

ANISOARA AYDIN



Erasmus+ Programme- Strategic Partnership

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“Taking a Learning Journey on the STEAMTrain” (2019-2022)

-TEACHER'S GUIDE-



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PROJECT SUMMARY

Social inclusion is a priority for Europe so our Project is related to the 2017 European Pillar of Social Rights https://ec.europa.eu/commission/priorities/deeper-and-fairer-economic-and-monetaryunion/european-pillar-social-rights_en and to 2015 Paris Declaration

http://ec.europa.eu/education/news/20150316-paris-education_en It promotes inclusiveness, diversity, equality, gender balance, non-discrimination, tolerance through education, as the strategic framework in Education and Training 2020

http://ec.europa.eu/education/policy/strategicframework_en

Regarding making lifelong learning and mobility a reality. Improving the quality and efficiency of education and training. Promoting equity, active citizenship and enhancing creativity/innovation, entrepreneurship, at all levels. Our children have a variety of social and educational backgrounds. They face obstacles of communicating effectively in the language of the country they live in. Student wellbeing is a priority for us. The need to be more inclusive is a concern and motivation to prevent leaving school early so we decided that the best is an exchange of good practices, as all 6 schools face the same problem: social inclusion.

Back then, in 2019, all 6 partner schools had a need for educational intervention to keep up to date with the latest methods and best practice in European Education and social inclusion through digitalization, gamebased learning, robotics, integrated science, arts and mathematics with digital devices (STEAM).

The Project created a European dimension and promote global citizenship. Over 2 years, we shared the good practice in order to improve the quality, continuous training of teaching staff by organizing 2 short term joint staff training events. The 2 short-term exchanges of groups of pupils ensured a better language competence and ICT competencies. They gained socio-cultural knowledge of the partner countries and become more confident, resilient global learners.

Our project was inclusive to all ages, ability, and gender including children with disadvantaged backgrounds and/or special needs. We aimed to better language fluency, particularly in English

Achieved Objectives:

1. Using non-formal education methods we improved language competences, ICT skills and relationship skills in our pupils from 6 partner schools from Bulgaria, Croatia, Italy, UK, Romania and Turkey during 2 short-term exchange of groups of pupils and Project's activities.
2. Using structured courses during staff training mobilities, we taught 24 teachers from 6 partner schools from Bulgaria, Croatia, Italy, UK, Romania and Turkey with 15 effective methods of interactive teaching and learning based on web tools 2.0 and robotics; phenomena based learning and inquiry based learning, essential tools for delivering 21st century lifelong teaching and learning strategies and aiming to develop skills of critical thinking, problem solving and research techniques.
3. Using non-formal education methods focused on social inclusion activities we developed the international dimension of 6 partner schools from Bulgaria, Croatia, Italy, UK, Romania, and Turkey by participating in this Project.
4. Using non-formal education methods we ensured an inclusive educational atmosphere in 6 partnership schools participating in this Project and communicating through a variety of media.

Methodology

Research, experiments, teamwork, kinaesthetic learning approach, phenomenon and inquiry based teaching and learning, discussions, cultural visits, design and making, acting, mobilities.

Results

- Increased motivation by 20% to learn English in 4000 students and 250 teachers from the 6 schools
- 4000 students and 250 teachers developed ICT competences by 20% (learning about robotics, programming, web tools 2.0, PPT presentations, creating project materials, Scratch, web design, survey monkey, making videos, training and sharing information and expertise with staff from other schools, scientific investigations and other STEAM related tasks)
- Social integration and civic involvement: during 2 short term exchanges of pupils and Project activities, 4000 pupils learnt how to respect, tolerate and integrate with each other
- Entrepreneurial abilities: during 2 short-term exchanges of pupils, all 6 partner schools organised a local fair and promote their country and its produce. PBL promotes skills required to be young entrepreneurs.

The tangible results

Project website, TwinSpace, a Guide for Teachers, Padlets, lionoits, postcards, Project Logo, articles in media, posters, leaflets, schools' website, Erasmus+ boards, rollups, brochures, testimonials, eTwinning Clubs "Prepared for Future. Prepared for Life" in all partnership schools, folders with best practices/ learning scenarios learnt during this Project, surveys, greet- meet videos.

CHAPTER 1

TRAINING MATERIALS

STEM vs. STEAM

Technology is driving transformation and innovation in all aspects of our lives. It is our duty, as educators, to keep up with it, so our students will benefit from it.

Computers, smartphones, and AI became part of our existence. The modern technology helped improve our education, daily activities, and much more. However, there remain certain soft skills a computer simply cannot replicate in the workplace: teamwork, cooperation, creativity and adaptation to change, emotions, etc. For the jobs of the future, “Proficiency in the arts will be particularly important to engineers and computer scientists in emerging industries, such as themed experiences, gaming, and simulation and training,” explains Ali P. Gordon, Ph.D., an associate professor in mechanical and aerospace engineering at the University of Central Florida. “Programmers and engineers are increasingly teamed up with artists to co-develop software, products, renderings and more.”

As a result, education professionals have developed the acronym STEAM (science, technology, engineering, art and math), leading many to assess STEM vs. STEAM, their merits, and their application in the professional sphere.

What Is STEM?

STEM-focused curricula aim to equip professionals with the skills and knowledge necessary to compete in a global economy across the disciplines of science, technology, engineering and math, as well as subspecialties such as statistics, biology, psychology, economics, agriculture and aeronautics.

While STEM jobs contribute to advancing the economy through innovation, rapid technological changes continually create demand for new jobs within the STEM field, making some previously required skills and tasks obsolete. As such, STEM represents a dynamic set of fields, and it is important for students to gain subject-matter knowledge while also developing the flexibility and well-roundedness needed to adapt to changes as they occur.

What Is STEAM?

These changes, as well as the growing emphasis on soft skills across industries and roles, are creating the need for curricula that integrate **STEM with the arts**. According to The Conversation, creative skills and knowledge of the arts, such as design, writing and history, help STEM employees solve problems in more innovative ways.

By integrating the arts into STEM, **STEAM-focused curricula incorporate the study of the humanities, language arts, dance, drama, music, visual arts, design, new media and more**. The 2019 LinkedIn report notes that creativity, persuasion and collaboration are the top three skills companies seek in prospective employees.

What Is the Difference Between STEM and STEAM?

When looking at STEM vs. STEAM, the difference lies in the way they approach scientific concepts. STEM focuses explicitly on the hard scientific, technological, engineering or mathematical skills to drive progress or create a new concept. In STEAM curricula, per The Conversation, students leverage both hard and soft skills to solve problems.

For example, STEAM encourages collaboration to understand a STEM concept. By integrating concepts and practices of the arts, STEAM uses tools such as data visualization or fine art imagery to deepen one's understanding of science, math and technology. It is a out-of-the-box thinking that leads to create new products using 3D printers or distill complicated data sets into easy-to-understand formats, such as infographics.

Digital STEAM. Teaching integrated science, arts and mathematics with digital devices focuses on pedagogical use of tablets in STEAM lessons, both in-class, science museum and outdoors settings.

This LTTA for teachers covers: apps covering different content and activities to support learning, communication and self-assessment, best practice approaches and practical examples for using mobile devices, tablets, laptops, and PCs in lessons and education, responsible and safe use of digital devices and new media, creating interactive materials for classroom use, designing, planning and writing sample units of work or lesson plans that deploy the digital devices and more.

- web 2.0 tools: 3D Designing Tools. Printing 3D. Virtual tours, music/collaboration tools
- Communicate, Collaborate, Build Engaging Learning Experiences
- Geometric Art in nature/ human products

- Using Geometric Art in Industry (textile, furniture, publishing etc). Making Geometrical art products
- Programming Geometric Art. Basic steps in programming language LOGO.

The added value of this training is that it offers app search/store possibilities, experience in the tablet/apps use exchange, innovation in methods and approaches while using the m-devices, and implementation of them into daily activities in teaching and learning.

The training event *methodology* - creating an output by working individually or in groups on a concrete product to be used in your own school, such as creating lesson plans, learning scenarios, and educational activities.

Responsible and safe use of digital devices and new media

- Brainstorming



Basic steps in programming language LOGO: from beginning to Geometrical Art

How to program geometrical art in programming language LOGO?

BASIC

FD – forward

BK – backward

RT – right

LT – left

CS – clear screen

With each command must be number written, e.g. RT 90.

Example 1:

FD 50 RT 90

FD 50 RT 90

FD 50 RT 90

FD 50 RT 90

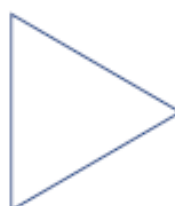


Example 2:

FD 50 RT 120

FD 50 RT 120

FD 50 RT 120



Example 3:

FD 50 RT 60

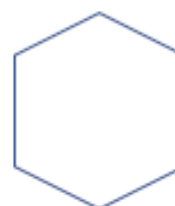
FD 50 RT 60

FD 50 RT 60

FD 50 RT 60

FD 50 RT 60

FD 50 RT 60



Turn left or right in regular shapes: $360/\text{number of corners}$

Easier programming regular shapes with loop REPEAT:

Example 4: REPEAT 4[FD 50 RT 90]

– write it in Edall: TO SHAPE :N :D

CS

REPEAT :N[FD :D RT 360/:N]

END

- after File - Save and Exit run program with numbers :N (how many corner shape has) and :D (how long side of shape is) e.g. Shape 5 75

- try few times with different numbers

EASY GEOMETRICAL ART

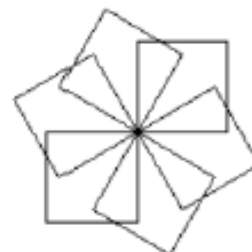
Task 1: Make a program according to rules:

- name of the program is ART1

- the basic shape is a square with side long 50

- there are a total of 6 squares properly arranged in a circle

- the squares touch at one common point, the starting point of the drawing



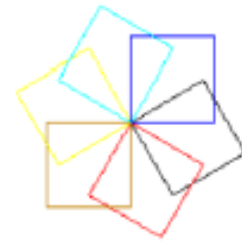
Solution:

TO ART1

CS

```
REPEAT 6[REPEAT 4[FD 50 RT 90] RT 360/6]
```

END



Task 2: Add some colour

- use command SETPC RANDOM number

- add this command in your ART1 program

TO ART1

CS

```
REPEAT 6[SETPC RANDOM 10 REPEAT 4[FD 50 RT 90] RT 360/6]
```

END

Task 3: BE CREATIVE 🧐

- implement what have you learned and make beautiful creative geometrical art

Suggestions:

- use Example 4

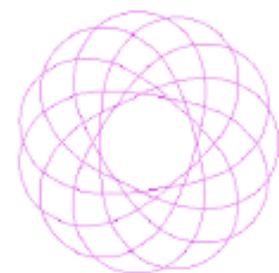
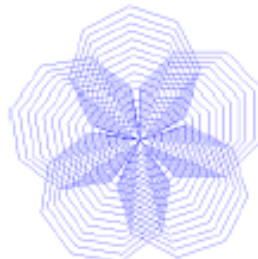
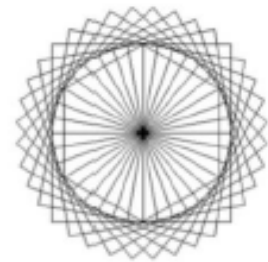
- use random colour

- use different number of shapes

- try to move shape before rotating it

- if you wish to add some circles, command is CIRCLE number

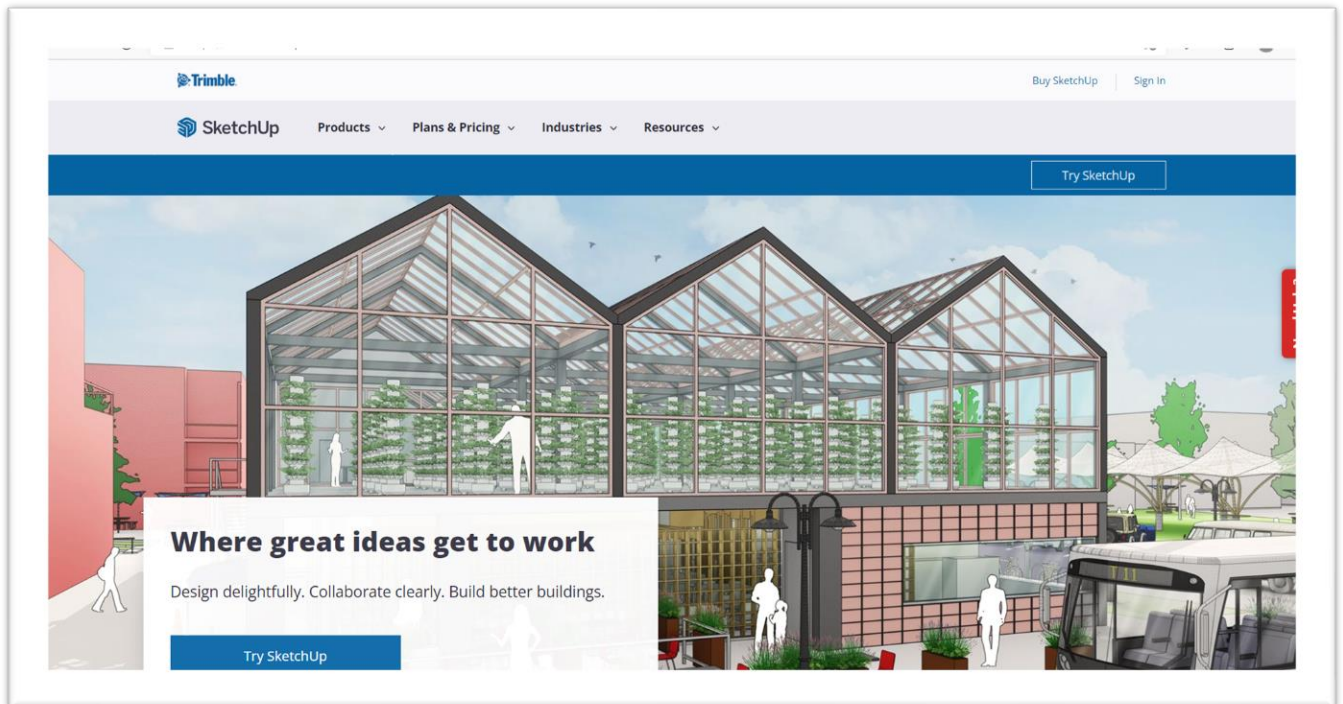
- upload best drawing you can into a Padlet



Try some examples from: <http://www.mathcats.com/gallery/15wordcontest.html>

web 2.0 tools: 3D Designing Tools

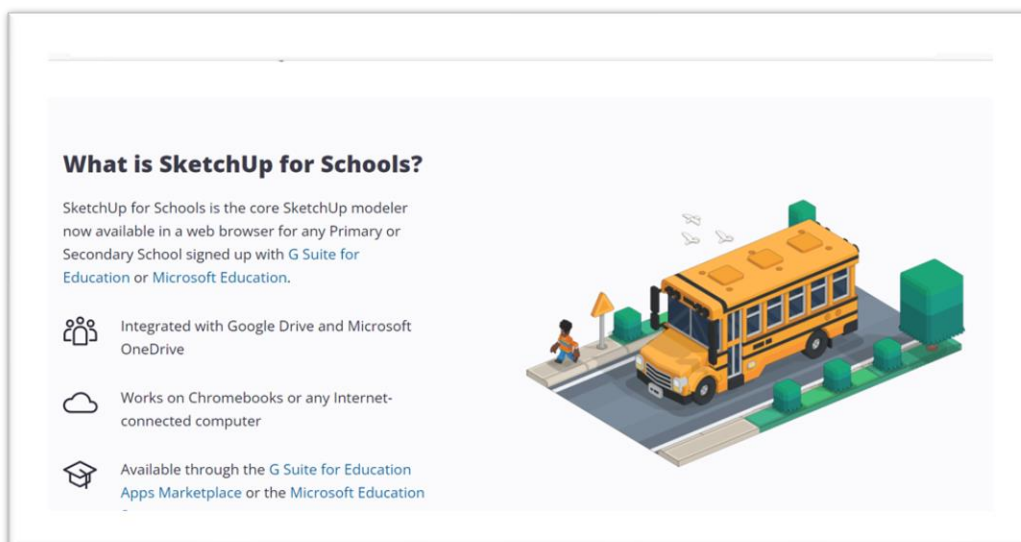
<http://www.sketchup.com/>



SketchUp is a 3D modeling computer program for a broad range of drawing and design applications- including architectural, interior design, industrial and product design, landscape architecture, civil and mechanical engineering, theater, film and video game development.

The program includes drawing layout functionality, surface rendering in different "styles", enables placement of its models within Google Earth.

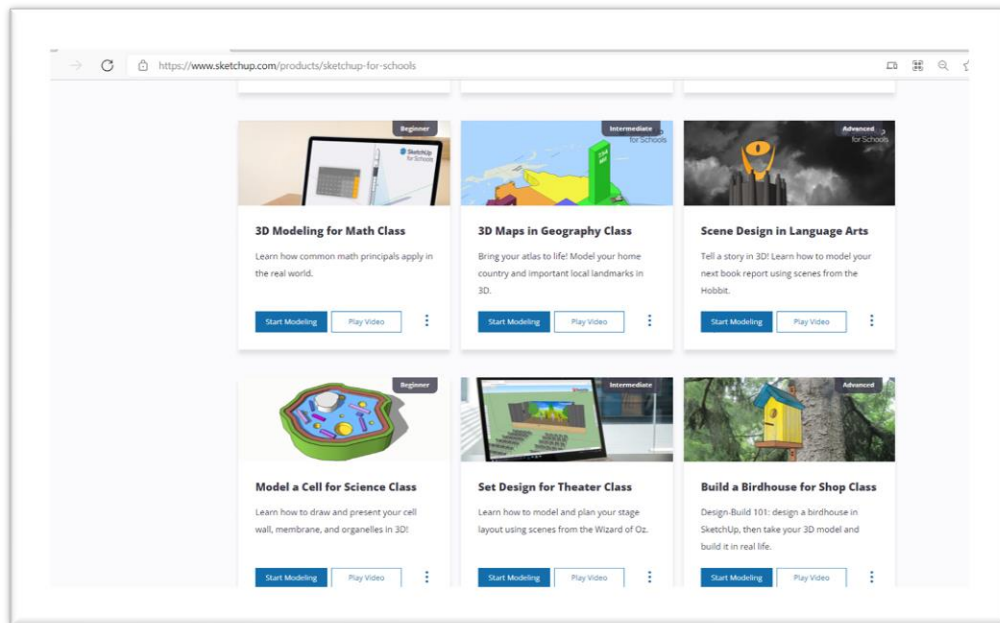
<https://www.sketchup.com/products/sketchup-for-schools>



The platform offers **3D for printing from its sketches for different levels (beginner, intermediate or advanced)**. Here are some videos:

[Printing from SketchUp - Square One - YouTube](#)

[3D Modeling for Geometry Class \(Beginner\) - YouTube](#)

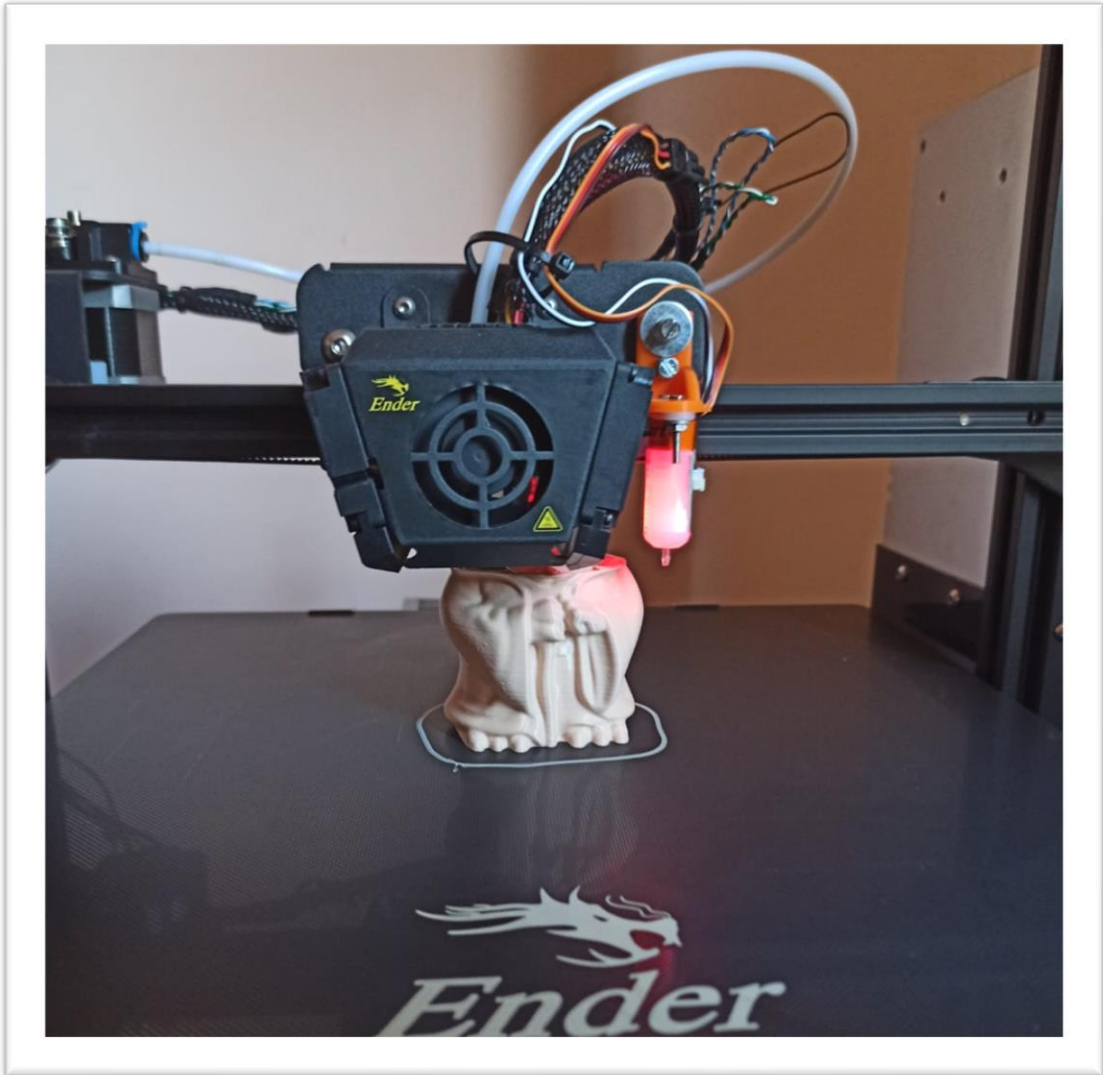
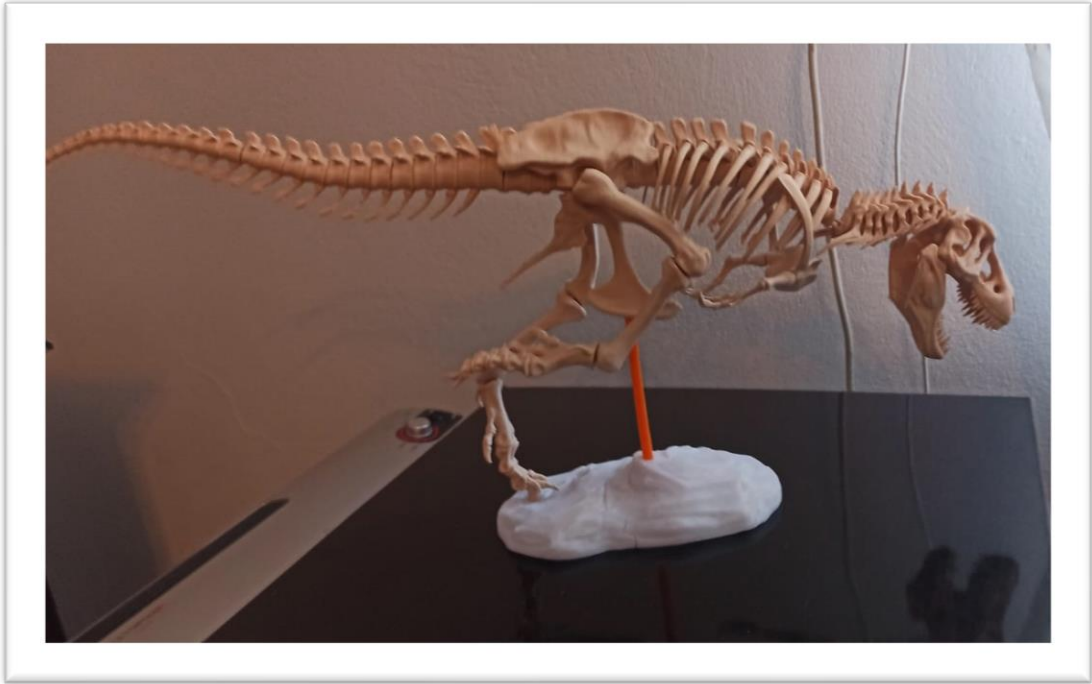


To start modelling, you will need to install the program.

