

Panhellenic STEM Competition 2024

Open Category STEM

(1st- 4th elementary class)

Simple machines unite the Mediterranean Sea



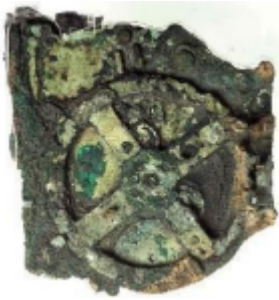
Regulations

A' edition (July 2023)

Edited by: Michalis Bakaloglou, Anna Koumara

INTRODUCTION

The Mediterranean Sea has been the cradle of civilization since ancient times. Prehistoric peoples, traders and seafarers, began to explore the sea, establish colonies, and tell stories from other peoples. Mythical heroes such as Odysseus roamed the Mediterranean, having adventures that are still sung.

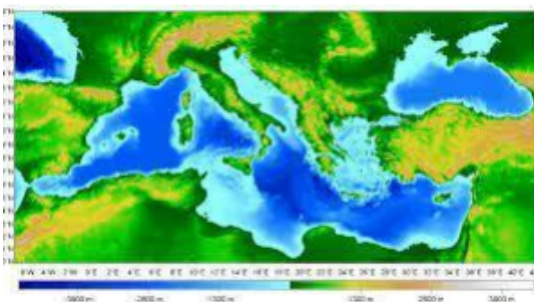


But also throughout history, legendary ports such as Piraeus, Thessaloniki, Syracuse, Marseille, Alexandria, and Larnaca lived years of prosperity, with sailors coming and going, carrying goods from the edge of the earth.

The origins of the ships grew larger and larger; as a result, they eventually managed to cross the Straits of Gibraltar and venture out into the ocean in search of new worlds.

When the Suez Canal was closed, more ships used it to travel to distant lands. They frequently brought local young men and women who were seeking to create a better life elsewhere with them.

The interaction between the cities, however, was not always amicable. He witnessed wars, great naval engagements, and notable shipwrecks that had an impact on the region's geostrategic development. The creation of the lever for the



protection of Syracuse, the orders of knights of Malta and Rhodes during the crusades, the conquest of Constantinople by the Venetians, and the wars between his empires in the nineteenth century, as well as the Second World War, are all part of his long history.

The geophysical map of the Mediterranean is very interesting, as it contains numerous significant seismic faults. Its habitats are also fascinating. The Mediterranean basin is the world's third-richest system in terms of plant

biodiversity (25,000 species), and it is one of the most important areas on the planet for indigenous plants.

The Mediterranean Sea, despite being a minor part of the world's seas, is home to an extraordinarily rich and diverse group of creatures. It is one of the most important marine and coastal biodiversity reserves, with 28% of endemic species, 7.5% of the world's marine fauna, and 18% of its marine flora.



About a third of the Mediterranean fauna are endemic species.



But don't forget about human meddling, which could be a result of overexploitation, tourism, or pollution. As a result, the European Union has defined various regions.

As Natura-protected regions, they are united.

Create your own ecosystem at a time when climate change is becoming evident, with forest fires ravaging the Mediterranean every summer, tourism on the rise, and local animals and flora being preserved.

A long-term project utilizing simple machines. Don't forget that we have 17 goals to alter the world by 2030!



Team composition

Your team consists of:

- the coach (over 20 years old)
- 3-6 students who in the current school year are in grades A' - D' Elementary school

Objective - Themes



Your team needs to work on a project with at least 3 mechanisms viz which use simple machines and an electric motor connected to the battery case described in the equipment materials.

This category excludes the use of automation.

Students' proposals should present answers that are not based on the logic of "smart cities." The goal is to achieve 11 of the 17 UNESCO Sustainable Development Goals for Green and Sustainable Cities. Consider the social, economic, and environmental implications, the living conditions of inhabitants, and their symbiotic relationship with the local flora and fauna while planning a sustainable city¹. Finally, this design will not deny future generations the chance to continue this work.



Buildings, utility networks (electricity, water, telecommunications, drainage), security, public transport, the network of cycle lanes and pedestrian routes, wellness, and recreation places are all concerns that you can research and portray. Education of high quality (UNESCO Objective 4) is essential. Schools, libraries, and local museums are all participating.



Your mechanisms should be applications that solve an existing problem in one or more of the above UNESCO goals for sustainable development (3, 4, 6, 7, 9, 12, and 13), particularly in urban areas.

¹ https://en.wikipedia.org/wiki/Sustainable_city

Goal 17 for all of us (state and people) to work together is crucial to attain, is understood by the youngsters, and can be shown in the solution they will suggest.

