

**POWER OF AR AND VR**

# **CLASS-VR LESSONS**



**Co-funded by  
the European Union**



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# IMPORTANT

**FIRST OF ALL, YOU NEED TO  
CAREFULLY EXPLAIN  
AND ENFORCEMENT  
THE SAFETY RULES  
FOR USING 3D GLASSES**

## WE IMPLEMENT OUR PROJECTS ON TWO SYSTEMS

### HTC



### CLASS VR



### LEKCJE Z CLASS-VR

# FOR HTC GLASSES WE USE UNITY



**THIS IS A GREAT  
SYSTEM  
BUT IT ALLOWS  
YOU TO  
INVOLVE  
ONE PERSON**



**OF COURSE THIS CAN BE SOLVED DIFFERENTLY  
BY CREATING WEBSITES OR APPLICATIONS FOR USE  
ON A **COMPUTER** OR **SMARTPHONE****



PROJEKT KOŁOBRZEG 3D - Wirtualny Port i Fortyfikacje Kołobrzegu - XIXw

STRZĄLKI-poruszanie, SHIFT-chodzenie, SPACJA-skakanie, C-przysiad

## A SOLUTION THAT CAN BE USED MORE EFFECTIVELY IN CLASSES IS TO USE THE **CLASS-VR SYSTEM**



 **CLASSVR**<sup>®</sup>  
Virtual Reality for Schools

**IN THIS SYSTEM WE CAN ANALYZE  
MANY STUDENTS AT THE SAME TIME**

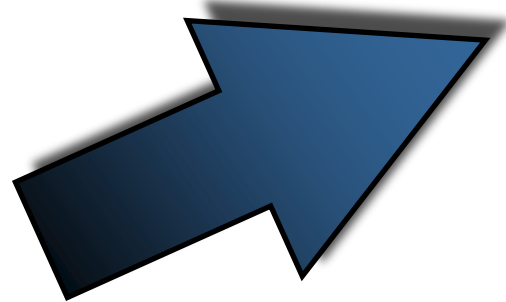




# POWER OF AR AND VR



**ADDITIONALLY, WE CAN ALSO USE MULTIPLE  
COMPUTERS AND SMARTPHONES**



**LEKCJE Z CLASS-VR**





**I WILL NOT EXPLAIN HOW TO  
USE THIS SYSTEM**

**ALL INFORMATION AND  
TUTORIALS ARE VERY WELL  
PRESENTED ON THE INTERNET**

**EVERY SYSTEM HAS SOME  
LIMITATIONS**

**HOWEVER, IN ORDER TO USE IT  
EFFECTIVELY,  
YOU HAVE TO SIMPLY KNOW IT**

**YOU SHOULD BE AWARE  
THAT WE DO NOT HAVE  
TO PRESENT  
EVERYTHING WITH  
3D GLASSES**

## NA PRZYKŁAD

**ANIMATION THAT WE DID AS  
STANDARD  
FOR BIOLOGY IN BLENDER  
WILL LOOK VERY GOOD  
ON A BIG SCREEN**

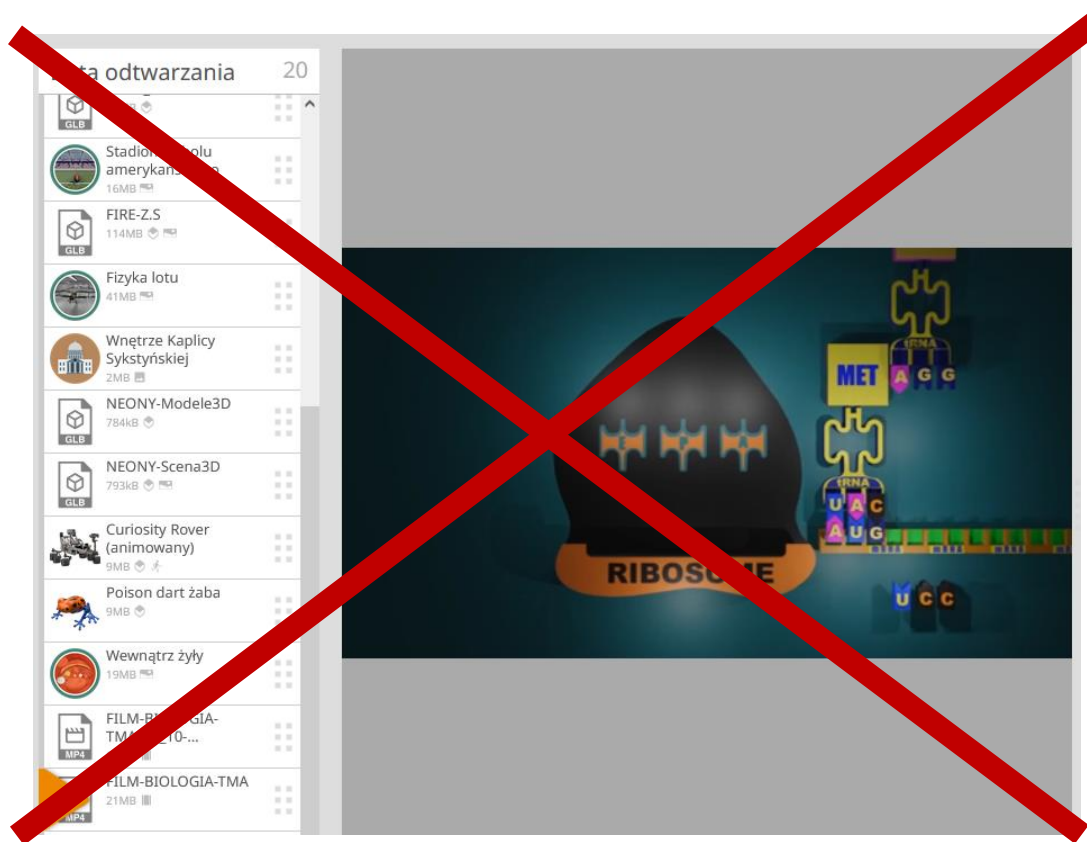
# BIOLOGY

## PROTEIN BIOSYNTHESIS



<https://youtu.be/NgaW5EXi17Y>

**HOWEVER,**  
**IT IS NOT AT ALL SUITABLE FOR**  
**PRESENTATION IN 3D GLASSES**



← FILM-BIOLOGIA-TMA\_4k\_10-fokal\_length



**MP4**

FILM-BIOLOGIA-TMA\_4k\_1...