There are also communities <https://blog.sketchup.com/> and <https://forums.sketchup.com/c/developers/12>

to discuss your ideas.



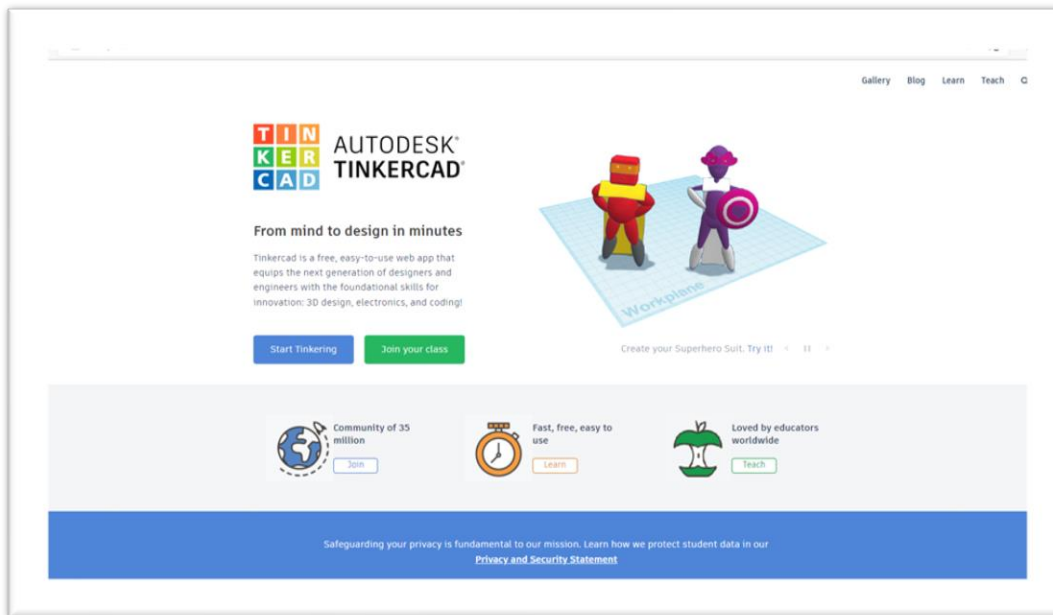




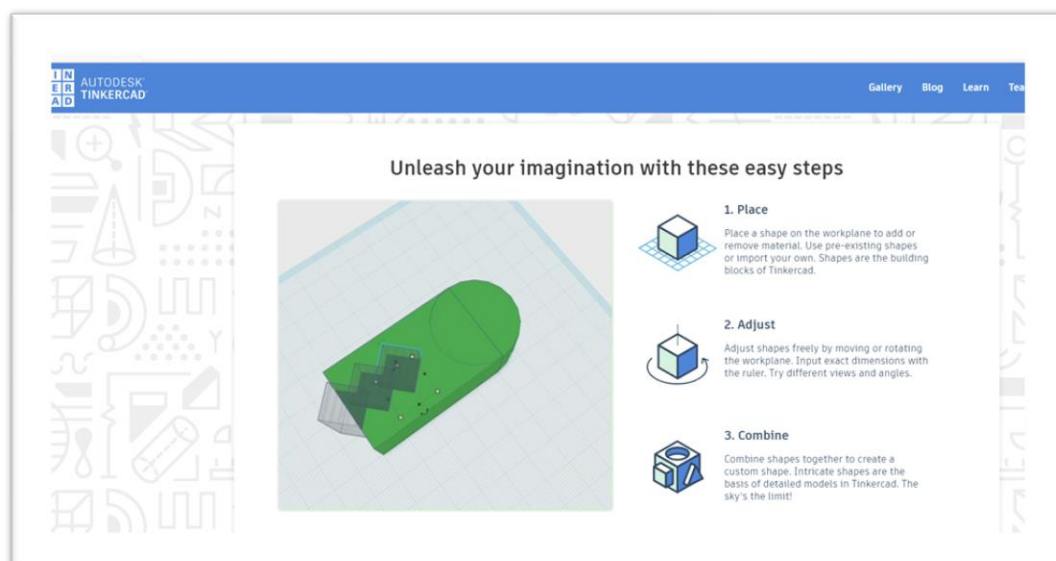
TINKERCAD

<https://www.tinkercad.com/>

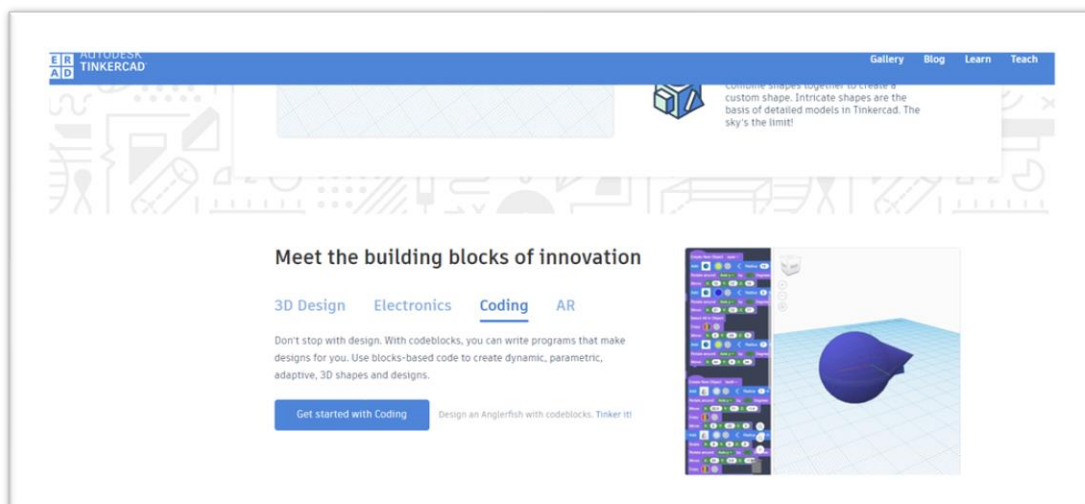
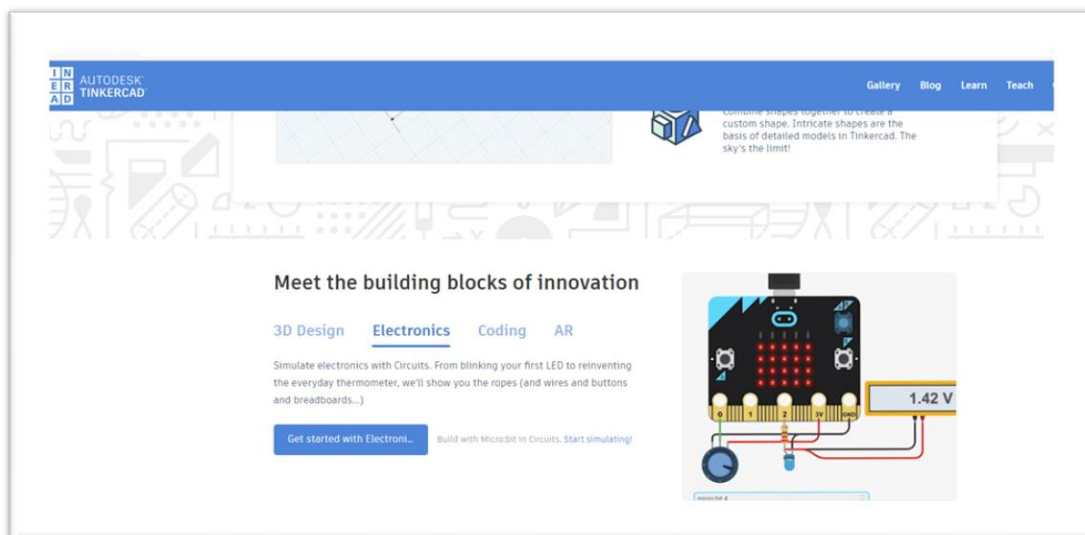
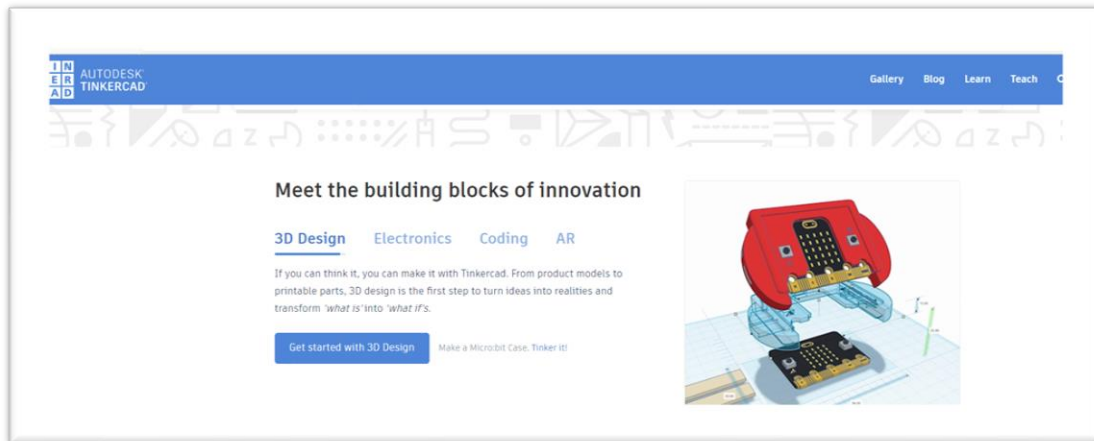
Tinkercad is a free, easy-to-use web app that equips the next generation of designers and engineers with the foundational skills for innovation: 3D design, electronics, and coding.

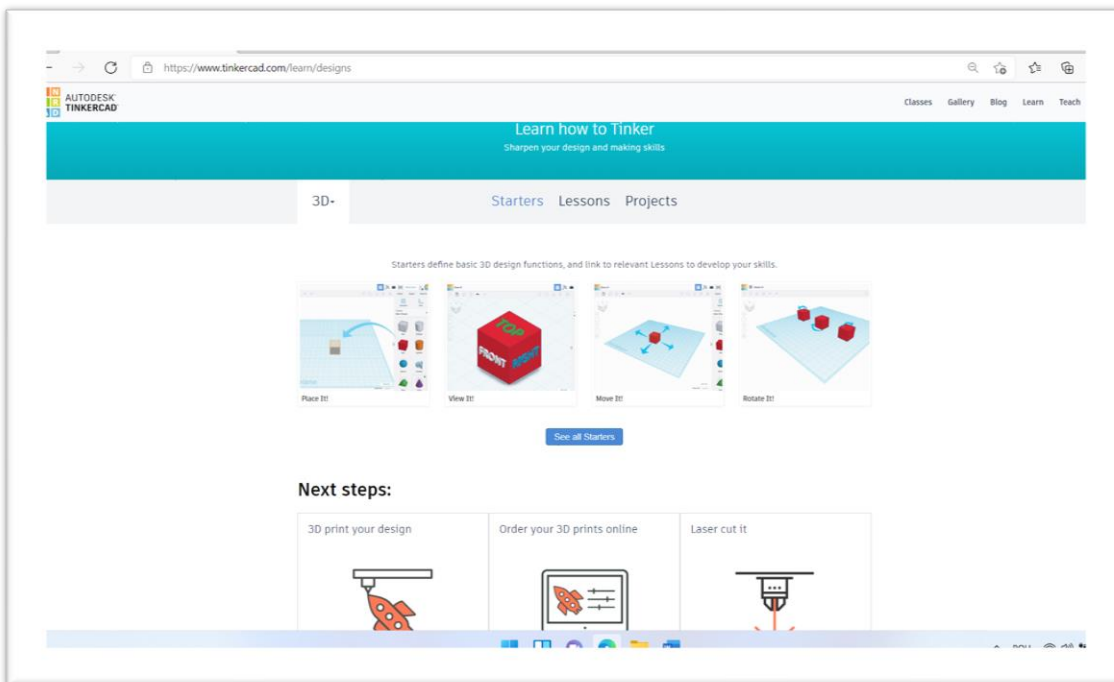
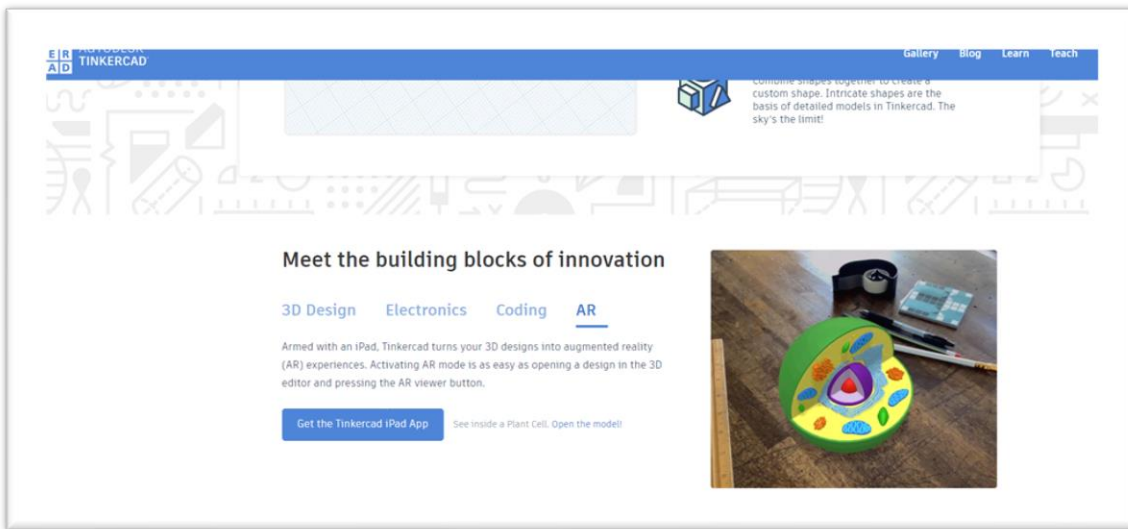


Tinkercad is a free-of-charge, online 3D modeling program that runs in a web browser. Since it became available in 2011 it has become a popular platform for creating models for 3D printing as well as an entry-level introduction to constructive solid geometry in schools.



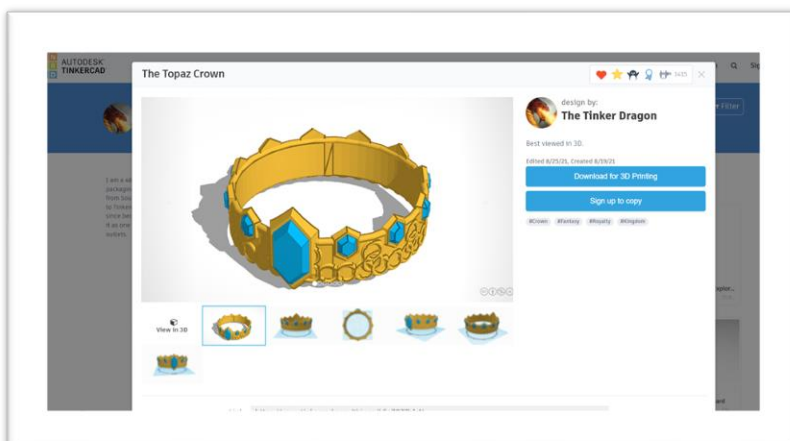
Tinkercad uses a simplified constructive solid geometry method of constructing models. A design is made up of primitive shapes that are either "solid" or "hole". Combining solids and holes together, new shapes can be created, which in turn can be assigned the property of solid or hole. In addition to the standard library of primitive shapes, a user can create custom shape generators using a built-in JavaScript editor.





It offers free 3D Printing samples.

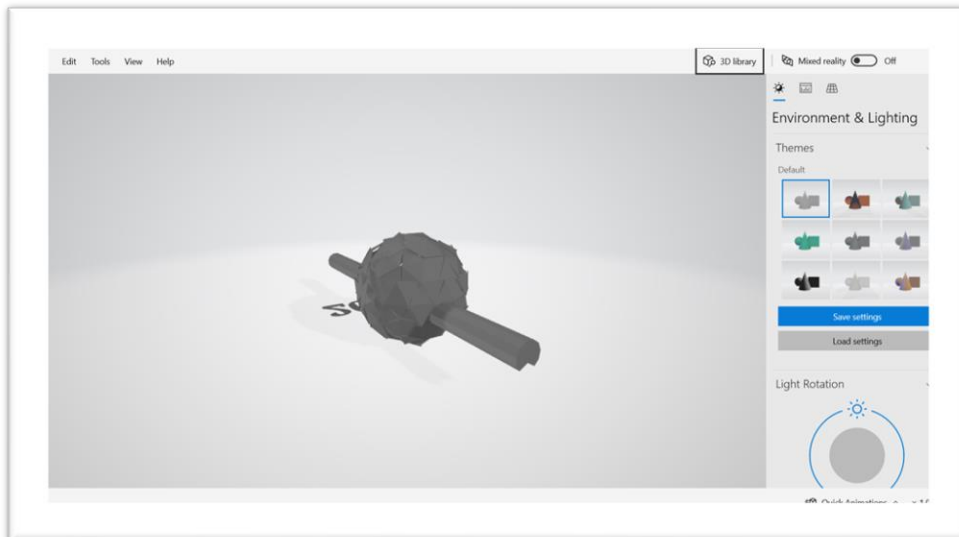
Shapes can be imported in three formats: STL and OBJ for 3D, and 2-dimensional SVG shapes for extruding into 3D shapes. Tinkercad exports models in STL or OBJ formats, ready for 3D printing.



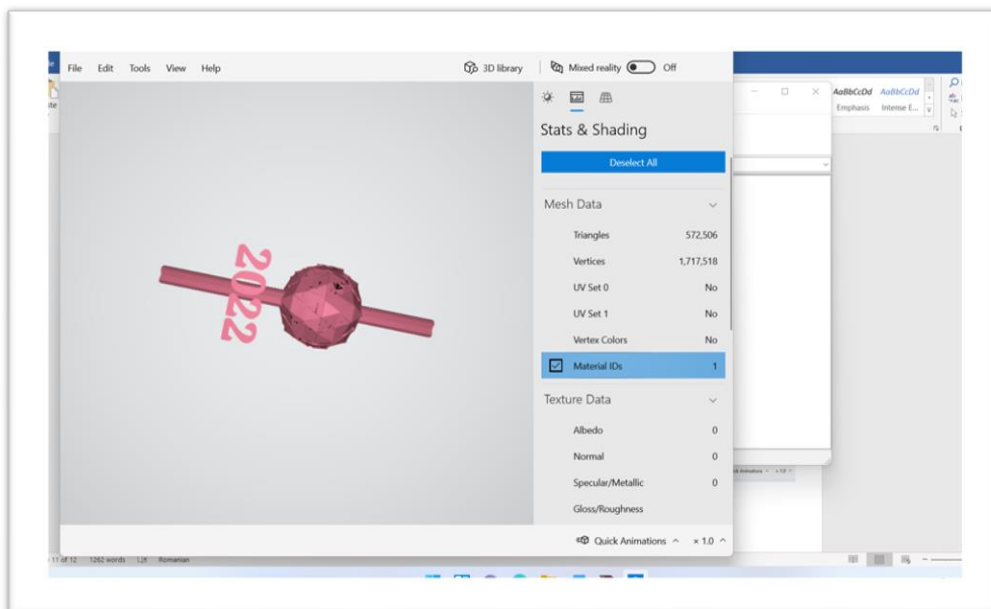
To download the 3D printing, you need to create an account.

<https://www.tinkercad.com/things/38GPH8eL3sP>

Press the button Donload for 3D Printing. An archive will be downloaded, it a file obj.mtl (you need to install .mtl previously), and a 3D Object file tinkercad.obj opened by the help of 3D Viewer. You can edit it, then use it.



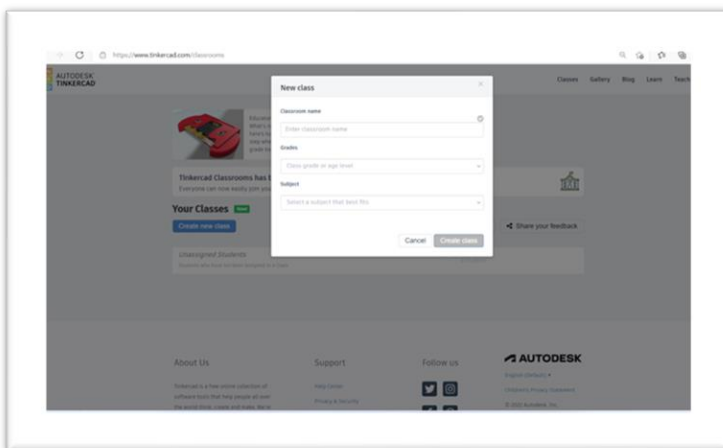
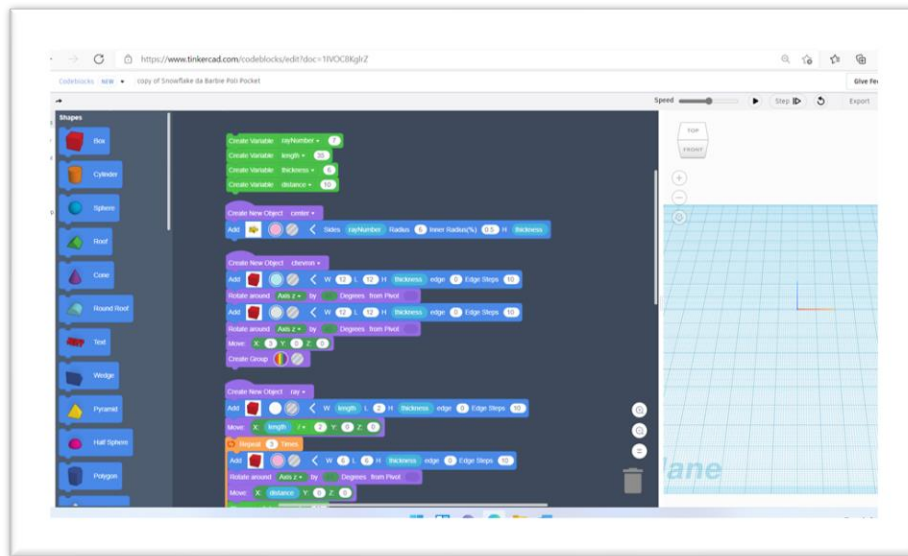
Tinkercad also includes a feature to export 3D models to Minecraft Java Edition, and also offers the ability to design structures using Lego bricks.