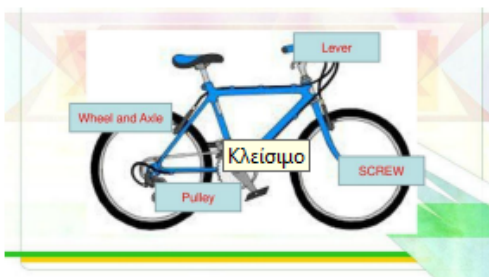
Examples of mechanisms with simple machines in cities that pick up learners:



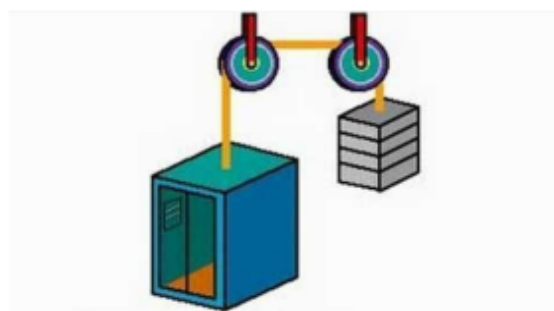
Εικόνα 2 Μηχανήματα στα εργοτάξια χρησιμοποιούν πληθώρα απλών μηχανών για να λειτουργήσουν



Εικόνα 3 Καρότσι και εργαλεία για τους αστικούς ή σχολικούς κήπους



Εικόνα 4 Ποδήλατο... μηδενικές εκπομπές CO2!



Εικόνα 5 Ανελκυστήρας για ανύψωση αντικειμένων

Ενδιαφέρουσες παραπομπές:

https://www.bbc.co.uk/bitesize/articles/zdqt7nb?fbclid=IwAR0I4DgNfYoDW3qRnlpcCd8NPxvXiscNtEwQ9UOfJMdhfr5IAI_pEau2M

<https://theconversation.com/people-love-the-idea-of-20-minute-neighbourhoods-so-why-isnt-it-topof-the-agenda-131193>

General Guidelines

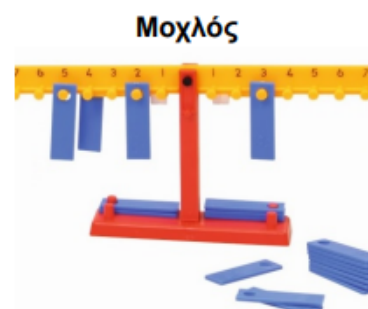
- The coach is over 20 years old, continually follows the children, looks after their safety and requirements, and collaborates with the organization. He is responsible for setting a good example and encouraging fair play among students, employees, and other participants. He is accountable for his team's behavior and attitude.
- 3-6 students currently in grades A'-D'
Primary school.
- The equipment is recommended under a special section of the regulations below.
- A mechanism is defined as a structure with moving parts that accomplishes a specific task. basic results for the purpose for which it was built machines
- There must be at least one of these three mechanisms present.
 1. In addition to the axis, at least two simple machines must be used.
 2. All or sections of them must be moved manually or with a motor.
 3. or one of them must be powered by a motor with a switch.
 4. you can make more than three mechanisms Attention: The grading is overall to everyone.
- Mechanisms can be prefabricated and pre-assembled for presentation at the competition.
- **ATTENTION** Projects that are not relevant to the subject of the competition or they use automations, will not be evaluated.

Types and Examples of Simple Machines

Simple machines are parts of the mechanisms you aim to build. The most fundamental of them are the following 7:

Gear	Pulley	Lever
Wheel with screw	Axle	Inclined plane

We find them in many objects that children use, such as educational STEM games at home and educational material at school.



And, of course, in many more structures that have served us in the past and continue to aid us in the present time!



Εικόνα 6 Χειροκίνητη



Εικόνα 7 Ελαιοπιεστήριο (Μοχλός, βίδα και άξονες)



Εικόνα 8 Door Stop (Σφήνα)



Εικόνα 9 Ψαλιδωτός ανυψωτήρας
(Μοχλός, βίδα, οδοντωτή μπάρα)

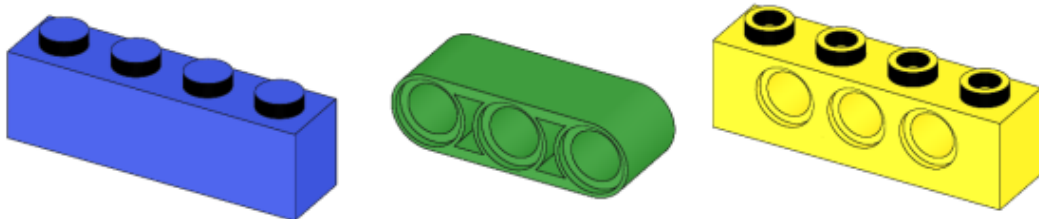


Εικόνα 10 Χειροκίνητο βίντσι με συρματόσχοινο
(Γρανάζι, κασάνια, άξονες, βίδες και μοχλός)

Equipment materials

Mechanism building materials and motors must be Lego Classic, Technic or hybrids. Lego pieces can also be used from students' toys.

