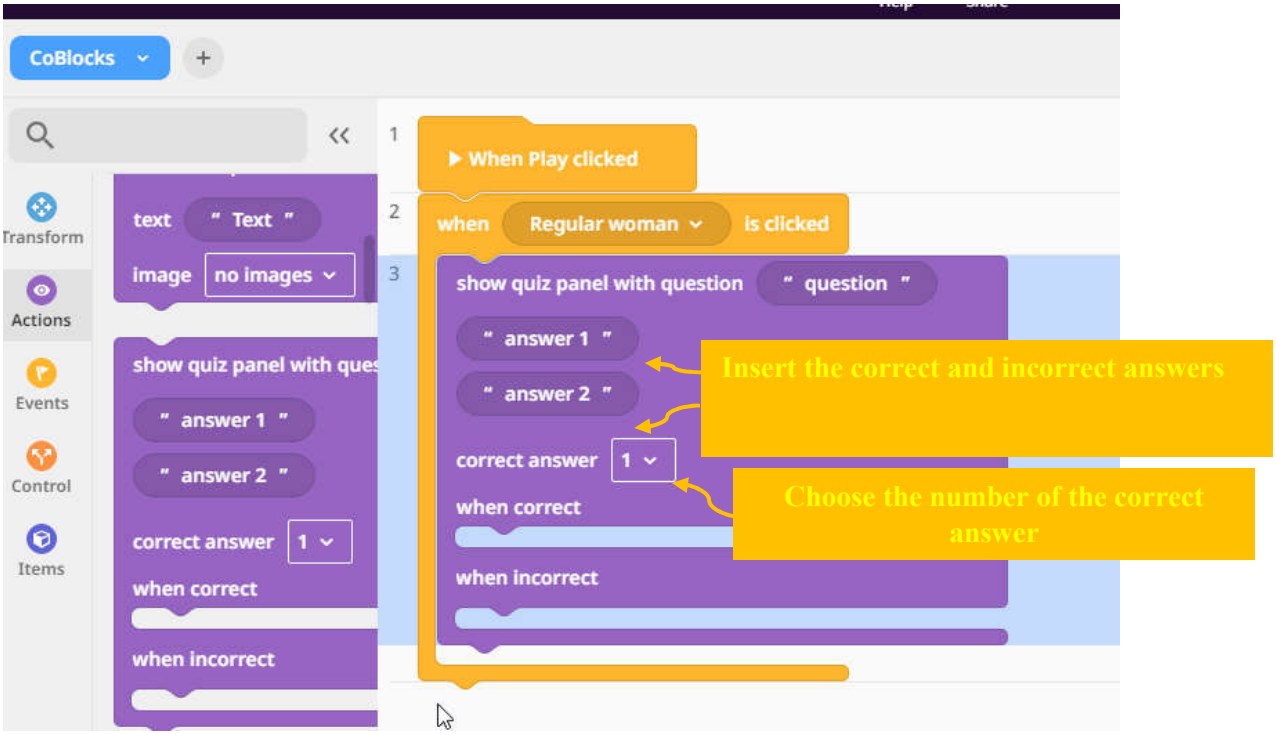
Step 6. Select the "**Events**" section and find the "**When (no items) is clicked**" block, which we place next to the "**When play clicked**" block.



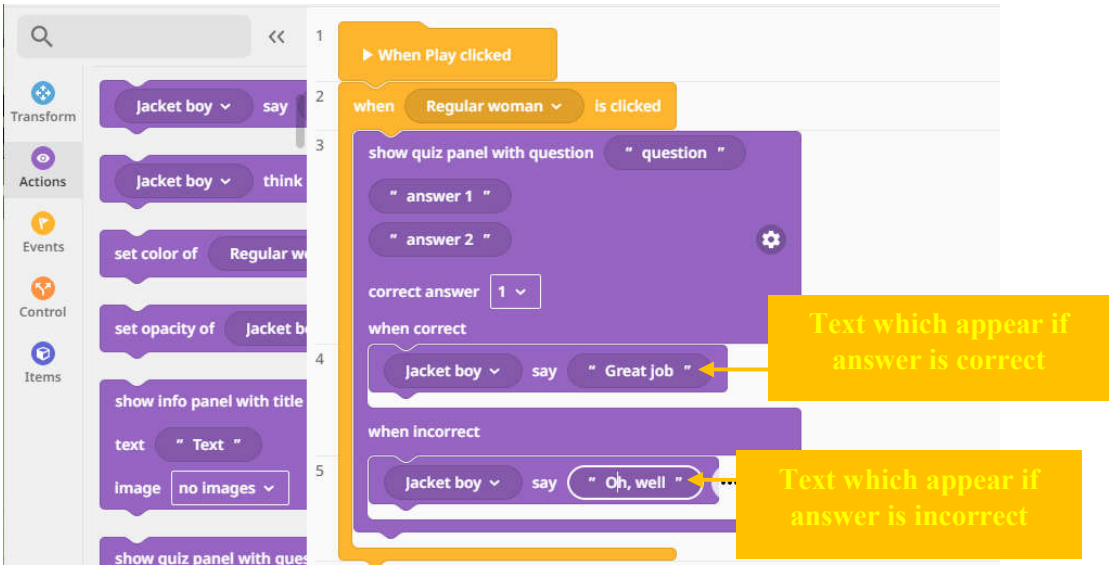
Step 7. In the "**When (no items) is clicked**" block, select the character you want to program.



Step 8. Select the **"Actions"** section and insert the **"Show quiz panel with question (question)"** block. Instead of the "question" text, write your own question.



Step 9. Select the Actions section and insert the block "**Say (hi)**", instead of "hi" text write a message if the answer is correct and if the answer is incorrect.



Step 10. Complete the quiz, add more questions, characters, program the movement of the characters after a sentence, review your project ("**Play**" button) and share your project link (**"Share**" button).

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Training Programme

Introduction to programing. Creating our virtual world in VR and AR

Co-funded by the
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of the European Union

MY GEOMETRIC HERO

DAY 4

VR vs. AR
Equipment
and Easiness

IF the light is red,
THEN stop!

IF the light is green,
THEN go!

CoSpaces Edu

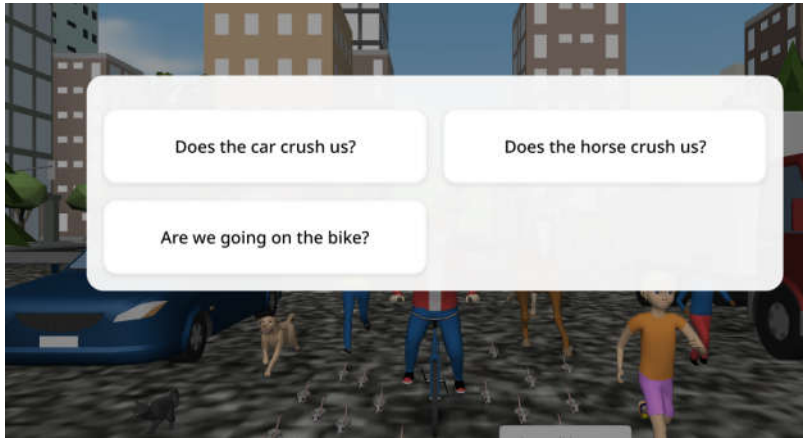
Delightex GmbH Education

Everyone

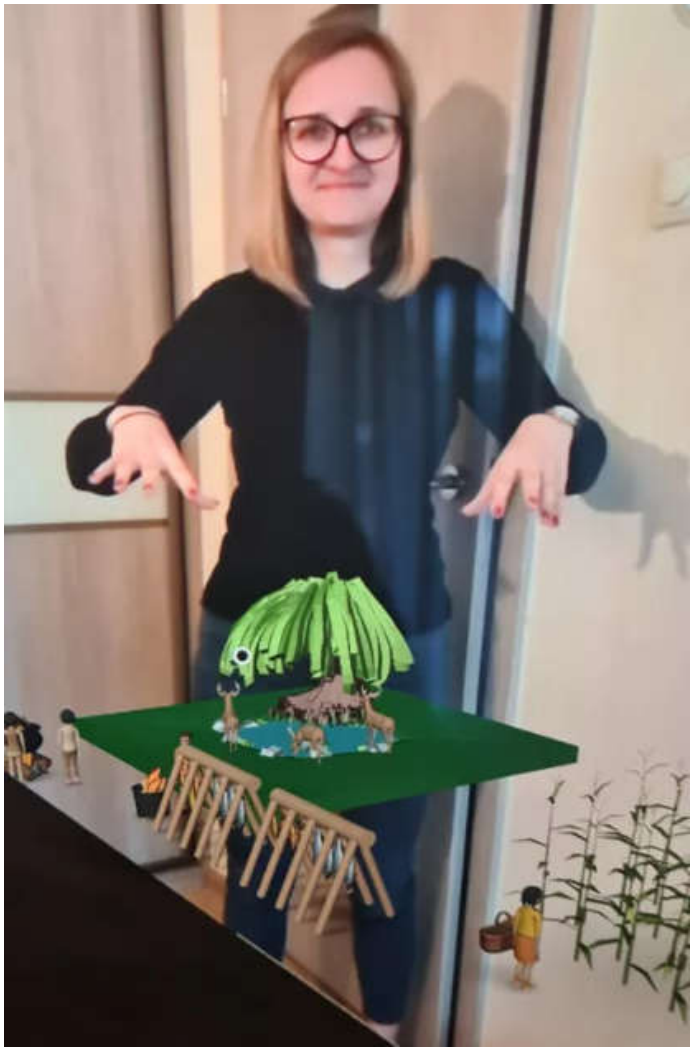
Add to Wishlist

WHAT WE DID YESTERDAY?

