



# Simulations

## Lesson plan

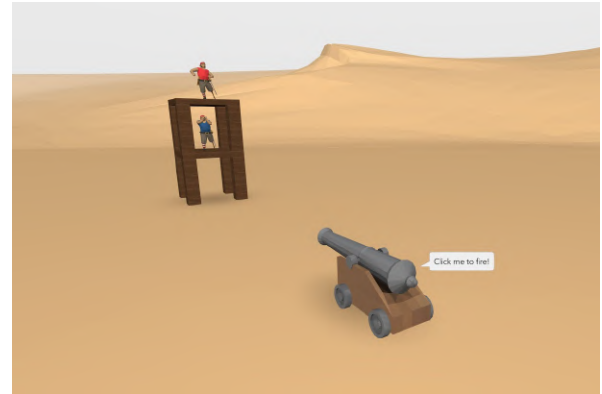
*Created by the CoSpaces team*

**Education level:** Adaptable to any

**Subject:** STEAM, physics, geography, earth sciences, social sciences

**Format:** Individual or in groups

**Duration:** Approx. 3 hours



### Introduction and lesson objectives:

As anything is possible in CoSpaces Edu, it's the ideal tool to conduct any experiment and simulate anything virtually!

You and your students can create various types of simulations of subjects studied in class and make it possible to visualize concepts in 3D and in fun ways such as VR and AR or even by interacting with the MERGE Cube if you have the add-on.

- **Real-life simulation** - Your students create or interact with a virtual and dynamic demonstration of phenomena taken from real-life and get some learnings by interacting with it.
- **Scientific experiment** - Your students use their CoSpace to freely and safely conduct their own scientific experiments such as playing around with the physics properties of objects on the earth.
- **3D visualization** - Your students create or play with a 3D representation of something they've learned in class in order to physically connect with it for better understanding and retention.



### **Learning goals and student benefits:**

- Develop 3D creation skills
- Engage with the study material
- Understand through visualization
- Practice collaboration

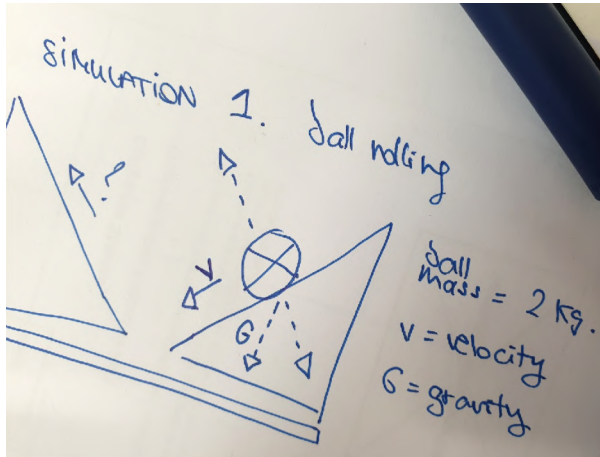
### **Activity example:**

1. Assign your students with a simulation to experiment with.
2. Ask them to collect some of their key observations based on the simulation.  
What did they notice? Is there anything they found surprising?
3. Discuss the simulation conducted in small groups or as a class.
4. Summarize the different learnings and other outcomes of this simulation.  
How did it feel to visualize this simulation in 3D? Was it easier to understand?  
Is there anything they wish they could have been able to interact with?

### **Assessment and evaluation suggestions:**

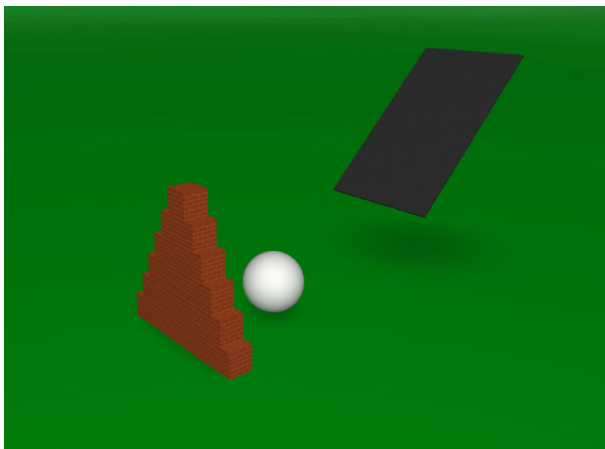
- Have your students managed to experiment with the simulation?
- Did your students understand the simulation?
- Did your students express relevant and interesting observations?