The following 3 pieces belong to the respective Lego Classic, Technic and hybrids.



Depending on what you are missing, see the suggestions below.

Recommended packages and components (click on the blue letters to see them see)

1. Engineering Packs (if you have no equipment)

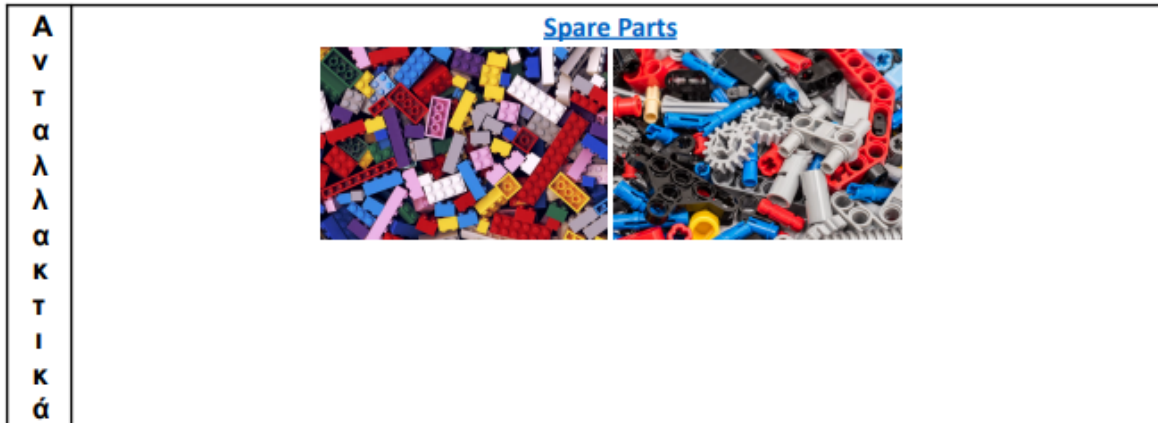
Π Ρ Ο Τ Α Σ Η Α	<p>Απλές Μηχανές</p>	<p>Battery SET and 3 Sizes of Motors and Accessories</p>
--------------------------------------	--------------------------------------	--

Σύνθετες Ηλεκτρικές Μηχανές



2. Individual parts of mechanisms (to supplement the already existing your equipment)

Κ Ι Ν Η Τ Η Ρ Ε Σ Κ Α Ι Π Α Ρ Ε Λ Κ Ο Μ Ε Ν Α	<p><u>Battery Box</u></p>	<p><u>M-Motor</u></p>
	<p><u>L-Motor</u></p>	<p><u>XL Motor</u></p>
	<p><u>Καλώδιο επέκτασης 8"</u></p>	<p><u>Extension Wire 20"</u></p>
	<p><u>Control Switch</u></p>	<p><u>Servo Moto</u></p>
	<p><u>Επαναφορτιζόμενη μπαταρία για μοντέλα</u></p>	<p><u>IR Receive</u></p>
	<p><u>Ηλεκτροκίνητος Συμπιεστής Πνευματικό Σειτ Κατασκευή</u></p>	<p><u>Κιτ Τηλεχειρισμού Κατασκευών</u></p>



Especially for the pulleys it is allowed to use a rubber band, a thread for it their operation.

Technical specifications of the presentation space

In the competition, each team will be allocated:

- space of approximately 1.5 m x 1.5 m where all the material parts of the project
- In this area there will be a table of size approximately 100cm x 60cm and electricity is available. The model of the project should not exceed the dimensions of the table
- Posters can be placed back to back on the stand approximately 2 m high or to be held by the group during the presentation.

Required deliverables

At least 7 days before their participation in the regional competition of their region, teams should post on their registration form the link to the portfolio described below. They are essential for judging panels on the day of the competitions and the free distribution of invitations practices in the educational community in Greece!

Steps for posting the portfolio:

- The teams will create a folder in the cloud (Google Drive, One Drive, Dropbox etc) that will belong to them and they will post the portfolio described below.
- The link to the team's cloud should be shared with WRO Hellas AND with download rights (!) to anyone who visits it.
- This notification is made through processing their registration form and completing the "Required deliverables" field with the aforementioned link.
- To edit your registration form at any time, find at your received emails with the subject "Confirmation of participation" from the sender eventora.