It offers free coding samples:

SNOWFLAKE <https://www.tinkercad.com/codeblocks/gCyyP4FV36E-snowflake-da-barbie-poli-pocket>

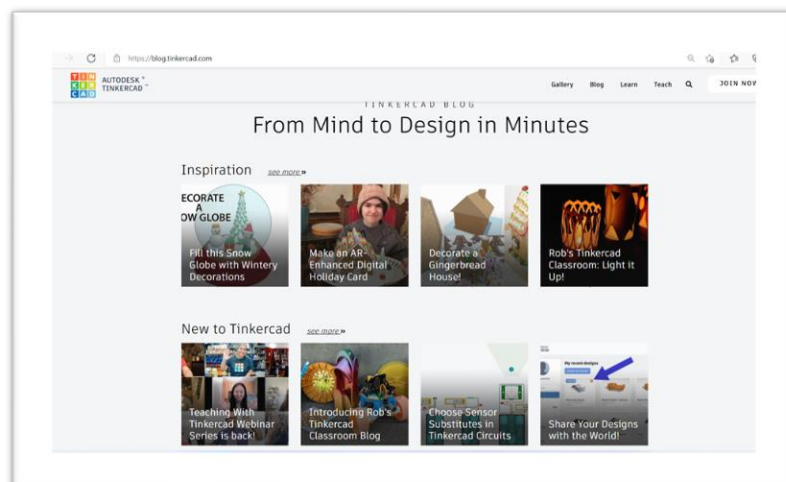
<https://www.tinkercad.com/codeblocks/edit?doc=1IVOC8KglrZ>



You can create your class

When needed, it offers support

<https://blog.tinkercad.com/>



LESSON PLANS & LEARNING ACTIVITIES:

Start Simulating

Let's learn how to test a circuit design with the simulator!

Click the Start Simulation Button

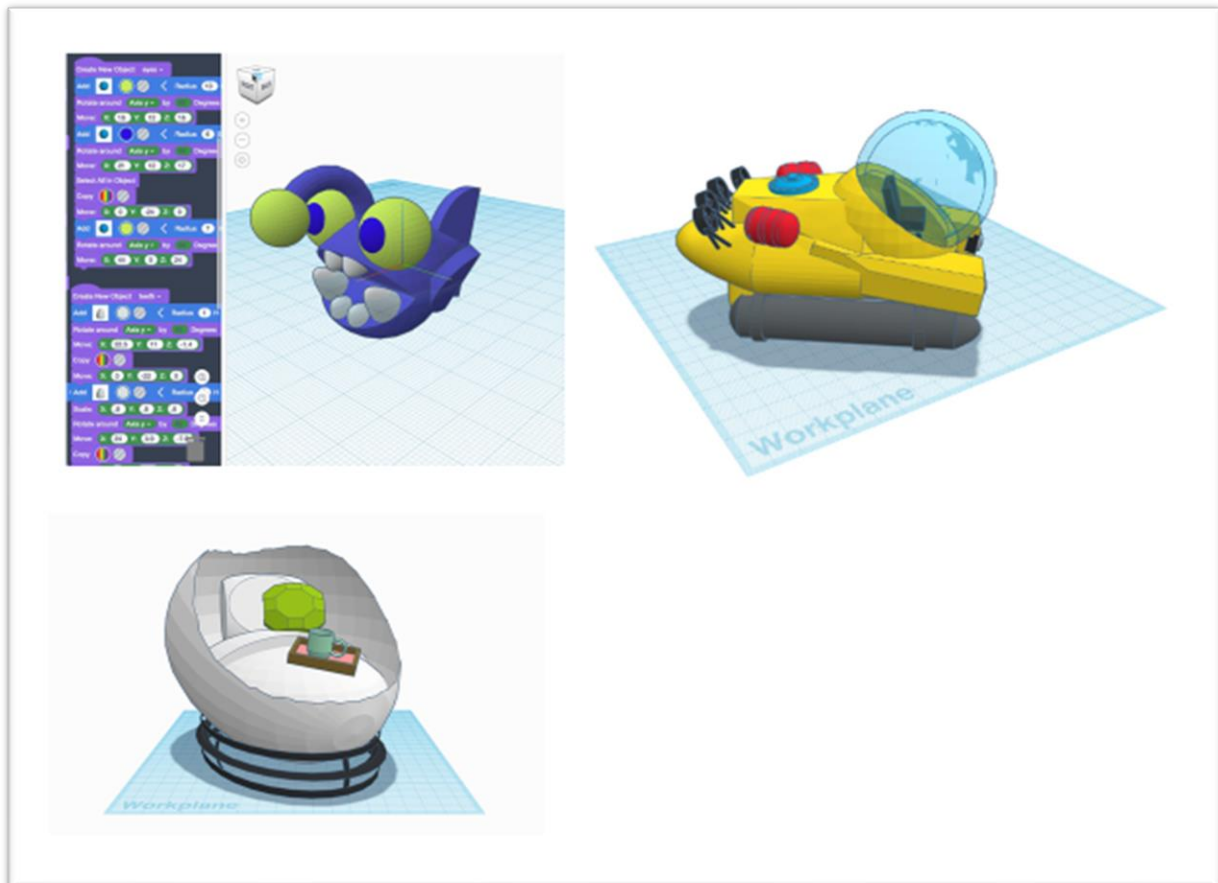
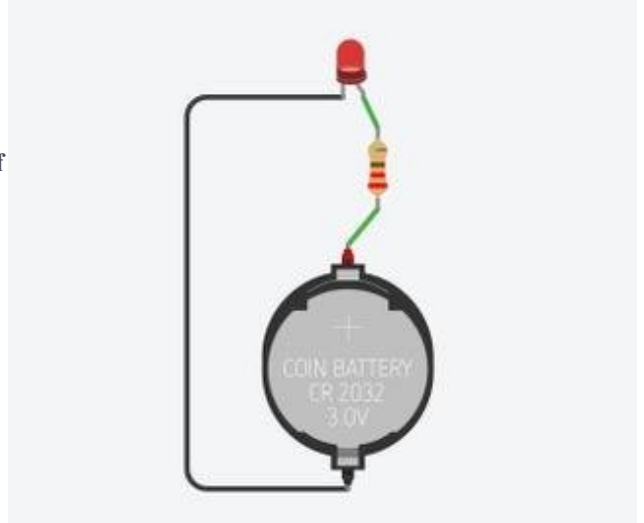
Instructions

1. Click on the Start simulator button located at the right of the toolbar.
2. Continue to the next step



Congratulations - you simulated your first circuit!

- Use the simulator to test your circuit design at any time.
 - If you want to simulate other pre-made designs, check out the Starter Circuits, which you can find by clicking the "+ Components" button and then selecting the "Starters" tab.
- Continue onto the next lesson to learn how to edit component properties in Circuits.



Tinkercad Learning example:

CREATE YOUR OWN AVATAR <https://lessonplan.prd.tinkercad.com/assets/2021-04-29T16/edc72c23.pdf>

APPS TO CREATE ONLINE MUSIC



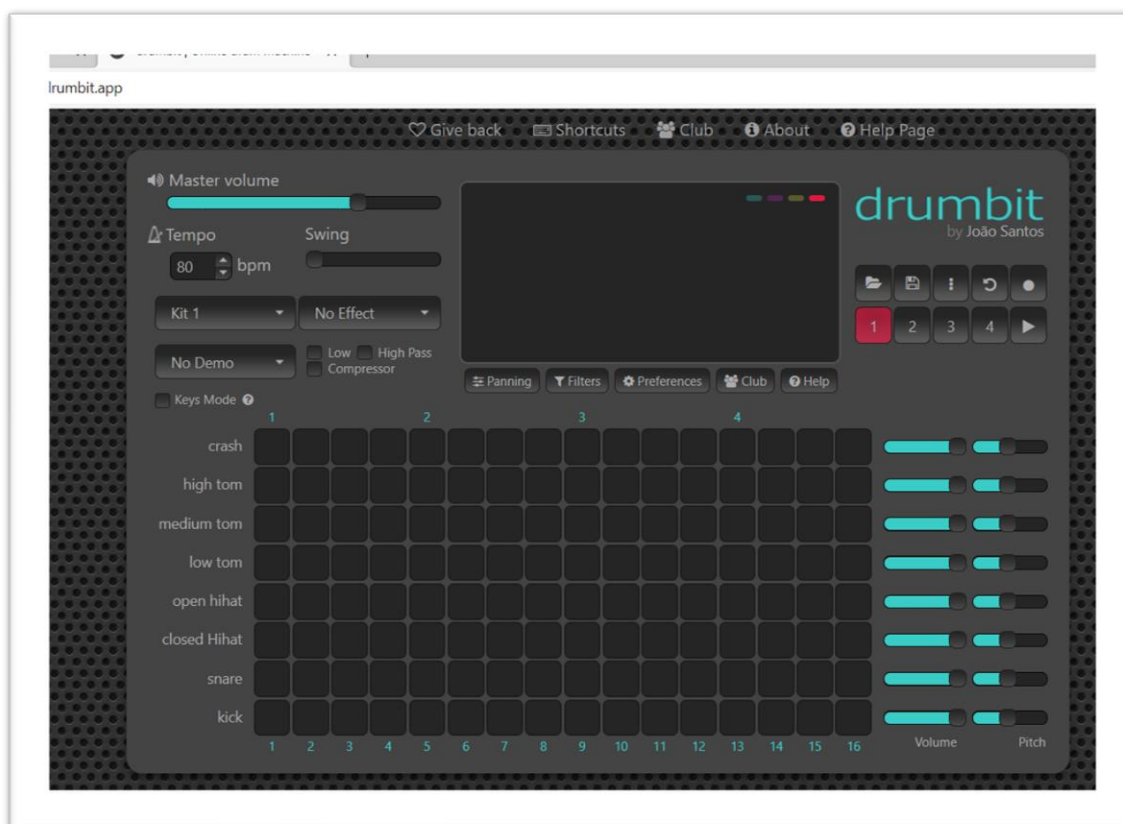
<https://drumbit.app/>

A very easy to use drum machine

It is a web based drum machine, made with HTML5 and it is compatible with all modern browsers. It aims to be a very easy to use drum machine, offering means to put together a drum beat very quickly and in a very intuitive way.

With drumbit you can choose from various drum kits, apply filters and room effects, change individual volume and pitch of the samples in a track and control the left-right distribution through panning. When you're done creating your amazing drum pattern you can save it for later editing or record it as an audio file.

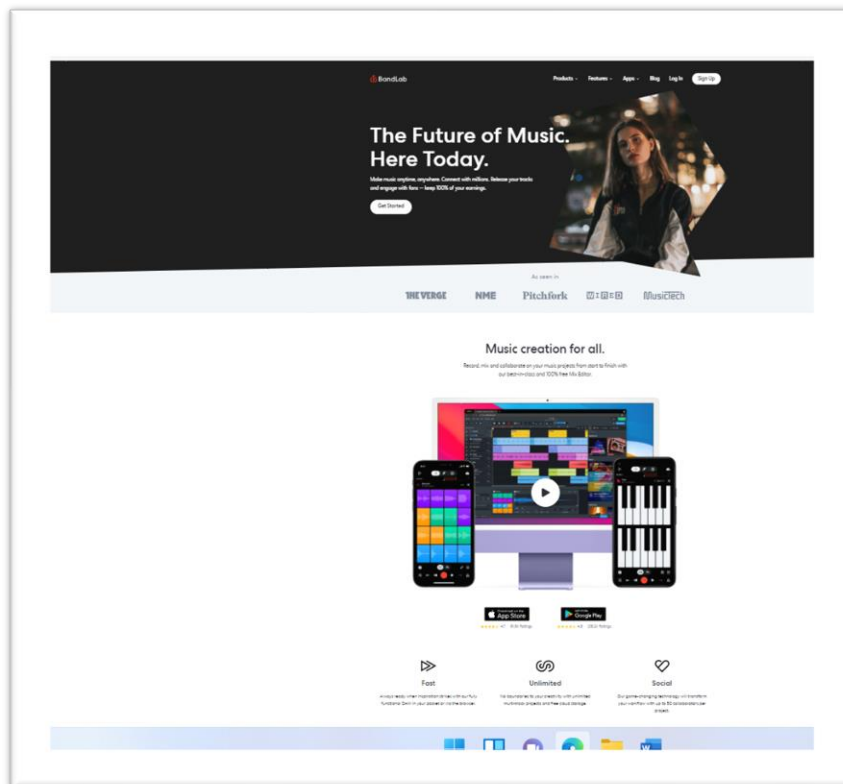
You can share your patterns with other users on [drumbit Club](#), join the drumbit [Facebook Group](#) or get news about the latest developments of drumbit subscribing the [Newsletter](#).



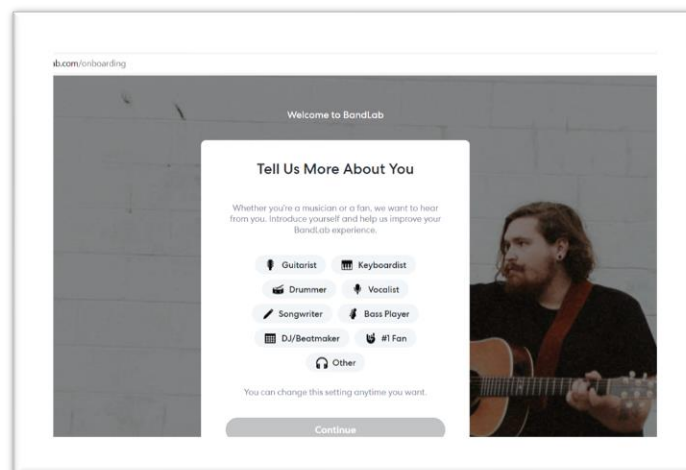


<https://www.bandlab.com/>

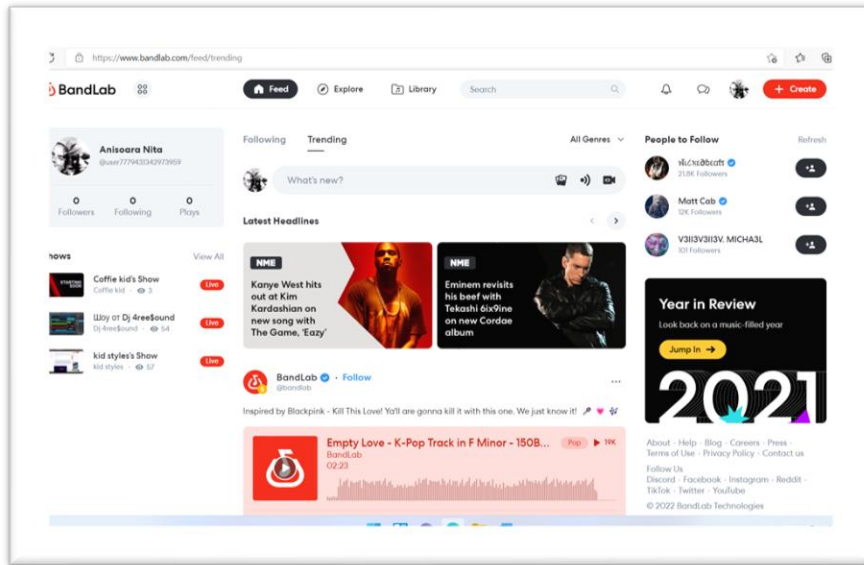
BandLab – a free online Cloud Digital Audio Workstation (DAW) tool for creating music and collaborating with other musicians. It works in a browser or with a standalone app.[21] Bandlab includes BandLab Albums, a digital distribution tool for musicians, allowing them to also create exclusive content for listeners such as demo tracks and behind-the-scenes videos. The tool also includes BandLab Live, a livestreaming feature.



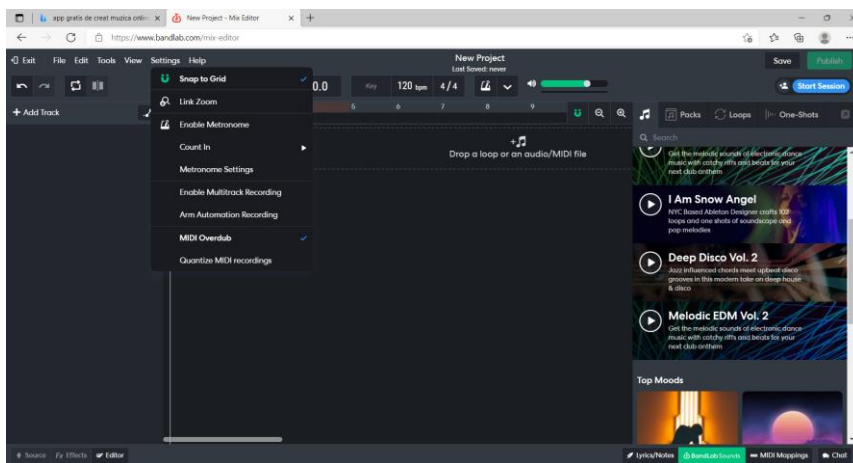
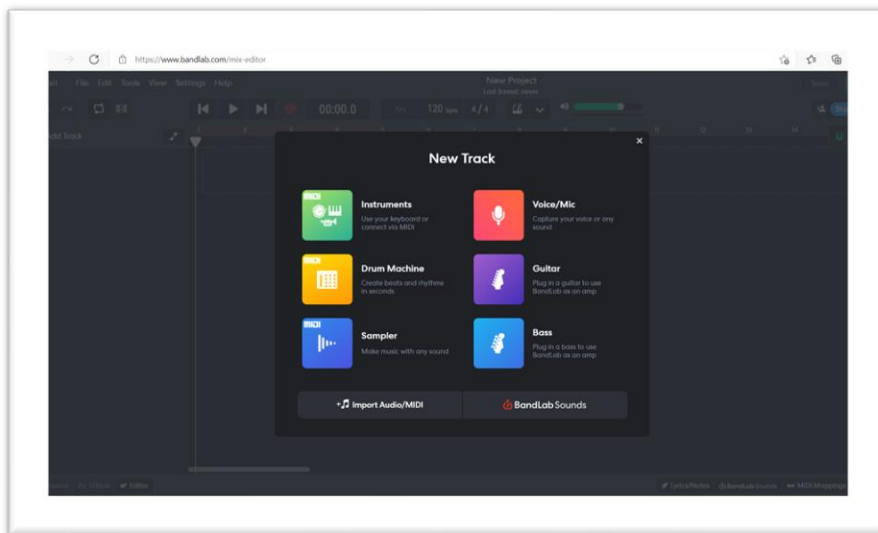
Create an account. Follow the easy steps. Create your music.



Click the red button + Create



Choose New Track



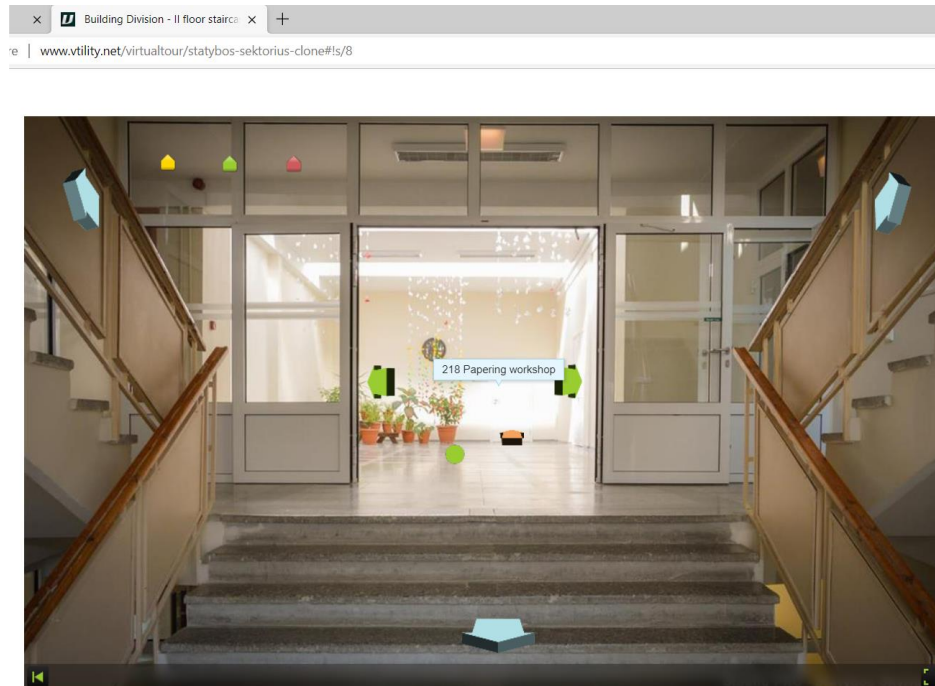
Good luck creating your music!

