



MAKER EDUCATION

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Project Title: Maker Education

Main objective of the project: Exchange of Good Practices

Project Start Date: 01-09-2019

Project End Date: 31-08-2022

Project Total Duration: 36 months

**Applicant Organisation: Colegiul Tehnic „Gheorghe Cartianu”,
România**

Website: <https://makereducation6.weebly.com/>

Partner Organisations:

- **SABA, The Republic of North Macedonia, partner**
- **Insignare - Associacao De Ensino E Formacao, Portugal, partner**
- **Erbakir Fen Lisesi, Turkey, partner**
- **Iis Alessandro Volta, Italy, partner**
- **Centrum Kształcenia Praktycznego w Jastrzebiu-Zdroju, Poland, partner**



I. C5.Science and art

1.Short-term exchanges of groups of pupils

21th-25th February 2022

Project title: Maker Education

Project reference number: 2019-1-RO01-KA229-063086_5

FIRST DAY – 21/02/2022

09:00 Welcome Coffee, signing list of participants. Opening

10:00 Presentation of the school.

Each school will tell a legend of its own country.

Presentations about school and country: Turkey, Romania, Poland, The Republic of North Macedonia, Portugal, Italy

12:00-13.00 Lunch at school

13.30-17.00 visit to FERRARI in Maranello

FREE TIME

SECOND DAY - 22/02/2022

09:00-11.30 Workshop

12.00-13.00 Lunch at school

13:30-17.00 VISIT TO MARAZZI which is **The ceramic tile industry's best known brand**. Marazzi has been responsible for the **main technological, process and design innovations** in the ceramic tile industry

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17.00 FREE TIME

THIRD DAY - 23/02/2022

08:50 Pick up from the hotel for a day trip to Modena

09.30 -12.30 Guided tour

13.00 Lunch in Modena

14.00 free time for shopping

17.00 departure

FOURTH DAY - 24/02/2022

09:00 workshop

12.00-13.00 lunch at school.

14.00-17.00 guided visit to Palazzo Ducale in Sassuolo one of the most important baroque residences in northern Italy

FREE TIME

20.00 Farewell dinner in Sassuolo.

FIFTH DAY - 25/02/2022

09:00 Evaluation meeting with teachers feedback

Activities for students

12.00 Lunch at school.

13:00 Free time

SIXTH DAY - 25/02/2022

Departure of partner schools

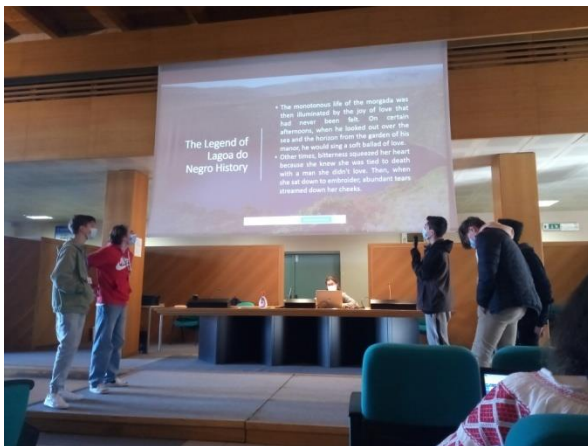
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•February 21, 2022

The agenda of the day included:

-presentation of schools and partner countries in Romania, Italy, Portugal, Poland, Northern Macedonia and Turkey;

-visiting the Ferrari Museum Maranello - A unique and captivating opportunity to discover the history of Ferrari. The museum belongs to the Ferrari company and is dedicated to the Ferrari sports car brand, the museum exhibits, along with cars, technological innovations, trophies, photographs and many historical objects related to the Italian racing car industry.



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•February 22, 2022

A new Erasmus + day! A new journey into the fascinating world of science and art! A special day in which I participated in school workshops on electronics, automation, art, modeling, going through, step by step, the processes of processing ceramics!

We all had the opportunity to visit Marazzi, the most famous brand in the ceramic tile sector. Present in over 140 countries, Marazzi is universally recognized as synonymous with quality ceramics for floors and walls but also a symbol of the best products in Italy in the furniture and design sector. Marazzi, undisputed leader in ceramics, the place where you can find technological, process and design innovations!

Marazzi - The charm of four Mediterranean lime stones, reinterpreted in a new synthesis of nature and innovation!



•February 23, 2022

"What a beautiful day - it's a sunny day
A gentle breeze after a storm...
There is already a celebration in the fresh air
How beautiful is a sunny day! ”

Located in the Emilia Romagna region, Modena is a city famous for its admirable architectural treasures, a UNESCO World Heritage Site! Its hospitality focuses on cuisine and cultural life, all with a fascinating and characteristic blend of innovation and tradition. Modena is also famous as Luciano's home town Pavarotti.

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•February 24, 2022

Another Erasmus day full of attractive events. From 3D printing workshops and T-shirt printing technologies in school, to outdoor activities, walking through Sassuolo.

We all enjoyed the beautiful weather, the walk through the park and the city center but also the grandeur of the Ducale di Sassuolo palace!

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•February 25, 2022

The agenda included:

- Graphic editing workshop
- evaluation of the activity
- discussions about the new mobility in April 2022



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Geometry and arts in ceramic decorations

Autor: Eleonora Dragomir

Geometric surface art, with both abstract and symmetrical patterns, have pervaded the pottery arts of most ancient cultures. The earliest on record is the Protogeometric period (1050-900 BC). Systems of concentric circles or semicircles, groups of oblique shapes, parallel lines, hatched triangles, lozenges and rows of solid triangles, were the main motifs of the period. The shapes of the pottery vessels had evolved into designs such as the amphora, trefoil oinochoe and lekythos, krater, kantharos, skyphos and pyxis.

From the Early Geometric period up to the Middle Geometric which ended in 760BC, the decoration eventually covered the entire surface of the vase in zones separated from each other by vertical groups of lines, creating panels. The following Late Geometric phase saw vases adorned by multi-figural scenes of everyday life, such as naval and land battles, hunting, and dances at religious ceremonies, confined within zones or panels. Geometric motifs were still found, amongst them chequer-board pattern, lozenges, complex meanders, leaves, and rosettes, all arranged vertically or horizontally.



The roots of Cucuteni–Trypillia culture can be found in the Starčevo–Körös–Criş and Vinča cultures of the 6th to 5th millennia, with additional influence from the Bug–Dniester culture (6500–5000 BC)

Over the course of the fifth millennium, the Cucuteni–Trypillia culture expanded from its 'homeland' in the Prut–Siret region along the eastern foothills of the Carpathian Mountains into the basins and plains of the Dnieper and Southern Bug rivers of central Ukraine. Settlements also developed in the southeastern stretches of the Carpathian Mountains, with the materials known locally as the Ariuşd culture (see also: Prehistory of Transylvania). Most of the settlements were located close to rivers, with fewer settlements located on the plateaus. Most

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early dwellings took the form of pit-houses, though they were accompanied by an ever-increasing incidence of above-ground clay houses. The floors and hearths of these structures were made of clay, and the walls of clay-plastered wood or reeds. Roofing was made of thatched straw or reeds.

Various representations of geometric designs have consistently appeared over time, and with some cultures like the Native American, the geometric images on their pottery took on a tribal and spiritual significance. Other eras like Art Deco, featured a predominance of geometric aspects.



Geometric pyxis with four horses standing on the lid. Terracotta, 760–750 BC (Middle Geometric II).

Made in Athens.

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Although geometry has always existed in art, geometric art as we currently think of it - or **geometric abstraction** - emerged at the turn of the 20th Century with the Cubist movement in France. Pablo Picasso (1881-1973) and George Braque (1882-1963) rejected the rules of perspective and space, reducing objects to geometric forms. In the decade that followed, geometric abstraction went on to take different expressions in the work of the Russian Avant-Garde artists and the De Stijl group in Holland.

Modern geometric artists produce work that is as rich and varied as the historic movements and artists interpretations that fall under this seemingly simple classification. Geometric art seems a straightforward enough concept, inviting thoughts of lines, squares, triangles, circles and combinations of the above. In reality, contemporary geometric abstraction movements are just one face of this multifaceted genre.