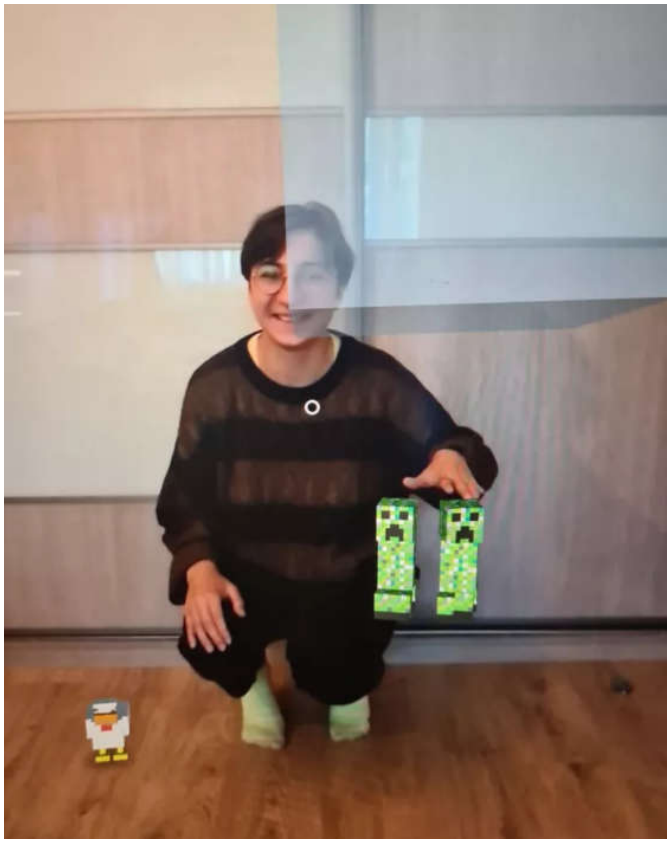
Our first virtual world

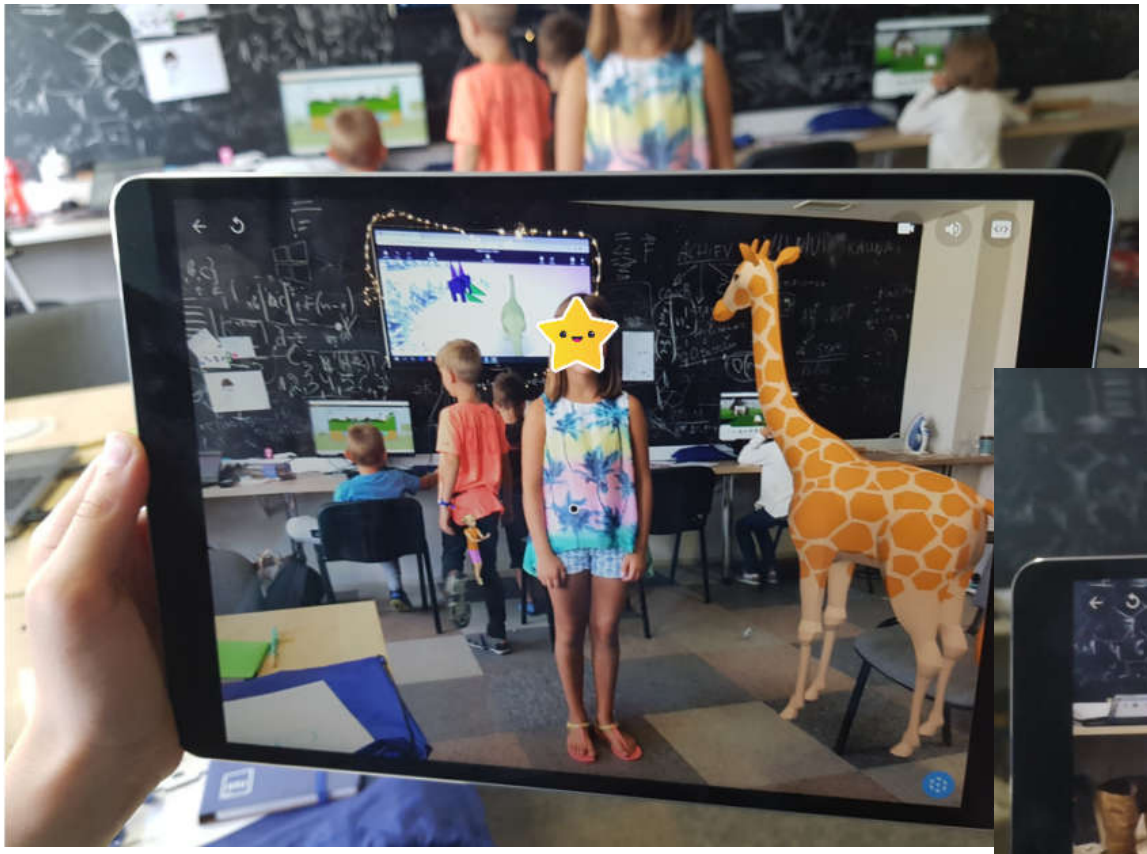


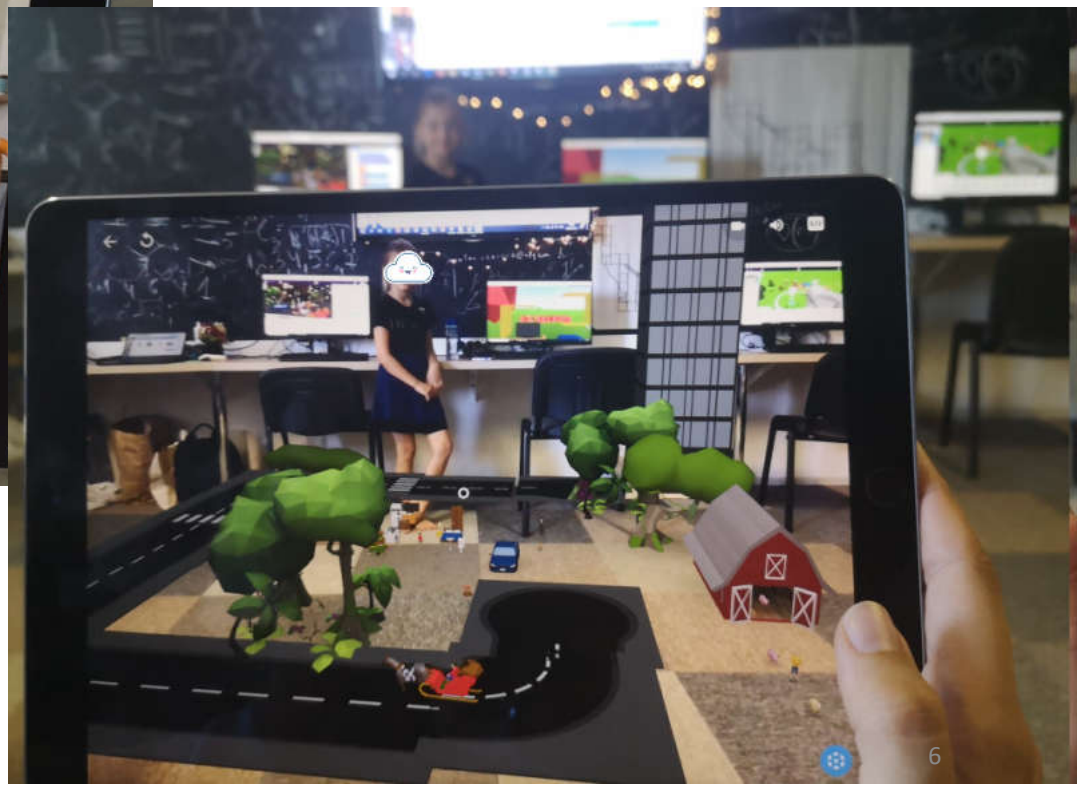

Hm...
Let it be!




Da....!!!
AR







Add your opinion of today lesson. You can add a printscreen/photo of your project reviewed in AR or else.

8

3 comments

Anonymous 16h
Fatma Dönmez 👏👏👏

Anonymous 16h
Harika 👍👏👏👏

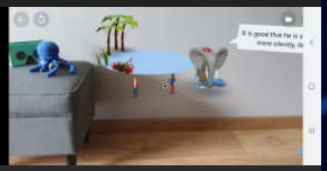
Anonymous 14h
https://edu.cospaces.io/HMC-XUY

Add comment

Sardarescu Carmen 16h

Carmen from Romania

I liked to know about conditionals



1

Add comment

Richiteanu Gina-Eugenia 17h

Let It Be!!!

3

1 comment

Neringa Kelpsaite 1m
You have your Grinch on the table! :)

Add comment

Enrique Picón 17h

Very interesting!! I am sure that it is a very functional tool

Stanca Alina RO

Very interesting!! Thank you.

1

Add comment

Anonymous 17h

Interesting and functional in app

https://edu.cospaces.io/SLW-BMR

1

Add comment

Anonymous 17h

I love this app

i think cospaces is a very interesting and practical app. I will work with it in class next year.

2

Add comment

Anonymous 17h

my project

Can you get out of the maze?

CoSpaces Edu :: Laberinto
¿Podrás salir del laberinto?

find the treasure

https://edu.cospaces.io/GQS-YAW

4

Add comment

Anonymous 17h

So interesting! Nice to see the characters on my floor!

3

Hola Comunidad 3D

Interesante la proouesta de CoSpace y todas las plataformas que hemos aprendido en esta semana. Gracias Clara, Rimante, Neringa, Enrique y todos los que han hecho posible este espacio de aprendizaje.

1

2 comments

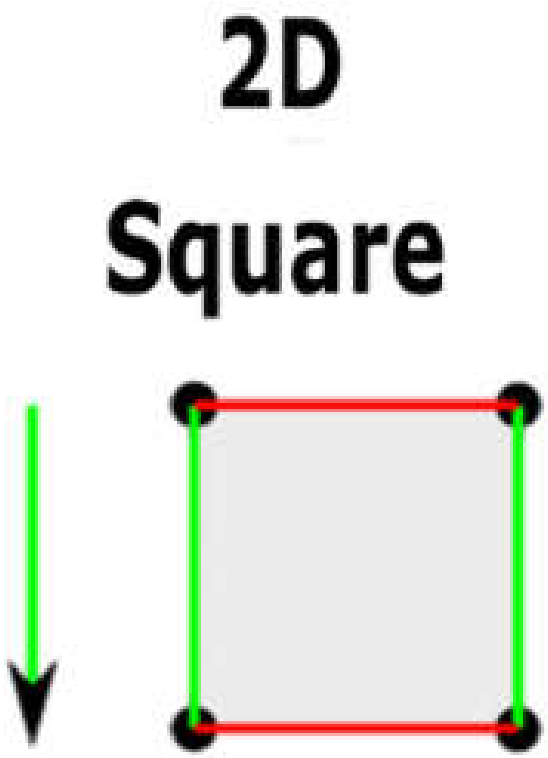
Neringa Kelpsaite 12h
Translation: "The CoSpace proposal and all the platforms that we have learned this week are interesting. Thank you Clara, Rimante, Neringa, Enrique and all those who have made this learning space possible."

Neringa Kelpsaite 12h
Thank you very much!

Add comment

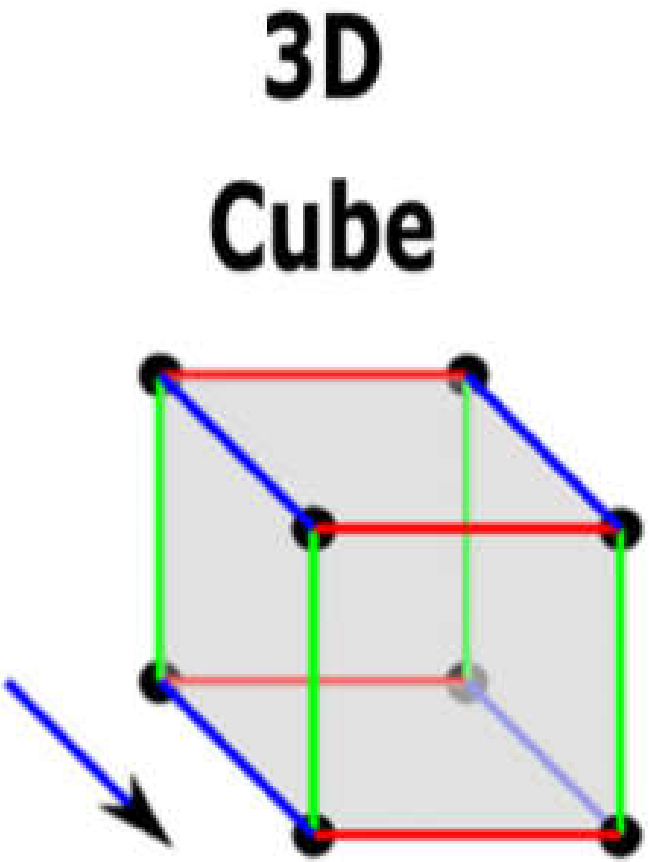
dogaru aura 16h

2D VS 3D



2D (two dimensions)

- 2-dimensional (2D) shapes have only two dimensions, length and width. They can be drawn on a piece of paper

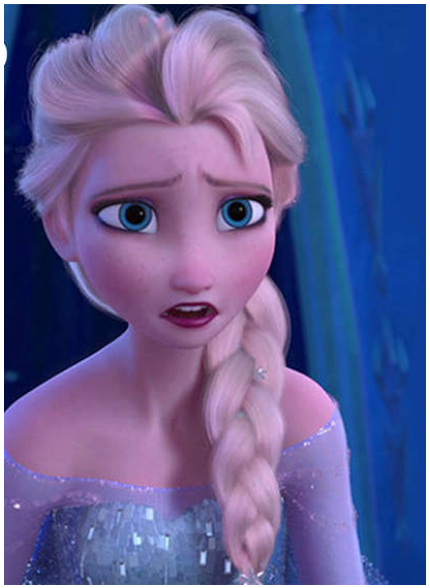


3D (three dimensions)

- In geometry, a 3-dimensional shape can be defined as a solid figure or an object or shape that has three dimensions – length, width and height.