Creating your virtual tour

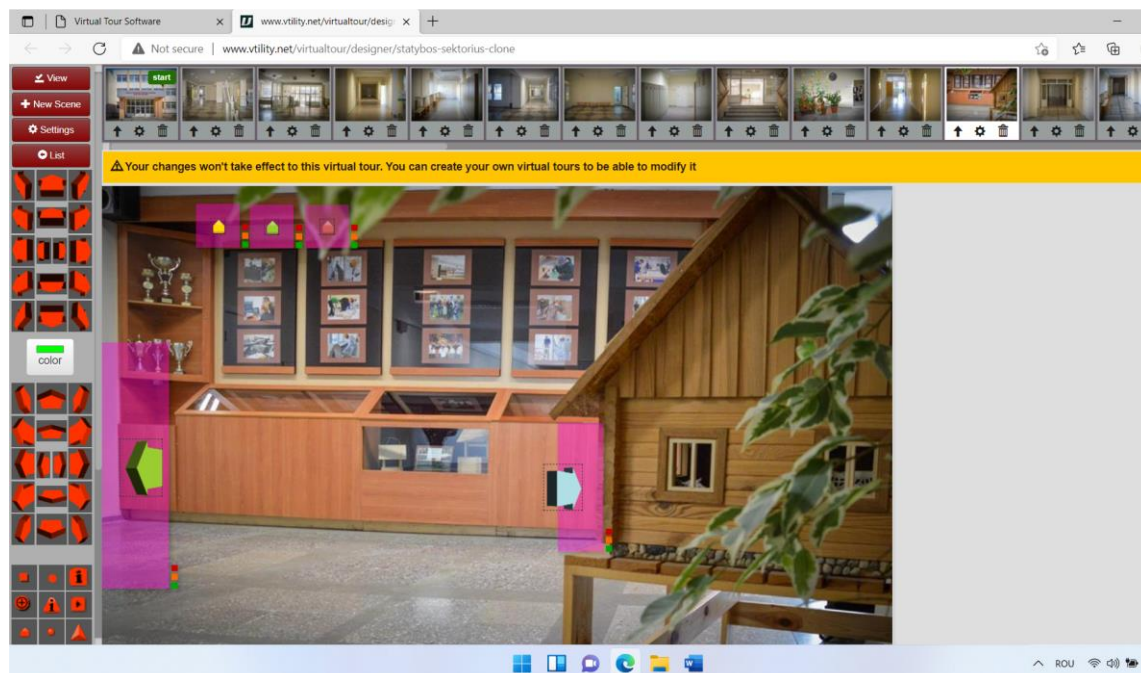
<http://www.vtility.net/>

Vtility is an online virtual tour software for creating online virtual tours. You can design your virtual tours online, for education without any special equipment or software packages. This app offers virtual tours on mobile and tablet friendly and based on cloud.

In order to use the app, you need to have pictures of your school, and upload them to create your virtual tour. Follow the steps given. Add the arrows.



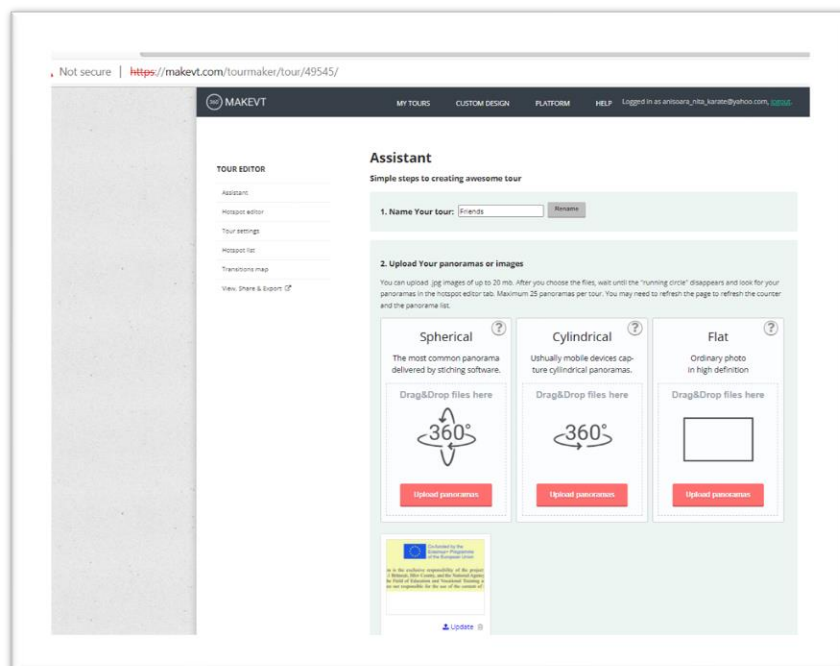
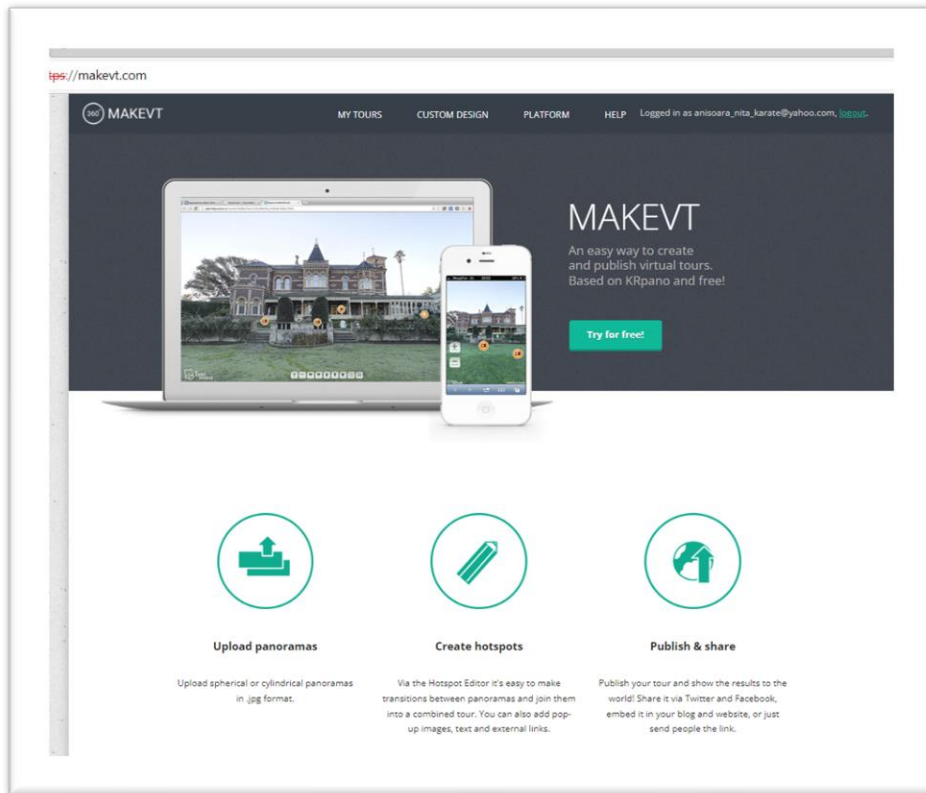
The virtual tour of a school frame by frame:



MAKEVT

<http://www.makevt.com/>

An easy way to create and publish virtual tours. Based on KRpano and free.

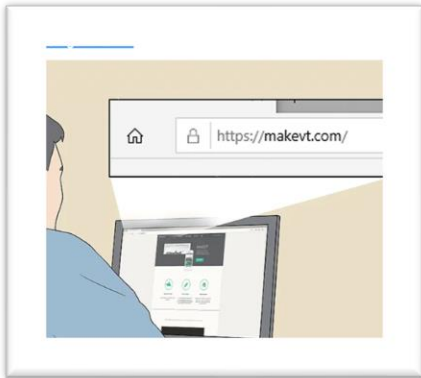


STEPS

A. Recording Your Tour

1. You'll need a camera which can shoot 360° panoramic footage, and a tripod for the camera.
2. The camera must be able to work remotely, controlled via a remote or an app on your smartphone so as to avoid capturing you in the shot.
3. Position your camera. Place the camera in the first room that you want to shoot, making sure to position it in the best location to capture the largest part of the room.
4. Make sure your tripod is level.
5. Turn on and connect to the camera. (Bluetooth. Wi-Fi).
6. Take a panoramic shot. Step out of the room in which you're shooting, then use the remote control or the app to record a 360° take of your selected room.
7. Shoot the rest of the scene, a maximum of 25 photos.
8. Move the photos from the camera to your computer.

B. Creating Your Tour

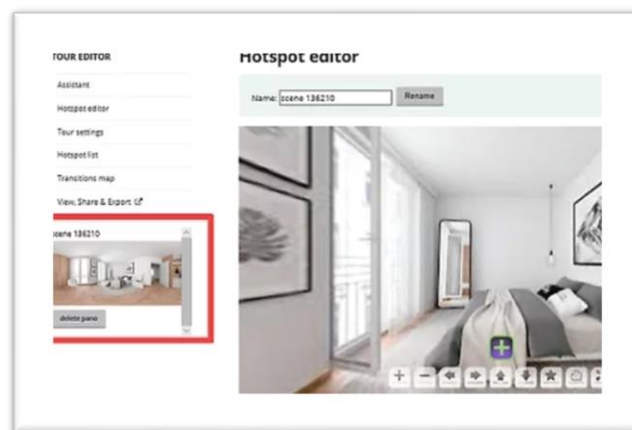


1. Open the MakeVT site. Go to <https://makevt.com/> in your computer's web browser.
2. Click Try for free!. This blue button is in the middle of the page.
3. Create an account and sign in.
4. Click CREATE NEW TOUR. You'll find this option on the left side of the page.
5. Enter a name for your tour. In the "Name Your Tour" text box, type in whatever you want to name your virtual tour, then click Rename to the right of the text box.

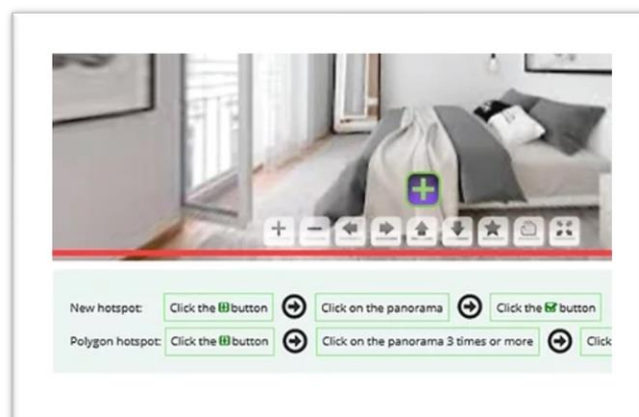
6. Upload your photos. Do the following:

- Click Upload panoramas under either the "Spherical" or "Cylindrical" heading.
- Hold down Ctrl (Windows) or ⌘ Command (Mac) while clicking each photo you want to upload.
- You can upload a maximum of 25 photos at 20 megabytes apiece.
- Click Open.
- Wait for the photos to finish uploading.

7. Scroll down and click Go to the Hotspot Editor. This blue button is near the middle of the page.



8. Select the first scene's panorama. Click the panorama from the first room you shot on the left side of the page. This will open it in the middle of the page.



9. Create a link to the next scene. In order to create a link to transition from the first room into the next one, do the following:

Click +. Click once the panorama. Click ✓

Click an indicator shape (this is what a user will click to move to the next scene).

Click the "Select type of hotspot" text box, then click Transition in the drop-down menu.

Click the next scene's panorama in the "Select the destination panorama" section.

Scroll down and click Save.

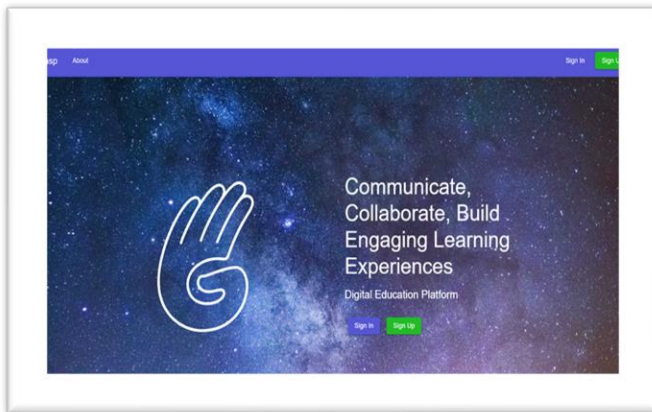
10. Link the rest of your scenes. You'll do this in the same way in which you built the link from the first room to the second one. Once you've completed this process, you can proceed.

C. Publishing the Tour

1. Click View, Share, & Export. It's a link on the left side of the page.
2. Click Publish and view the tour. This blue button is in the middle of the page.
3. Open the virtual tour. When it appears, click the click on this link link in the text below the button.
4. Run through your tour.
5. Add the virtual tour's link to other pages.

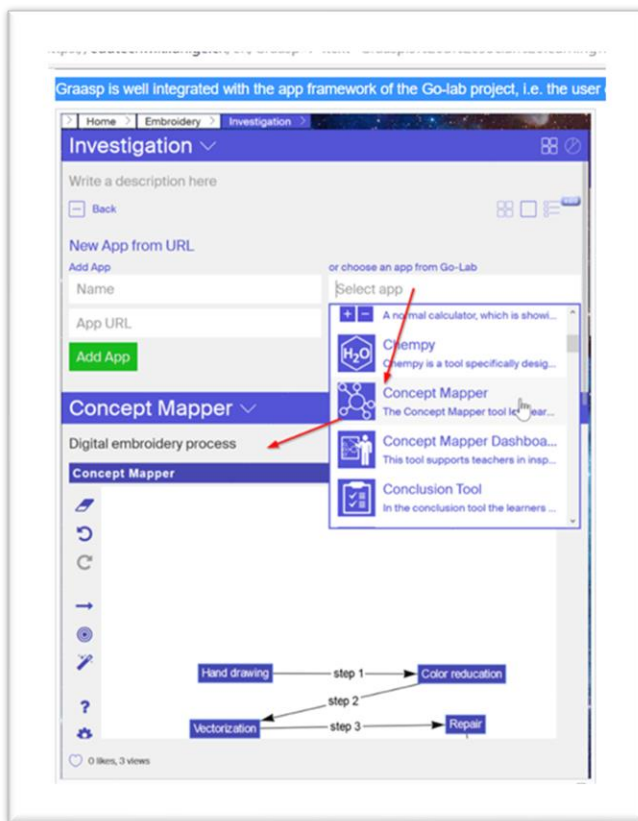
Communicate, Collaborate, Build Engaging Learning Experiences

<https://graasp.eu/>



Graasp is well integrated with the app framework of the Go-lab project, i.e. the user can directly select an app. However some apps require that teachers do something beforehand.

It is a social learning platform. It supports collaborative learning, inquiry learning, using online labs, knowledge management, creating personalized spaces. Graasp is also part of the go-lab project



Users can create either an empty personal learning environment (PLE) or a structured one enforcing inquiry learning scenarios and referred as an Inquiry Learning Space (ILS). Typically, an ILS is created by a teacher who then can invite students.

Graasp has built-in templates to support inquiry learning, e.g. the Pedaste et al. framework, in which inquiry learning is organized in phases: Orientation, Conceptualization, Investigation, Conclusion and Discussion. Each of these items can be filled with sub-items, i.e. "spaces" (aka folders), documents with a page editing tool, attach files, attach links, attach apps, create an ILS, create discussion forum.

Source of image: Graasp - EduTech Wiki (unige.ch)

Geometric Art in nature/ human products



<http://loki3.com/flex/index.html>

Flexagons are fascinating origami-like puzzles. They can be created from a piece of paper by cutting, folding and pasting.

Here is an example: When put on a 3-sided silver octaflexagon, all the rows, columns and major diagonals in the following magic square sum to 222, even after flexing. A flex mirrors each of the four smaller squares along its diagonal and rearranges them, so most magic squares wouldn't survive in this environment.

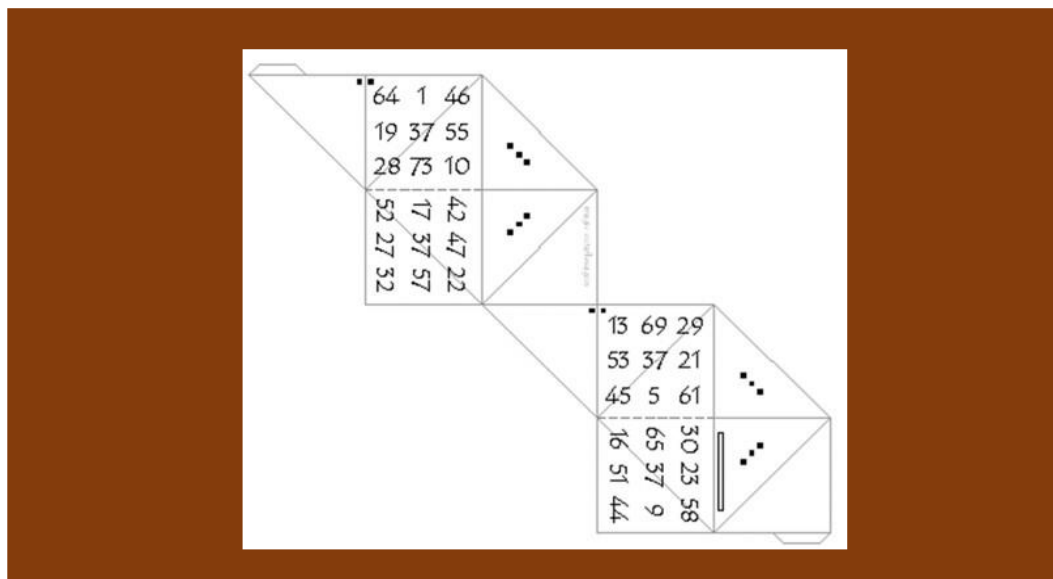
16	65	30	2	45
51	57	23	57	57
44	9	58	29	34
4	1	46	22	25
19	37	55	47	27
28	73	10	47	25

67	17	19	30	58
69	5	5	65	9
51	55	54	16	44
32	27	52	28	19
57	37	17	73	1
47	47	42	10	46

To make a magic octaflexagon, click on the following image to get the full-sized version. Print and cut out.

After cutting it out, also cut along the two dashed lines. Pre-crease along all the gray lines. Find the two numbered squares connected by only a single edge and fold them backwards and paste in place. You should see two pairs of adjacent triangles with three squares on them. Fold these adjacent triangles face to face. Fold the two pairs of adjacent triangles with a single square in the corner back to back. You should now have a large square, with all the numbers on one side. Tape the extra flaps down to finish the flexagon.

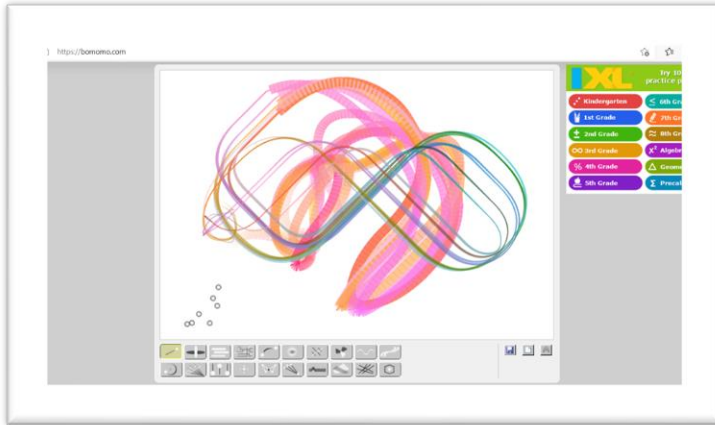
To flex the flexagon and rearrange the numbers, start from the numbered side and perform a pinch flex, similar to what you can do on a [hexaflexagon](#). Fold the four diagonals into valley folds and the four lines between the squares into mountain folds. Bring the four corners together in the back and open up the center. This rearranges the numbers, but all rows, columns and major diagonals still sum to 222.



Making geometric line art –

simple drawing using pencil and colour expression and tools

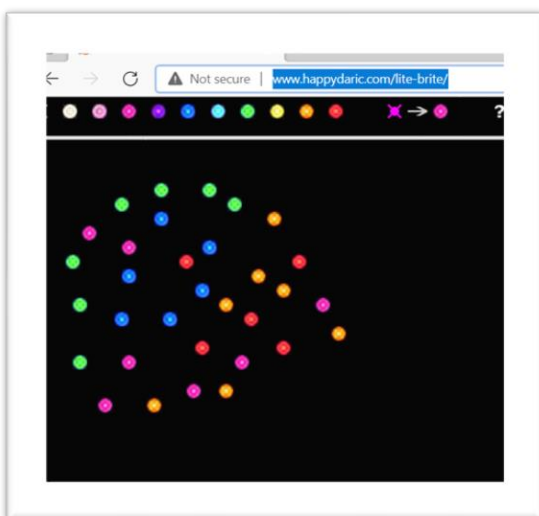
bomomo.com



It is an online tool in which users can use their imagination and create pieces of abstract art while moving the mouse around as they please. This is not an art program that you use when you already have an image in mind, everything happens in the present moment and this is what it makes it unique and very fun.

This art program does not have an erase option, just a clear. Although correcting mistakes is possible, as there is a permanently white brush. The user does not choose the colours. They are randomly selected, and usually change. Drawings can be saved in jpg format.

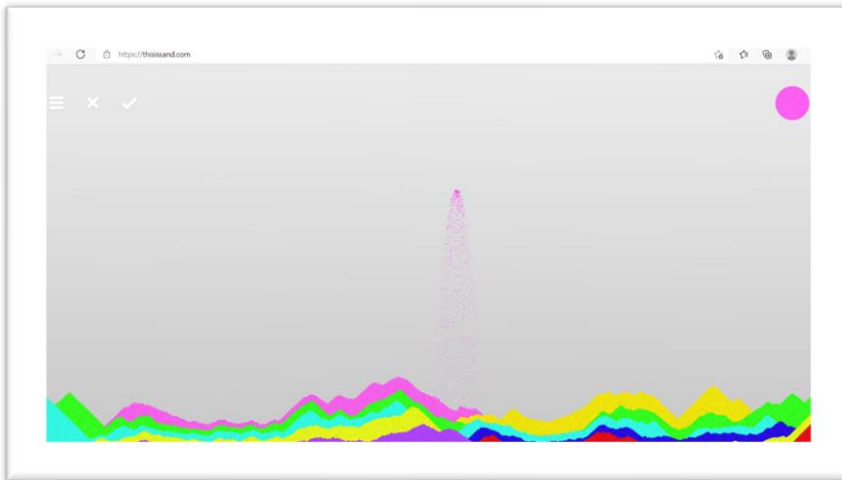
<http://www.happydaric.com/lite-brite/>



Lite-Brite is a toy that was originally marketed in 1967. It consists of a light box with small colored plastic pegs that fit into a panel and illuminate to create a lit picture, by either using one of the included templates or creating a "freeform" image on a blank sheet of black paper. There are eight peg colors: red, blue, orange, white (clear/colorless), green, yellow, pink, and violet (purple).

In the event that pegs were lost or damaged, Hasbro provided refills and/or new colors. Color-by-letter templates were sold with the set so that children could create characters including Mickey Mouse, Scooby-Doo, My Little Pony, and Transformers among others

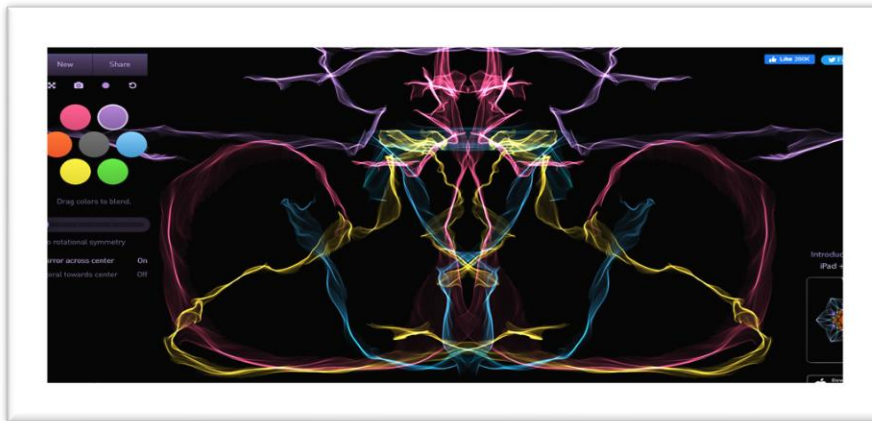
<https://thisissand.com/>



Thisissand was created in 2008 as a website. It was a school project of a few art students from Finland, and to a surprise for the creators it attracted lots of visitors for years to come.