Filename	FILM-BIOLOGIA-TMA_4k_10-fokal_length
Type	video/mp4
Size (bytes)	16 326 465
Timestamp	2023-03-14T12:23:05.000Z

Podgląd



0:00 / 0:54

**TO SHOW THIS MOVIE  
IN 3D GLASSES  
IT NEEDS TO BE  
RENDERED  
IN**

**4K**

**IN**

**10 FOKAL  
LENGTH**

## BIOLOGY

## PROTEIN BIOSYNTHESIS

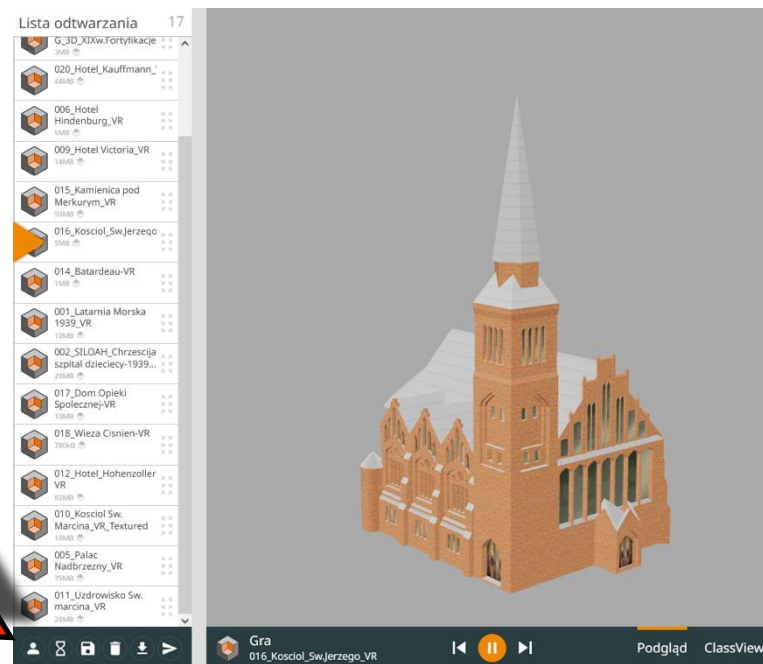
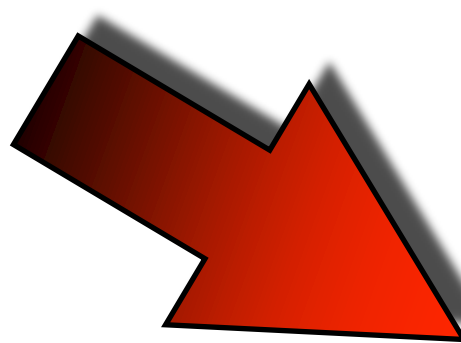
# 4K 10 FOCAL LENGTH



<https://youtu.be/Eg2bdVH9Wo0>



**THE USE OF 3D GLASSES IN CLASSES  
SHOULD BE INTRODUCED GRADUALLY  
BY USING THE AVAILABLE TOOLS  
THAT NEED TO BE KNOWN VERY WELL**



**THE USE OF 3D GLASSES SHOULD NOT BE LONGER THAN  
10-15 MINUTES DURING A LESSON**



**360 PHOTOS AND VIDEOS  
LOOK VERY GOOD IN THIS  
SYSTEM WHICH CAN BE EASILY  
TAKEN WITH  
A DRONE OR 360 CAMERA**

← 360-SALA 208

Akcje

- Przemianować
- Edytuj notatki nauczyciela
- Edytuj notatki ucznia
- Usuń utwór

Głoska bezdźwięczna

- Usuń znacznik prostokątny
- Dodaj znacznik stereo (górną-dół)
- Dodaj znacznik stereo (obok siebie...)
- Ustaw ikonę z podglądu


Właściciel

- J. Kawalek

360-SALA 208  
BMB

JPEG

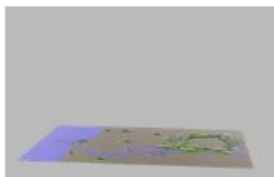
Podgląd



**WHEN CREATING YOUR OWN MODELS AND SCENES IT IS GOOD TO USE ICONS THAT MAKE IT VERY EASY TO FIND THE RIGHT MODEL**



3D\_Klasztor Koszalin



3D\_XIXw.Fortyfikacje



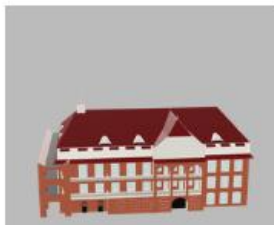
3D-Hotel\_Kauffmann



3D-Hotel Hindenburg



3D-Hotel Victoria



3D-SILOAH\_Chrzescijanski...



3D-Uzdrowisko Sw. Marcina



3D-Palac Nadbrzezny



3D-Hotel\_Hohenzollern



3D-Wieza Cisnien\_Animacja



3D-Dom Opieki Spolecznej



3D-Kamienica pod Merkur...