2D VS 3D

2D VS 3D



3D PRINTING

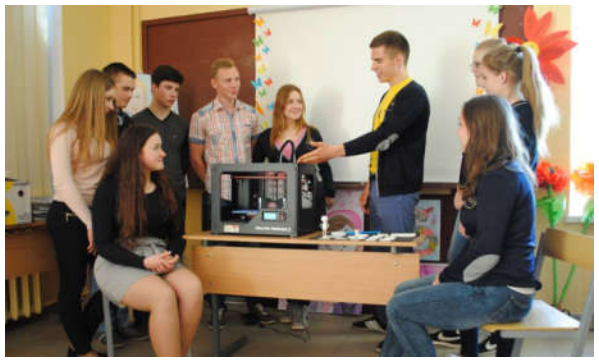
https://www.youtube.com/watch?v=Vx0Z6LplaMU

3D Modeling

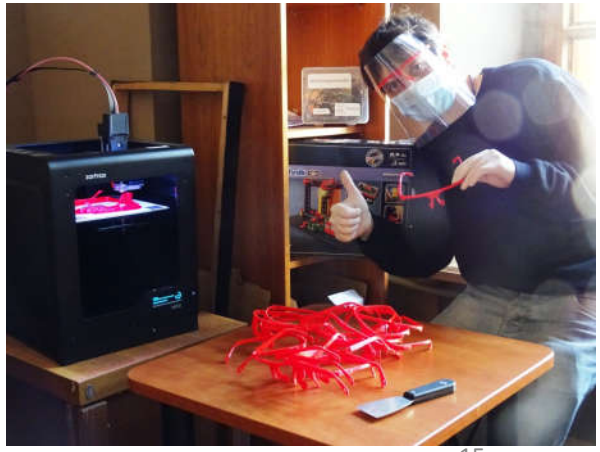
- 3D modeling is a technique in computer graphics for producing a 3D digital representation of any object or surface.
- 3D models are used for a variety of fields: like video games, movies, architecture, illustration, etc.

3D PRINTING IN EDUCATION

- Not just in business and laboratories
- Also in schools, libraries, homes



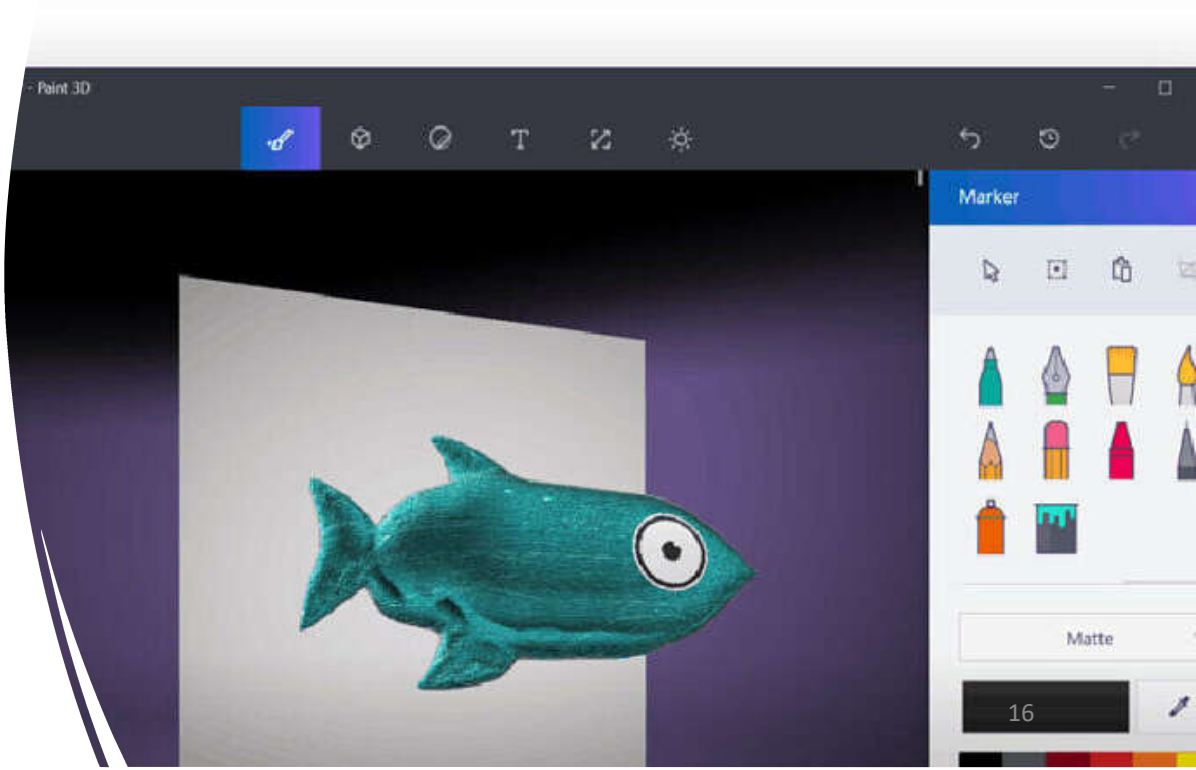
http://kvitrina.lt/3-d-spausdintuvas-tai-kelias-i-motyvacija-mokymosi-procese/#prettyphoto[post_gallery]/0/



https://amb.lt/lt/naujienos/bibliotekoje-3d-spausdintuvu-spausdinamos-apsaugos-priemones-medikams/1876

PROGRAM 3D FOR KIDS

Paint3D®



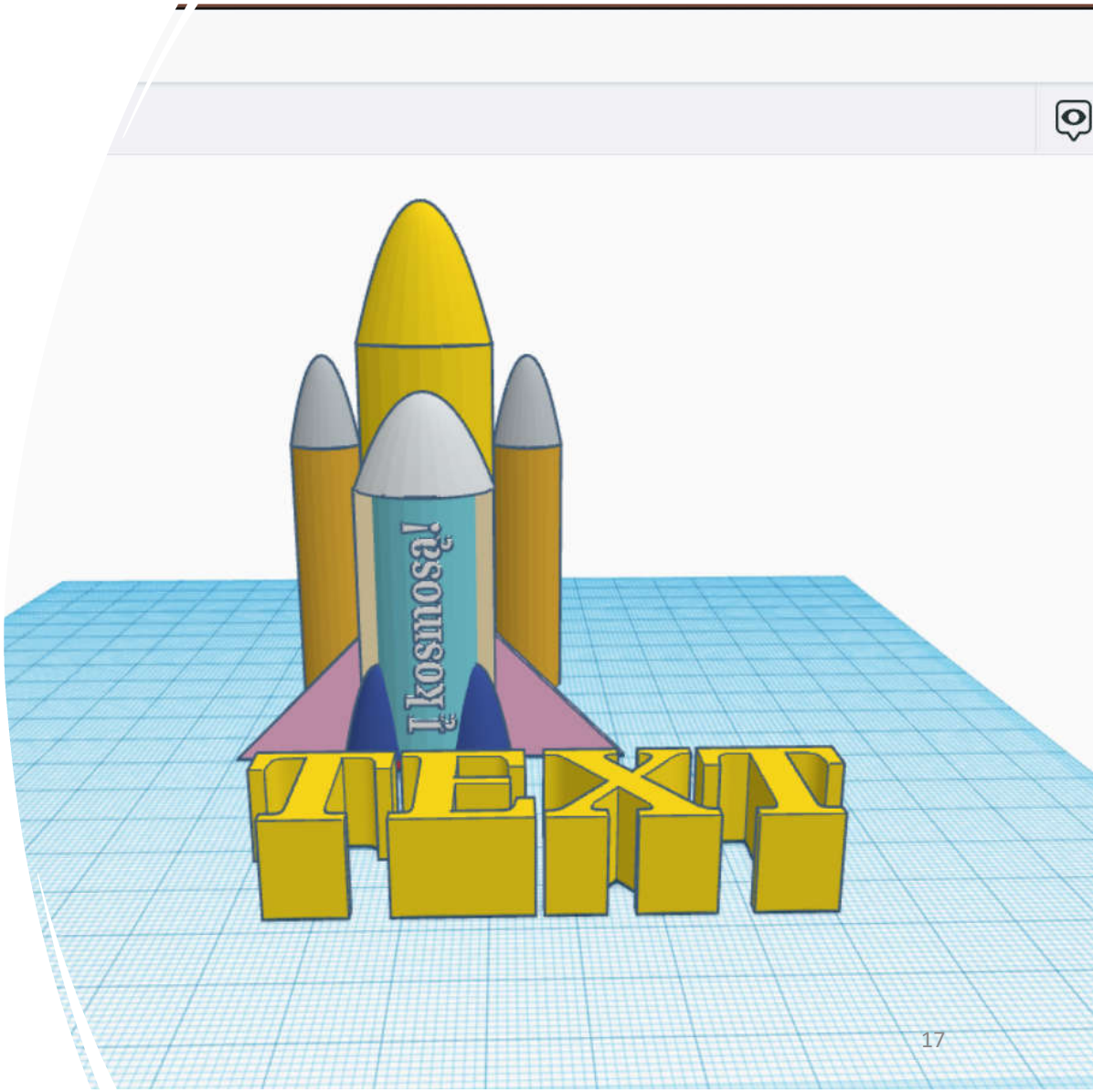
PAINT 3D

Windows 10 – installed automatically with Windows

PROGRAM 3D FOR KIDS

Thinkercad

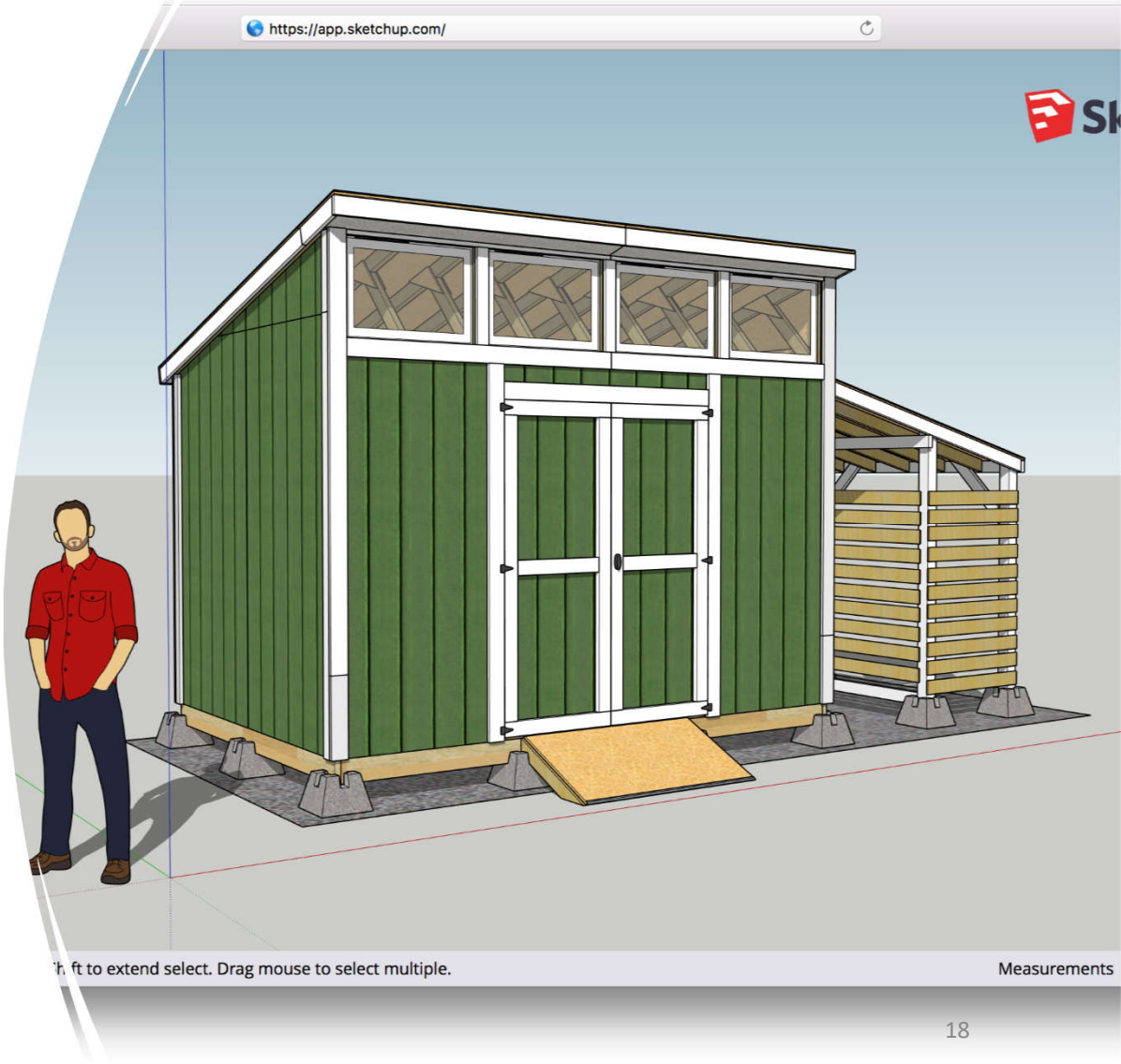
https://www.tinkercad.com/dashboard



PROGRAM 3D FOR KIDS

Sketchup

https://www.sketchup.com/



Day 4. 4nd Project „My hero“

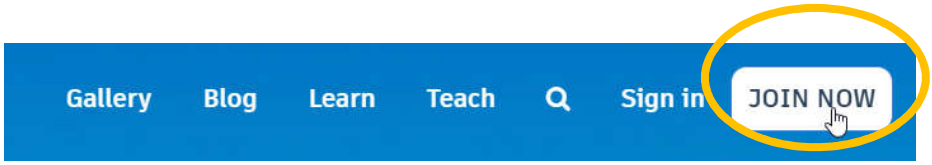
During this session you will perform 2 practical tasks, during which:

- Create an account in „TinkerCAD“ program.
- Will get acquainted with the „TinkerCAD“ environment.
- Learn to model your hero.

