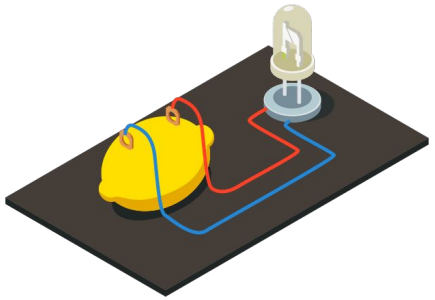
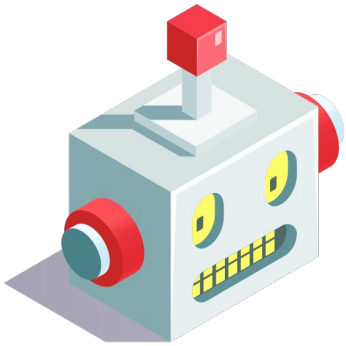


ROES association

Simple machines Presentation

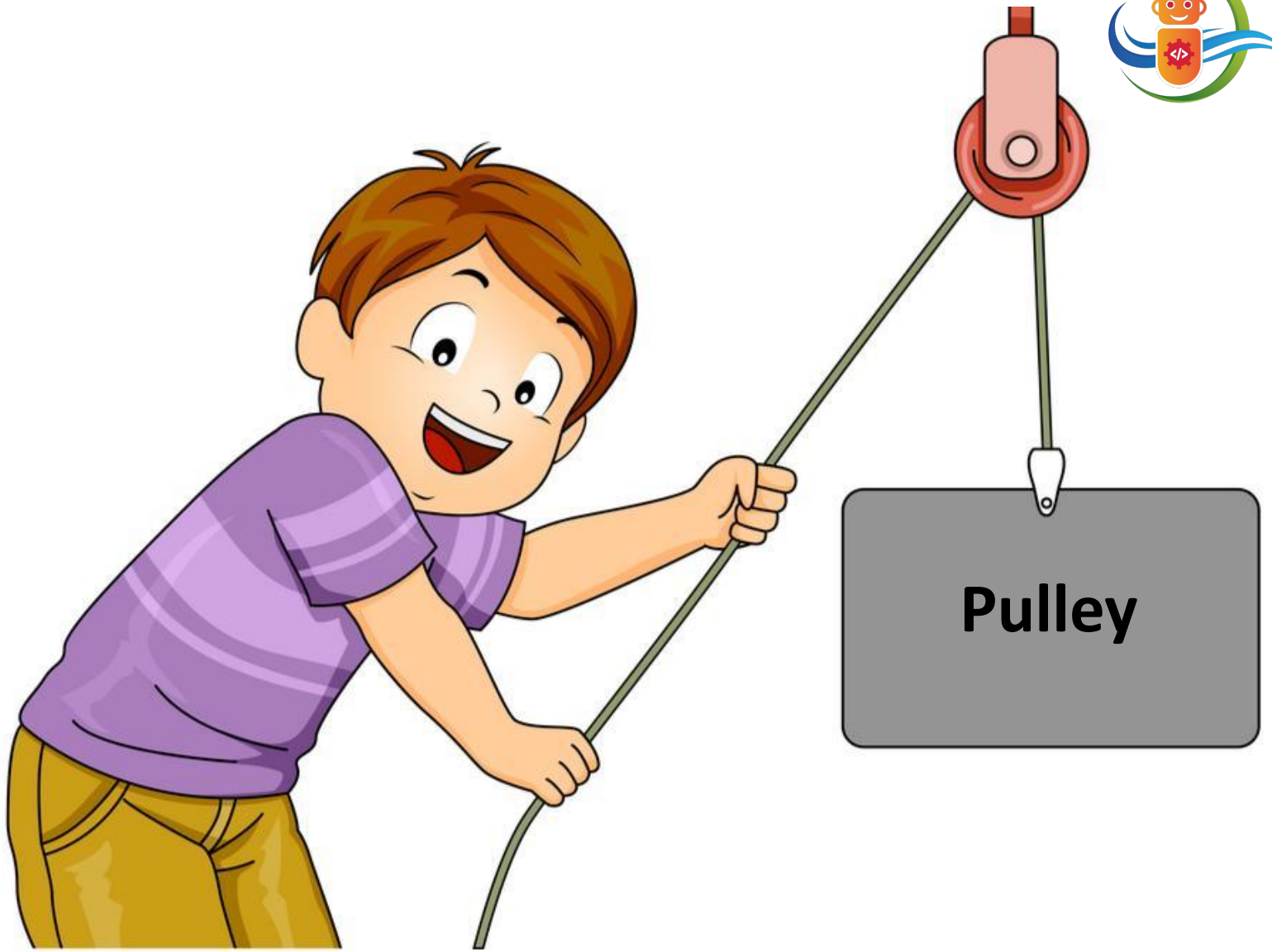


ROES association

Simple machines

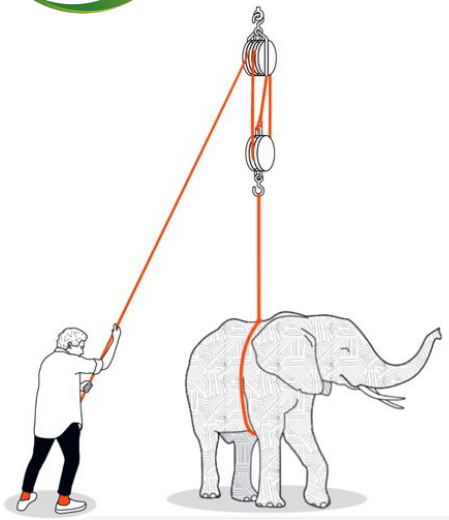
The simplest mechanisms
we can use
the mechanical advantage to
increase the output force