## FOR BETTER EFFECTS DURING CLASSES WE CAN COMBINE **3D GLASSES** WITH **3D PRINTING**

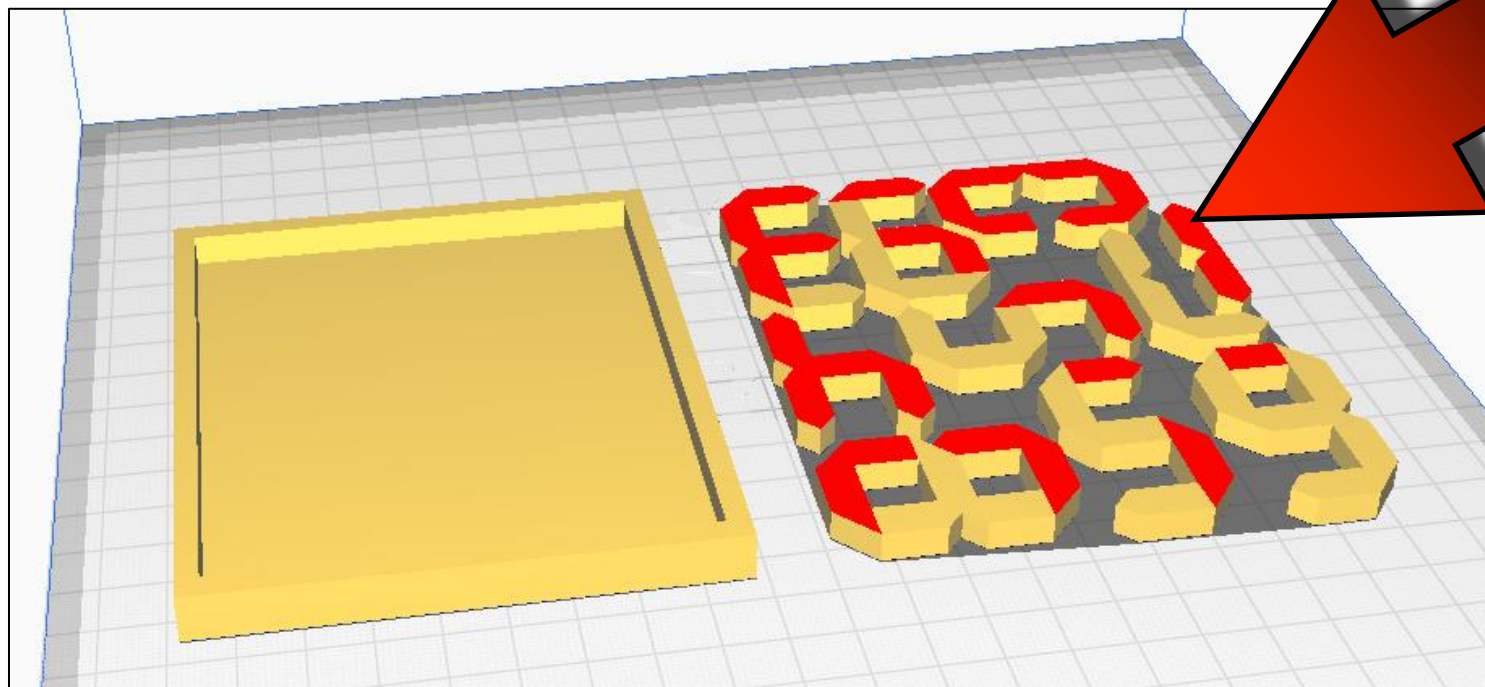


**YOU CAN PRESENT A SHORT ANIMATION IN GLASSES OR ON THE SCREEN AND AFTER TURNING IT OFF GIVE THE PRINTED BLOCKS TO BE ARRANGED**

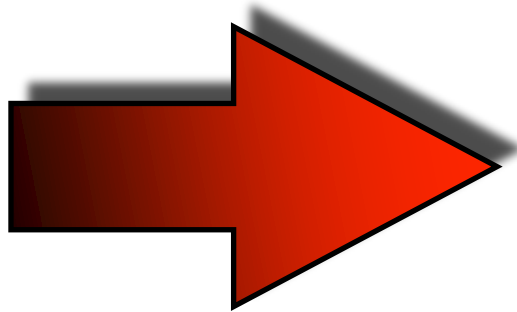
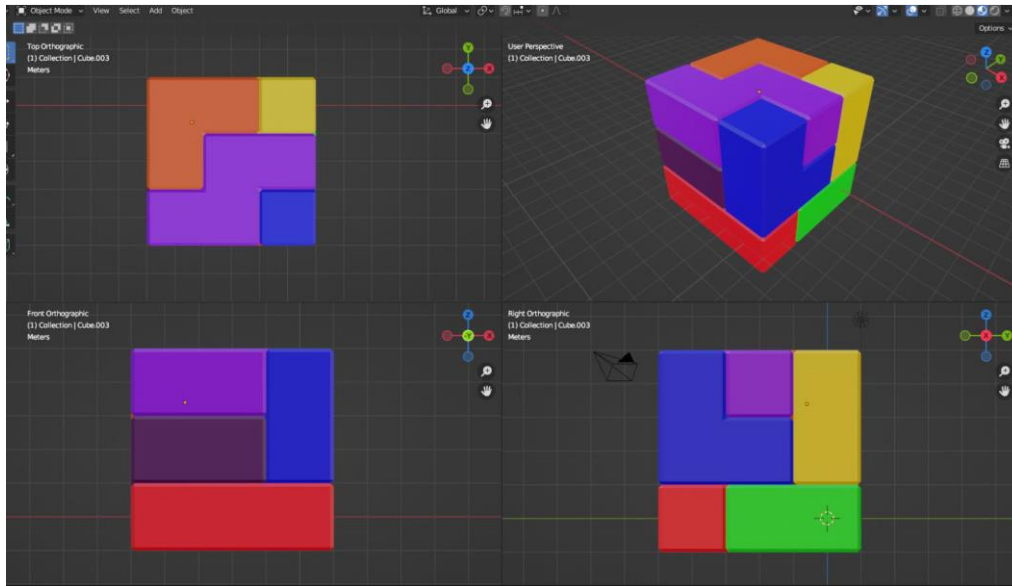