Sassuolo Village in Italy has the largest collection of interior and outside ceramics decorations in a very large pallet of stiles .

It is tremendous fascinating the way of combining ancient styles and modernism in the proposed home decorations.



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Sources:

<https://ceramichesassuolo.com/it/>

<https://www.riseart.com/guide/2265/art-collections-5-contemporary-artists-creating-new-geometric-abstract-art>

<https://www.veniceclayartists.com/geometric-pottery-styles/>

https://en.wikipedia.org/wiki/Cucuteni%E2%80%93Trypillia_culture

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3.The steering wheels (home made)

Adelin-Gabriela Catană, student

The steering wheels are used in most land vehicles, including all mass production cars, buses, light and heavy cams, and tractors. The steering wheel is the steering system that is operated by the driver; the rest of the steering system responds to such inputs of the driver. This can be through direct mechanical contact, as in recirculating ball or rack steering transmissions, with or without hydraulic power steering, HPS, or as in some modern production machines with computer-assisted motor assistance, known as power electric steering.

Starting with a controller model, in video games, very well known in the entire gaming industry, the famous LOGITECH Driving Force G29, I decided to build one myself at home.

The steering wheel consists of:

- the steering wheel
- 3 pedals
- 7-speed manual gearbox

In carrying out this project we used materials, both recycled from dismantled vehicles, and parts printed using a 3D printer.

The basis of this project is the Arduino development board which

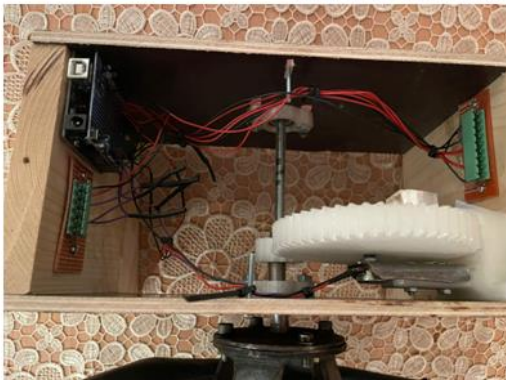


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connects the physical control to the digital control.

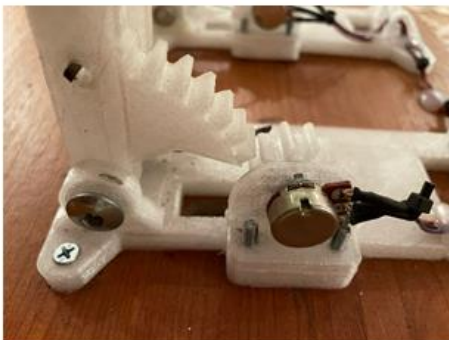
1. The steering wheel

It consists of two gears of different ratios and a potentiometer.



2. The pedals

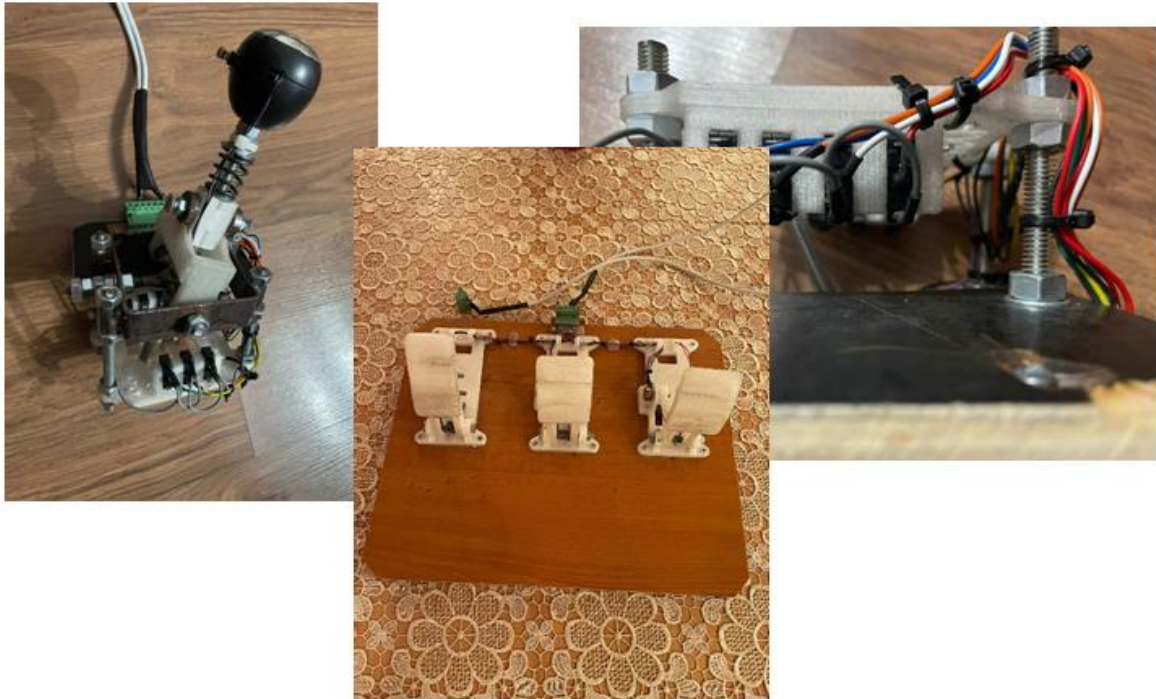
They consist of parts made using a 3d printer and three potentiometers that send signals to the Arduino board.



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3. The exchanger

It consists of 7 switches that are connected to the board pins via GND.



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4. Art, science, creativity

Prof. Șalaru Constanța, Technical College

"Gheorghe Cartianu" Piatra Neamț

Art and science are not separate, humanistic culture and scientific culture in reality are intertwined, even if they are different.

There is only one culture, human culture, the creativity culture, in which art and science influence each other, non-stop.

Intuition is the engine of scientific creation.

At the heart of artistic creativity is also intuition.

Over time, science has influenced art and art has influenced science. Art and science are synchronized.

Were Dante, Galileo, Michelangelo, Leonardo da Vinci, Descartes, Goethe, Einstein, artists or scientists? They were the visionaries of the world!

Jules Verne and Herbert G. Wells had remarkable anticipatory visions and described technologies, ideas, and societies for which the knowledge of the time was insufficient.

Art and science have always intertwined! This is well observed in the current age of digitalization.

Artificial intelligence and computer science even influence art. Art influences virtual reality, Today, we are immersed in multiple realities, and young people have grown up (born...) with a tablet or a smartphone in their hand.

Janet H. Murray, author of "Hamlet on the Holodeck: The Future of Narrative in Cyber Space," Computer Culture "Printed Childhood."

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While the books offer essentially linear stories, she claims that computers tell "procedural, participatory, encyclopedic, and spatial" stories.

Today, the perception and experience of art have gone beyond what can only be perceived in the "real" world. Thus, virtual reality combines science and art, using computer technology to create a framework that simulates reality. The virtual reality 3D glasses create a sense of physical presence in different graphic environments. Augmented reality glasses "teleport" us in an environment that seems real, natural. The content rendered by these virtual glasses can be anything: 3D movies, games, tourist circuits, etc. The devices use different sensors: gyroscope, accelerometer, infrared sensors, magnetometer. The user can control the viewing angle by moving his head, as in reality, with a large viewing angle. Some VR applications also allow interaction by hand movements (activated by touch controllers).

We can move freely in virtual reality, while the sensors outside the glasses / headphones watch over our safety. We can live truly thrilling and captivating experiences.

But, virtual reality is not only used for fun, it has also an important impact and can bring major changes in other areas such as:

- education (testing skills before using them in the existing reality - simulator experiences for trucks, training for different professions such as air conditioning installation, welding or educational experiences for children.)
- the art
- aerospace engineering
- auto industry
- architecture, planning and urban reorganization
- medicine, for treating certain ailments

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- psychology and social sciences, in various studies
- in the military field, for simulating parachute jumps or other physical training programs.