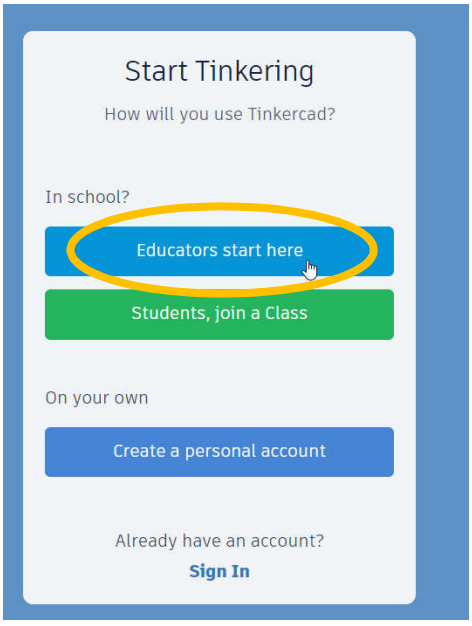
Task 1. Create an account

Step 1. Open the **CoSpace** page in the browser. Link: [Tinkercad | Create 3D digital designs with online CAD | Tinkercad]

Step 2. Press „**JOIN NOW**“ button.

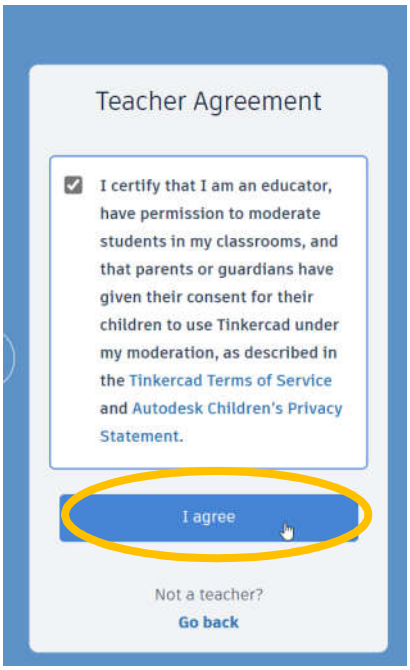


Step 3. Select the button „**Educators start here**“.

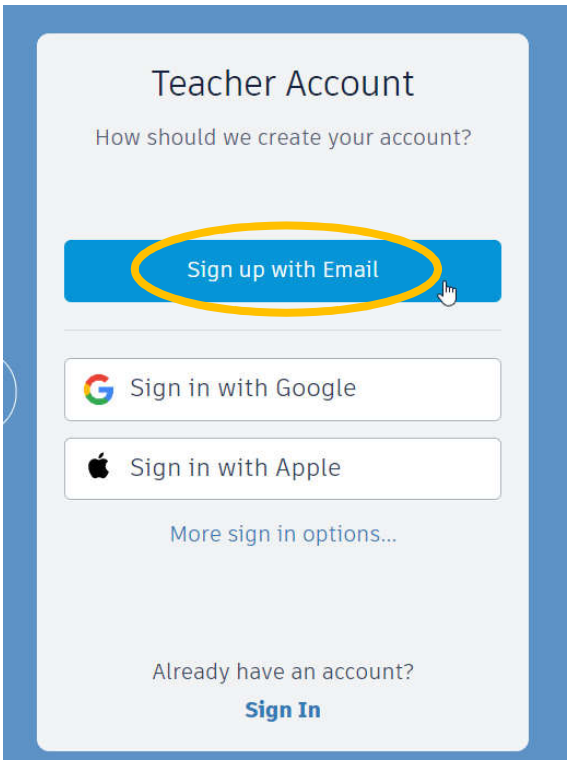


Step 4. Select the consent button „**Continue to start making my educator account**“.

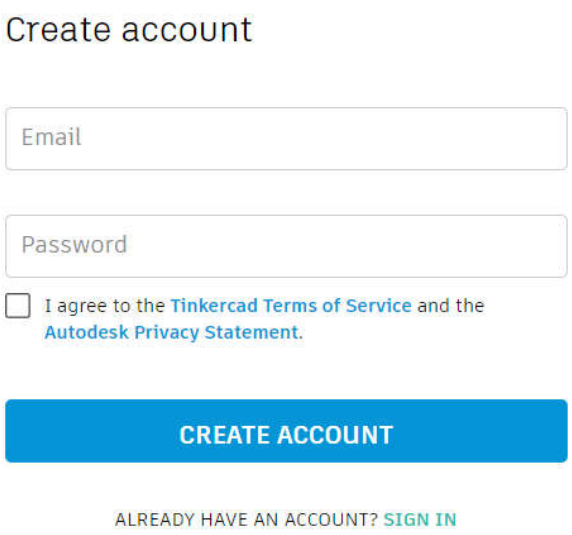
Step 5. Click the checkbox and the consent button „**I agree**“.



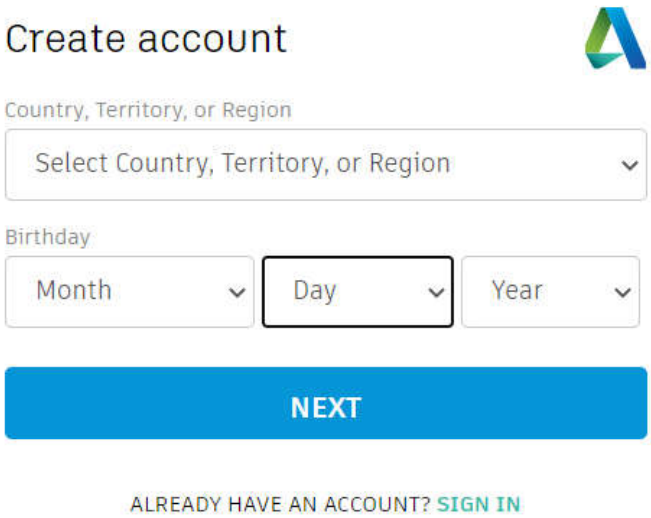
Step 6. Select the button „**Sign up with Email**“.



Step 7. Create an account by entering an email and password.

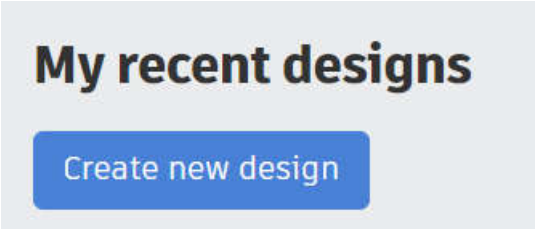


Step 8. Select the country and year of birth, click the **"Next"** button.