<https://youtu.be/lzmngNM3iWI>

**WHEN PRINTING, REMEMBER THAT THE WALLS IN THE MODELS ARE CORRECTLY REVERSED IN THE **ULTIMAKER CURA** PROGRAM, THE **RED COLOR** INFORMS US ABOUT THE **WRONG WALLS**. THIS IS DESCRIBED IN THE TRAINING ON NUMBERS**



**SIMILARLY, WE CAN USE OUR PREVIOUS EXERCISE AND USE  
MAGNETIC CUBES**





**FOR BIOLOGY LESSONS WE HAVE PRINTED  
OVER 600 BLOCKS WHICH ARE  
VERY ENGAGED IN STUDENTS**



## **CLASS-VR SYSTEM CAN BE USED IN TWO WAYS**

**WHEN IT IS CONNECTED TO  
THE INTERNET**

**OR WHEN THERE IS NO  
POSSIBILITY TO USE IT**

**IN BOTH CASES, I RECOMMEND  
UPLOADING THE MODELS TO THE  
GLASSES BEFORE THE CLASSES**

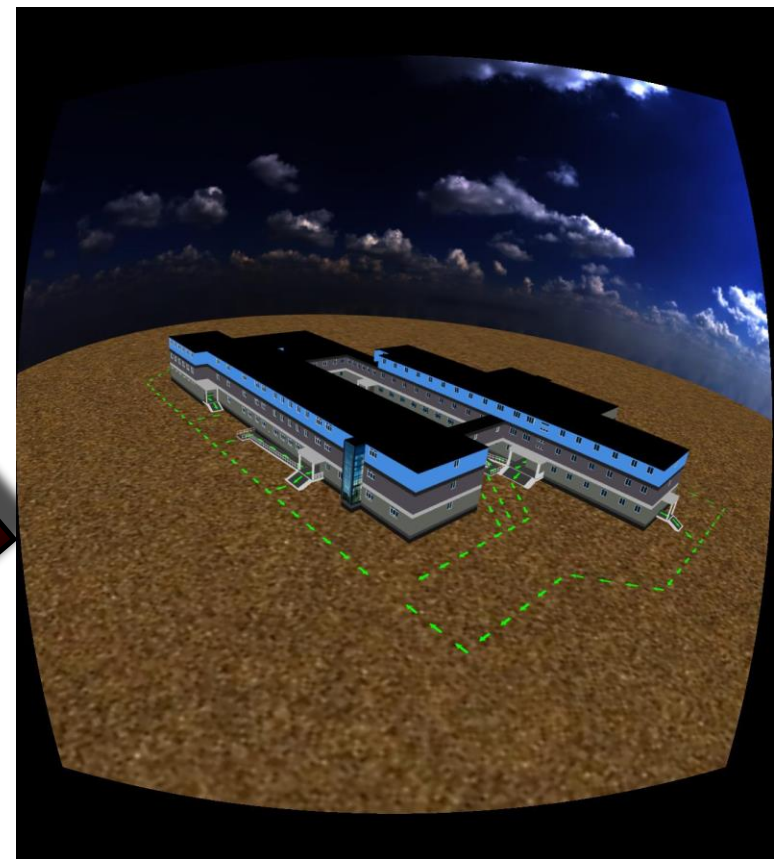
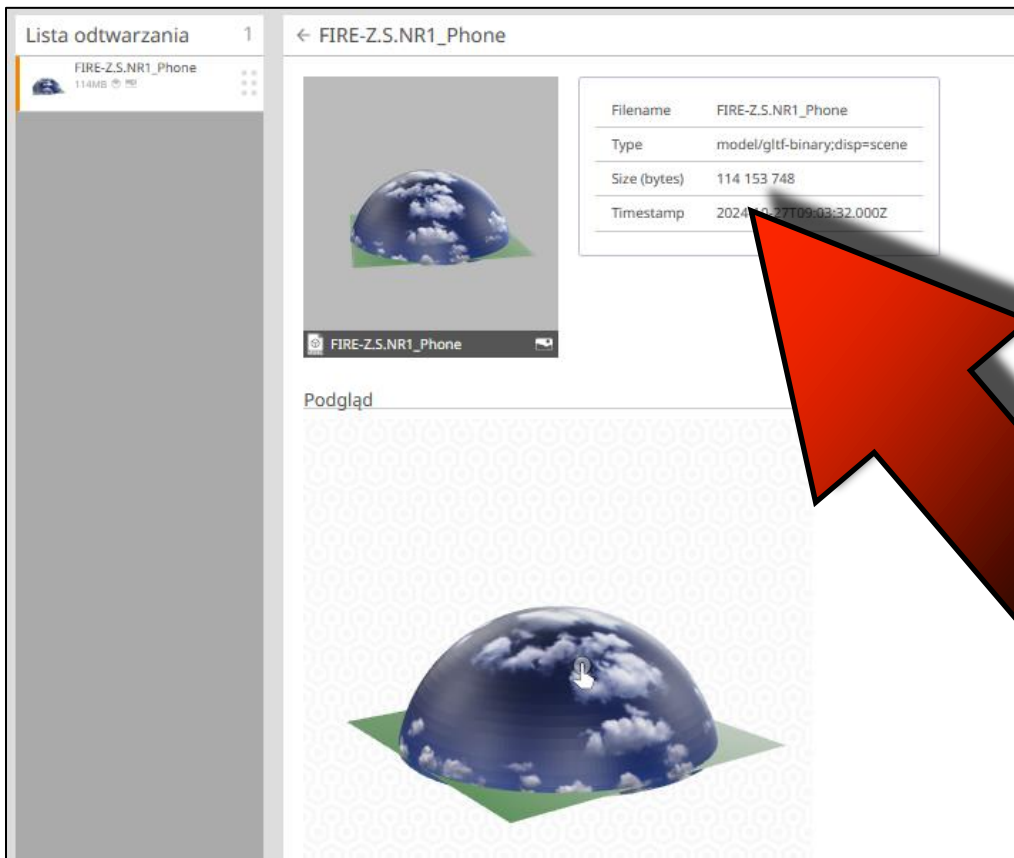
**EVEN THOUGH WE REMOVE THEM  
FROM THE LIST, THEY WILL BE  
WRITTEN IN THE GLASSES**