In 2012 Thisissand was developed into an app and is still run by one of the original creators. It offers different kinds of tools for choosing the sand color.

<http://weavesilk.com/>



Weavesilk--Generative Art, also known as Silk , is an Amazing free online art tool that allows you to create colorful digital drawings. Silk was made by Yuri Vishnevsky, with music and sound crafted by Mat Jarvis.

3D PRINTING (training material)

-from file to Yoda-

Why FDM 3D printing?

Fused Deposition Modeling, also known as FDM 3D printing, is an affordable 3D printing technique and an excellent choice for quick, low-cost prototyping.

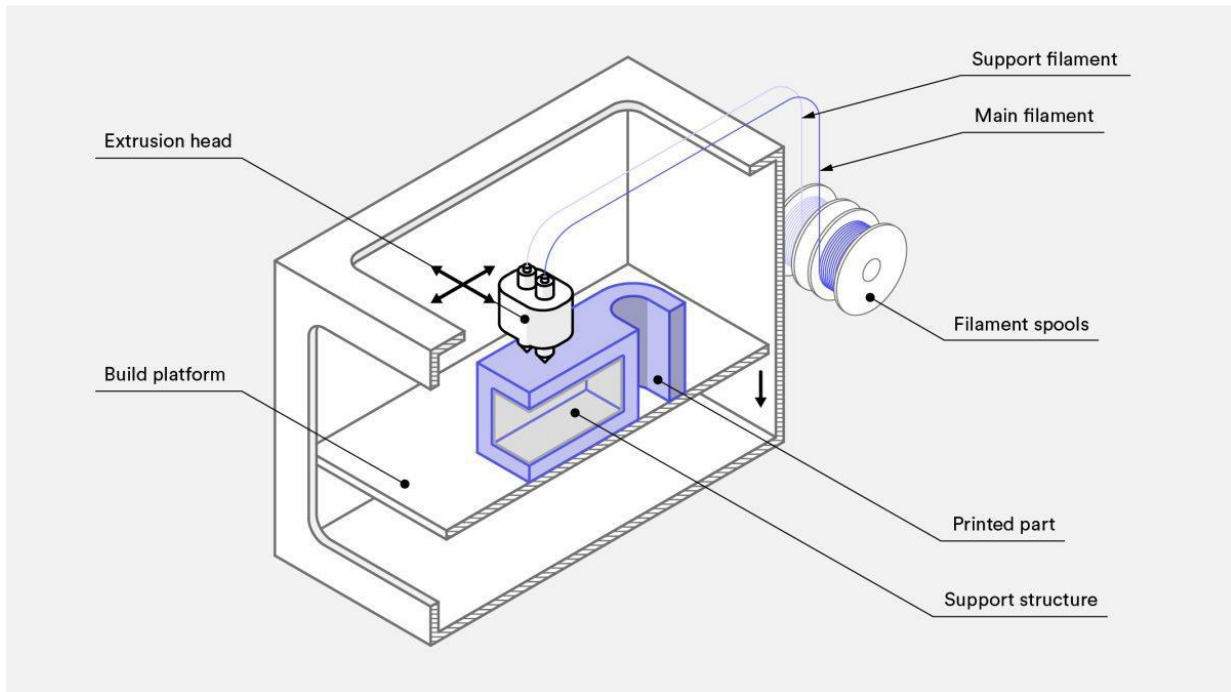
FDM materials

Fused deposition modeling (is also known as fused filament fabrication (an additive manufacturing process In FDM, an object is built by selectively depositing melted material in a predetermined path, layer by layer The materials used are thermoplastic polymers, which come in a filament form.

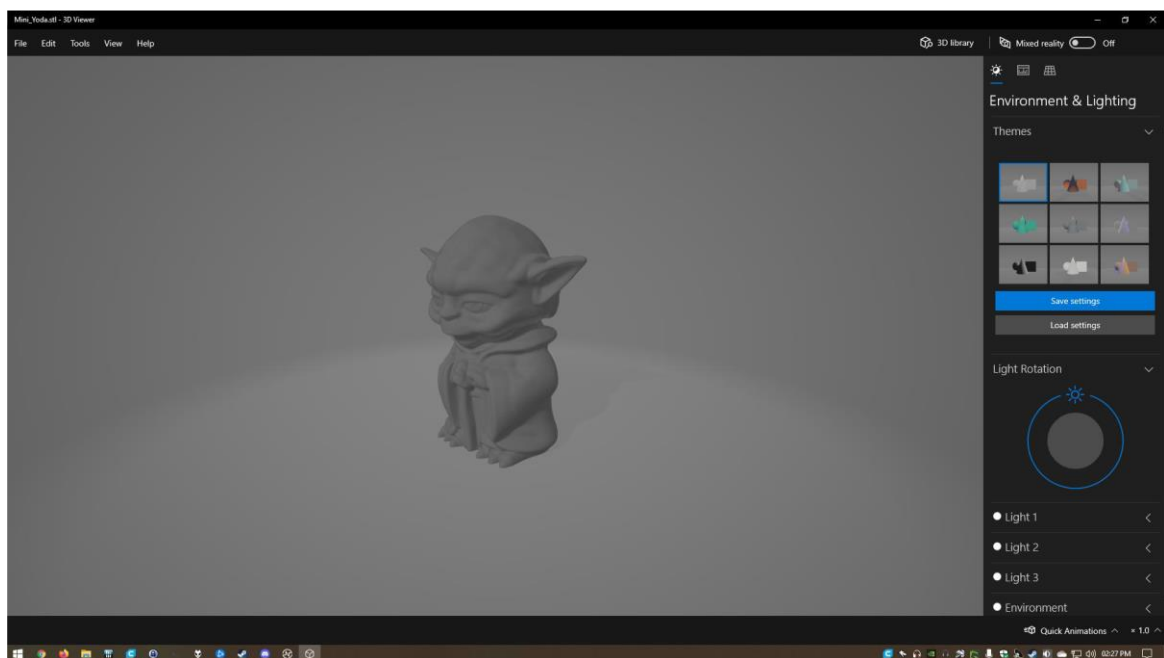
How does FDM work?

The FDM fabrication process works by first loading a spool of thermoplastic filament into the printer Once the nozzle has reached the desired temperature, the filament is fed into the extrusion head and nozzle, where it melts.

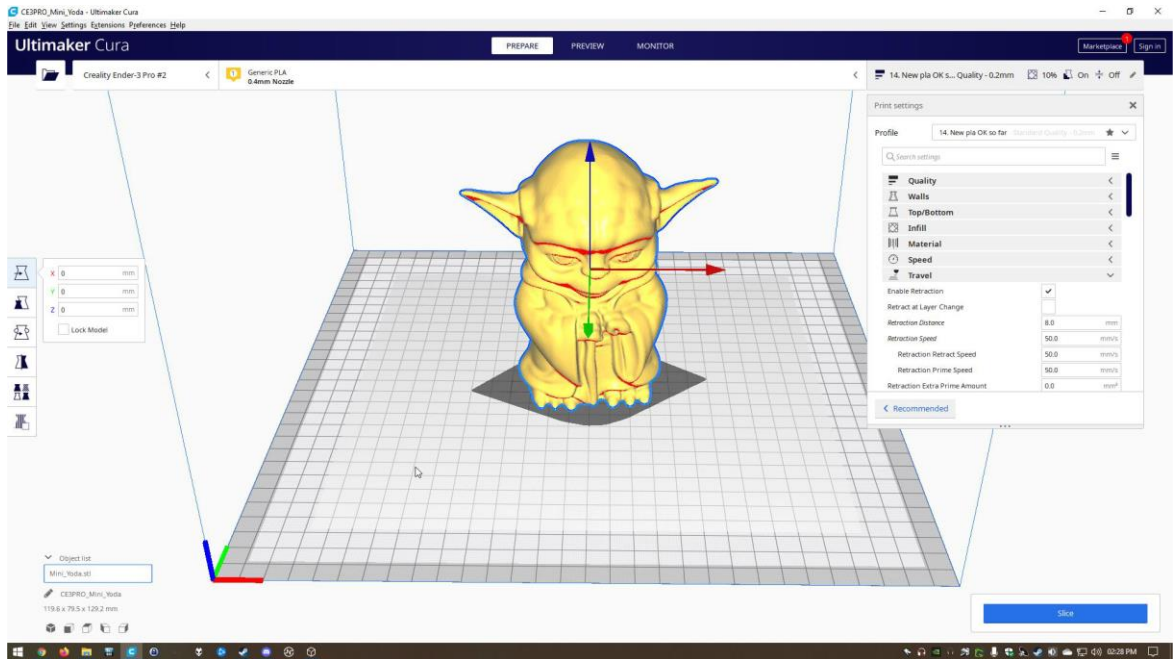
The extrusion head is attached to a three axis system that allows it to move in the x y and z directions Melted material is extruded in thin strands and deposited layer by layer in predetermined locations, where it cools and solidifies Fans can be attached to the extrusion head to accelerate the cooling. To fill an area, multiple passes are required, similar to coloring in a rectangle with a marker. When a layer is finished, the build platform moves down (or in some machine setups, the extrusion head moves up) and a new layer is deposited. This process is repeated until the part is complete.



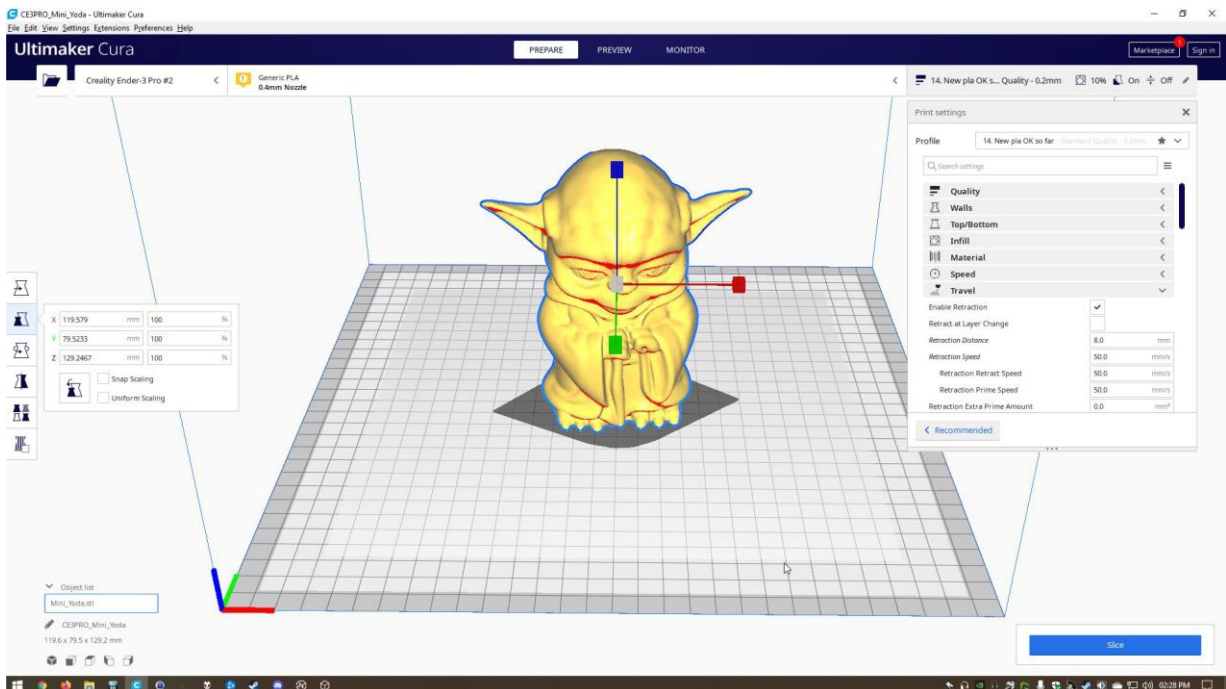
1. The base STL file



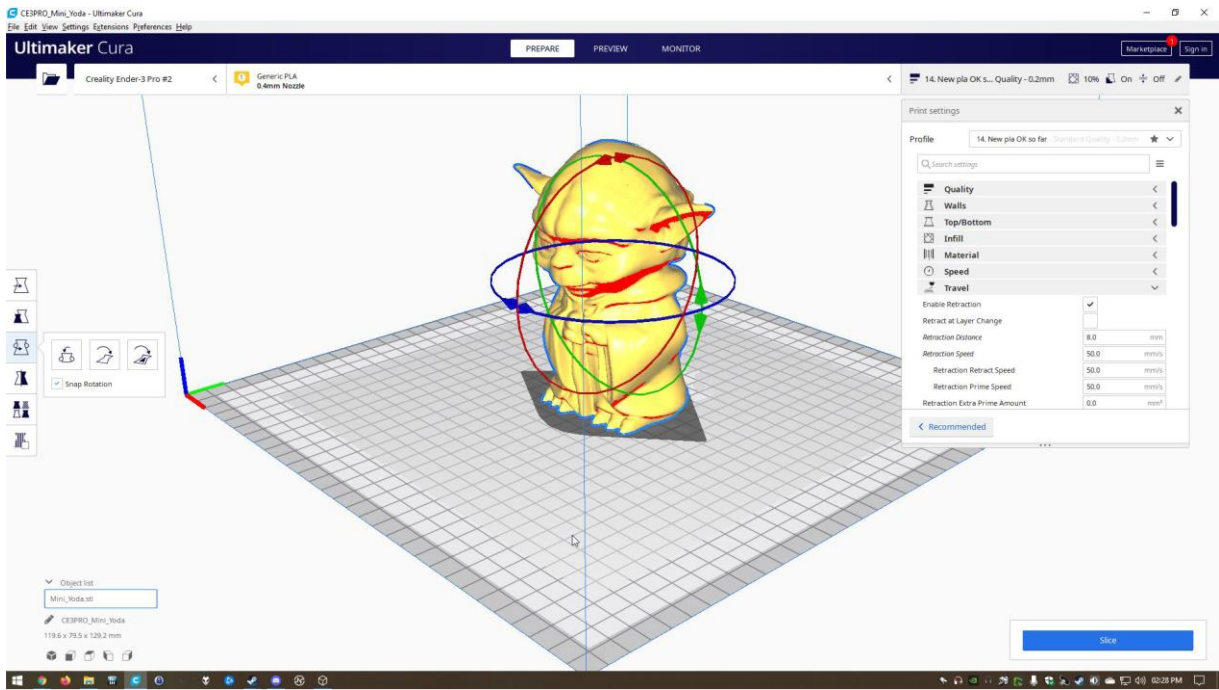
2. Position



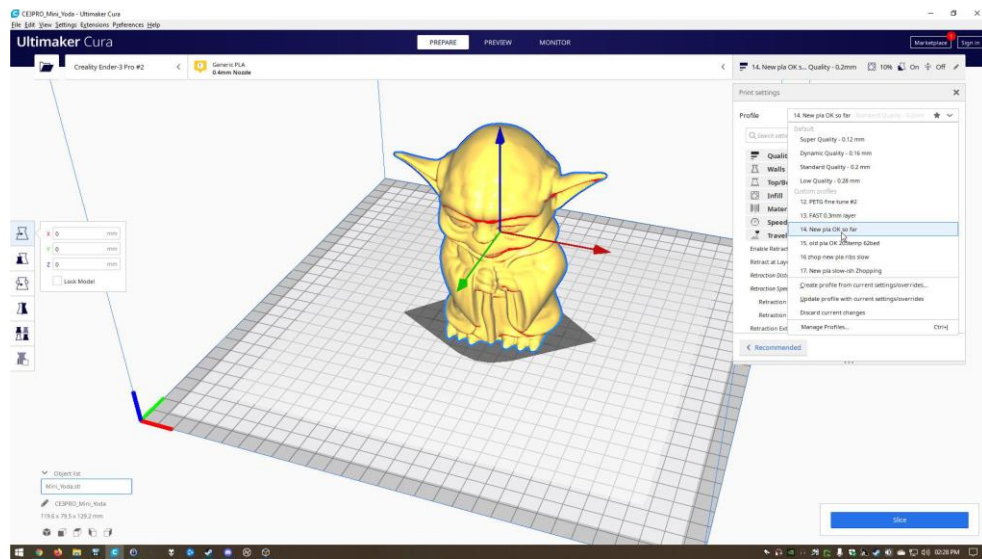
3. Scaling



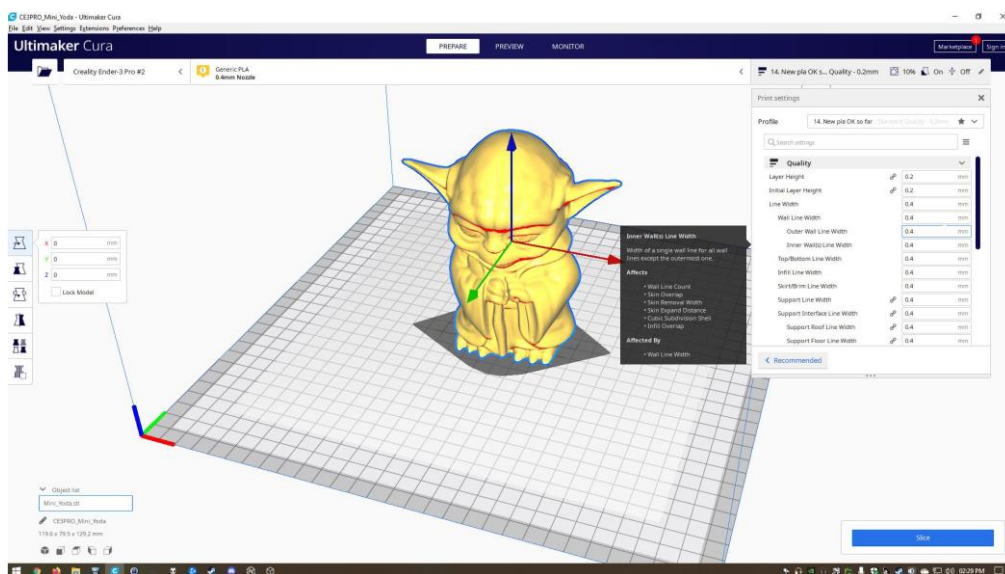
3. Rotation



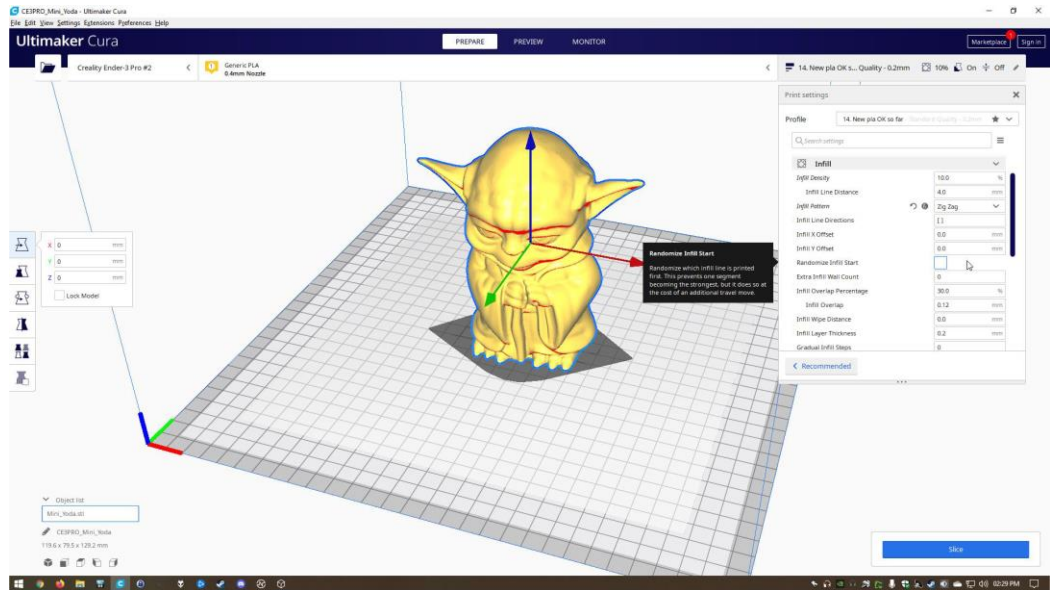
5. UltimakerCuraprofiles selection



6. Quality settings

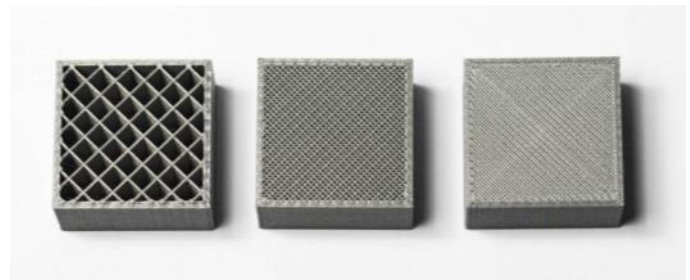


7. Infill settings

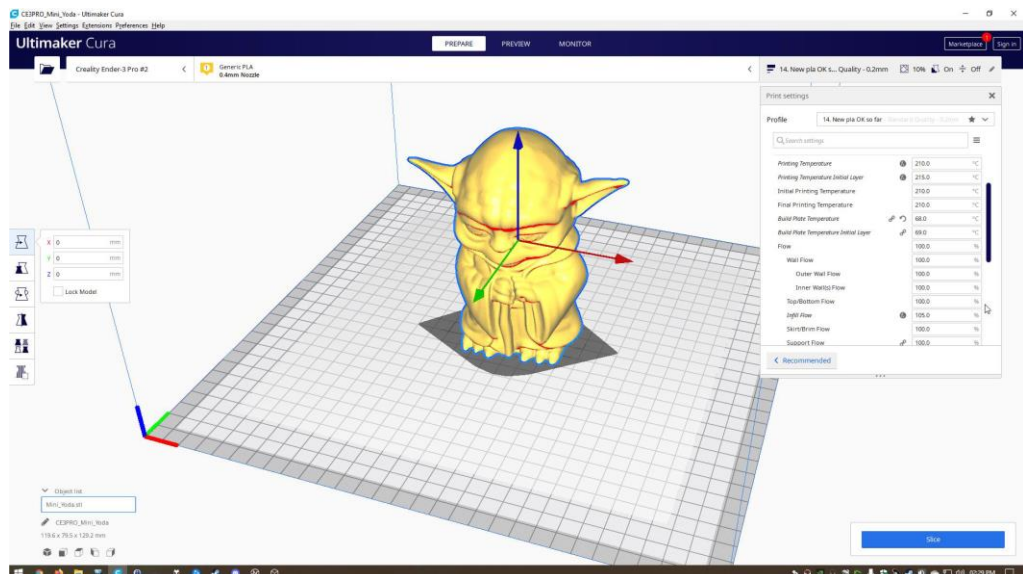


The internal geometry of FDM prints

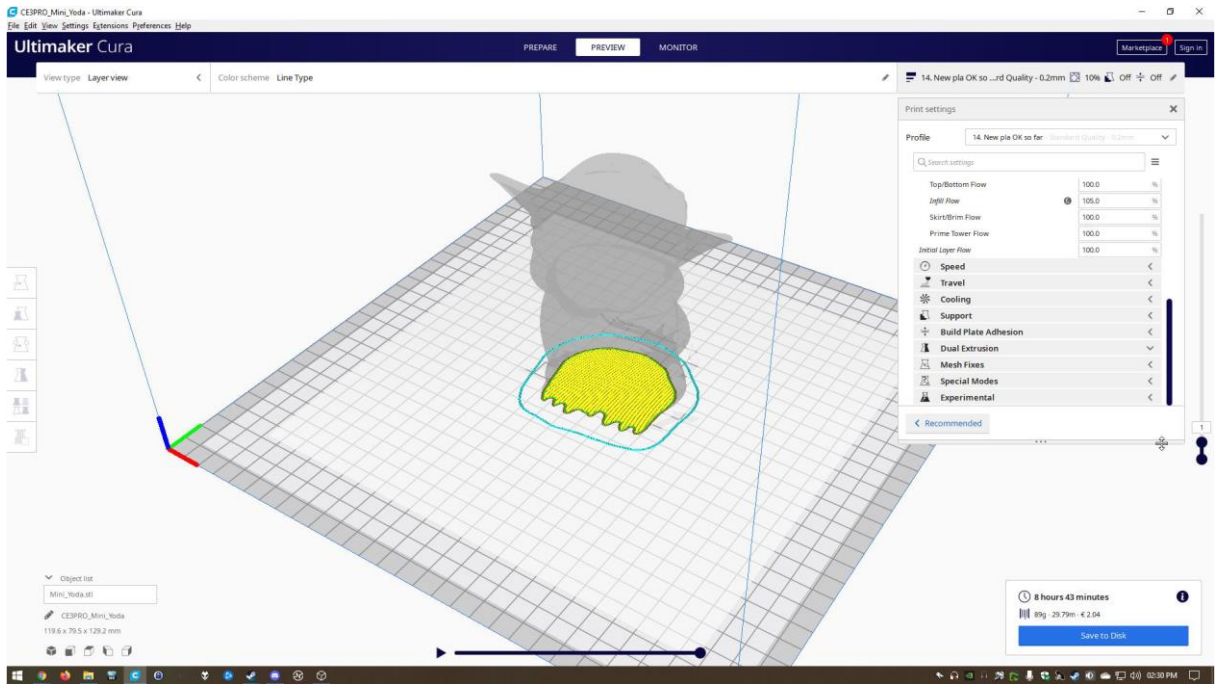
To reduce print time and save on material, FDM parts are usually not printed solid. Instead, the outer perimeter called the shell is traced using several passes, and the interior called the infill is filled with an internal low-density structure.