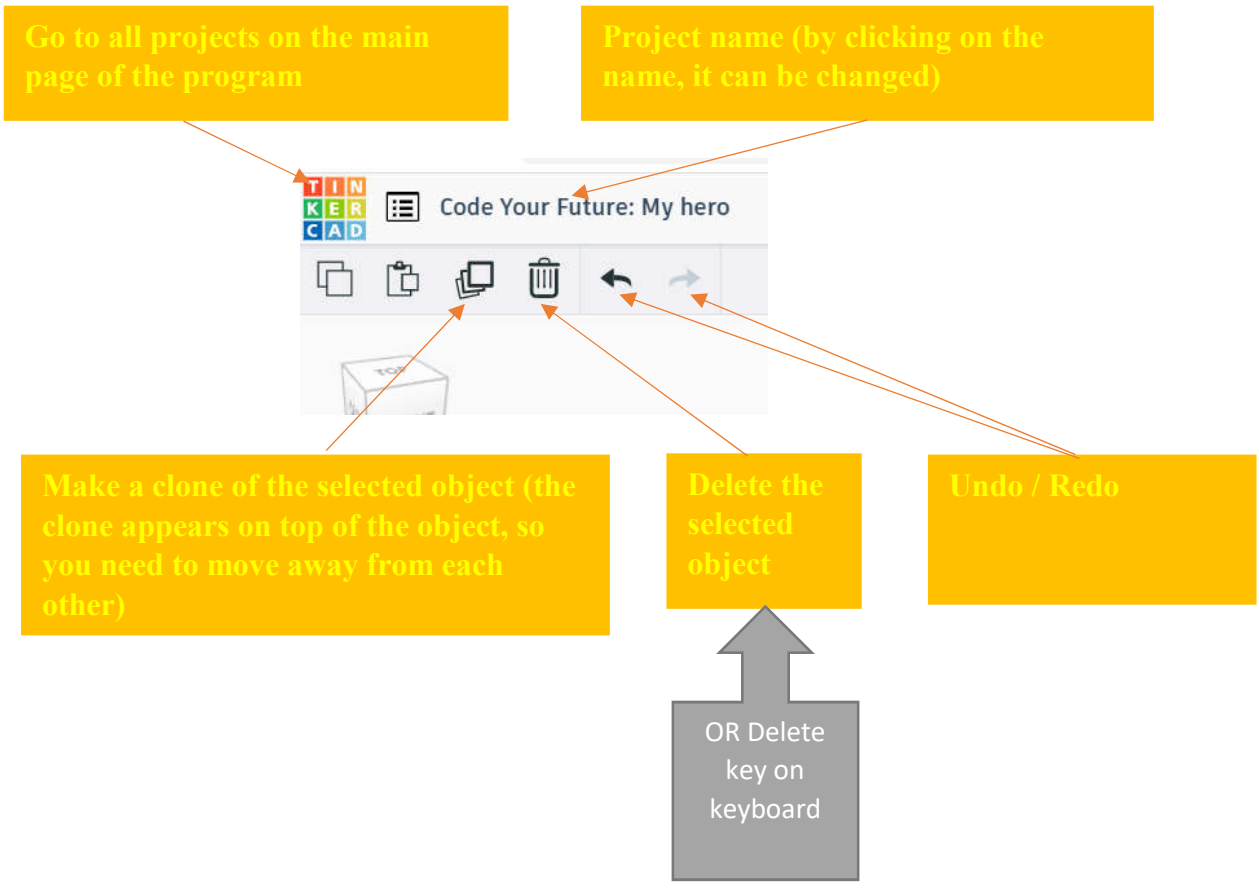


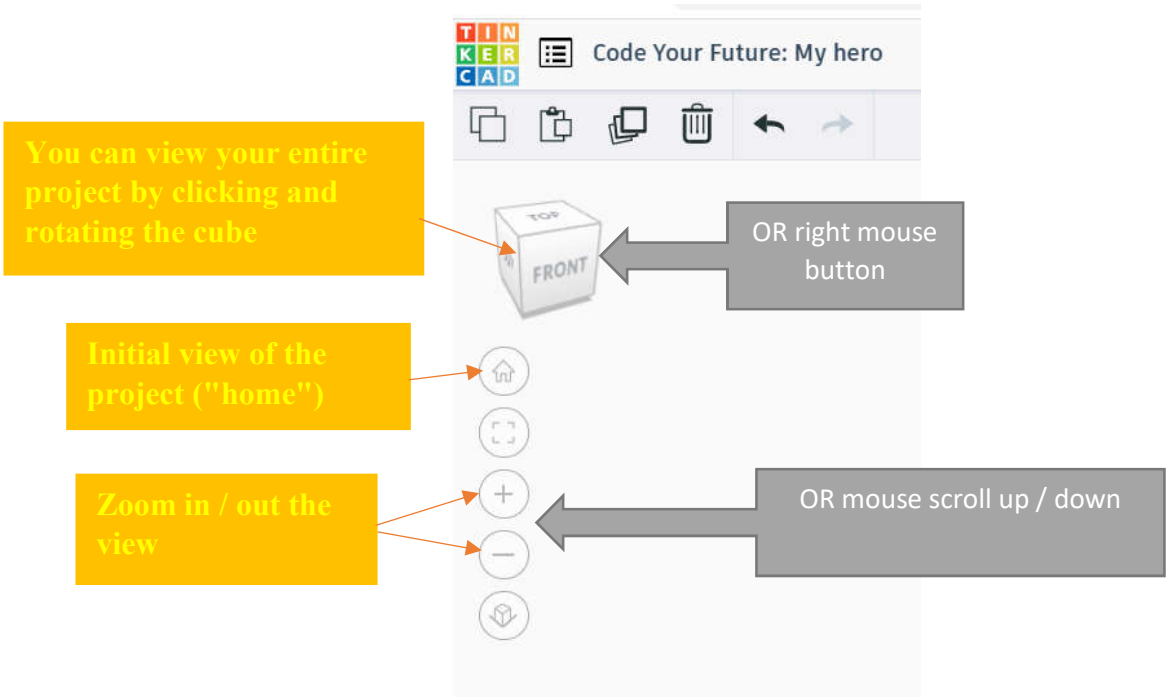
Task 2. My hero

Step 1. Creating a project. Click the **"Create new design"** button.



Step 2. Navigation.



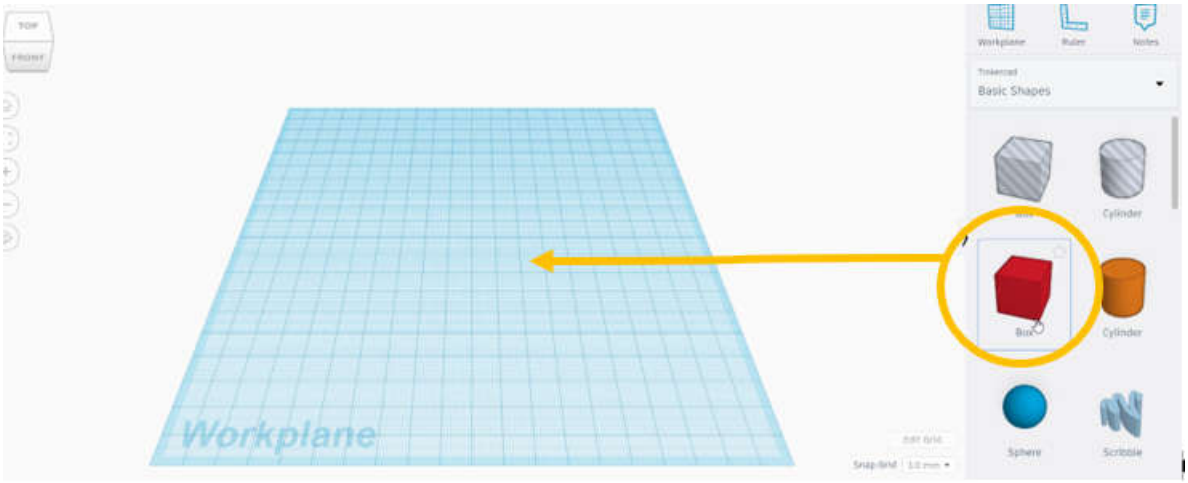


Video about navigation TinkerCAD (in English):
https://www.youtube.com/watch?v=VxpJbJsNaes

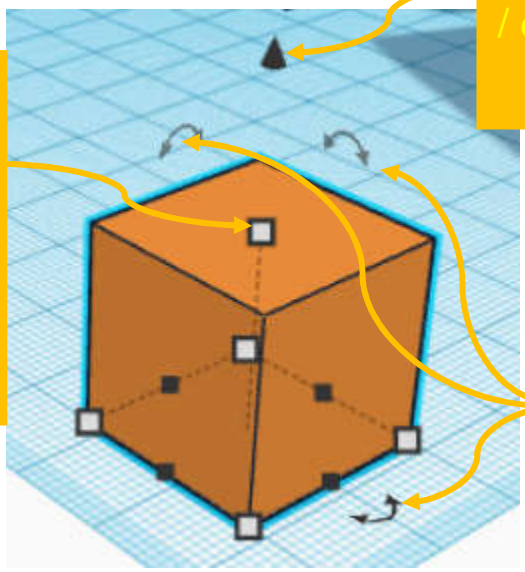
Navigation video (longer, but Youtube auto-subtitles are available in any foreign language (e.g. Italian, Lithuanian, Spanish, Romanian, Turkish, etc.)):

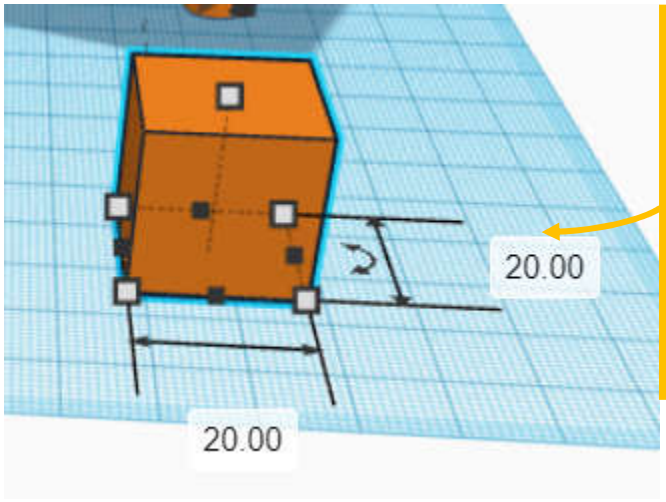
https://www.youtube.com/watch?v=2JFxtUIOnEI

Step 3. Drag the desired object.

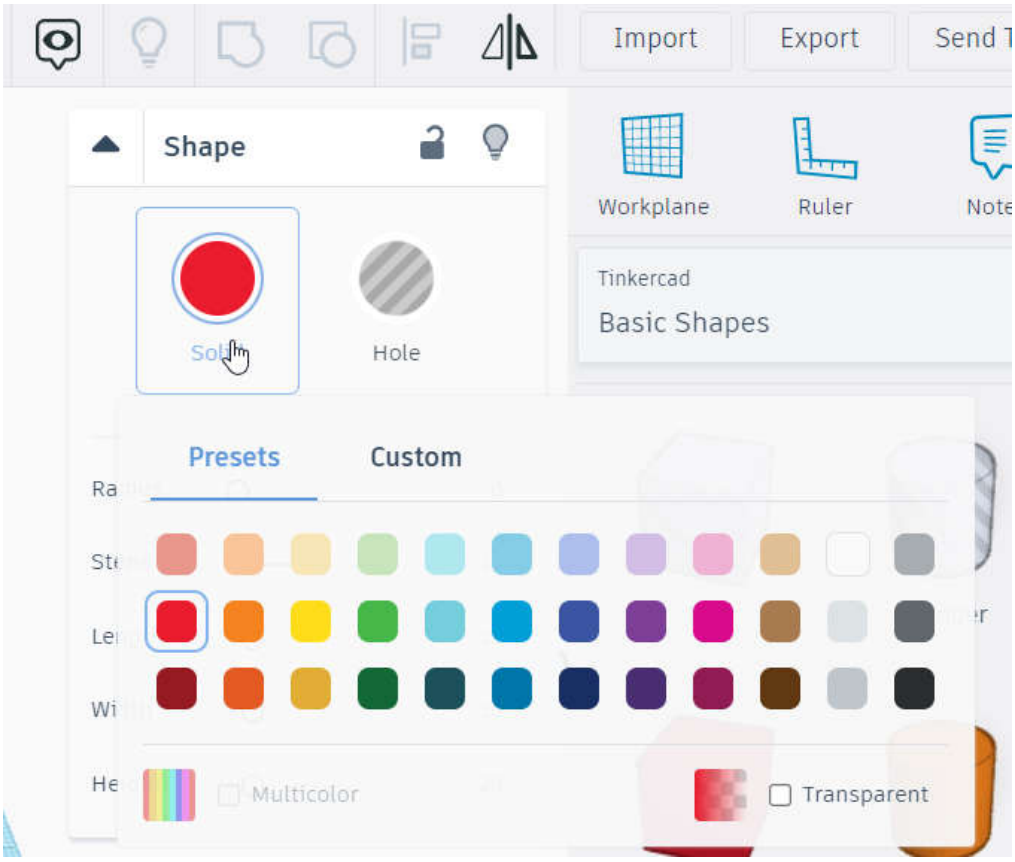


Step 4. Editing an object.

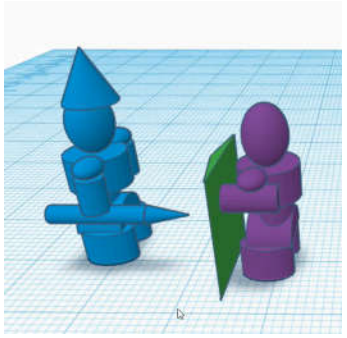


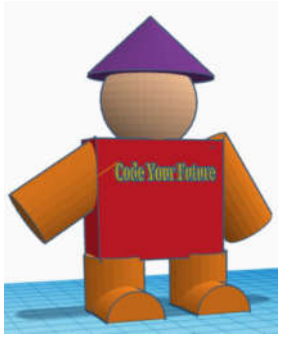


Step 5. Change the color of an object: highlight the object and select a color.

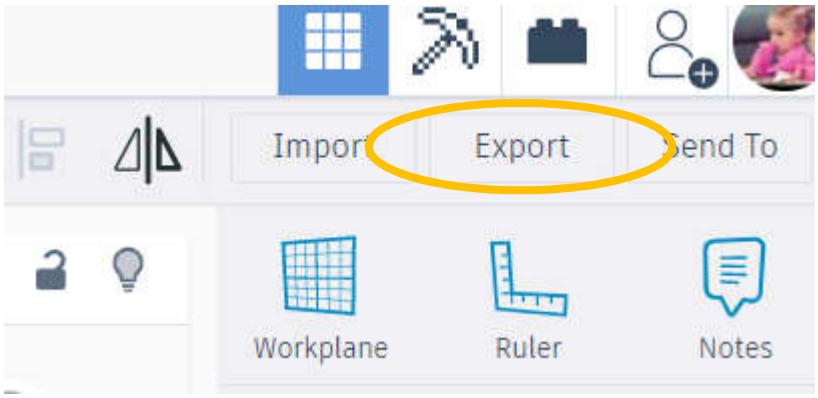


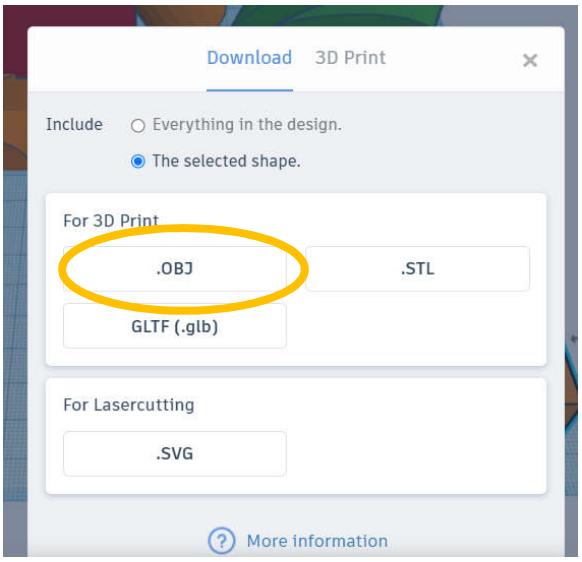
Step 6. Model your hero which will be programmed on walkinh through a maze (next day's theme): select geometric shapes (objects) on the right side, drag them to the center of the screen on a blue background (Workplane). To put the shapes on top of each other to will help by rotating the whole view (with the navigation cube on the left side or right mouse button).