Required portfolio contents:

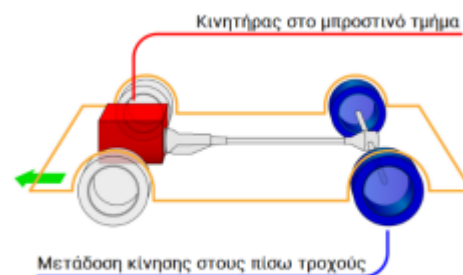
Inside the cloud folder you will create 6 separate folders named bold letters and will contain the files described below. On his day, competition and upon presentation to each group of judges must be handed over to them an envelope containing in A4 size the contents of folders 2, 4 and selectively material from 3 and 6.

1. **Consent Documents:** Documents with parental consent for the use of photos or videos in which their faces may appear students (special printable forms to be posted on the WRO website Greece)

2. **Team Report:** The Team Report form and a table for each mechanism you will present (you will find them at the end of the regulations)

3. **Photos:** Clear photos showing the construction stages, and in particular the construction of the mechanisms

4. **Scribbles:** The Scribbles of the simple machines of the mechanisms or in electronics format (pdf, jpg, png) or digital photo the imprint on the rice paper (Information at webinar you can watch live or asynchronous). Example of a digital Construction Sketch with the simple machines which were used:



5. **Video:** At least one video where the students will show and describe the operation of the mechanisms, with an emphasis on the simple machines they used. To be zoomed in, to show the construction details in pause and in mode!!! Its size should not exceed 7 minutes and 200MB

6. **Other material:** posters, presentation and any other material related to project!

Tender Process

The teams must during the (Regional or Final) competition:

- Install their project in the space that will be allocated to them (including putting up posters, doodling, etc.).
- Pass inspection for compliance with regulations.
- Demonstrate and present the project to the judges, answering their questions
- Visit the booths of the other teams, keeping in mind that they call back to their booth.
- Show and present the project to the students of the other groups who will visit their booth.

When presenting to the judges, they should be given the file that described in the required deliverables in 3 to 4 copies.

Evaluation

Each panel will be given a set length of time to judge the projects—roughly seven minutes—of which a portion (e.g., five minutes) will be devoted to the presentation by team, as well as the remaining time for judging queries.

- Students will present the project they have created and will State how it relates to the theme of the contest.
- The group report and mechanism tables contain important information for the judges, which the team should present.
- There will be a demonstration of the operation of the project, with an emphasis on presentation of simple machines.
- The scribble will be presented via a digital or printed poster, with reference to the function and resolution of the problem it solves.
- The students will answer any questions from the judges related to project.

During the assessment, no assistance or involvement of any kind is permitted. from the coaches to the teams

Evaluation process

There will be only one round of project evaluation for students, and following a session, the judges will award unique prizes to all teams based on the grounds on which their proposal stood out!

The evaluation table shows the requirements for these prizes, which are tied to attaining one or more of UNESCO's 17 Sustainability Goals. It is necessary for the procedure to be handled more efficiently and quickly. The teams' portfolios must be updated one week before the final; their content deliverables are considered at the committee meeting!

Evaluation Criteria

categories	#	Criteria	Points
Idea & innovation	A	Total Category Score 60	
	1	idea & innovation	15
	2	Research & idea development	15
	3	Applied & quality problem solving	15
	4	Creativity	15
Educational engineering	B	Total Category Score 60	
	1	Structural stability, Calesthesia	15
	2	Mechanical performance	15
	3	Correct indication and nomenclature of simple machines	15
	4	Functionality of the mechanism	15
Scribbles constructions	C	Total Category Score 30	
	1	Accuracy in depicting the framework of constructions	10
	2	Aptitude in depicting the mechanisms of constructions	20
Presentation & team building	D	Total Category Score 50	
	1	Presentation Evaluation	15
	2	Communication skills, Cooperation	20
	3	Stand decoration, videos, posters	15
TOTAL POINTS:			200

Panhellenic STEM Competition 2024

Open STEM Class
(Primary grades 1-4)

Simple machines unite the Mediterranean Sea

TEAM REPORT

TEAM NAME		
COACH (FULL NAME)		
PARTICIPANTS	1.	2.
	3.	4.
	5.	6.
THEME OR THEMES		
WHAT WE ARE GOING TO INVENT OR IMPROVE		
WHERE WE SEARCHED FOR INFORMATIONS	Internet, libraries, museum, professionals other:	
WHAT SOLUTIONS DID YOU AGREE TO CONSTRUCT		
HOW MANY MECHANISMS WILL YOU PRESENT		
WHAT DIFFICULTIES AND CHALLENGES ENCOUNTERED		

TEAM REPORT

MECHANISM TABLE NO ____

MECHANISM NAME:	
PROBLEM	SOLVING
PHOTO OF THE CONSTRUCTION	SCRIBBLE OF THE MECHANISM
SIMPLE MACHINES THAT BEEN USED	
<ul style="list-style-type: none"> 1. Wheel with Axle 2 Gear 3 Pulley 4 Lever 5 Screw 6 Inclined plane / Wedge 	