

Inspiration Teacher material

Inspiration for maker activities/projects

A. Credits to Makerspace Larnaca <https://makerspace.onek.org.cy/ekpaidefsi/>

“The Youth Board of Cyprus has put together an Educational Curriculum on Educational Technology. It is based on expanding topic units of school curricula through STEAM topics, with the application of technological tools. The programme aims at enhancing 21st century skills and has been designed in a way that develops critical thinking, scientific learning, as well as communication and cooperation skills. The education curriculum is facilitated by Youth Makerspace employees at its premises or at the school’s premises which can be visited by the Mobile Makerspace.”

Language: Greek

Primary school	Middle school	High school
Bridge manufacture Complimentary material	Design a tiny house Complimentary material	Video Game I & II Design
Paper drop	Design a mean of transportation	Fan with Arduino sticky notes Complimentary material
We travel to space Complimentary material	We make exercising fun!	Wheelchair with recycling material
	We explore our body Complimentary material	We care about the people around us

B. Credits to John Spencer’s YouTube channel

Maker challenges for students

<https://www.youtube.com/playlist?list=PLzDOGMsmDvetek2wQR1xyCD0SG6ekGU4c>

Specifically:

Video 1: Design the drone delivery system (maker challenge)

<https://www.youtube.com/watch?v=Q8fPxa2rpeg&list=PLzDOGMsmDvetek2wQR1xyCD0SG6ekGU4c&index=3>

Video 2: Create an arcade game (maker challenge)

<https://www.youtube.com/watch?v=4am6dNDQVz4&list=PLzDOGMsmDvetek2wQR1xyCD0SG6ekGU4c&index=4>

Video 3: Design the ultimate tiny house (maker challenge)

https://www.youtube.com/watch?v=6a_P-N3EFIc&list=PLzDOGMsmDvetek2wQR1xyCD0SG6ekGU4c&index=5

Video 4: Design the ultimate rollercoaster (maker challenge)

<https://www.youtube.com/watch?v=PaKtnAsqIt4&list=PLzDOGMsmDvetek2wQR1xyCD0SG6ekGU4c&index=10>

Video 5: Design the ultimate treehouse (maker challenge)

<https://www.youtube.com/watch?v=JfB26SYIdAE&list=PLzDOGMsmDvetek2wQR1xyCD0SG6ekGU4c&index=12>

C. Credits to Stella Timotheou (PhD student at Cyprus University of Technology)

The below activities are adjustable to the age group of the students.

Reduce the school's environmental footprint - Environmental week

The lesson was conducted online. The teacher created an interactive presentation, using [Nearpod](#) about the environmental footprint and students had to answer questions individually. After that, students worked in groups to manufacture an artifact, such as media, threefolds, t-shirts, etc. Finally, students shared their results with the school's population.

Students decided to work together as a class to reduce the school's environmental footprint, with the use of technology. They suggested creating a herb and vegetable garden in the school's garden. They researched about the plants and vegetables they would plant and they discussed having compost makers around the school, so that they could use the fertiliser in the herb and vegetable garden. They also discussed having a water fountain near the garden and sensors that would track the moisture, so that the garden is automatically watered. The students created a prototype using wood and styrofoam and incorporated the micro:bit. They programmed the micro:bit and added a sensor in a small empty bottle. Duration: 2 months

- Smart home** - environmental issues and STEAM

Programming and use of micro:bit sensors (automatic lights, fan with temperature sensor) Variety of tools and materials (wood, matchboxes, etc.) Students are free to use any material they have available and as a result, creativity is developed.

- Roomba (vacuum robot)** - rounding in Math (Grade 3)

Use of Edison robot, Lego and arts & craft

The students program the robot to move freely in space and when it hits an object, the robot moves backwards and right. Students can use a big white carton box and add a black line to go backwards. Others put boxes in front to recognise an obstacle.