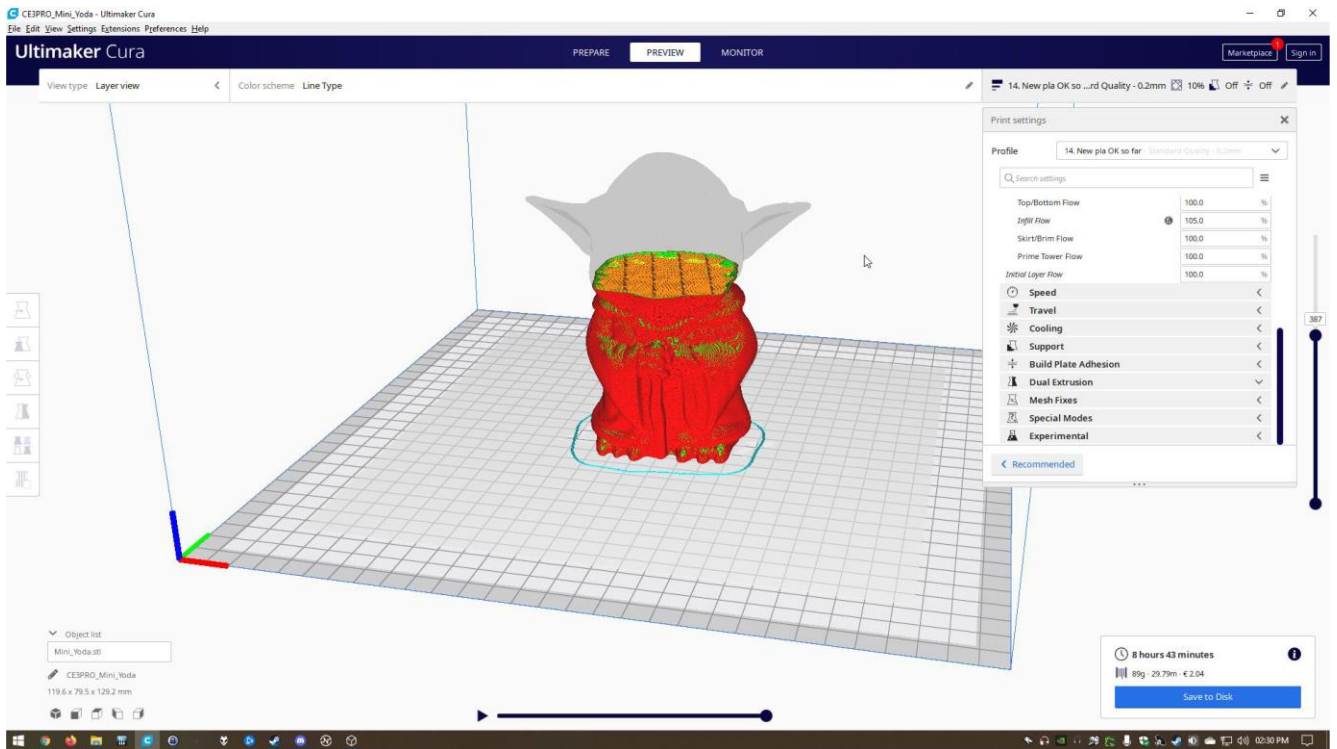
8. Material settings



First layer



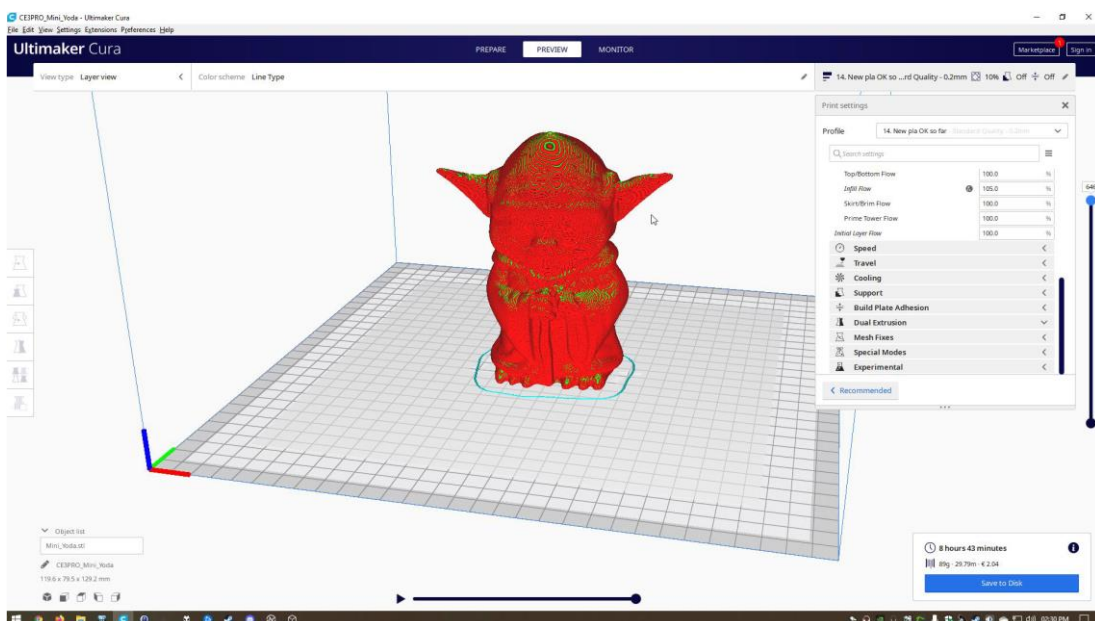
Layer 387



Work in progress



Finished product



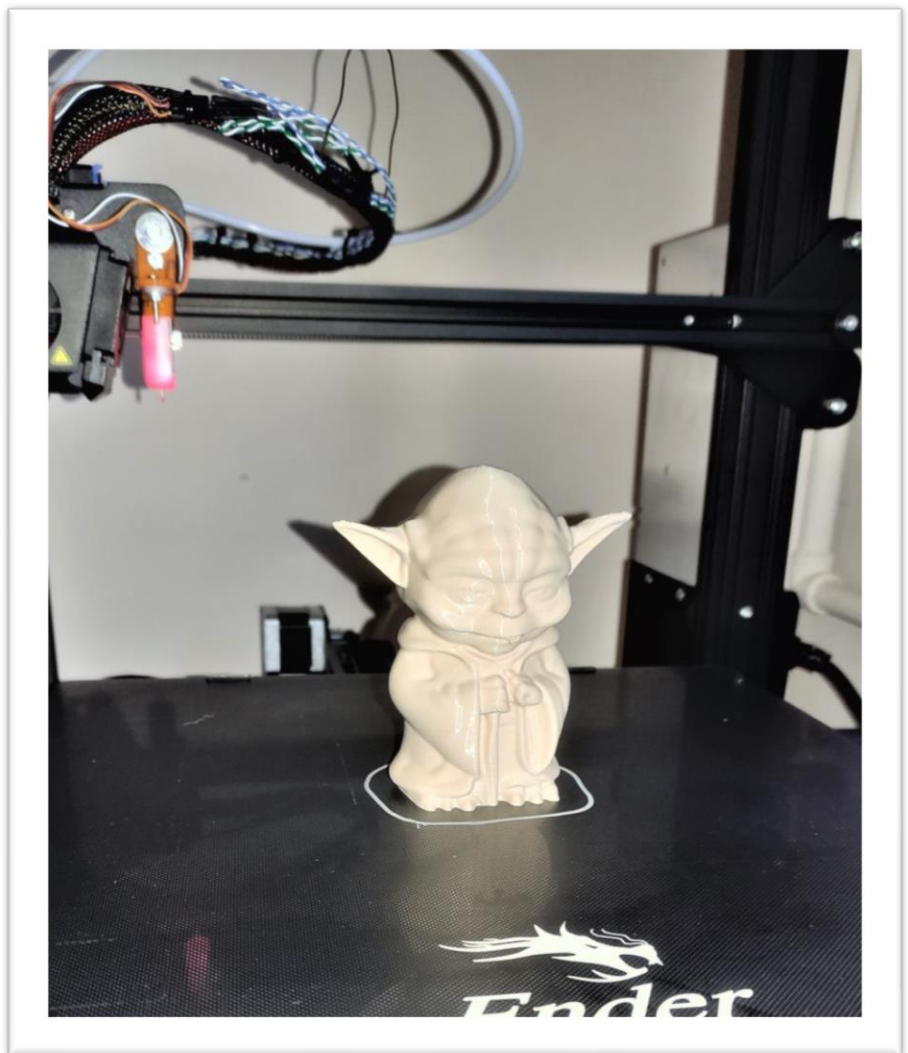
What are the advantages of FDM 3D printing?

- ✓ FDM is the most cost effective way to produce custom thermoplastic parts and prototypes.
- ✓ Lead times are short (typically a few days) due to the ubiquity of the technology.
- ✓ A wide range of materials is available, suitable for both prototyping and some functional applications.

What are the disadvantages of FDM 3D printing?


- ❖ FDM has the lowest resolution compared to other 3 D printing technologies, so it is not suitable for parts with very small details.
- ❖ Parts are likely to have visible layer lines, so post processing is required for a smooth finish.

**May
the
Force
be
with
you!**




LEARNING SCENARIOS

INFORMATION TECHNOLOGIES AND SOFTWARE COURSE DAILY LESSON PLANS

GRADE	5th class
	PROBLEM SOLVING AND PROGRAMMING
TOPIC	Geometrical shapes
TARGETS	Develops algorithms with decision structures. Creates algorithms with loop structure.
TIME	40+40 minute
MATERIALS USED:	https://code.org , scratch
COURSE WORKING:	<ol style="list-style-type: none"> 1. It will be announced that block coding practices will continue. 2. It is explained that this week, activities for decision cycles will be made using the scratch program. 3. The “repeat command” required for loops is mentioned. It is noticed that the codes placed in the repeat block are repeated as much as the number of repetitions. 4. For this, the square shape with 4 sides of equal length is used. It is shown that when this function is repeated 4 times with 90 degree angles after drawing one side of the square, a square will be drawn in the middle. 5. Ask the children what will happen if the number of repetitions is increased in the square drawing codes? With the feedback received, it is evaluated whether they understand how the code works. 6. Similarly, they are asked to find the codes required to draw equilateral triangles themselves, based on the square drawing codes. 7. With this activity, besides the coding knowledge, the basic knowledge that the students learned in the mathematics lesson is reinforced. 8. Work is done with the students to determine the necessary codes and repetition numbers for rectangle and circle drawing. 
ASSESSMENT AND EVALUATION :	Participation of the students in the activity will be observed.

PLAN 1

CLASS	5th class
	PROBLEM SOLVING AND PROGRAMMING
TOPIC	Keep a number in mind
TARGETS	Develops an algorithm for solving the problem. Debugs by testing an algorithm. Develops algorithms with decision structures
TIME	40+40 minute
MATERIALS USED:	https://code.org , scratch
COURSE WORKING:	<ol style="list-style-type: none"> 1. 1. In today's lesson, students are motivated by saying that they will make a game using the scratch program. 2. 2. It is stated that the competition is about numbers and it is a game that we play a lot in daily life. 3. 3. The person playing this game will play against the computer. 4. 4. In the Scratch program, students are asked to choose a character for this game. 5. 5. The character we choose will keep a number between 1 and 50 in mind and will ask us to find this number as soon as possible. 6. 6. Before creating the necessary game for this, they will be asked to write their algorithm. <pre> 1. first number = 1, last number = 100 2nd guess = guess randomly between first_number and last number Did I know number 3? if yes write number known - finish if no { ----Is the number you hold greater than your guess? ---- if yes, first_Num = guess ---- if no, last number = guess go to line 2 } </pre> 7. 7. Students who write the algorithm create the appropriate code and apply it. When it is wrong, it is asked to find out whether the error is from the algorithm or the code. Correcting the error in the algorithm is requested to apply.

	
ASSEMENT AND EVALUATION :	Participation of the students in the activity will be observed.

LESSON PLAN

PART I

LESSON	English Language
GRADE	5
NAME OF THE UNIT / NUMBER	5
LANGUAGE SKILLS AND LEARNING OUTCOMES	Using present tense in daily activities
DURATION	40+40

PART II



Language skills and learning outcomes	<ol style="list-style-type: none"> 1. Sts will be able to identify the structure of "Simple Present Tense". 2. Sts will be able to make sentences with "Simple Present Tense". 	
Functions & Useful Languages	What do you do every day? What do you have at breakfast? What time do you get up?	get up, wash, have breakfast, leave home, get on, get off, buy, study, arrive, sleep, have lunch, have dinner, watch TV, go to bed.
Teaching techniques	Question answer, Brainstorm	
Materials	Sts Book, Mobile computers	
Teaching and Learning Activities ❖ Warm up ❖ Motivation ❖ Scanning ❖ Activities in peer ❖ Activities in group ❖ Summary	<ol style="list-style-type: none"> 1. Give examples about daily activities such as 'Get up, wash, have breakfast, leave home, get on, get off, study, arrive, sleep, have lunch, have dinner, watch TV, go to bed.' 2. Want sts to use Wordart web 2.0 tool to create their own picture using the words they know about daily routines. 3. Print their pictures and hang the on the notice board. 4. Want them to write some sentences using the words they pictured. 5. Ask each other about their daily activities. 6. Write the most interesting sentences they make on the board. 	

PART III

Evaluation	Ask sts some questions a. What do you do every day? b. What do you have at breakfast? c. What time do you get up?
PROJECT	Want sts to create their own imaginary characters in pixton/bitmoji and make them speak about their daily routine

ENGLISH LESSON PLAN

GRADE	5 th Grades	TIME/DURATION	40+40 / 40 min. (3 les.)
UNIT	5		
TOPIC	HEALTH		
LANGUAGE SKILLS AND LEARNING OUTCOMES	<p>Listening</p> <p>E5.5.L1. Students will be able to identify common illnesses and understand some of the suggestions made.</p> <p>E5.5.L2. Students will be able to understand simple suggestions concerning illnesses.</p>		
FUNCTIONS & USEFUL LANGUAGE:	<p>Making simple suggestions</p> <p>—You should stay in bed.</p> <p>— Have a rest.</p> <p>—Stay in bed.</p> <p>—Visit a doctor.</p> <p>—Take your pills.</p>	<u>Suggested Vocabulary</u>	
		<p>backache/headache/toothache/ stomachache</p> <p>cold</p> <p>cough</p> <p>dentist</p> <p>faint</p> <p>fever</p> <p>flu</p>	<p>have a pain/ache</p> <p>hurt</p> <p>ill/illness</p> <p>medicine</p> <p>pill</p> <p>sneeze</p> <p>sore throat</p> <p>syrup</p> <p>vitamin</p>
Suggested Contexts, Tasks	<p>Contexts</p> <p>Cartoons</p> <p>Conversations</p> <p>Lists</p> <p>Posters</p> <p>Songs</p> <p>Videos</p>	<p>Tasks /Activities</p> <p>Drama (Role Play, Simulation, Pantomime)</p> <p>Games</p> <p>Information transfer</p> <p>Matching</p> <p>Questions and Answers</p> <p>True/False/No information</p>	
ASSIGNMENT & EVALUATION	<p>Assignments</p> <ul style="list-style-type: none"> Students keep expanding their dictionary by including new vocabulary items. 		

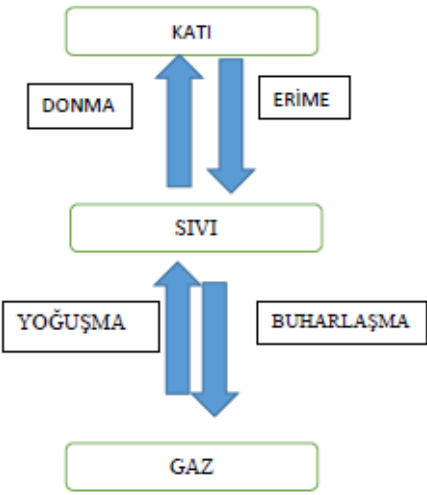
	<ul style="list-style-type: none"> An example animated movie will be shown to the students. Students will be asked to make an animation about this topic. Students will come together and prepare their own story animations on the scratch program and will be shared with the class. https://scratch.mit.edu/projects/651339270/fullscreen/
	  

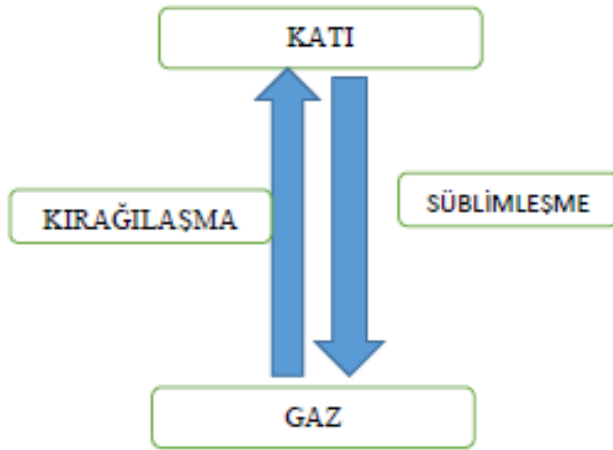
Science Lesson Plan

Lesson	Science
Class	5
Topic	Changes of state of matter
Time	40'+40'

BÖLÜM II

Student Achievements / Goals and Behaviors	3.1. Regarding the state change of matter, students; 3.1.1. He conducts experiments that show that substances can change state with the effect of heat, and makes inferences based on the data he has obtained.
Unit Concepts and Symbols/Behavioral Pattern	Melting, evaporation, defrosting, phase change, solid, liquid, gas...
Teaching-Learning-Methods and Techniques	Question and Answer, Invention, Research, Demonstration, Analysis, Experiment
Educational Technologies Used-Tools, Materials and Bibliography	Textbook, poster, projection, helpful video resources, bone-related images, Canva (worksheets prepared with web 2.0 tool)

Summary	<p>CHANGES OF STATE OF SUBSTANCES</p> <p>Substances exist in three states as solid, liquid and gas.</p> <ul style="list-style-type: none"> Melting solid into liquid state; The transformation of a liquid into a solid is called freezing. The transformation of a liquid substance into a gaseous state is called evaporation, and the transformation of a gaseous substance into a liquid state is called condensation. The direct transition of a solid substance to the gas state without passing the liquid state is called sublimation. <p>We can summarize the above situations as follows.</p> <div style="text-align: center;">  </div>
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In the above state change events:

☒ Materials receive heat during melting, evaporation and sublimation. So these 3 events take place by taking heat.

☒ During defrosting, freezing and condensation events, the substance gives off heat. In other words, these 3 events occur by giving heat to the outside.

The consequences of these events in daily life are as follows:

☒ Since melting, evaporation and sublimation takes place by taking heat, the substance takes the heat of the environment and the environment gets cold. For example, when the sun comes out after rain, the environment is cool although it is sunny. It also gives the same result. Cologne takes the heat of our hand in order to evaporate and our hand gets cold.

☒ As a result of defrosting, condensation and freezing, the environment warms up. Because empty events take place by giving heat to the environment. This is why the air warms up before it rains. This is why the water in the vapor state must give off heat in order to become liquid. happens when it happens. The liquid in the vapor state turns into a solid by cooling and gives heat to the environment while it passes into the solid state.

The differences between evaporation and boiling are as follows:

☒ Evaporation occurs at any temperature, while boiling occurs at a constant temperature.

☒ Evaporation takes place on the surface of the liquid, while boiling occurs all over the liquid.

☒ While the rate of evaporation changes depending on the temperature of the liquid, the temperature of the liquid does not change while boiling occurs.

When the air gets cold, thousands of small water droplets in the atmosphere combine and become heavier. The heavier water droplets cannot hang in the air any longer. The falling of the heavier water drops to the ground is called rain.

Water droplets in the clouds turn into tiny ice particles when the temperature drops below zero. When these particles reach a sufficient size, snow is formed.

The water vapor in the clouds is carried to the cold regions by the upward air flow. Meanwhile, the water drops freeze. As they descend towards the ground, the air currents turn them into larger pieces of ice.

Fog forms when water droplets in the air cool near the ground.

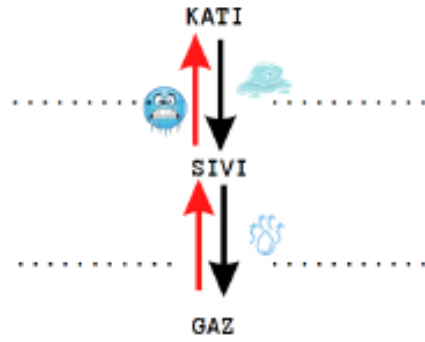
Especially in regions where it is hot during the day and cold or cool at night or during the seasons, the water vapor in the air condenses on solid materials such as stones, leaves and soil at night and turns into water droplets. Empty water droplets are called dew.