**AND WHEN YOU CALL THEM AGAIN  
THEY WILL BE LOADED QUICKLY**

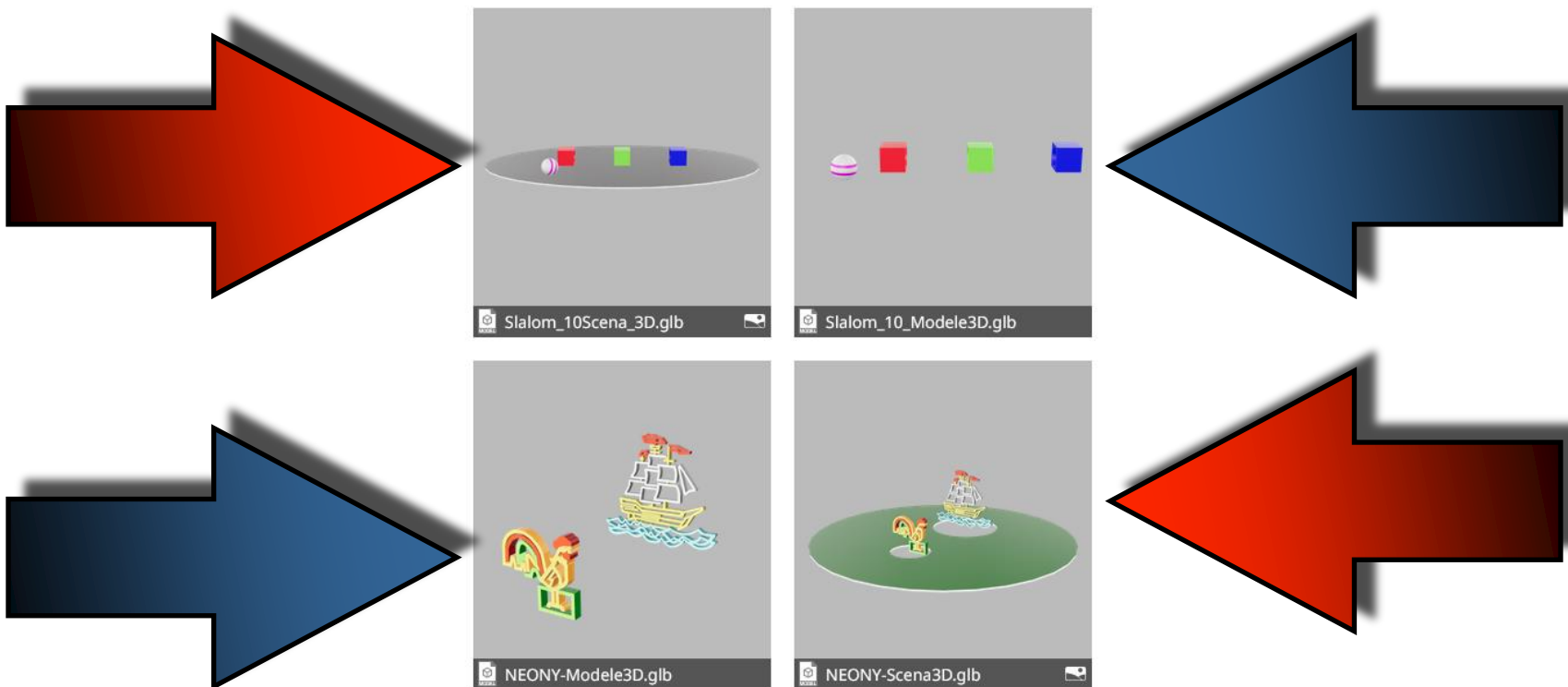
**HOWEVER, WHEN WE DO NOT HAVE  
ACCESS TO THE INTERNET,  
WE NEED TO UPLOAD THE ENTIRE  
LIST**

**THIS IS A VERY USEFUL WAY WHEN  
WE GO SOMEWHERE  
TO CONDUCT TRAINING AND WE  
DON'T KNOW WHAT THE INTERNET  
ACCESS WILL BE LIKE.**