In education, virtual reality offers a multitude of resources: physics, chemistry, history, geography, biology. There are trainings for different professions that are easier, safer and more efficient in virtual reality: doctors, drivers, welders, border guards, workers from oil rigs, etc.

Virtual reality is one of the fastest growing technologies of recent times.

There is no culture of art and no culture of science! Its were never separated. Are intertwine, forming a single culture: that of creativity.

... And, because we are talking about creativity, science and art, because we are in March, the month of “mărțișor” in Romania, we can creatively recycle some components dedicated to science and offer you, virtually, a “mărțișor” made by students of our school.



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II. Other Erasmus+ projects

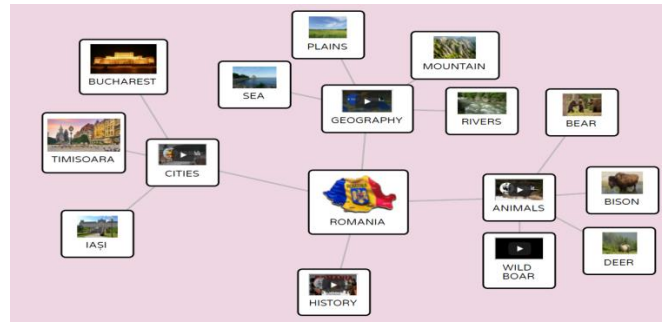
1. DIGIT+ - Digitalization for in group integrative training

Elena-Liliana Airinei, teacher

POPPLET

Popplet is a web 2.0 tool that provides a canvas on which you can create visual representations of your ideas or projects. It goes beyond just writing or typing out thoughts or doodling. It allows you to connect ideas and create concrete visualizations of your plans and ideas. You can make concept maps and relate images and work areas to each other. You can add images, videos and content from Flickr, YouTube and Google maps. It can be exported and used in presentations. Popplet is amenable to any environment: education, business, home and personal projects. Sharing it with others can inspire collaborations and enhance productivity. You can also collaborate real-time on a Popplet. Groups of people can come together to brainstorm ideas, work through problems, or build presentations, to name a few uses. When you share a Popplet, you can let some else just view it, add to it, or edit it (so that it really becomes a collaborative effort). A name-tag on the Popple lets you know who contributed that Popple. It is simple and easy to use so all ages can use it. It is a fun way to make your ideas usable and present them to others, or work on a project in a group.

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How to use Popplet in a teaching environment

We could use Popplet to enhance problem solving and collaboration among students. During their class time I would ask them to divide into groups of 3-4 students and have each group choose a specific topic from a preset list of subjects. They would be instructed to create a Popplet outlining the pros and cons of that problem. They would be asked to provide arguments, features, examples, pictures, videos that illustrate that problem and formulate a plan of management. Since those name-tags on the Popples allow you to see who creates it, this would be a way to analyse who contributed to the project and how the work was shared. The groups would then publish/share their Popplet so that others could learn about that specific problem.

Advantages of using Popplet

It lets individuals or groups brainstorm and create concepts. It is a great avenue for promoting problem solving and teamwork through its collaborative features. Easy to follow instructions make it simple to use, so a variety of skill levels can use it. Additionally, an iPad app is also available for using Popplet on the go.

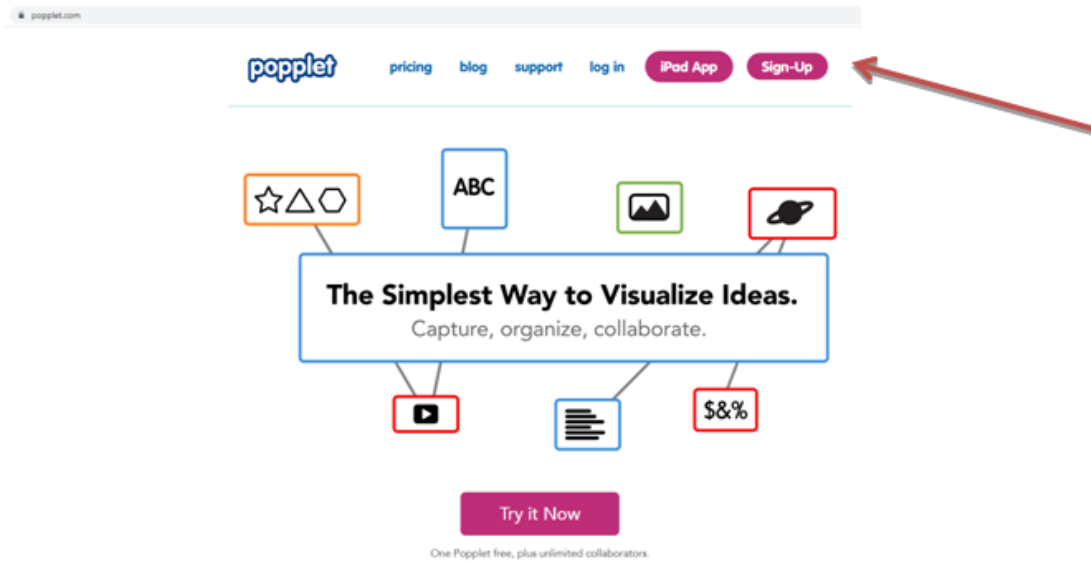
Disadvantages of using Popplet

The tool doesn't offer much flexibility in editing text or images once they are in the Popplet.

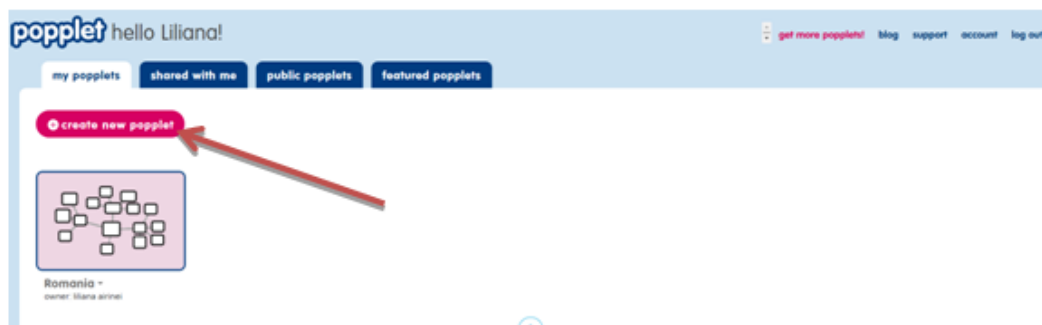
How to use Popplet at your classroom?

Access the site <https://www.popplet.com/> and Sign-Up

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Click on *Create new popplet* button

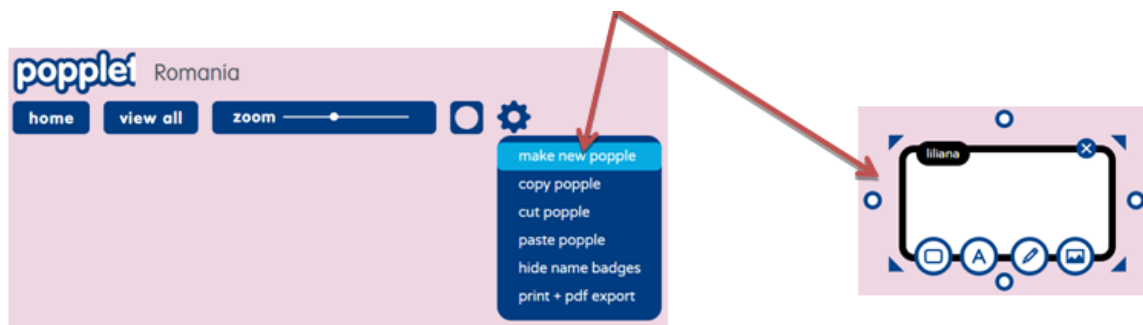


Name your popplet and choose a color for it.