Step 7. Download the completed project / your hero to your computer for the next lesson project – in order to upload to CoSpaces (a .zip file will be created).





If you have a 3D printer (personal, school or library), you can print your object by downloading the file in .stl format.

Video on how to model a little machine and print with a 3D printer (in English): https://www.youtube.com/watch?v=tyQgkeZ3hsA

More about TinkerCAD (information for beginners, keyboard shortcuts, 3D printing materials, etc.): https://blog.tinkercad.com/tag/new-to-tinkercad

Co-funded by the
Erasmus+ Programme
of the European Union

Training Programme

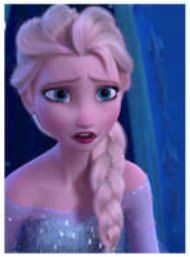
Introduction to programing. Creating our virtual world in VR and AR

THE MAZE

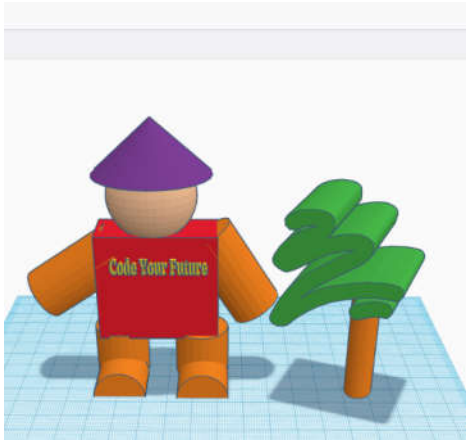
DAY 5

Which one is 3D?

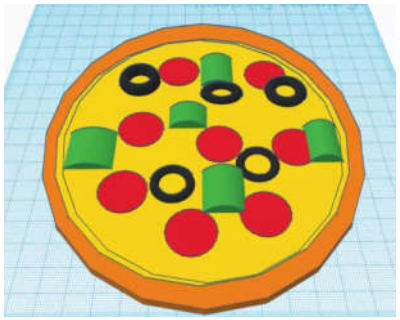
rise your both hands up

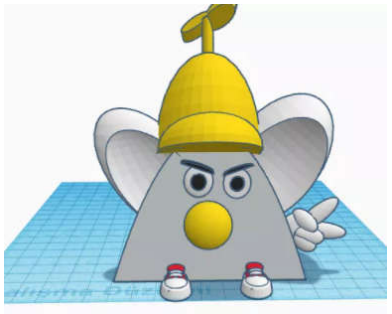


artificial goggles



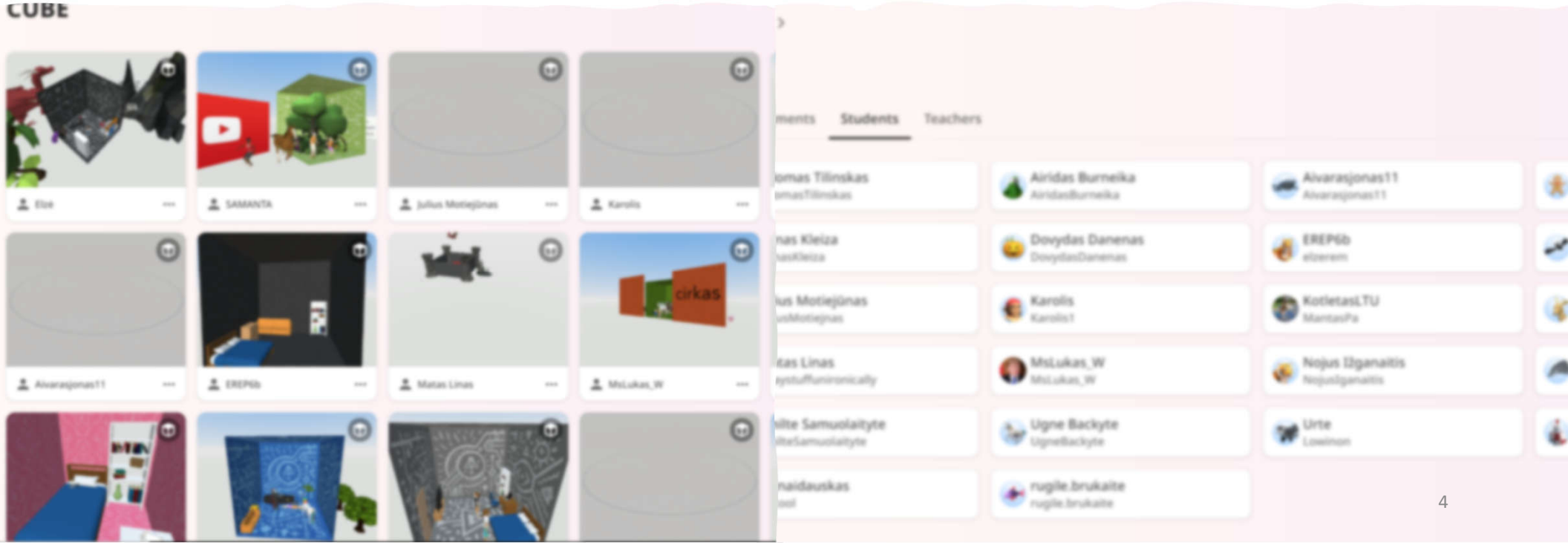
WHAT WE DID YESTERDAY?





Teacher's account

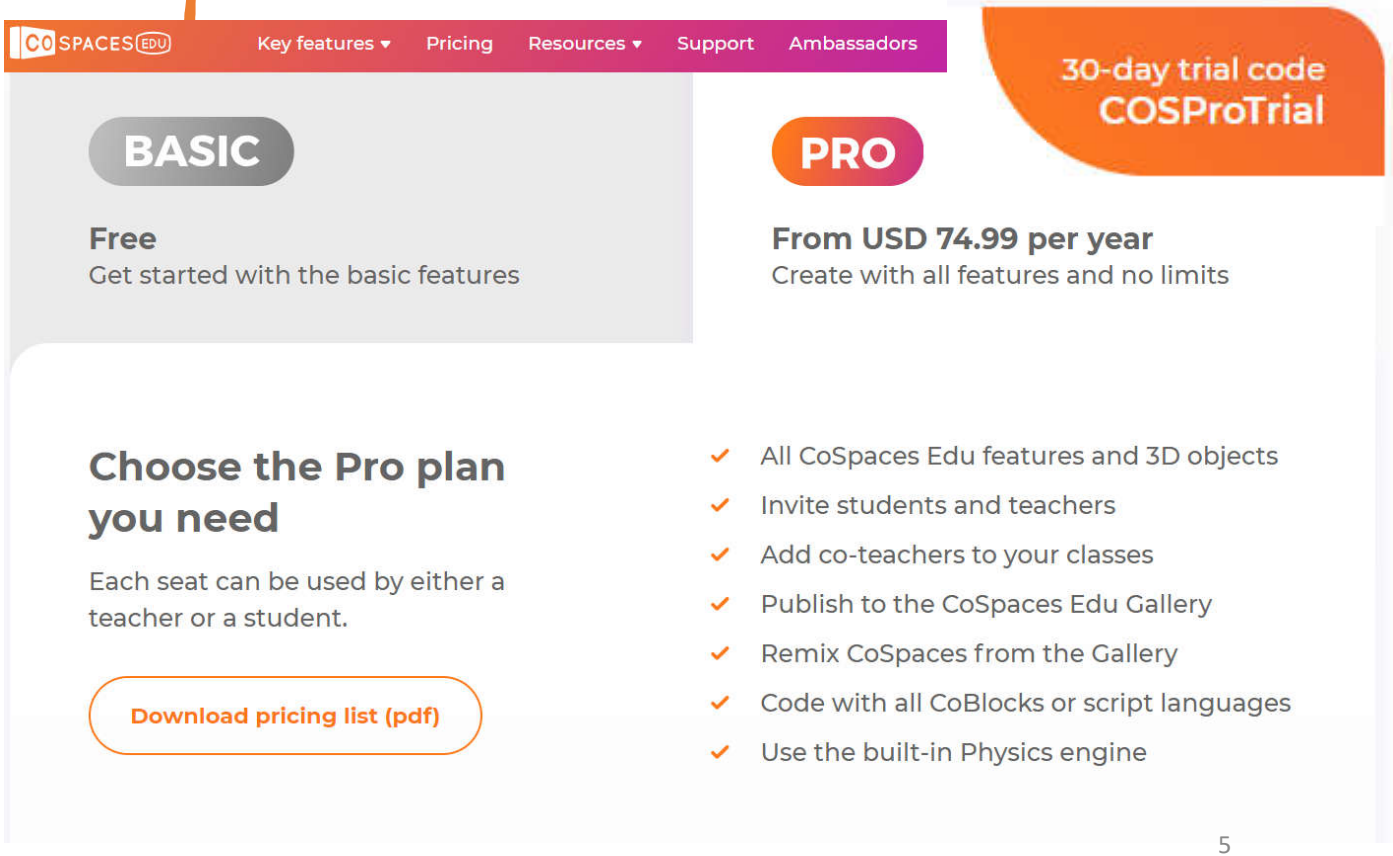
- Manage classes and students
- Share online assignments
- Observe student work



Pro Version

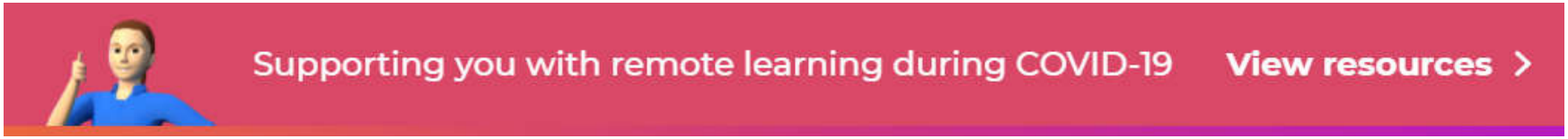
https://cospaces.io/edu/

Free trial version 30 students, 30-days



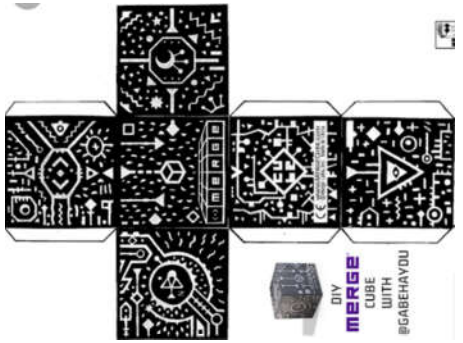
Trial Version

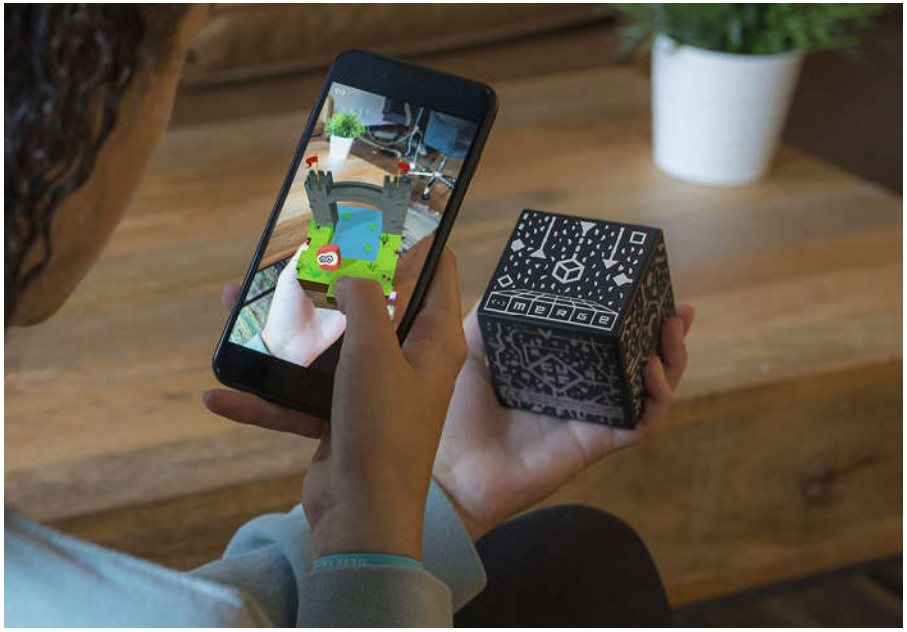
- Free trial version **100** students, 30-days
- Merge Cube