The freezing of supercooled water vapor on objects such as soil, grass or leaves and turning into ice crystals is called rime.

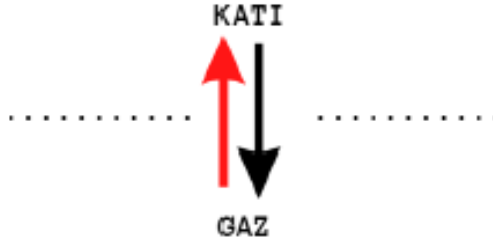
BÖLÜM III

Assesment and evaluation
• Measurement for individual learning activities
Evaluation
• Assessment for group learning activities
Evaluation
• Additional Assessment-Evaluation activities for students with learning disabilities and students with advanced learning speed

MADELERİN HAL DEĞİŞİMLERİ





MADELERİN HAL DEĞİŞİMLERİ



DERS PLÂNI

Lesson	Science
Grade	5
	ESSENTIAL IN OUR LIFE: ELECTRICITY
Topic	electrical circuit
Time	40'+40'

Student Achievements / Goals and Behaviors	<p>6.1. Regarding the variables affecting the lamp brightness in a simple electrical circuit, students;</p> <p>6.1.1. Predicts the variables that affect lamp brightness in an electrical circuit and tests their predictions.</p>
Unit Concepts and Symbols/Behavioral Pattern	Electricity, circuit, switch, connection cable
Teaching-Learning-Methods and Techniques	Question and Answer, Invention, Research, Demonstration, Analysis, Experiment
Educational Technologies Used-Tools, Materials and Bibliography	Textbook, helpful video resources, mini arduino kit.
Summary	<p>ESSENTIAL IN OUR LIFE: ELECTRICITY</p> <p>A) CHANGE THE BRIGHTNESS OF THE BULBS</p> <p>1. What's in a Circuit?</p> <p>A simple electrical circuit should contain a battery, light bulb, switch and connecting wire.</p> <p>Battery: It is the energy source of the circuit.</p> <p>Bulb: It provides lighting by working with electricity.</p> <p>Switch: Allows the circuit to be switched on and off.</p> <p>Connection cable: It carries electrical energy.</p> <p>In order for the bulb in the circuit to light, the connections must be made correctly.</p> <ul style="list-style-type: none"> • If the connection cable is broken, the bulb will not light.  <ul style="list-style-type: none"> • If there is no battery or the battery is dead, the bulb will not light. 

- If the switch is open, the bulb will not light.



- The bulb will not light if the batteries or the cable are connected in reverse.



2. Which is Shiny

Effect: In Which Circuit The Bulb Is Too Bright



- The circuit element whose number is changed in Figures I, II and III is the light bulb.
- The circuit element whose number is kept constant in Figures I, II and III is the battery.
- The bulb in the circuit with fewer bulbs gave more light.
- Result: As the number of bulbs is increased while the number of batteries is fixed, the brightness of the bulbs decreases.

Three types of variables are used in scientific experiments.

Independent variable: It is the variable whose effect we investigated in the experiment. It is the variable whose amount we change ourselves.

Dependent variable: As the name suggests, it is a variable that changes depending on an effect. In scientific experiments, the dependent variable changes depending on the independent variable.

Controlled variable: It is the variable whose effect we keep constant so that it does not affect the outcome of the experiment.

For example; "Does the path taken by the car on a surface depend on the type of surface? If we are going to do an experiment to answer the question;

Independent variable: It is the variable that we changed and investigated the effect of, that is, the type of surface. (Sand surface - glass surface)

Dependent variable: The variable that changes depending on the type of

While the number of batteries is fixed in an electrical circuit, if the number of bulbs is increased, the brightness of the bulbs decreases.

<i>Kontrol edilen değişken</i>	<i>Bağımlı değişken</i>	<i>Bağımsız değişken</i>
<i>Pil sayısı</i>	<i>Ampul parlaklığı</i>	<i>Ampul sayısı</i>

Effect: Let's Increase the Batteries



- The circuit element whose number is changed in Figures I, II and III is the battery.
- The circuit element whose number is kept constant in Figures I, II and

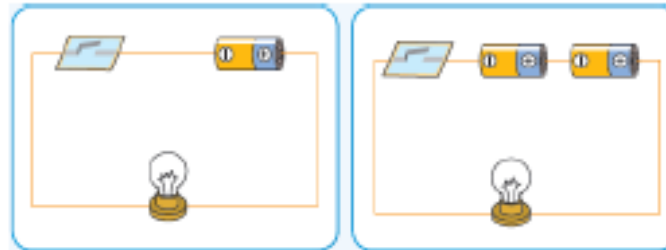
III is the light bulb.

- The bulb in the circuit with more batteries gave more light.
- Result: When the number of batteries is increased while the number of bulbs is fixed, the brightness of the bulbs increases.
- In an electrical circuit, while the number of bulbs is fixed, the brightness of the bulb increases if the number of batteries is increased.

<i>Kontrol edilen değişken</i>	<i>Bağımlı değişken</i>	<i>Bağımsız değişken</i>
<i>Ampul sayısı</i>	<i>Ampul parlaklığı</i>	<i>Pil sayısı</i>

In an electrical circuit, the brightness of the bulb can be changed by changing the number of batteries and the number of bulbs.

- If the number of batteries increases, the brightness increases.

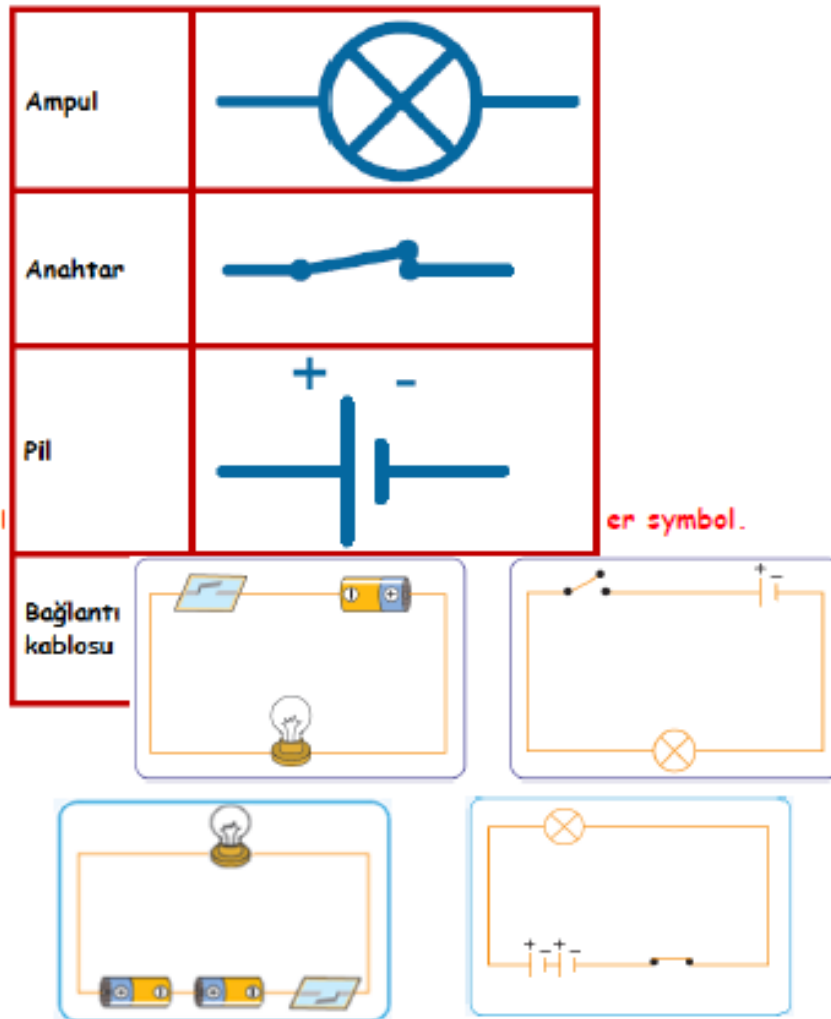


- If the number of bulbs increases, the brightness decreases.

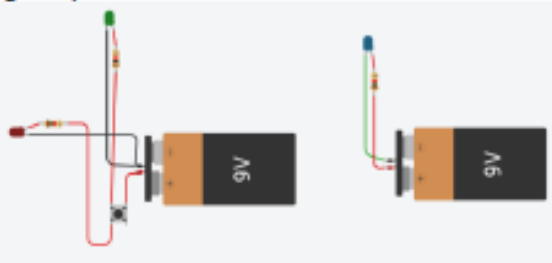


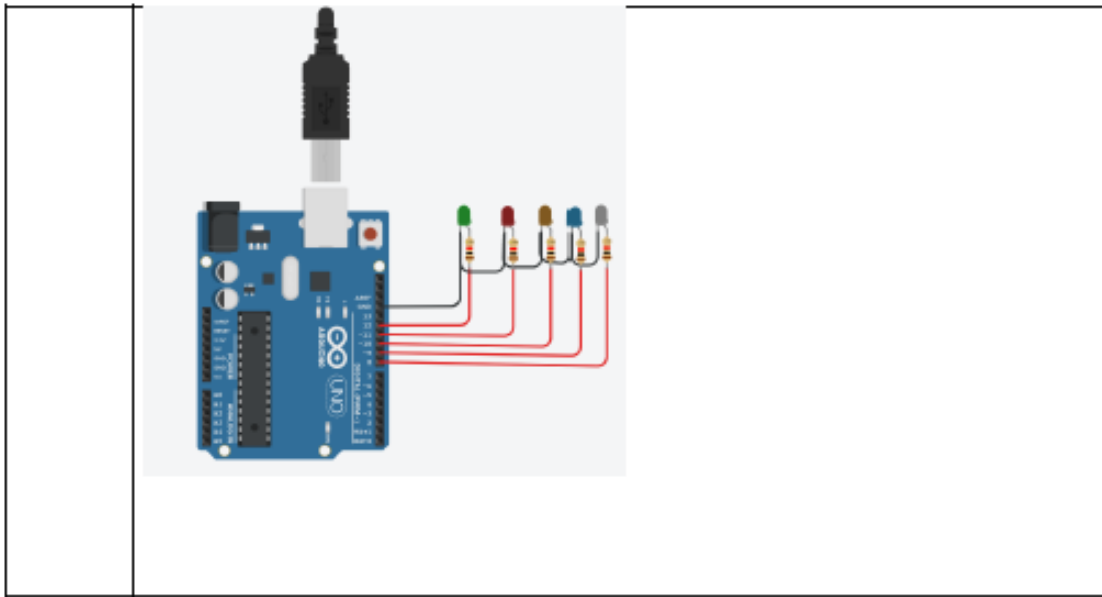
B) LET'S SHOW WITH SYMBOLS

Circuit elements in electrical circuits are shown with symbols to form a common language all over the world. Thus, the electrical circuit diagram installed anywhere in the world can be easily understood by the whole world.



By setting up similar circuits on arduino sets and coding them with the mblock program, the LEDs are lit with the students. Keyed and keyless example bindings are shown. We can code the LEDs as we want so that they light up in the order we want..





<p>Assesment and evaluation</p> <ul style="list-style-type: none"> • Measurement for individual learning activities Evaluation • Assessment for group learning activities Evaluation • Additional Assessment-Evaluation activities for students with learning disabilities and students with advanced learning speed 	<p>Students will use the tinkercad program at home to create the circuit first with a single battery using arduino, and then with 2 batteries. Finally, he will build the circuit using the arduino and code it through simulation.</p>
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Lesson	LESSON PLAN
Class	Science
	MEASURING THE SIZE OF FORCE
Topic	<i>Let's measure the magnitude of the force</i>
Time	40'+40'

Student Achievements / Goals and Behaviors	She explores the inhibiting effect of friction force in various environments by experimenting and gives examples of friction force from daily life.
Unit Concepts and Symbols/Behavioral Pattern	force, newton, dynamometer, elastic material, friction
Teaching-Learning-Methods and Techniques	Question and Answer, Invention, Research, Demonstration, Analysis, Experiment
Educational Technologies Used-Tools, Materials and Bibliography	Textbook, auxiliary video resources, MBot robot, carpet piece, piece of cloth, glass, bone images.
Özet	<p><u>FRictionAL FORCE</u></p> <p>Force has moving and accelerating effects. However, there are some forces that make it difficult or even prevent the movement of objects.</p> <p>Here, the force that makes it difficult or prevents the movement of the object between the object and the surface in the opposite direction of the movements of the objects is called the friction force.</p> <ul style="list-style-type: none"> • It occurs between the object and the surface. • It happens in the opposite direction to the direction of movement. • It has a slowing and stopping effect. <p><u>What does friction force depend on?</u></p> <ul style="list-style-type: none"> • The friction force depends on the type of surface. It is seen that the ball on the concrete and earth ground travels more distance at equal speeds. • Friction force depends on whether the surface is rough or slightly rough. <p style="text-align: center;"><u>Effects of friction force:</u></p> <p>1) positive effects: friction force does not always affect our life negatively.</p> <p>If there were no frictional force, we would not be able to stop when we run.</p> <p>If there was no friction force, we would not be able to hold pen and paper.</p> <p>If there was no friction force, cars would not be able to stop on slopes.</p> <p>If there was no friction force, even if chains were attached in winter, the cars would not be able to stop.</p>

2) Adverse effects:

Wear of shoes

Decreased teeth of car wheels over time

Deterioration of door hinges.

Friction force in air

Just as the surface has a frictional force on the objects on any surface, the air also exerts a frictional force on the objects. The larger the surface of the objects in contact with the air, the greater the friction force exerted by the air. The smaller the surface, the lower the friction force. This is the reason why parachutes are made larger.

In order to better understand the friction force experienced by the cars on the road, the students are provided to move 3 same mbot robots, which they have coded using the mblock program, on 3 different surfaces. Robots coded to move at the same speed are moved on carpet, cloth and glass surfaces. Although the same amount of power is given to the motors, the robot moving on a smooth surface such as glass moves faster, while the robots moving on rough surfaces such as carpets and cloths are noticed to be left behind due to the friction force. They are asked to rank the amount of friction force between the 3 surfaces from the largest to the smallest.

Note: The reason why the front of the planes is pointed is to reduce friction.


Rictional Force in Liquid Media

Just as the air has a frictional force, its liquids have a frictional force on the objects. This force, which has the effect of forcing and preventing the movement of the objects occurring in the liquid, is called the fluid friction force.

BÖLÜM I**DERS PLANI**

Dersin adı	TÜRKÇE
Sınıf	8
Önerilen Süre	40+40+40 (3 ders saati)

BÖLÜM II

<p>Öğrenci Kazanımları /Hedef ve Davranışlar</p> 	<p>OKUMA Akıcı Okuma</p> <p>T.8.3.4. Okuma stratejilerini kullanır.</p> <p>Söz Varlığı</p> <p>T.8.3.5. Bağlamdan yararlanarak bilmediği kelime ve kelime gruplarının anlamını tahmin eder.</p> <p>T.8.3.7. Metindeki söz sanatlarını tespit eder.</p> <p>T.8.3.8. Metindeki anlatım bozukluklarını belirler. (Karma)</p> <p>Anlama</p> <p>T.8.3.14. Metinle ilgili soruları cevaplar.</p> <p>T.8.3.16. Metnin konusunu belirler.</p> <p>T.8.3.17. Metnin ana fikrini/ana duygusunu belirler.</p> <p>KONUŞMA</p> <p>T.8.2.2. Hazırlıksız konuşma yapar.</p> <p>T.8.2.4. Konuşmalarında beden dilini etkili bir şekilde kullanır.</p> <p>YAZMA</p> <p>T.8.4.2. Bilgilendirici metin yazar.</p> <p>T.8.4.13. Yazdıklarının içeriğine uygun başlık belirler.</p>
Ünite Kavramları ve Sembolleri/Davranış Örüntüsü	Yaşamak, insan olmak, değer vermek, dik durmak, onur, şeref...
Güvenlik Önlemleri (Varsa):	
Öğretme-Öğrenme-Yöntem ve Teknikleri	Soru-cevap, anlatım, açıklamalı okuma ve dinleme, açıklayıcı anlatım, inceleme, uygulama...
Kullanılan Eğitim Teknolojileri-Araç, Gereçler ve Kaynakça * Öğretmen * Öğrenci	www.tdk.gov.tr https://sozluk.gov.tr/ internet siteleri, sözlük, deyimler ve atasözleri sözlüğü, EBA, plikers uygulaması, videolar...
• Dikkati Çekme	<ul style="list-style-type: none">• Hayatı dolu dolu yaşamak sözünden ne anlıyorsunuz?• "En çok yaşamış olan, uzun yıllar yaşamış olan değildir; yaşamının anlamını en fazla anlamış olandır." Soren Kierkegaard (Sörin Kirkığıd)

	sözünden ne anladığınızı açıklayınız.
<ul style="list-style-type: none"> • Gündüleme 	<p>Bu hafta "YAŞAMAYA DAİR" adlı metni işleyeceğiz. Sevgili çocuklar, hayat bizlere sunulmuş bir armağandır. Bu dünyada hayat bulmamız, varlığımızı devam ettirmemiz biz insanlara bahşedilmiş büyük bir ödüldür. Hepimiz bu hayata geldik, yaşıyoruz ve bir zaman sonra bu hayata veda edeceğiz. Herkes uzun yaşamak ister ancak ne kadar uzun yaşarsak yaşayalım bu hayatın sonu mutlaka bir gün gelecektir.</p> <p>Hayat gerçekten çok kısa ve zaman su gibi akıp geçiyor. Daha dün gibi aklımızda olan anılarımıza şöyle bir göz attığımızda üzerinden ne kadar uzun zaman geçtiğini fark edip hayıflanıyoruz. Bu kadar kısa olan bir ömürde önemli olan unutulmayacak anılara sahip olmaktır. Bize verilen ömrü güzel ve başarılı işlerle geçirirsek ömrümüzün sonu geldiğinde bu dünyadan mutlu ve huzurlu şekilde ayrılırız. Hepiniz duymuşsunuzdur genel bir kanı vardır: Önemli olan uzun yaşamak değil, önemli olan güzel yaşamaktır.</p> <p>Bu hayatın nasıl geçtiği çok önemlidir. Hayatımızı güzel ve mutlu bir hale getirmek ise tamamen bizim elimizdedir. Biz mücadele eder, zevk aldığımız ve başarıya ulaştığımız işler yaparsak hayatımızı da dolu dolu yaşamış oluruz. Bu nedenle yaşamımızda her zaman bardağın dolu tarafından bakmalı ve bu dünyayı kendimize verilmiş bir armağan olarak görüp hakkını vererek yaşamalıyız.</p>
<ul style="list-style-type: none"> • Gözden Geçirme 	<p>Bu dersimizde hayatın değeri hakkında konuşacağız.</p>
<ul style="list-style-type: none"> • Derse Geçiş <div style="border: 1px solid black; border-radius: 15px; padding: 10px; text-align: center;"> <ul style="list-style-type: none"> • Fazıl Say-Genco Erkal (Yaşamaya dair) • Yaşamaya dair(Rüştü Asyalı) • İçerik videolarını aşağıdaki bağlantıdan indirebilirsiniz: https://disk.yandex.com.tr/d/Mv1N3TKRi8QEvG </div>	
	<p>Yaşam yeryüzünde canlıların doğumlarından, ömürlerinin sonuna kadar geçen zamanı ifade eder.</p> <p>İnsanlar da dünyaya geldikleri gün hayata başlarlar. Doğumlarında itibaren yaşamlarının son günlerine kadar yaşadıkları yaşam sürecinde, çeşitli durum ve olaylarla karşılaşır. İnsanlığın ilk günlerinden başlayarak bir arada yaşama isteği ve mecburiyeti devamlı olarak süregelmiştir. Bilinmeyenleri araştırmak, yeni şeyler öğrenmek, oluşabilecek zorlukları karşılayabilmek amacıyla birlikte yaşama kuralını uygulamışlardır.</p> <p>Her toplumun bir diğerinden farklı yaşam tarzı ve kuralları olmuştur. Toplumu oluşturan bireyler daha önceden belirlenmiş kural ve adetlere uyarlar. Bazı toplumlar daha önceden belirlenmiş gelenek ve kuralları zamanla esneterek daha uygar ve modern bir şekle getirmişlerdir. Bazıları ise bu kural ve kaidelere ilk günkü şekliyle bağlı kalmaktadır.</p> <p>İnsanın hayatı, yaşayış amacı ona kendi istek ve şartlarına göre, uyum sağlaması ve onu kolaylaştırması olmalıdır. Gereksiz şartlar ve katı kurallar geliştirmek insanın kendi yaşamını zorlaştırır ve onu çekilmez hale getirir.</p> <p>Toplumların birlikte yaşam nedeniyle oluşturdukları kural ve şartları yaşadıkları zaman ve mekâna göre daha modern, daha çağdaş ve esnek şekle getirmeleri kendilerinin ferah ve huzuru için önem teşkil etmektedir.</p> <ul style="list-style-type: none"> • Dikkati çekme sorusu sorulduktan sonra öğrencilerden metnin içeriğini tahmin etmeleri istenecek.

- Metnin başlığı hakkında öğrenciler konuşturulacak. Metnin içeriği öğrenciler tarafından tahmin edilecek. (Metinde neler anlatılmış olabilir?)
- Güdüleme ve gözden geçirme bölümü söylenecek.
- Parça öğretmen tarafından örnek olarak okunacak.
- Öğrenciler tarafından anlaşılmayan, anlamı bilinmeyen kelimeler metnin üzerine işaretlenecek
<https://sozluk.gov.tr/>

Ciddiyet	Zerre	Ajans
Laboratuvar	Yüzükoyun	Kahr
Kadife	Hücum	Mahzun

- Anlaşılmayan, anlamı bilinmeyen sözcüklerin anlamı ilk önce sözcüğün gelişinden çıkarılmaya çalışılacak. Sözcüklerin anlamı sözlükten bulunacak, sonra defterlere yazılacak.
- Öğrencilere 5-8 kelimededen oluşan cümleler kurdurularak bilinmeyen kelimeler anlamlandırılacak.
- Yanlış telaffuz edilen kelimeler birlikte düzeltilecek.
- Kelimelerin anlamlarının pekiştirilmesi için öğrencilerle plikers uygulaması üzerinden yarışma yapılacak.

• 1.Etkinlik yapılacak.

Aşağıdaki sözcükleri anlamlarıyla eşleştiriniz. Eşleştirmede açığa kalan sözcüğün anlamını bularak sözcüğü bir cümlede kullanınız.

ajans	1. Uzgün.
hücum	2. Çok koyu.
hinc	3. Çok küçük parçacık.
zerre	4. Haber toplama, yayma ve üyelere dağıtma işi ile uğraşan kuruluş.
zifir	5. Saldırı.
mahzun	6. Oç alma duygusu ile dolu öfke, kin, gıybet.
kahr	

Anlamı:
Kahr: Çok etme, peşına etme, ezme.