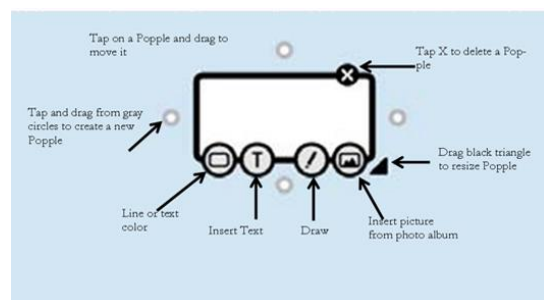


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Start making a popple and enter text in it.



The popple can be modified using his buttons



Using the *Share* button you can add collaborators or you can share your popplet on Facebook or Twitter.



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Popplet Activity

1. Open <https://www.popplet.com/>
2. Double tap anywhere on the screen to start a mind map.
3. Add text, a drawing, or a photo from your camera roll.
4. Create a vocabulary map with at least 4 bubbles.
 1. Animal
 2. Description
 3. Average lifespan
 4. Bonus: Add a Picture
 5. Bonus: Add a Video (youtube link)
5. Click on the words “My Popplet” to rename your Popplet
6. Click on Print+pdf export and save as a PDF to your computer

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ZUMPAD

ZUMpad is a web 2.0 tool that can be used to create texts collaboratively. Collaborative means that the users of a pad can work on it at the same time on different end devices via the Internet and can follow the changes made by others in real time. Text styling and formatting features are limited, but nonetheless all the basic features are there. Different font colours make it clear who wrote which paragraph. There is also an integrated chat where you can exchange ideas. The processing history can also be viewed. Texts can be imported into the pad and exported in various file formats, including HTML, PDF or Word files. The cooperative desktop can be used by anyone who has the link.

The document can be viewed and edited by anyone invited. When editing, each person is assigned their own colour. In addition to editing the text, a live chat with all participants is also possible.

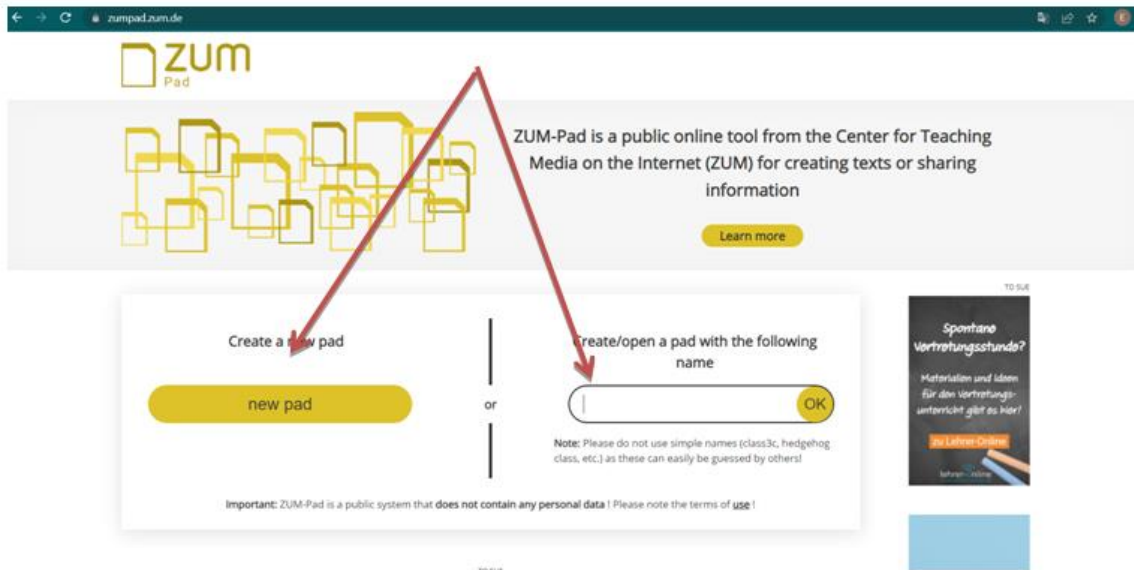
Advantages of using ZUMpad

- Easy to use, quick to set up

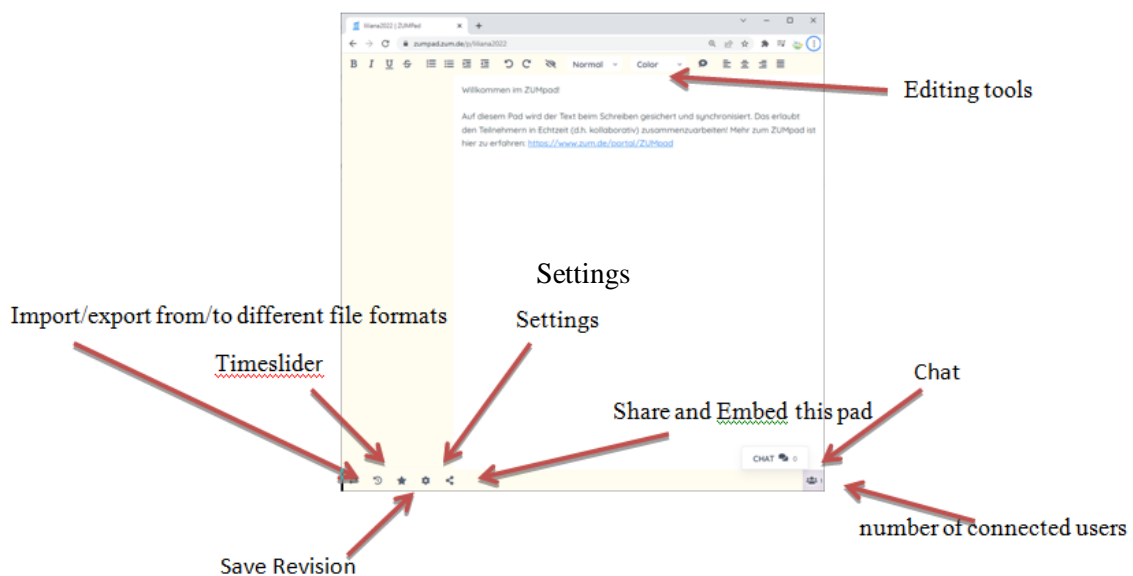
How to use ZUMpad at your classroom?

Access the site <https://zumpad.zum.de/> and click on create a *Newpad* or *Open a pad with the following name*

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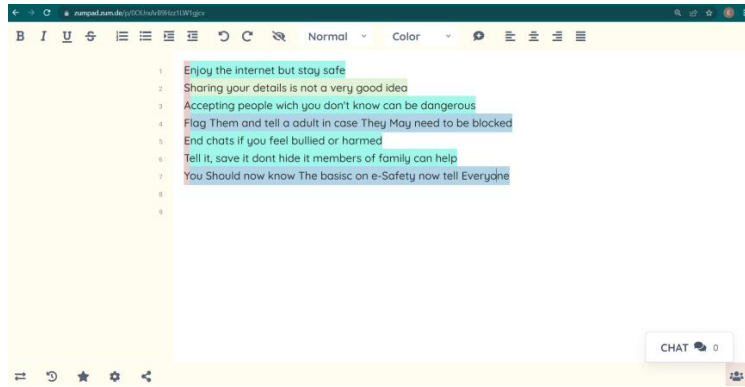


The following window will open:

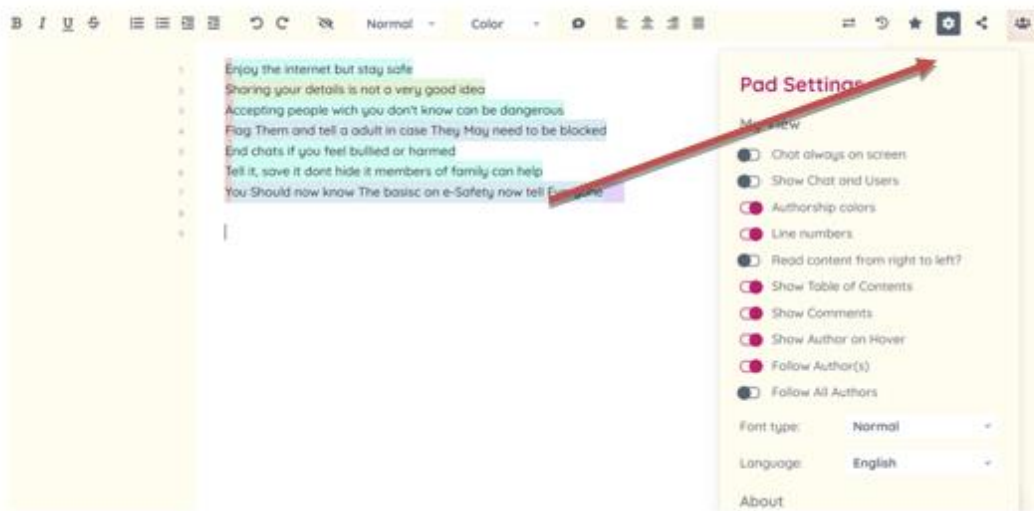


Share the pad with other collaborators, they will connect and you will be able to edit texts together. Each contributor will edit in a different color.