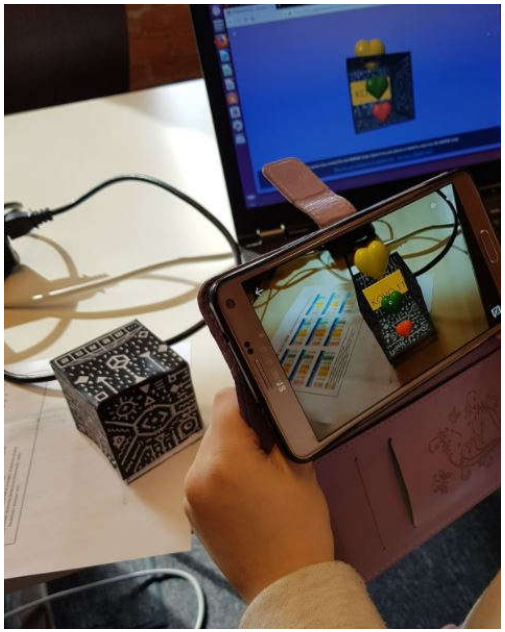


Merge Cube

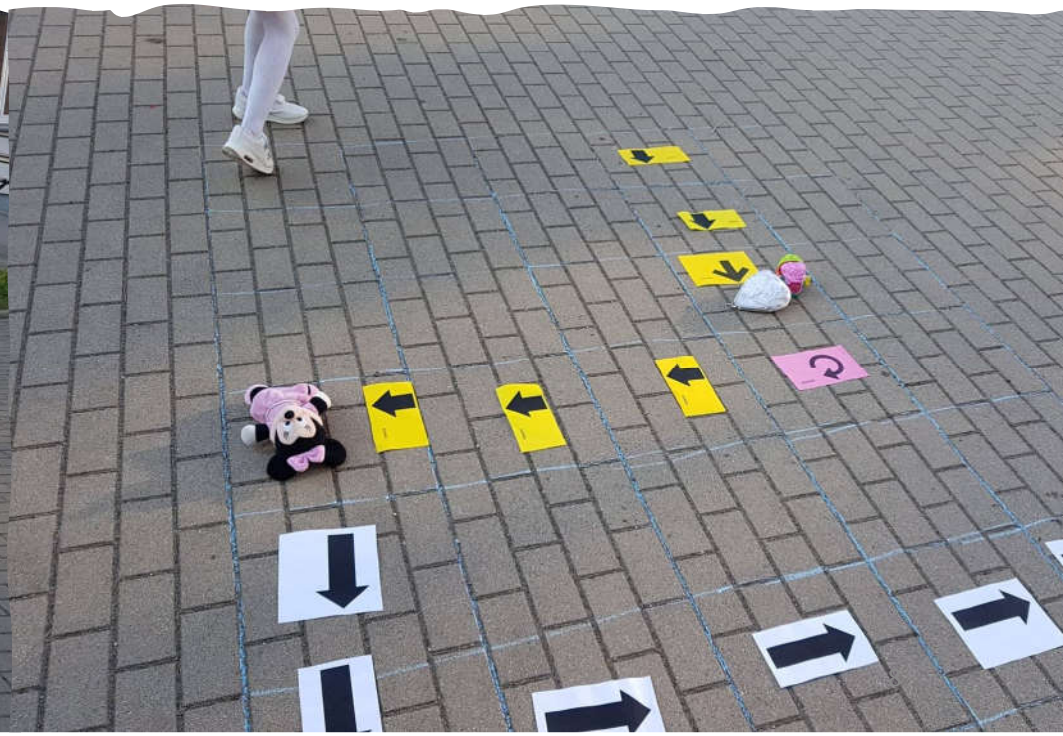
- Printable Merge Cube Template
- https://www.pinterest.com/pin/712624341022398957/





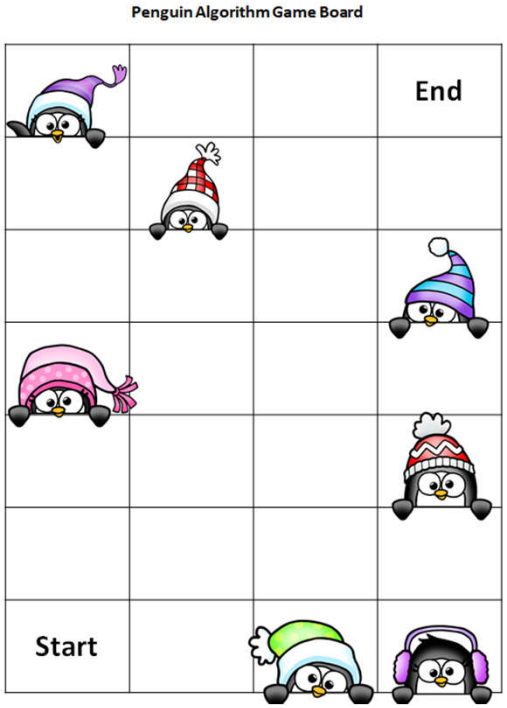


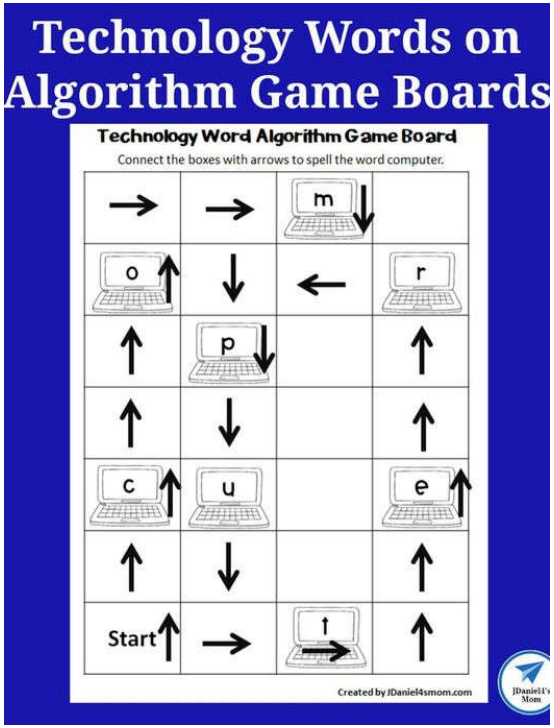
Step by step

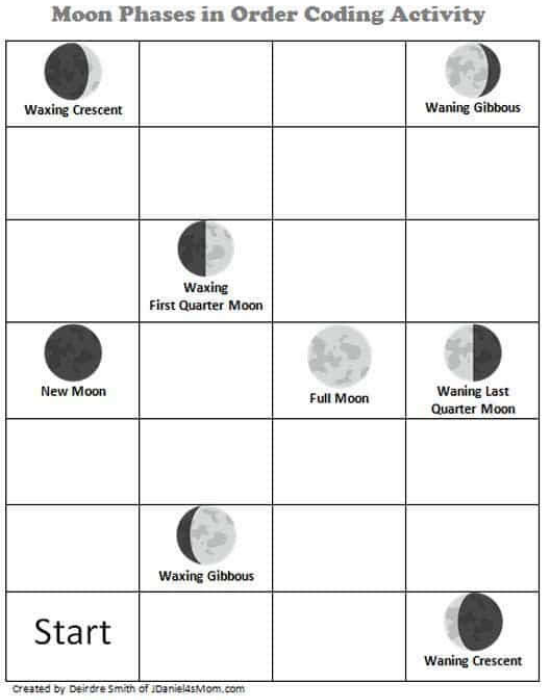


Step by step

https://jdaniel4smom.com/2020/10/technology-words-on-algorithm-game-boards.html







Scottie Go!

https://scottiego.com/en/

Thank you for your attention!

- Pridet heroju I cospaces
- nubraizyti savo labirinta/

Hello Ruby

https://www.helloruby.com/

Buna template, pamoku planu, knygos medziaga parsisiuntimui, reikia sekti.
Instagrame galima, sekti, ted konferencijos, mielai dalinas
Ruby – programavimo kalba. Visi veikejai susije su programavimo elementais.

- Kurybine uzduotis: practice/action/game without computer - planas/piesimas/braizymas - igyvendinimas
- Kai nemoka skaityti – algorimta aiskinti rodyklemis

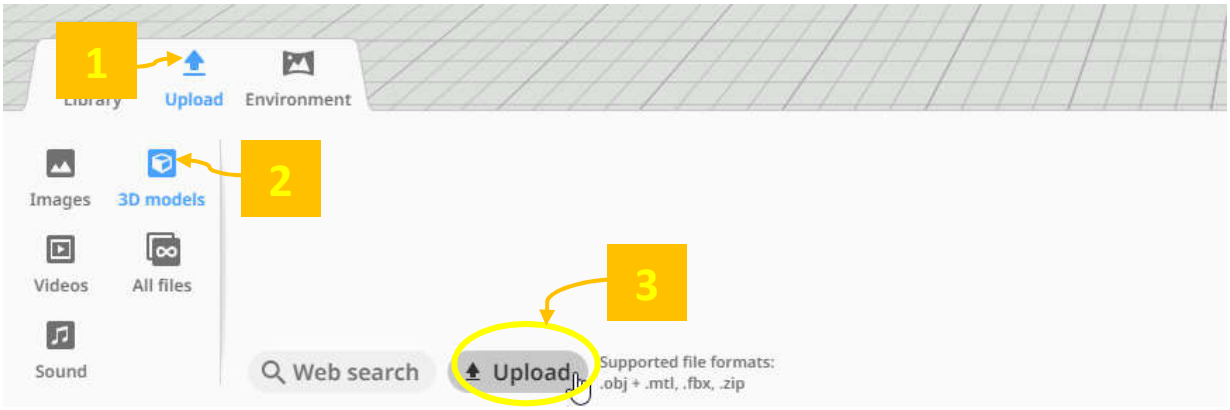
5 DAY „The Maze“

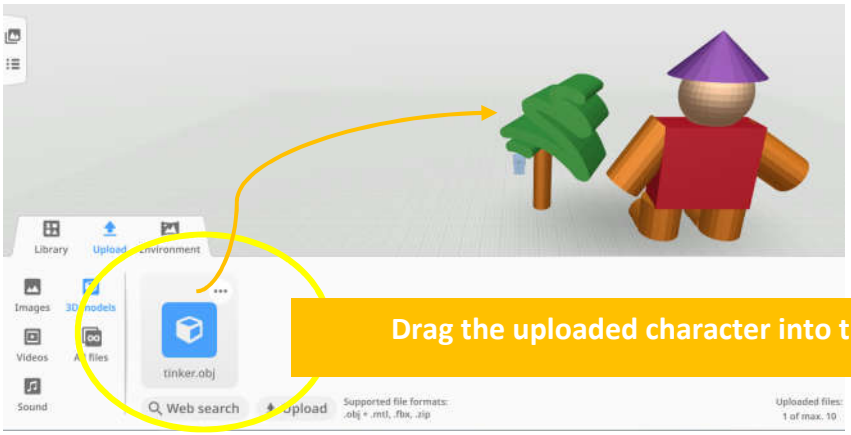
During this sessions you will complete 2 practical tasks:

- Upload the hero you created with “TinkerCAD” to the „CoSpaces“.
- Remember the „Cospaces“ environment and navigation.
- Learn to program the movement of the character.