**EVEN IF WE HAVE ACCESS TO THE INTERNET,  
IT IS BETTER TO UPLOAD SUCH LARGE MODELS  
IN ADVANCE TO THE GLASSES**



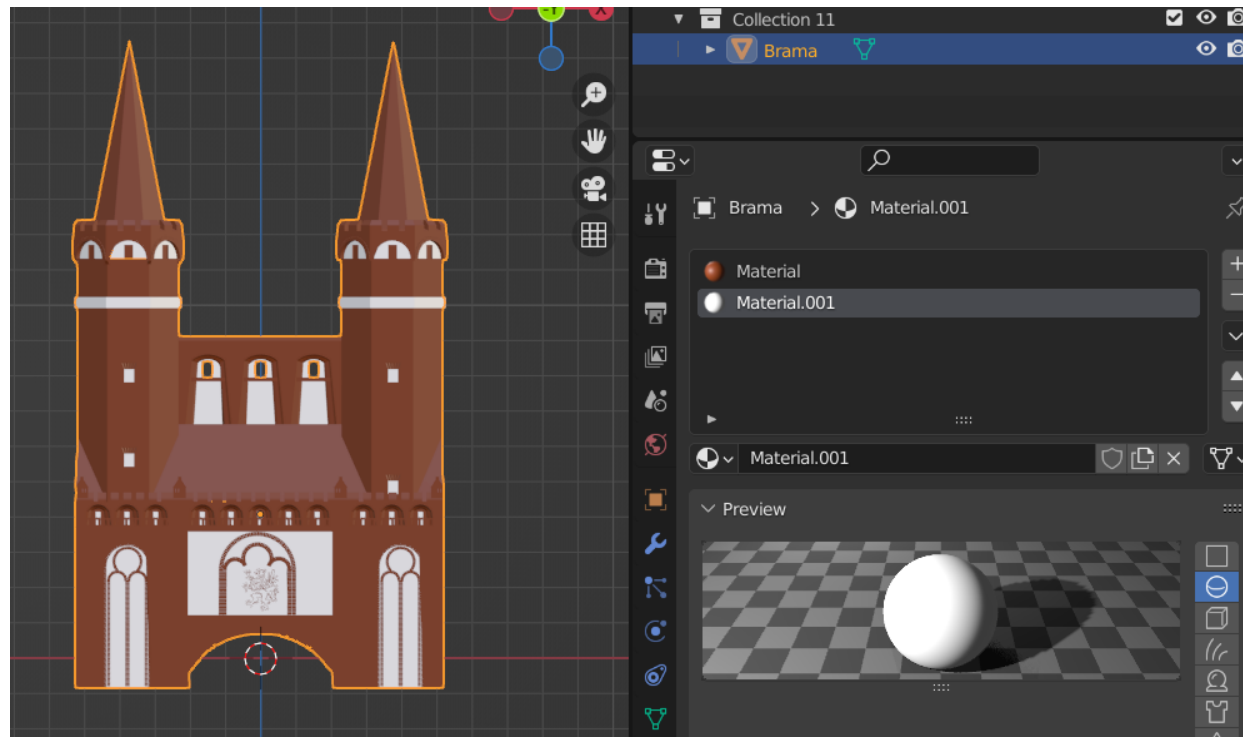
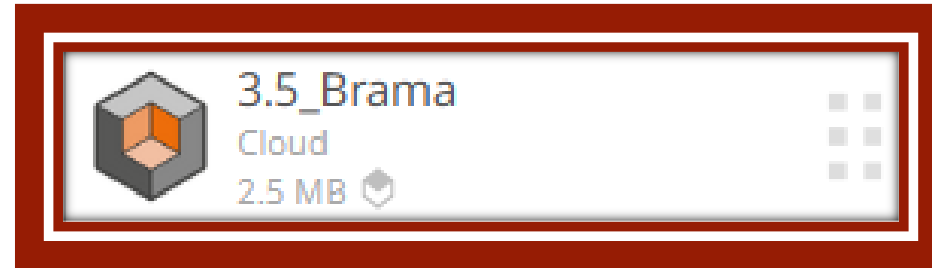
**YOU SHOULD ALSO CHECK BEFORE WHICH  
WILL BE BETTER FOR PRESENTATION  
A **SCENE** OR A **3D MODEL****



**WHEN CREATING YOUR OWN MODELS, TRY TO KEEP  
THE MESH AS SIMPLE AS POSSIBLE**



**THIS MODEL WILL BE SUITABLE FOR  
PRESENTATION IN 3D GLASSES**





**AND AT THE SAME TIME IT CAN BE  
PRINTED ON A 3D PRINTER AS A GIFT**



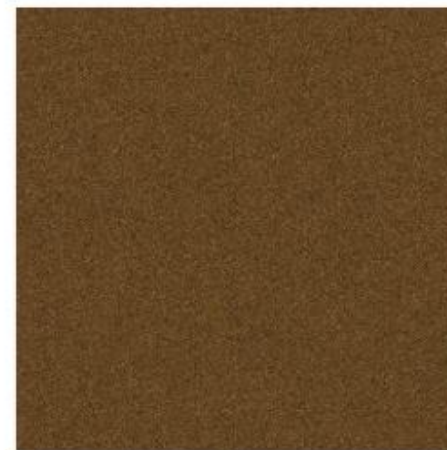
**YOU ALSO NEED TO TRY TO MAKE SURE THAT THE TEXTURE FILES ARE NOT TOO MUCH OF A BUFFER**