# Creation guide



First, clearly define the **subject** of your simulation and discuss it with your teacher. What are you trying to show or test? What are the **possible outcomes**?

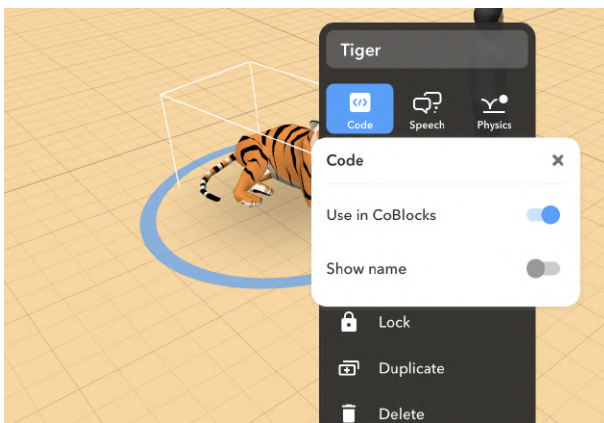
Make sure you have a concrete idea in mind and that it's of a reasonable scale. Write down a **plan** and make **sketches** to conceive what you'll build.



Layout the various elements that will be needed to create your simulation.

Drag and drop **3D objects** from the **Library** and use the **building blocks** from the **Building** category to build anything you might need.

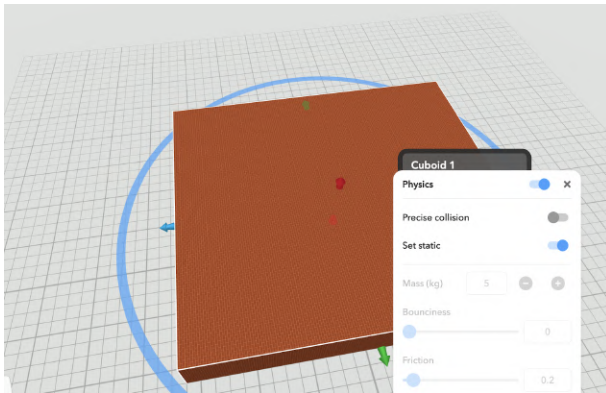
Need something you can't find there? You can add it under **Upload**.



Once all the elements are in place, you can start coding your simulation.

Double or right-click each object, click **Code** and activate their **Use in CoBlocks** to program it.

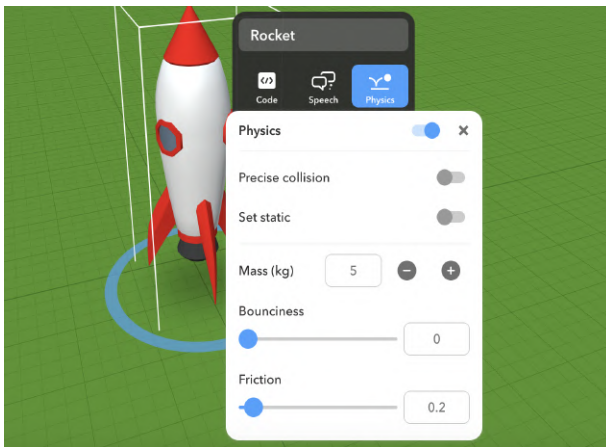
Also activate **Show name** to make it easier to see what objects you're coding. Don't forget to give them clear names!



Do you want to use physics on the objects in your CoSpace?