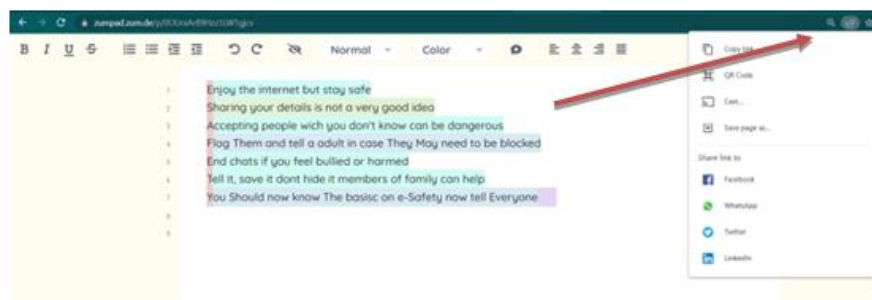
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You can change the Pad Settings on *Settings* button.



When the pad is finished it can be shared or saved.



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ZUMpadactivity

1. Open <https://zumpad.zum.de/>
2. Create a new pad
3. Propose an acrostic based on the name of a personality from the scientific world or based on a learned notion
4. Send the link your to colleagues and work together
5. Share your pad with your collaborators

LearningApps

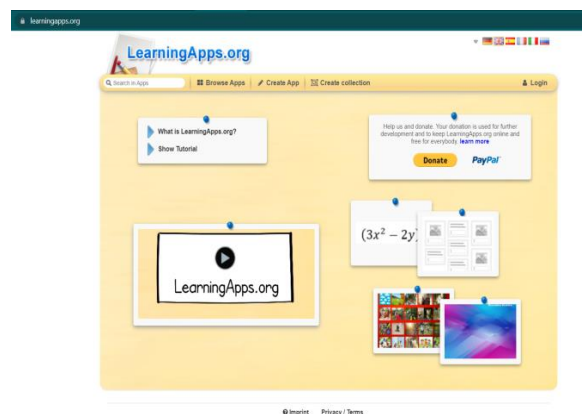
The LearningApps.org platform emerged from a doctoral thesis at the University of Mainz and is freely accessible. The software offers building blocks for creating tasks as a web app. However, these are not classic tasks for a worksheet, but multimedia learning modules. This means that the tasks can contain several media formats such as text, images, videos and/or audio files and are opened and solved on a PC, tablet or smartphone. In addition, some tools (voting, chat, calendar, notebook and pinboard) are offered to simplify teaching processes. Thus, cooperative work is also offered to some extent. Registration is only necessary for the teacher, whereby the students can also register and thus receive a multimedia learning environment, the learning progress of which can be observed by the teacher.

LearningApps.org is very easy to use with a walkthrough tutorial on the home page explaining all of the features. You can create your own activities from scratch using one of the templates provided or you can adapt activities already created. Enter a key word or choose a category to explore and, when you find an activity you like, you can 'Create a similar app' with your own ideas and then share it with your learners. Practice tasks can be made in minutes and you can use them again by saving them in your account - creating an account is free! Registration is only required if you want to create your own games and then save them.

Tasks can be completed individually and then shared or they can be done in pairs or groups in class or at home. Some LearningApps.org activities also have chat boxes where learners and teachers can add comments during games and there are some more sophisticated competitive tasks which learners can play in groups to compete with each other. As well as interacting with each other to do the activities, learners enjoy working with each other to create activities for their classmates to do. They can collaborate on choosing the task type, finding suitable materials and thinking of hints and feedback.

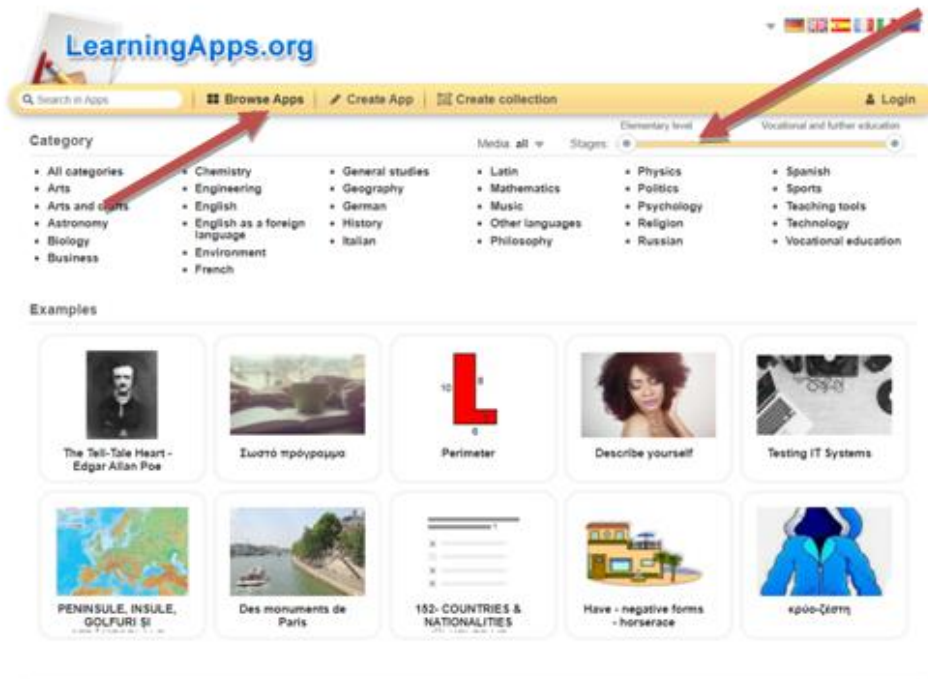
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Because of the ease with which teachers and learners can create activities using a video or a text on a specific subject, LearningApps.org is a great platform for creating activities learners can use to build knowledge in school subjects. In the 'Technology' category there are a number of ready-made activities which can be used as they are or adapted for a particular group of learners. For example, there are short videos on a variety of topics. Learners watch and complete pre, while and post watching tasks which check their understanding.



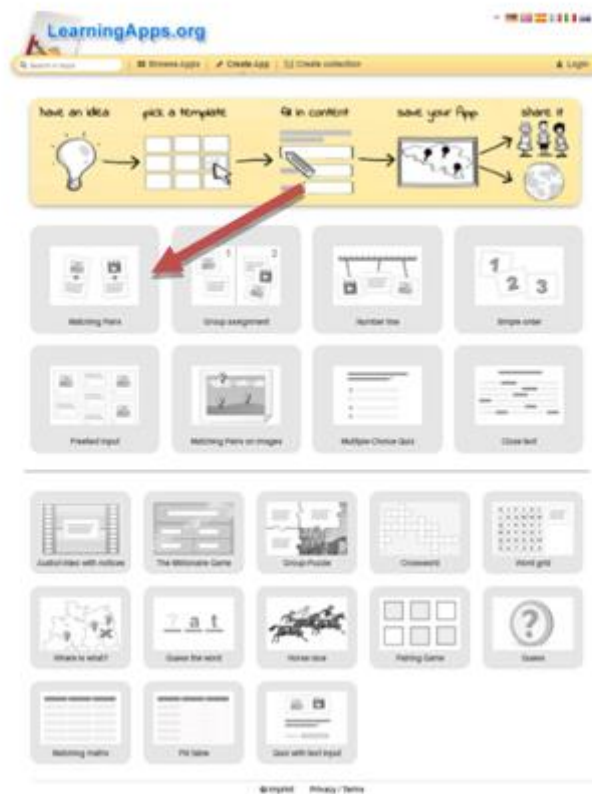
If you click on "Browse apps" you can choose between different thematic categories and even limit the target age in the top right.