- Maker projects with an emphasis on Math

<https://www.tandfonline.com/doi/pdf/10.1080/00220671.2021.1873721?nedAccess=true>

→ **Smart town:**

The robot identifies objects, recognises their colour and places them in the appropriate bin. Specifically, the robot wanders around until it recognises an object and then places it in the appropriate bin, based on its colour. Use of equipment: Lego EV3 robot and 3D printer to create objects.

→ **Designer robot:**

A marker will be placed on the robot and as it moves, the robot will draw. Specifically, the robot should draw a geometrical shape based on the algorithm students will give, such as a house, a word, a number, etc. Use of equipment: Arduino Uno Rev3, 3D printer to create the base and the wheels of the robot.

→ **LED Cube Robot:**

The led lights light up successively, based on the algorithm and they create a magnificent view. Use of equipment: Arduino Uno Rev3, 3D printer to create the base of the robot, Led lights.

More projects about: ATM manufacturing, frog, robot rescuer.

- D. Credits to the students of the University of Oulu, Finland (Year 1, Master program Learning, Education and Technology) Supervisor: Jari Laru, Master student: Maria Adamou

Group A:

Reducing food waste - Design challenge using TinkerCAD

Instructables:

<https://www.instructables.com/Reducing-Food-Waste-Design-Challenge-With-TinkerCa/>

Google Classroom:

<https://classroom.google.com/c/MjQyNjQzMjlyNDY1?cjc=yh3ptjo>

Group B:

Mnemonic world - Design challenge using TinkerCAD, Minecraft Edition

1) Brief presentation <https://spark.adobe.com/page/IHELqfMeOgvm8/>

2) Google classroom

<https://classroom.google.com/c/MjQ0NDMxMjU0OTI0/m/MjQ1MjgyMTY0OTUw/details?cjc=msxf2nr>

code: *msxf2nrmsxf2nr*

3) Main teachers' and students' instructions

<https://www.instructables.com/Mnemonic-WorldTinkercad-Minecraft-Quizlet/>

4) Instructions for Minecraft integration

<https://www.instructables.com/How-to-Upload-3d-objects-From-the-Tinkercad-to-the/>

5) Example of Quizlet activity <https://quizlet.com/class/16776876/>

Group C:

1) Student material <https://classroom.google.com/c/MjQ0ODUxNzM3NzY3?cjc=p5vsx3c>

2) Teacher material

<https://www.instructables.com/Urban-Farming-Integrated-With-Beekeeping/>

Examples:

- Flower tank <https://www.tinkercad.com/things/0tkwro2bSrt-flower-tank/edit>
- Bee hive <https://www.tinkercad.com/things/6bHKBZEoa17-bee-dome/edit>
- Arduino pump
<https://www.tinkercad.com/things/iGARI4mchNi-arduino-automated-temphumidity-control/editel?sharecode=DCSlyOsC0C2LTs3F2BkG7TjVPCFm60YBhRk9pu9v3c4>
- Adafruit LED+sensor https://makecode.com/_DgkeTuaDdTue

Group D:



- 1) Lesson plan:
https://docs.google.com/document/d/15o6anU_bAOTpkvZfrTuUxMc7HVmyXutF-S_1wfjaApw/edit
- 2) Students' learning environment - <https://sites.google.com/view/reinco/homepage>
- 3) Invite link to Google Classroom (Note: Only used for deliverable return)
<https://classroom.google.com/c/MjEwMTg3NTQzNDE2?cjc=o3jw4xw>

Further sources for information:

- A maker project or a maker activity can be introduced to students and align with one or more of UN's 17 Sustainable Goals (<https://sdgs.un.org/goals>)
- ATS STEM <http://www.atsstem.eu>
- <https://www.facebook.com/Αξιοποίηση-των-Νέων-Τεχνολογιών-ΤΠΕ-στο-Σχολείο-255717194447144/?ti=as>
- <https://blogs.sch.gr/bgkadolia/?p=158>
- <https://www.ck12.org/student/>
- Digital Tools: Miro, Padlet, Nearpod (organise material and activities), Flipgrid