Cümle:
Zahmeti açtıktan sonra mahzoldu.

• 2.Etkinlik yapılacak.

Yaşamaya Dair" şiirinden hareketle aşağıdaki soruları yanıtlayınız.

1. Şair, şiirin birinci bölümünde yaşamının nasıl olması gerektiğini düşünüyor? Açıklayınız.

- **Cevap:** Yaşamak şakaya gelmez denilerek, büyük bir ciddiyetle yaşamak gerektiği belirtilmiştir. Bir sincap gibi mesela.

2. "Bir sincap gibi mesela,

Yani, yaşamının dışında ve ötesinde hiçbir şey beklemeden,

Yani **bütün** işin **gücün** yaşamak olacak." dizeleriyle **şairin** anlatmak istediği ne olabilir?

- **Cevap:** İşin gücün yaşamak üretmek her andan keyif almak ve bir amaç uğruna bu dünyada yer almanın gereği anlatılmaktadır.

3. **Şiirde geçen, fedakârlıkla ilgili dizeleri bulup yazınız.**

- **Cevap:** Mesela, kolların bağlı arkadan, sırtın duvarda, Yahut kocaman gözlüklerin, Beyaz gömleğinle bir laboratuvarında İnsanlar için ölebileceksin denilerek, bilim adamlarının fedakarlıklarından bahsedilmektedir. Yetmişinde bile, mesela, zeytin dikecek, Hem de öyle çocuklara falan kalır diye değil, Ölmekten korktuğu hâlde ölüme inanmadığı için fedakarca davranmalıdır.

4. **Şiirde yaşama sevinci ile ilgili verilen örnekleri tespit ediniz.**

- **Cevap:** Duymamak mümkün değilse de biraz erken gitmenin kederini Biz yine de güleceğiz anlatılan Bektaşî fıkrasına, Yani, duvarın arkasındaki dışarıyla. Yani, nasıl ve nerede olursak olalım Hiç ölmeyecekmiş gibi yaşanacak, Böylesine sevilecek bu dünya "Yaşadım." diyebilmen için... dizelerinde görebiliriz.

5. **Şiirde örneklere sıkça yer verilmesinin anlatıma katkısı hakkında ne düşünüyorsunuz?**

- **Cevap:** Okurun hayal dünyasını zenginleştirmekle beraber şiirde yer alan bir çok soyut düşüncenin somutlanmasını sağlamaktadır.

6. **Okuduğunuz şiirde sizi en çok etkileyen dizeleri yazınız.**

- **Cevap:** Özellikle "Böylesine sevilecek bu dünya "Yaşadım." diyebilmen için" dizelerini çok sevdim. Çünkü bu dizelerde bence insanın yaşam amacıyla ilgili çok değerli bir yorum ve anlam vardır.

• 3.Etkinlik yapılacak.

Okuduğunuz şiirin konusunu ve ana duygusunu yazınız.

Konu: Yaşama sevinci

Ana duygu: İnsanın bu dünyada insanın bir yaşama amacının olması gerektiği ve bu amaçlardan birinin de yaşama sevinci olduğu

• 4.Etkinlik yapılacak.

Şiirde geçen söz sanatlarını bulunuz. Söz sanatlarının yer aldığı dizeleri yazınız.

Söz Sanatları	Söz Sanatının Yer Aldığı Dizeler
Benzetme	Buğulu bir ciddiyetle yazı-yazarsın
Abartma	Fakat yine de cildıra sığdırmak edersin
Benzetme	Yahut ölü bir bulut gibi de değil. Bazı bir canlı gibi yunurlanırsın.

Diğer metnin hazırlık çalışması verilecek.
(Cumhuriyet'in ilk yıllarında yapılan 1923 nüfus mübadelesi ile ilgili araştırma yapınız.)

BÖLÜM III

<p>Ölçme-Değerlendirme</p> <ul style="list-style-type: none"> Bireysel öğrenme etkinliklerine yönelik Ölçme-Değerlendirme Grupla öğrenme etkinliklerine yönelik Ölçme-Değerlendirme Öğrenme güçlüğü olan öğrenciler ve ileri düzeyde öğrenme hızında olan öğrenciler için ek Ölçme-Değerlendirme etkinlikleri 	<ul style="list-style-type: none"> Hayatımıza anlam aktarılan şeyler nelerdir? Hangi mesleği yapmak insanları daha çok mutlu eder? "Ay bir yandan sen bir yandan sar beni." Bu cümledeki anlatım bozukluğunun nedeni aşağıdakilerden hangisinde verilmiştir? <p>A) Mantık hatası B) Özne eksikliği C) Yüklem eksikliği D) Gereksiz sözcük kullanımı</p>
Dersin Diğer Derslerle İlişkisi	Okurken sesli okuma kurallarına, yazarken imla ve noktalamaya diğer derslerde de dikkat etmeleri sağlanır.



STEAM

On the road to Knowledge - integrated optional curricula –

Level: 7th grade

Topics: Mathematics and Sciences

Man and Society

Arts

Duration: 1 year

Number of classes per week: 1 h/week

PRESENTATION NOTE

Integrated teaching represents a challenge for any teaching staff, because it is very dynamic, it requires continuous adaptation and updating of both the teaching staff and the student. It is a strategy that requires radical reconsideration not only in terms of content organization, but also in the "ambiance" of teaching and learning.

The four pillars of integrated learning are: learning to know, learning to do, learning to work together with others, learning to be. Such knowledge of the world brings with it a deep understanding of the surrounding reality, scientific benchmarks and adaptability to social conditions.

In order to meet the continuous need for knowledge of our students, to keep up with European trends in terms of education and, above all, the effective teaching of mathematics and sciences, we thought of this joint integrated optional curricula in order to capitalize on the offer of knowledge of three of the curricular areas included in the education framework plans: Mathematics and Sciences, Arts, and Man and Society. These three curricular areas ensure openings to other skills (such as those of communication and artistic expression). Integrated teaching is a solution for a better correlation of science with society, culture, technology, such as coding and robotics.

This integrated optional subject includes a training time budget of 34 hours per year (one hour per week), and the structure allows flexible organization of learning time. It presupposes the creation of meaningful connections between topics or skills that are, as a rule, formed disparately within different disciplines. The curriculum is built from the perspective of ensuring the unity of knowledge,

considering knowledge as an end in itself. The proposed activities develop learning and self-assessment skills. Content elements are attractive, on topics of interest to students. The competencies proposed by the program of this integrated optional curricula have in mind the training profile of the primary school graduate and are correlated with the goals of education proposed in various national and European documents, being a tangible intellectual result of the strategic partnership only between schools, the KA229 "Taking a Learning Journey on the STEAM Train", implemented in our partnership schools from UK, Bulgaria, Croatia, Italy, Romania and Turkiye by the help of the European Erasmus+ program.

The contents are selected according to the proposed themes, respecting the age characteristics of the students, the specifics of the class (level of performance, learning styles, types of intelligence), the local specifics, the resources of the school unit and the expectations of the students. The flexible approach to the contents helps the motivation for learning. The formative function of the evaluation will be carried out systematically through the active participation of students in projects, learning through play, coding, experiments, portfolio creations and by familiarizing students with the structure and requirements of these methods and specific evaluation tools.

This integrated optional curricula will create added value by directly contributing to the development of the existing curricular framework, by supporting the integrated approach, by promoting key skills and, above all, by addressing two current topics that will have a great impact in the future: coding and robotics.

I. GENERAL COMPETENCIES

1. The identification of phenomena, processes and the processing of quantitative data from the fields of mathematics, technologies, arts and sciences, their correlation and valorization in different contexts;
2. Solving problems and problem situations by using inductive and deductive reasoning, concepts and methods specific to different fields of knowledge;
3. Investigating the connections between mathematics and various scientific, social, arts and technologies fields;
4. Oral and written communication using the specific scientific language in formulating explanations, conducting integrated investigations and reporting results;
5. The use of information and communication technology in the collection of data, in their processing, systematization and communication;

6. Personal development through the formation of integrated thinking and the management of one's own learning.

VALUES AND ATTITUDES

- Development of interest in scientific documentation
- Developing curiosity about mathematics, technologies, robotics, sciences, coding, arts
- Development of independence in thinking and action
- Confidence in scientific truths and critical appreciation of their limits.

V. SPECIFIC COMPETENCES AND EXAMPLES OF LEARNING ACTIVITIES

1. *The identification of some phenomena, processes and the processing of quantitative data from the fields of mathematics, technologies, arts and sciences, their correlation and valorization in different contexts*

Specific skills At the end of the course the student will be able:	Examples of learning activities
1.1. to identify in everyday language notions specific to the domains addressed	Creation of a vocabulary with specific scientific notions Exercises to identify the notions encountered in the optional in everyday language
1.2. to highlight characteristics of some phenomena and processes in nature based on the measurements made	Knowledge and understanding of nature: the human ability to discriminate between living things (plants, animals) as well as sensitivity to other features of the natural world, especially the environment
1.3. to use tools and standard measurement units for length,	Distance determination exercises Exercises to determine the geographical coordinates of some localities

capacity, mass, area, time in various situations	Exercises for drawing maps to scale Exercises for calculating the length of a tourist route using the map Exercises that make an analogy between geometric figures and architecture
1.4. to collect data, organize it in tables, sort and classify it based on given criteria and provide elementary interpretations of it	Data collection exercises Measurement exercises. Interpretation of local and county geographic data

2. Solving problems and problem situations by using inductive and deductive reasoning, concepts and methods specific to different fields of knowledge

Specific skills	Examples of learning activities
2.1. Identifying problems and problem situations in the surrounding world	Activities to identify problem situations Holding round tables, debates on topics from the areas addressed
2.2. The use of mathematical models to solve some problems and problem situations in the surrounding world	Investigative activities, organization of information Creation of geographical maps Designing a brochure with tips to protect the Earth Activities for making geometric mandalas
2.3. Justification of explanations and solutions to problems and problem situations	Mathematical reasoning of some meteorological phenomena Argument through examples of finding the Fibonacci sequence in nature, arts, architecture, etc

3. Investigating the connections between mathematics and various scientific, social, arts and technological fields

Specific skills	Examples of learning activities
3.1. Investigating the importance of mathematics in the study of astronomy, geography, biology	Research-documentation activities in the field of robotics * drawings of robots in the future * making models from recyclable materials * How we imagine robots in the future

	<p>* Programming Ozobot: “Escape the Labyrinth”</p> <p>* programming mBot or other robots (LEGO Mindstorms)</p> <p>Thematic debates with supporting arguments</p> <p>Making reports or thematic essays</p> <p>The Legend of the Minotaur/Labyrinth</p> <p>Study visit to the Technical Museum in Bucharest</p> <p>Students will learn about science and technology from qualified STEAM staff.</p> <p>By participating in these activities / documentary visits, they will discover the magic of science and technology. The museum develops activities with students based on the concept of learning-by-doing.</p> <p>Interactive experiments are placed in specific rooms, covering all STEAM disciplines – science, technology, engineering, arts and mathematics</p>
<p>3.2. Identifying and capitalizing on the integrated link between mathematics, sciences, technologies and arts</p>	<p>Documentation activities and making essays about geometry</p> <p>Investigating some documents, books, websites to determine the mathematical elements in Romanian folk art</p> <p>Scratch Coding: Students will learn the basics of Scratch, tolerance games, math games, etc.</p> <p>Watching thematic documentaries</p>
<p>3.3. Knowing the data from the history of the fields addressed related to mathematics and the contribution of great mathematicians in other scientific fields/arts/technologies</p>	<p>Documentation activities from the history of music, Romanian folk art and Romanian literature related to mathematics</p> <p>Researching the activity of some mathematicians: Leonardo da Vinci, Leonardo Fibonacci, Solomon Marcus</p>

4. Oral and written communication using the specific scientific language in formulating explanations, in conducting interdisciplinary investigations and in reporting the results

Specific skills	Examples of learning activities
4.1. Selecting information and distinguishing between relevant/irrelevant and subjective/objective information	Exercises for selecting relevant information Exercises to compare selected information from several sources to establish their subjectivity/objectivity
4.2. Decryption and interpretation of scientific texts and translation into common language	Activities of reading some scientific articles on mathematics, ecology, biology, architecture, geography and debating them for the understanding of the students Exercises of transposing the elements of sacred geometry, symbols from popular art into everyday life
4.3. The use of specific language in the oral and written communication of various observations on some systems or phenomena	Oral presentation activities of some topics to acquire the appropriate language for the respective field Exercises on the use of specific language in writing reports, thematic essays

5. The use of information and communication technology in the collection of data, in their processing, systematization and communication

Specific skills	Examples of learning activities
5.1. The correct use of information and communication technology in accessing and collecting mathematical information and data from various fields	Documentation-research activities on the Internet Creation of documentation sheets, using Google, Yahoo, Ask, Internet Explorer, Opera search engines
5.2. The use of information and communication technology in the processing and presentation of	Creating PowerPoint presentations Systematization of data and creation of diagrams in Microsoft Office Excel The use of Microsoft Office and other programs in the creation and presentation

mathematical information and data from various fields	of thematic materials Using web tools 2.0: padlet, kahoot, Cromebook, Kizoa, Powtoon, Photopeach, Emaze, Quiz makers, QR Code Generator
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6. Personal development through the formation of integrated thinking and the management of one's own learning

Specific skills	Examples of learning activities
6.1. The formulation of personal, critical and pertinent opinions, using appropriate language, regarding a problem or a concept	Oral presentation of some logical reasoning used in solving practical problems Making and presenting reports or thematic essays
6.2. Efficient management of own learning and study time	Realization of individual and group projects Systematization of notions and materials created in individual portfolios
6.3. Making various connections between acquired knowledge and their application in personal development	Completion of essays, projects that reflect the level of deepening and integration into the general culture of the knowledge accumulated by the students in the optional course
6.4. Cooperation with others in solving group or individual tasks/problems	Teamwork activities to achieve complex tasks by distributing tasks Brainstorming activities in order to find the optimal solution to accomplish the tasks/problems Intercollegiate evaluation and self-evaluation activities

III. CONTENT

1. Mathematics and technology in human history – 6 hours
2. Web tools 2.0 – 8 hours
3. Mathematics in coding and robotics – 3 hours
4. Mathematical milestones in geography – 6 hours
5. Mathematical foray into the arts – 6 hours
6. The applicability of the Fibonacci series – 4 hours

IV. METHODOLOGICAL SUGGESTIONS

In relation to the program's competencies, the learning and assessment activities are based on inquiry-based learning, project-based learning, discovery and experiential learning.

IV.1 Suggestions on the design of teaching-learning activities

The didactic approaches, both on the teaching-learning sequence and on the assessment, are appropriate to the specifics of the group of students and in accordance with the didactic and human resources available to the school.

Will be tracked:

- integration of previous learning experiences in new scientific contexts or new approaches to scientific contexts already studied;
- streamlining learning activities involves the use of media and computer resources in order to identify information, as well as its processing;
- partnership of education, the teacher assuming the roles of observer, mediator and regulator of the learning and knowledge process, the student being the generator of learning contents and responsible for the development of learning activities;
- independent research and group research, in which students are responsible for identifying and classifying information associated with the topics, integrating, ranking, using information in the context of interdisciplinarity and obtaining conclusions on the influence and educational gain. In this sense, project-based learning and evaluation will value documentation and investigation skills, communication, assuming tasks within the team, facilitating the development of correct attitudes and principles in collaboration and competition.

IV.2. Suggestions on evaluation activities

Related to the evaluation sequence of didactic approaches, both the evaluation of the process and that of the final results (group projects, individual portfolios, layouts, boards, PPT presentations, reports, essays), behavioral changes and the development of self-evaluation capacities and, implicitly, of the competence to learn to learn. Evaluation will accompany the training process at every moment or stage. The evaluation of the students will be carried out by referring to the specific competences of the topics and will involve complementary methods, which aim to integrate the essential in practical contexts, the acquisitions of the students proving their usefulness in relation to their responsibility for the quality of their own lives and the surrounding environment.

Assessment will focus on the specific strategies that students use in solving problems. The evaluation process will combine traditional forms with complementary ones (project, portfolio, self-evaluation, evaluation in pairs, systematic observation of the student's activity and behavior) and will focus on:

- the direct correlation of the evaluated results with the specific competencies targeted by the school curriculum;
- valorization of learning results by reporting on the school progress of each student;
- the use of various methods of communicating school results;
- recognition, at the evaluation level, of learning experiences and skills acquired in non-formal or informal contexts.

V.3. The use of information and communication technology in teaching

The efficiency of didactic approaches can be ensured by the use of interactive, attractive didactic means and materials, which presuppose the use of virtual libraries as a source of information, the modeling of some phenomena and the presentation of some devices, the realization of some virtual experiments, the processing of the obtained data, the creation of reports, the media presentation of information and reports.

V. BIBLIOGRAPHICAL SUGGESTIONS

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Introduce online platforms – kahoot, plickers, mentimeter.

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<https://www.mentimeter.com/>

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<https://qrinfopoint.com/>

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<https://www.wikihow.com/Multiply-With-Your-Hands>

PUPILS' CLUB



”Prepared for Future. Prepared for Life”

eTwinning CLUB

-activities for 1 year-

MONTH	NAME OF ACTIVITY	DESCRIPTION
SEPTEMBER	World multiplication table day	https://www.wmtday.org/basic-information-about-event
OCTOBER	EU Coode Week: Coding without computers: Pacman	<p>https://codeweek.eu/</p> <p>DESCRIPTION:</p> <p>Basic concepts of programming will be learned on a two-color grid like chess board. Some squares will be filled with objects. One student will give ordres which move, code, must other perform. Other student will act like Pacman. Goal of each pair of students is to reach agreed target and end a game without stepping on full square on using minimum of commands. Plan is to learn basic code (forward, backward, left, right) and developing of understanding why is necessary to give commands in the correct order.</p> <p>ACTIVITY TYPE: open in-person activity</p>

		THEME: Basic programming concepts, Unplugged activities, Playful coding activities, VisualBlock programming, Promoting diversity
NOVEMBER	EU Code Week: Codu Game Lab	https://codeweek.eu/
DECEMBER	EU Code Week: Scratch	https://codeweek.eu/
JANUARY	Robots in future	Drawings and models ACTIVITY TYPE: Open in person activity ACTIVITY TITLE: Design your own robot DESCRIPTION: All participants will design robots. Youngest students will draw and create robot from boxes, older will use software for designing robots. Potentially gifted students will build real educational STEM robot from parts and learn basic coding instructions.
FEBRUARY	Labyrinth	Making labyrinth, model of forest, put small trash inside
MARCH	Pi day	Students selected for mobilities will spread their hands and catch each other. That way they will make a circle. Two opposing students will measure their distance. The goal of the activity is to measure the length of the circle they created. Students will find their birthday in Pi number using simulation.
APRIL	Labyrinth	Robots (Ozobot, mBot, Lego...) must push trash out of forest to dump
MAY	microBit	https://microbit.org/ basics
JUNE	Scratch	https://scratch.mit.edu/ basics
JULY	Art and craft workshop: birdhome	Creating birdhomes of recyclable materials

AUGUST	Art and craft workshop: cups for pencils	Creating cups for pencils of recyclable materials
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Our partnership aimed to keep up to date with the latest methods and best practice in European Education and social inclusion through digitalization, gamebased learning, robotics, integrated science, arts and mathematics with digital devices (STEAM).

To create a European dimension and promote global citizenship.

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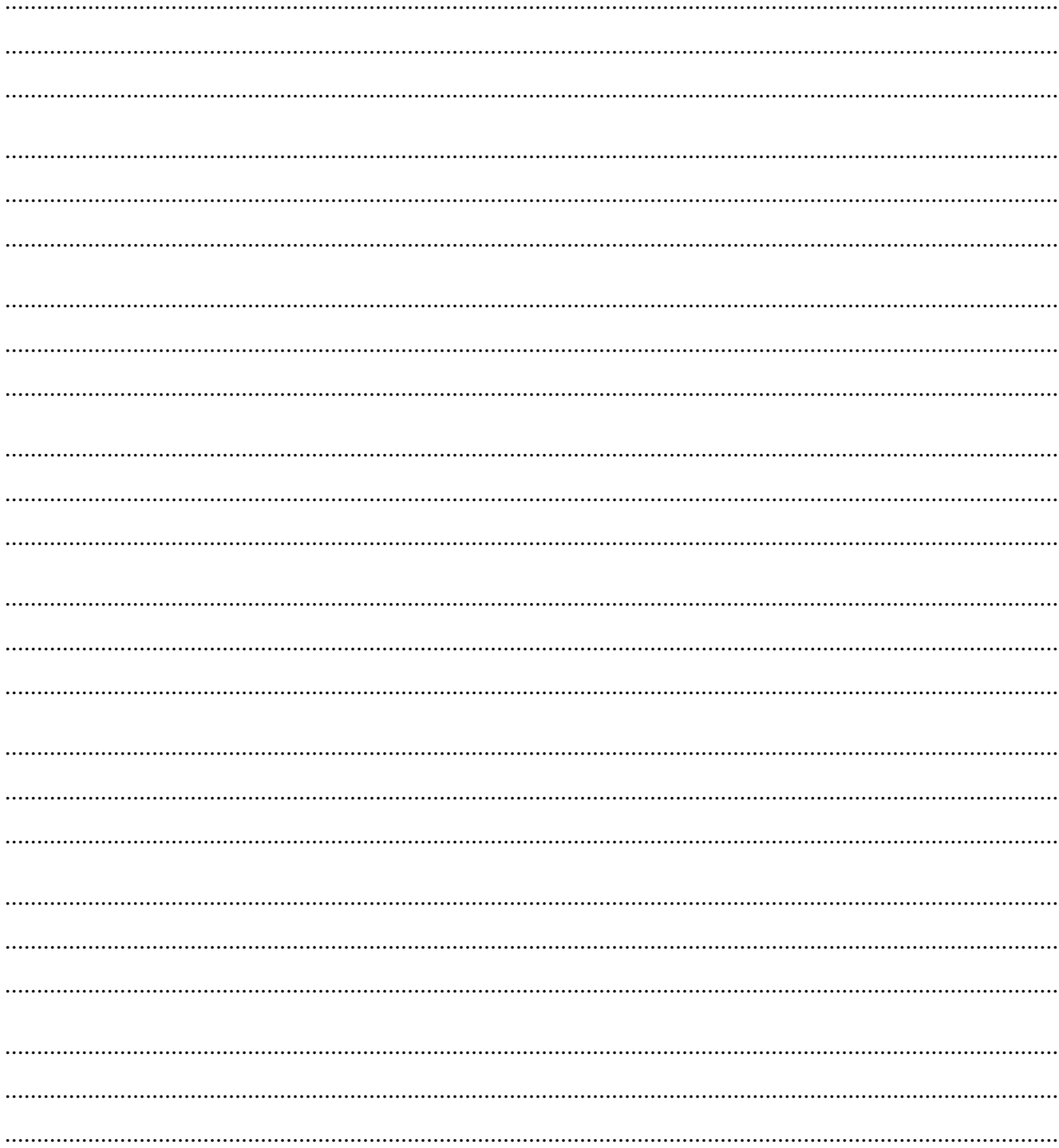
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