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If you click on “*Create App*” you get a large selection of tools. These are the different game categories.

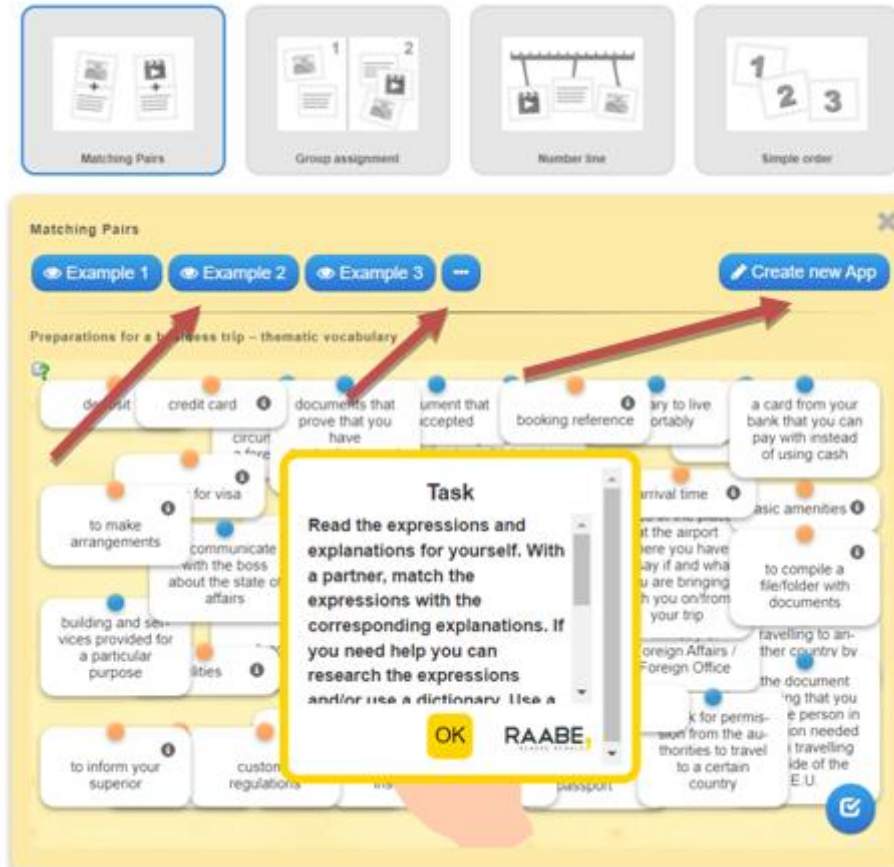
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We chose the first option, matching pairs. There are many other options such as creating sequences, assigning objects to a picture, classic memory, a group puzzle and much more.

If you now select one of these boxes, you always get a view with an example. At the top left you can choose between three different examples to get some inspiration. If you click on the "... " next to it, you get to other games from this category.

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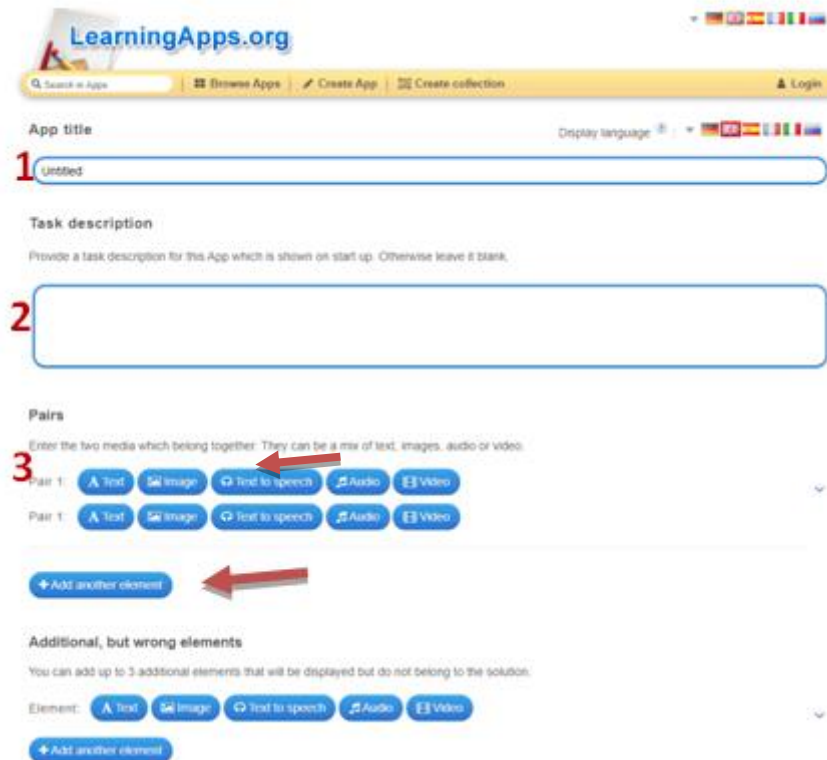


If you like the tool, you can click on “Create a new app” and get started right away.

Now the construction of your own app begins. Don't be put off by the many options available to you. The progress can be saved at any time and continued at a later point in time.

As an example, we will guide you through the creation of our animal voice memory.

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First, choose a name for your “app”. Second, you can formulate a task, which is displayed when you start the game. Now you have arrived at the pairs. You can choose between text, an image, text to audio (the written text is read out), audio and video. Of course, a pair consists of two objects.

For royalty-free images, our recommendation is: [Pixabay.com](https://pixabay.com)

With the audios, you have the choice of using something from YouTube or recording something yourself. This is then unlisted, uploaded to YouTube to be used. This means that one is not able to find the audio files on YouTube itself.

With "**+ add another element**" you then add as many pairs as you like.

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Additional, but wrong elements
 You can add up to 3 additional elements that will be displayed but do not belong to the solution.

Element: Text Image Text to speech Audio Video

+ Add another element

4 Make matching pairs disappear
 Matching pairs will be automatically checked and then disappear. Without this option you can keep pairing until you check the solution manually. Matching pairs will not disappear.

Make matching pairs disappear

5 Attach cards

Cards one above the other

6 Feedback
 Provide a feedback text which will be displayed when the solution is found.

7 Help
 Provide some hints how to solve the App. They can be viewed by the user via a small icon in the upper left corner. Otherwise leave it blank.

▶ Finish editing and show preview

You can decide whether pairs that have been assigned correctly should be hidden immediately, or whether they should be displayed until you click on "Check" yourself.

Fifth, you can decide whether the pairs should be sorted on top of each other or side by side. This is purely visual.

Now you are already at the "Feedback". This is the message that appears when you have everything sorted correctly.

As the seventh and last step, you can enter a "help". This can be accessed by clicking on the small lightbulb at the top left while playing.

Click on "***Finish and show preview***" to see your result.

Create similar App Bookmark in "My Apps"

| | | |
|--------------------------------------|---|---|
| About this App | Use App | Report copyright or misuse |
| Rate this App: ☆☆☆☆ (0) | Link: https://learningapps.org/view15207807 |  |
| Created by: | Embed: <code><iframe src="https://learningapps.org/wi</code> | |
| Category: Technology | Share: https://learningapps.org/15207807 | |
| | | |

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On this screen you have the option to decide whether the "app" is private or public. With public, the app is displayed on this page and can be played by all users. Accordingly, with "Private" only people who have the link or the QR code have access to it. Both are below this option if you want to share your game. You then have the option to revise the "App" on the right.

The "Revise app" button is a "Save app" button when creating it. This is also where you save your progress if you want to take a break.