1. Task: upload the character

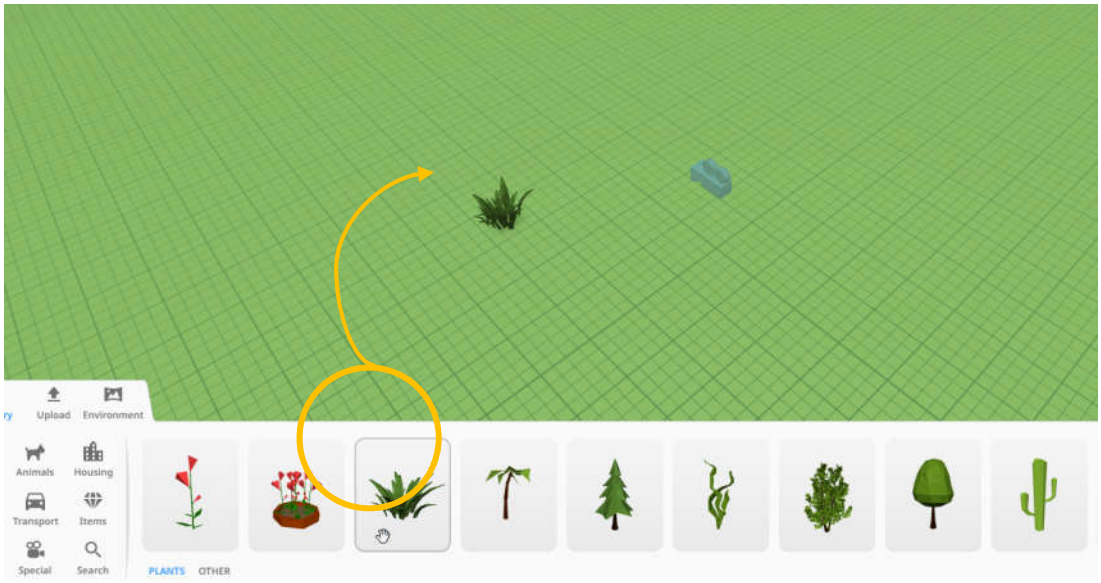
1. **Step**. Sign in to the „CoSpaces“ account and start a new project. Choose your „Environment“, where you will create the maze.
2. **Step.** Upload the character (your hero), created with “TinkerCAD” program (.zip file, downloaded from “TinkerCAD”). The instruction of downloading the character to the computer is on 4 DAY “My hero” instructions.



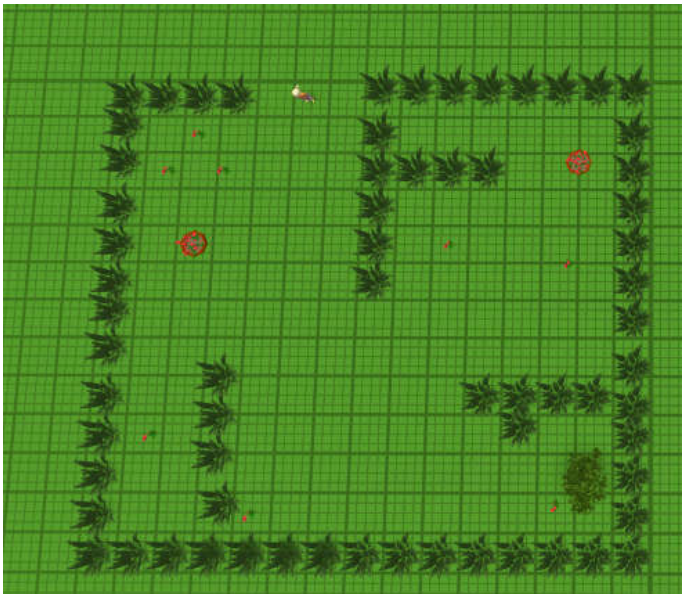


2. Task: The creation of the maze

1. **Step.** Upload a plant / cube or other object that you will use to create the maze.

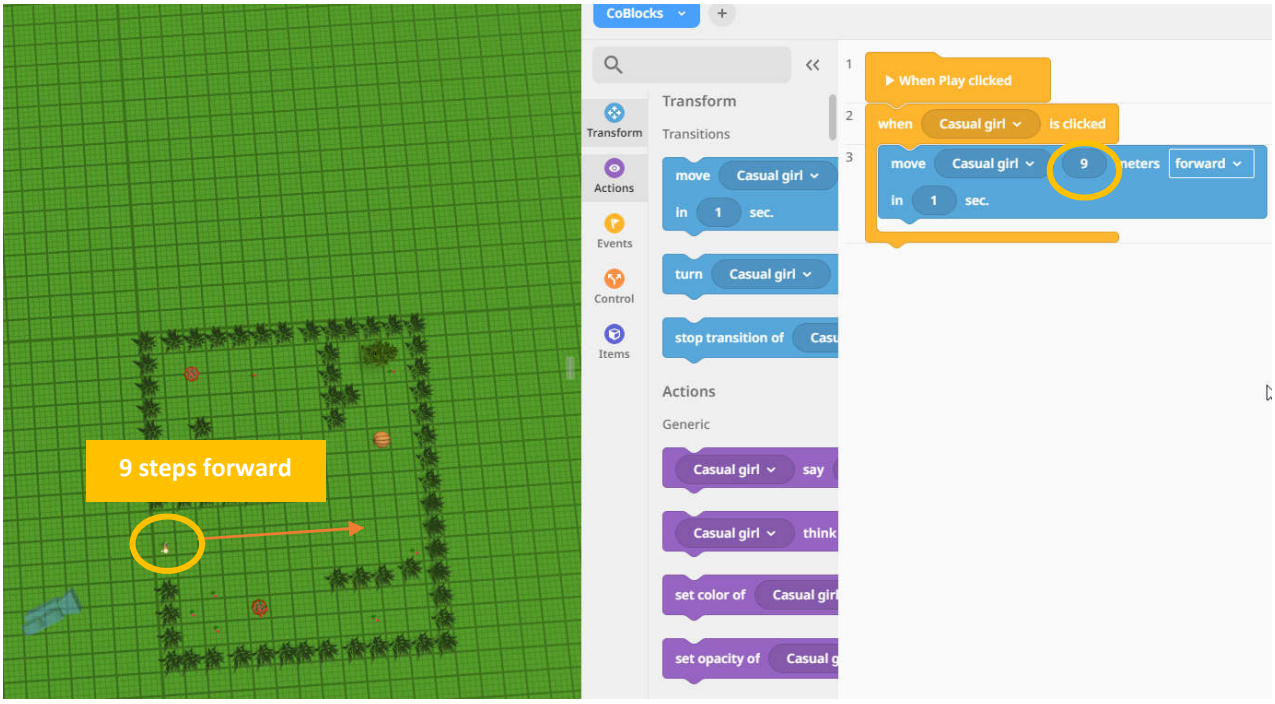


2. **Step.** Upload more characters to create the maze and 3 objects, that your hero will have to reach in the maze.



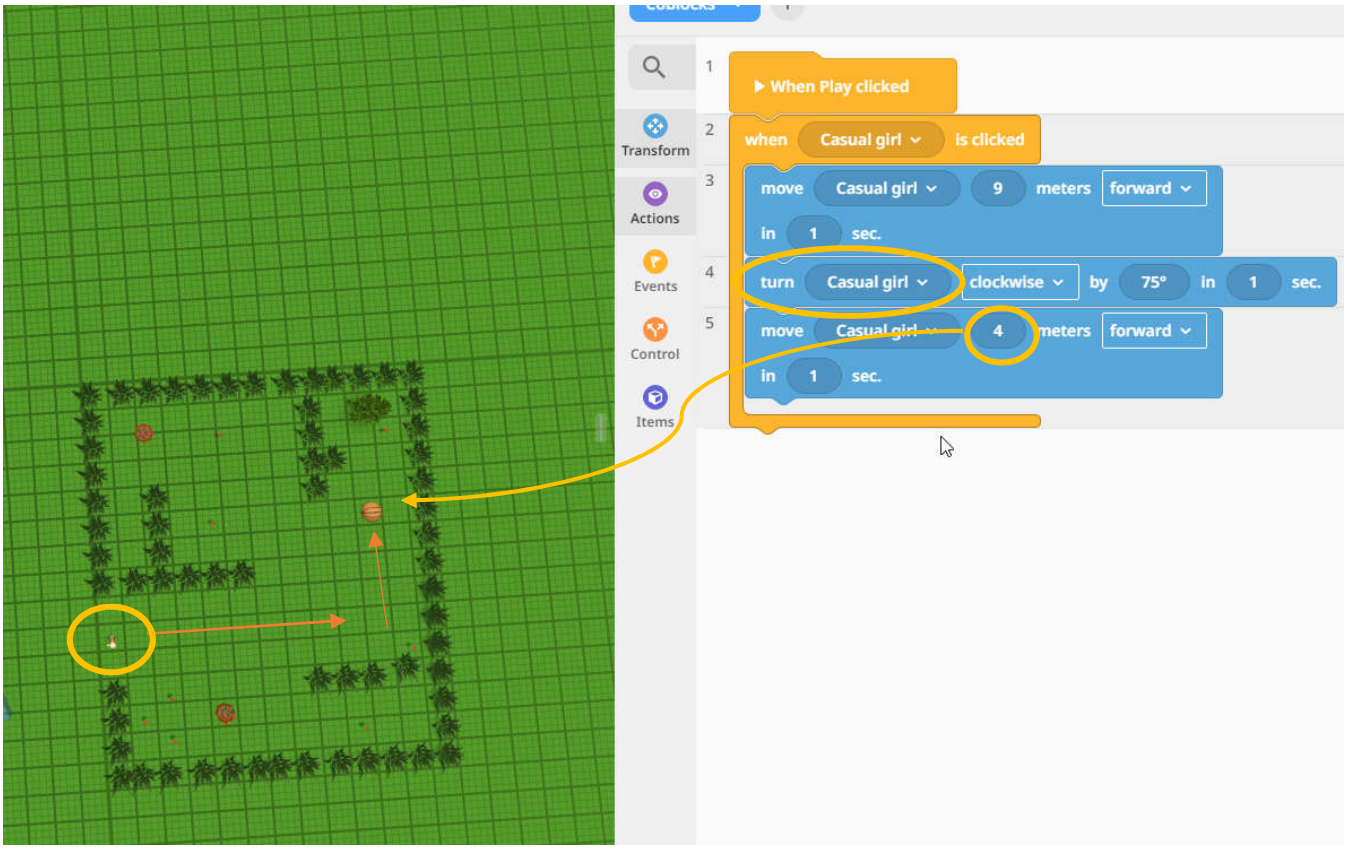
3. **Step.** Enable programming for the character who walks in the maze (turn on „Use in CoBlocks“). Find and drag to the programming area a block „**When (no item) is clicked**“ and choose your character.

4. **Step.** Find and use the block „Move“ and type in the number of counted stepsyou’re your hero to move forward. Right before it will need to turn.



5. **Step.** Continue with the block „Turn“. You can adjust the direction of the turn (clockwise or other), the degree of rotation (in the example 75 degrees) and the speed of rotation (in the example – in 1 second).

Then put the movement block again („Move“) and type in the steps that your hero should reach the ball or other object.



6. **Step.** Program the character to walk to all three uploaded objects. Also you can try to use other blocks and program the changes if the hero comes to the object that it would change the color or other. Be creative.

View your project **(“Play”** button) and share your project link **(“Share”** button).