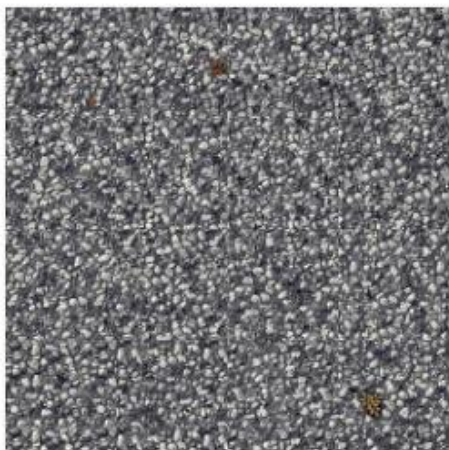
GRUNT-1.jpg



GRUNT-2.jpg



GRUNT-3.jpg



GRUNT-4.jpg



GRUNT-5.jpg



GRUNT-6.jpg

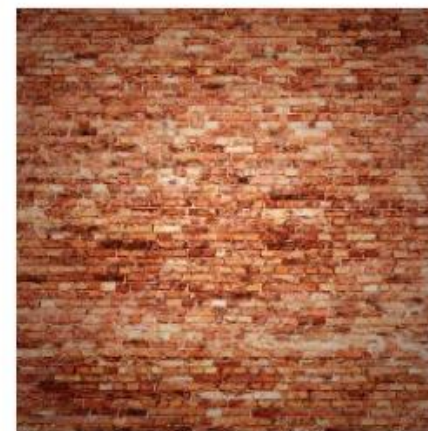
## BEFORE USING THE MODEL IN CLASSES, LET'S CHECK IT BEFORE



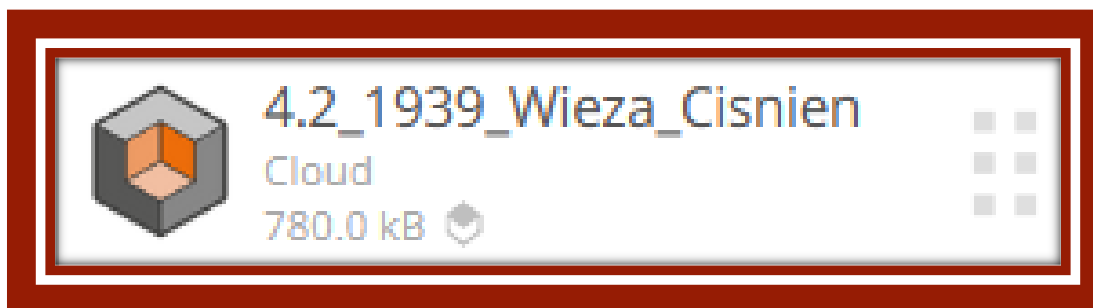
4.1\_WIEZA\_CISNIEN.tif



4.3\_1939\_Wieza\_Cisnien.blend



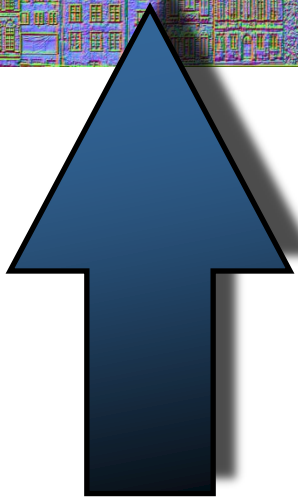
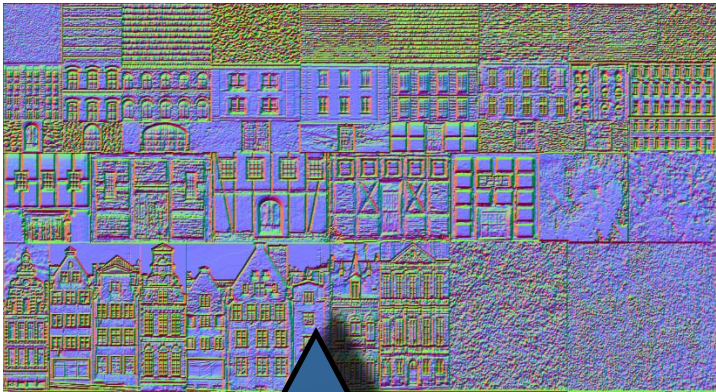
cegly.jpg



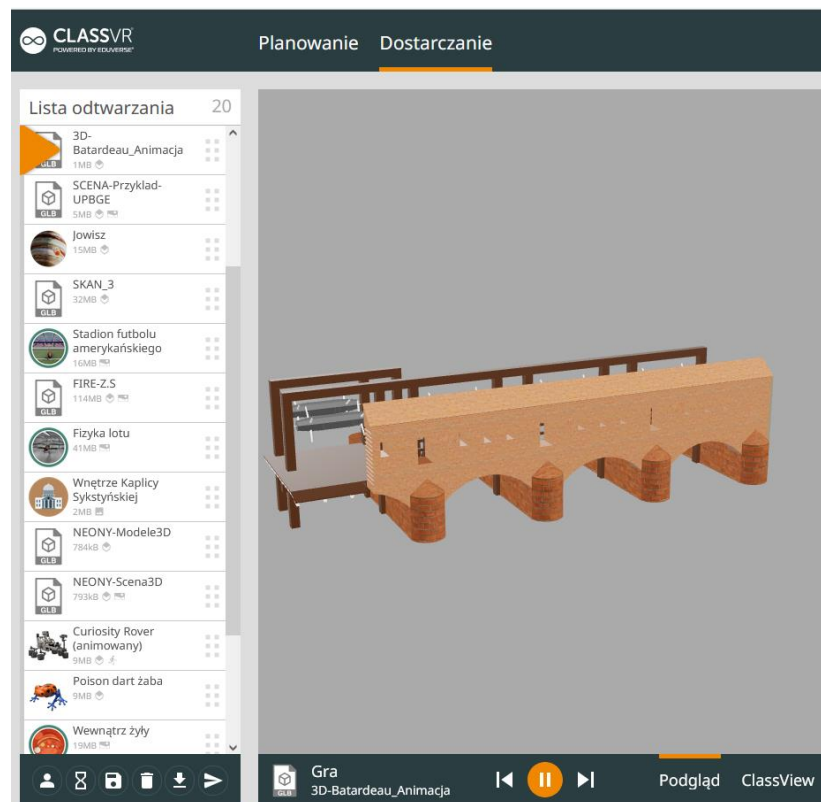
**THAT'S WHY IT'S A GOOD SOLUTION TO PUT ALL THE TEXTURES IN ONE FILE, THEN THE SYSTEM WILL LOAD IT MUCH FASTER**