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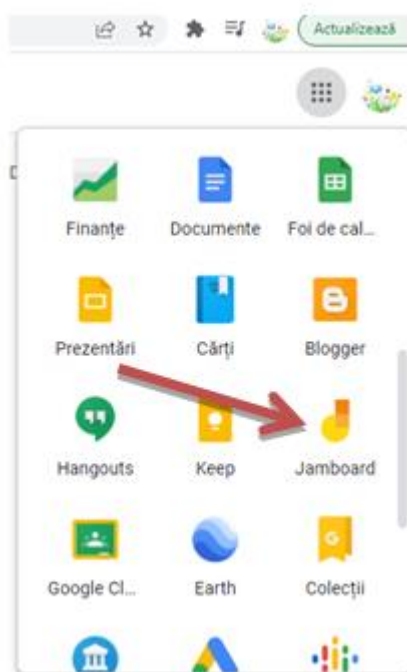
Jamboard

When it comes to collaborative tools, nothing beats Google Jamboard. This user-friendly system replicates a traditional meeting whiteboard, allowing participants to share ideas and brainstorm together. The app is simple and streamlined in its design, making it easy for users to navigate and (dare we say it) even fun for working or learning remotely.

If your group is large, Jamboard has you covered: it can accommodate up to 50 people working on a jam at once! Whether you are using it to teach remotely, meet with a committee, or even map out the annual family holiday scavenger hunt rules, Jamboard is a collaborator's dream. The ability to use a whiteboard with others in real-time – even if you are 500 miles away from each other – is something you will wonder how you lived without once you start meeting or teaching with it.

Getting to Jamboard is easy, and there are several ways you can do it:

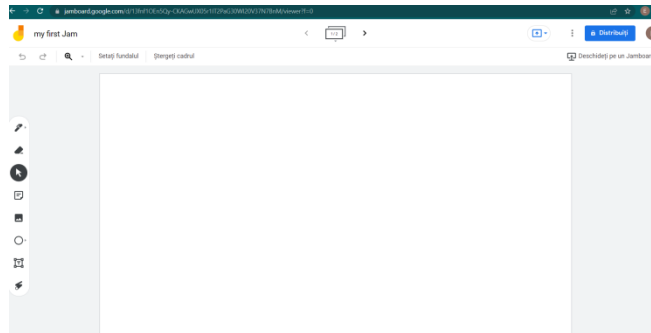
1. Open Jamboard within your Google account
2. Go to google.jamboard.com
3. Open a new Jamboard from within Google Meet



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Once you are in the app, you will see previous Jams you have created and saved.

Within the Jamboard app, you will see the tools menu on the left-hand side of your screen. These tools will help you write, draw, create, and communicate within the app. And if you make a mistake, you can erase it, too!

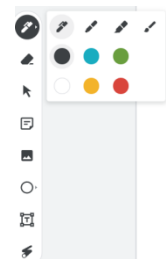


Pen

The pen tool is at the top of the menu on the left of your screen. If you click on the pen icon, a mini menu of choices will open up.

The pen can be used as a regular pen, a marker, a highlighter, or a brush. Plus, you can use one of six different colors to write.

The color choices are one of the best ways to keep your Jamboards organized. You can ask participants to use particular colors, perhaps grouping them by teams. Perhaps you've asked your students to plan a role-play session for a mock political debate, and you can ask the Republican team to write in red and the Democratic team to write in blue during the Jamboard session.



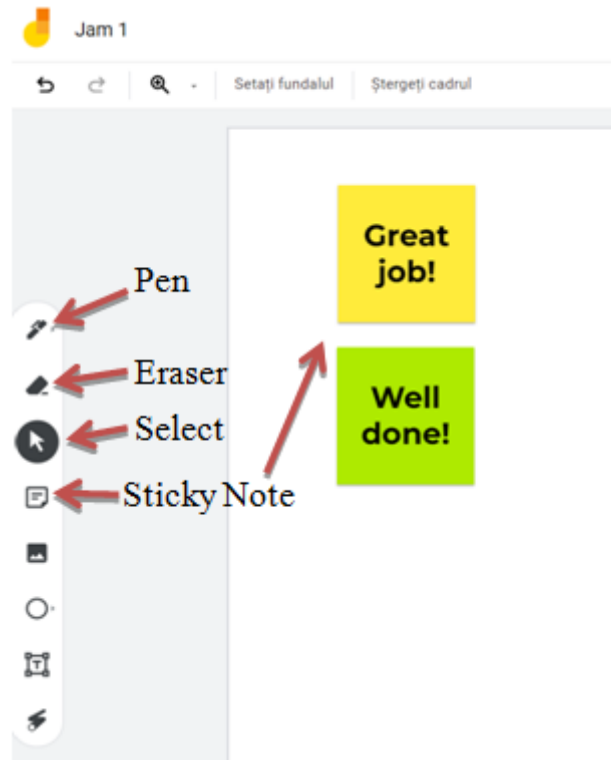
Eraser

The eraser function in Jamboard is a fantastic feature, with one caveat: you need to set some ground rules for using it! In collaborative environments, you want to be sure no one's efforts are either accidentally erased or intentionally removed.

Fortunately, if this scenario occurs (and you realize it immediately), the "undo" button comes to the rescue. (It is the first reversed arrow in the top menu bar).

If you've made more than just a minor error, you also have the option to clear the entire frame, which we will get to a little later.

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Arrow (Select)

Next in the list of tools on the left side of your screen, you will find the “*select*” tool represented by an arrow. You can use this tool to move or drag items around on your screen, as well as to increase or decrease sizes. If you insert an image (another tool we will cover), you can click on its corner with the select tool and drag it out to increase the image size.

Sticky Note

The sticky note is located under the select tool, and you can also bring one up quickly by typing **ctrl + shift + p**.

Once you either open a new note from the tools menu or by typing the shortcut, a screen appears where you can choose the color of your note. It defaults to yellow – the color most of us associate with “real life” sticky notes – but you can also choose from green, blue, pink, or orange.

After you create your note, you will see three grey dots appear in the top right corner if you click on it. Once you click on the dots, you have the option to edit the note, duplicate it, or delete it.

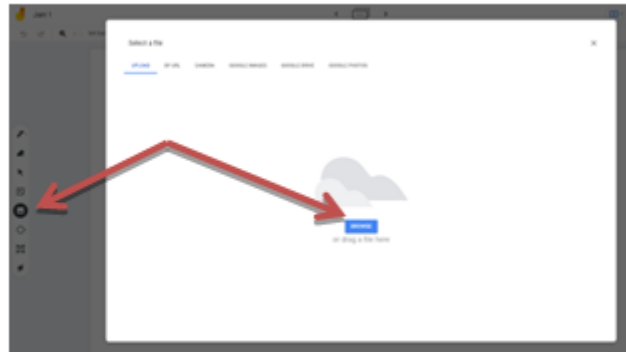
These sticky notes are a great way to pop in with real-time feedback that you can delete later; for example, perhaps you want to communicate to a student who has made a few careless errors “Brian, do you want to take one more look at the debate points on this page? I think you missed one from your earlier list?”

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Once the collaborator makes the necessary change, you can delete the note from the Jamboard.

Add Image

Below the sticky note, there is a small box with two triangles (mountains), and this is the “add image” tool.



If you click once on this box, a screen will pop up with several options. You may have a specific image in mind, or perhaps you even prepared an entire folder of images on your desktop before you invited others to collaborate in a Jamboard.

If that is the case, you can use this image menu to pull the appropriate pictures from your own folders or [Google drive](#).

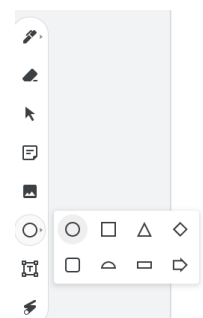
However, if you are looking for something in real-time, as an idea comes to you, the Google Image Search automatically built into Jamboard really delivers! Say, for example, your team is working on a project to introduce measures to stop bullying at school.

And a “stop sign” suddenly pops into your head. As quickly as you think of it, Google can find it: enter “stop sign” in the Google Image Search line, and numerous choices will appear instantly.