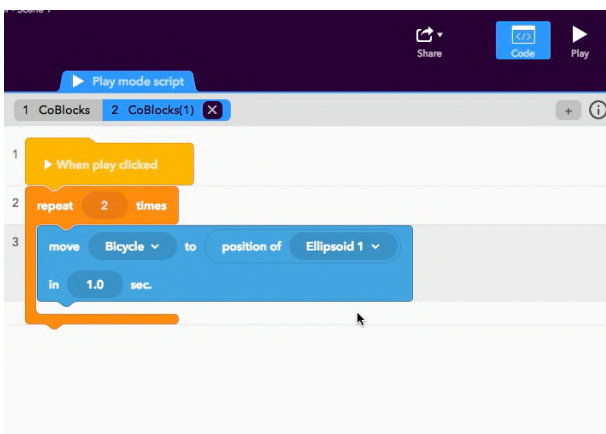
Click your objects and activate **Physics**.

You can then play with the physics properties of any object, define collision precision and whether your object should be set static.



You'll be able to precisely define several physics properties.

Define what your objects' **Mass**, **Friction** and **Bounciness** should be for your simulation.



Add code to make whatever you want to show with your simulation happen! Click **Code** editor and **CoBlocks**.

Don't forget to enable **Use in CoBlocks** for all objects. Want to use physics? Click your objects and activate **Physics**. Play with **physics properties**: define **Collision** precision and whether your object should be **Set static**.



Hit **Play** regularly in order to test your simulation and understand what works and what doesn't. Then, go back to your code to make changes.

The **CoBlocks debugger** lets you view your code running as you're playing with your simulation.



Time to see what happens when you interact with your simulation!

Try to summarize the results of your simulation. What happened? Is it what you expected?

Let your classmates play with it and test their simulations too.

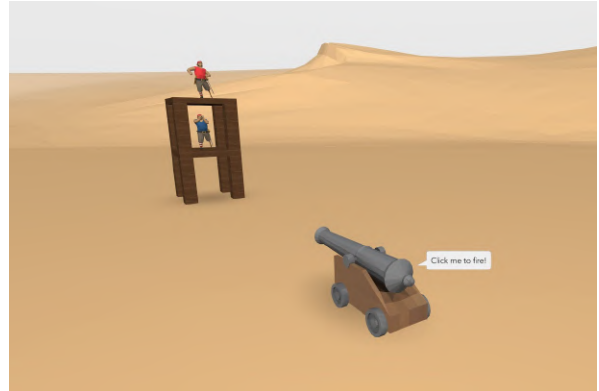


# Example CoSpaces



Catapult simulation

[edu.cospaces.io/YXU-XQT](http://edu.cospaces.io/YXU-XQT)



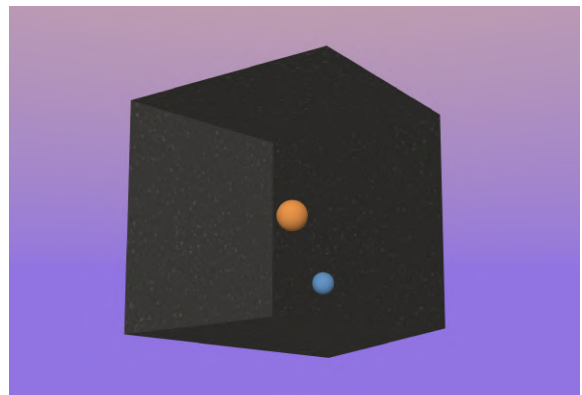
Physics with CoBlocks

[edu.cospaces.io/ZXW-YAC](http://edu.cospaces.io/ZXW-YAC)



Anti-gravity room

[edu.cospaces.io/JHA-CHJ](http://edu.cospaces.io/JHA-CHJ)



Atoms simulation

[edu.cospaces.io/SFC-CTG](http://edu.cospaces.io/SFC-CTG)