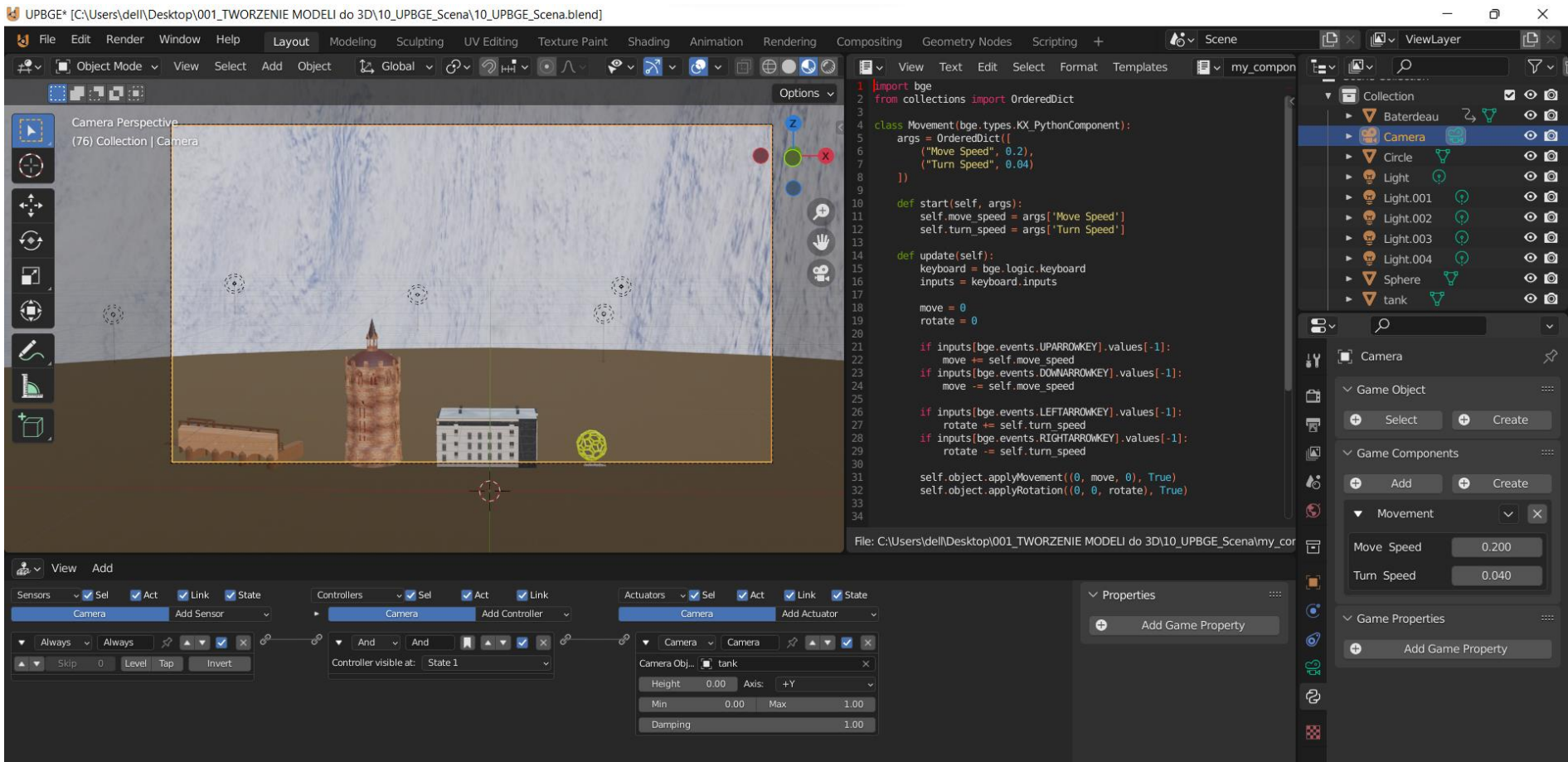
**WE CAN ALSO USE NORMAL MAP WHICH WILL GIVE US  
THREE-DIMENSIONALITY EFFECT  
WITH A SIMPLE 3D MESH**



**AFTER THIS TRAINING WE SHOULD BE ABLE  
TO CREATE OUR OWN 3D MODELS  
AND EXPORT THEM **TO GLB**,  
A FILE THAT THESE SYSTEMS WILL READ**



## HOW TO **CREATE SCENES** AND **INTERACTIONS** I WILL SHOW IN MY NEXT TRAININGS



The screenshot displays the Blender 2.80 interface. The main 3D viewport shows a scene with a camera, a ground plane, and several 3D models including a tower and a building. The left sidebar contains the Outliner and Properties panels. The right sidebar shows the Properties panel for the selected Camera object, with the Movement component selected. The Properties panel shows the Move Speed set to 0.200 and Turn Speed set to 0.040. The Scripting editor in the center-right shows the following Python code:

```
1 import bge
2 from collections import OrderedDict
3
4 class Movement(bge.types.KX_PythonComponent):
5     args = OrderedDict({
6         ("Move Speed", 0.2),
7         ("Turn Speed", 0.04)
8     })
9
10 def start(self, args):
11     self.move_speed = args["Move Speed"]
12     self.turn_speed = args["Turn Speed"]
13
14 def update(self):
15     keyboard = bge.logic.keyboard
16     inputs = keyboard.inputs
17
18     move = 0
19     rotate = 0
20
21     if inputs[bge.events.UPARROWKEY].values[-1]:
22         move += self.move_speed
23     if inputs[bge.events.DOWNARROWKEY].values[-1]:
24         move -= self.move_speed
25
26     if inputs[bge.events.LEFTARROWKEY].values[-1]:
27         rotate += self.turn_speed
28     if inputs[bge.events.RIGHTARROWKEY].values[-1]:
29         rotate -= self.turn_speed
30
31     self.object.applyMovement((0, move, 0), True)
32     self.object.applyRotation((0, 0, rotate), True)
33
34
```

The bottom of the interface shows the Logic Editor with a sensor for the Camera, a controller for the Camera, and an actuator for the Camera. The actuator is configured to apply movement and rotation to the Camera object.

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# THANK YOU FOR YOUR ATTENTION



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