Circle

When you click once on the circle, you will see eight different shapes you can automatically insert into your Jamboard. Each of the shapes can be manipulated with the select tool: you can make them larger or smaller and move them around to various places on the screen.

Like with the sticky note, if you click once on your inserted shape, you will see three small dots appear in the top right corner. There you will have the option to duplicate your shape or delete it.



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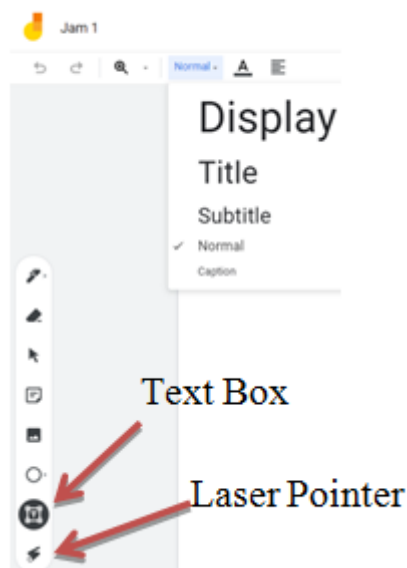
Duplicating shapes can come in handy when you need to create a space for each participant in a Jamboard. For example, let's say you create a rectangle for each of four participants to list their preferred name for the debate teams. You can quickly duplicate the same shape, spread them out on your Jamboard, and use the text box (which we will cover below), and type their answers into the spaces.

Text Box

The text box is probably the tool you will use most often in your Jamboards, whether it is to insert your own text or create spaces for collaborators to write.

Once you insert the text box, you have plenty of options to customize it. The three dots in the right corner will allow you to edit, duplicate, or delete the box. It will also allow you to change the order, i.e., creating an order for layering objects in your Jamboard.

The text color, style, and alignment can all be changed with the buttons in the top menu (just like in most word processing programs), and you can use your selection tool to drag the corners of the text box in and out to increase its size, too.



Laser Pointer

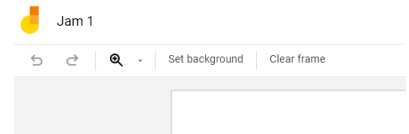
At the bottom of the left-side menu, the tool is the laser pointer, which acts just like a laser pointer would in a classroom or conference room. It allows the user to draw everyone's eye to a portion of the screen, but it ultimately disappears.

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When you use this tool, you are moving it across a specific section of the screen, where it will be visible briefly, but then it will disappear.

Top Menu Tools

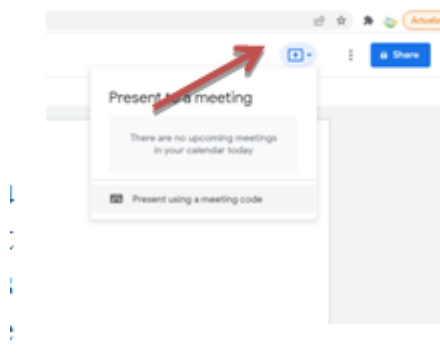
Across the top of the screen in Jamboard, you will see a number of other useful features, including:



- **Zoom:** You can zoom in and out to specific sections of your screen.
- **Background:** You can change the background of the Jamboard to a color, or you can even choose graph paper, among several different options.
- **Clear Frame:** This is how you can eliminate every item you have added to the frame in one easy click if, for example, your team has decided you need to scrap the ideas and start over. If you clear the frame by mistake, you can use the undo arrow to restore your work.

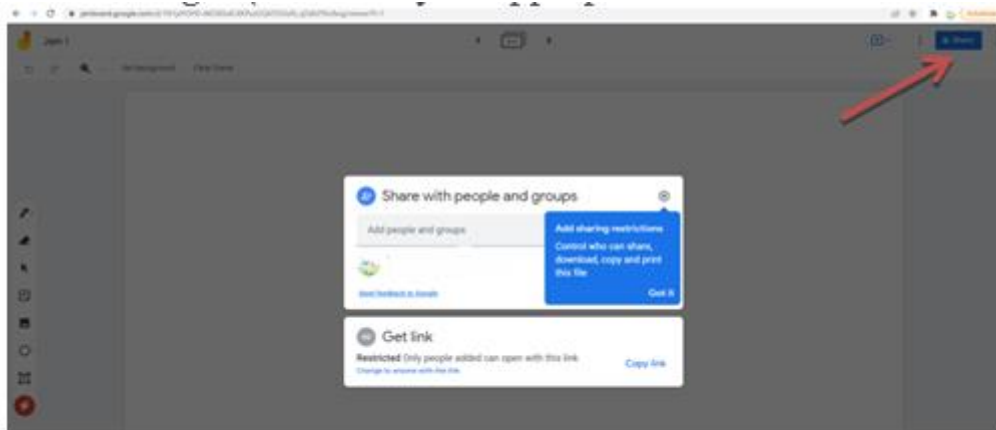
Also, at the top of your screen, the plus buttons will enable you to add more frames. You can number them and direct students or collaborators to fill out or work on a specific frame. Jamboard even shows you when someone is typing or adding content to a frame, with a small icon/initial in the area where they are working.

Jamboard can be used in a Google meet.



Finally, one more tip on collaborating with others: when you choose the “share” button at the top of your screen, you can insert contacts, and they will default to “editor.” This is what allows others to make changes. If you share and make them “viewers,” they will be unable to edit and make changes (which may be appropriate in certain circumstances for teachers).

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Examples of use Jamboard for collaborative learning

Jamboard is an excellent tool for collaborative learning.

1. Concept maps: We can start with a short group activity and discussion to get the students talking about the day's content. Next, the teacher put students in breakout rooms on Zoom to create concept maps using Jamboard to show what they had learned about the content. Since one Jamboard can have several boards, we assigned each group a different board. To make it simple, the teacher labeled the boards 1, 2, etc. The cool thing is that students can work together on the same board at the same time.

The teacher gave the students a short tutorial. They will have fun using different colors and shapes to make their boards attractive as well as informative. The teacher is able to watch the students work on their boards as they were creating them. The teacher also hopped in and out of the breakout rooms to make sure everything was going well. After a designated time, he had them wrap it up and brought everyone back together to present the boards.

Since he had created multiple boards on one Jamboard, everyone could see all of the boards. This made it easy for the students to look at the boards as they were presented. The boards provided a wonderful discussion and teaching opportunity. The teacher is able to expand on what they said and correct misconceptions. At the end the teacher can add one last board at the end for them to post questions they still had. This allowed everyone to read the questions as he answered them.

2. Inductive learning: Lessons that use this method call on students to investigate and categorize small bits of information in order to find patterns. This method can be used at the beginning of a unit to help students connect to

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background knowledge and develop a foundation for their new learning, as well as at the end of a unit to solidify student understanding and clarify misunderstandings.

To incorporate Jamboard, copy and paste vocabulary words or concepts you want to use onto one board in your Jamboard. Then duplicate the board in the same Jamboard, creating one board for each small group you have. If you teach the same class more than once, you can duplicate the entire Jamboard for another class. Have each small group organize the words into categories that make sense to them. After they finish, have each group share their thinking with everyone else.

3. Gallery walk: It can be use this for review questions to determine understanding or as a jigsaw to share learning. Write a different question, statement, or concept on each board, or have the students create a board to share. Put students in breakout rooms. Start each group at a different board. Have them discuss what's on the board and write a response. To keep everyone on track, use a timer, and have groups move to the next board when the timer goes off.

4. Four corners: Use something that can have multiple answers. Give each corner one possible solution, theory, or plan. Have the students choose their breakout room based on their choice of the best solution. Provide a board in your Jamboard for each corner. In their breakout rooms, they can build a case for their corner. They can present their ideas on their board to strengthen their case. Come back together to present ideas.

5. Idea lineup: Use this before and after a discussion. Choose a topic that elicits strong opinions. Create a Jamboard with a line that has the opposite choices at each end. Have the students put their initials, a picture, or a Bitmoji of themselves on the line showing where they stand on the matter at the beginning of class. Next, have a discussion and/or lecture. Close class with a new board where students place themselves again and talk about how their opinion did or did not change and why.

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