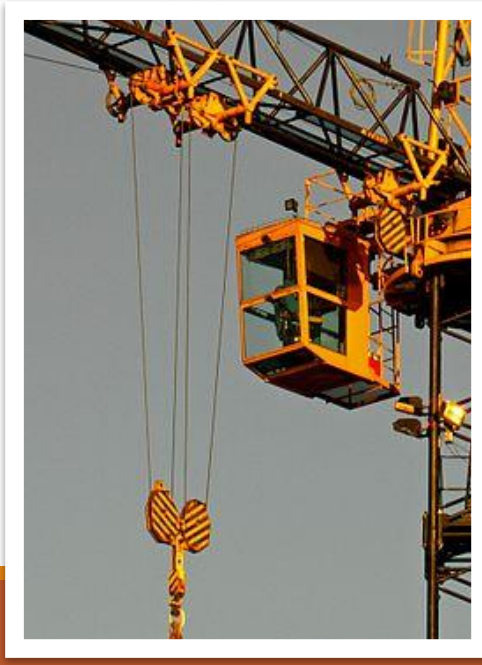
ROES association



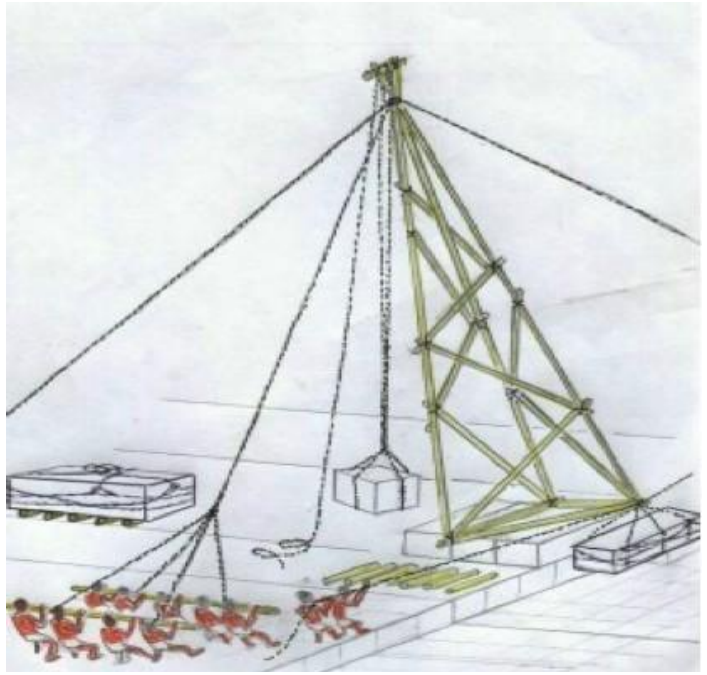
Motivation: Whare can you find a pulley? How are they used? What is the benefit to use them?

ROES association





Application: Crance



Known to students from their toys, used from the ancient times till today

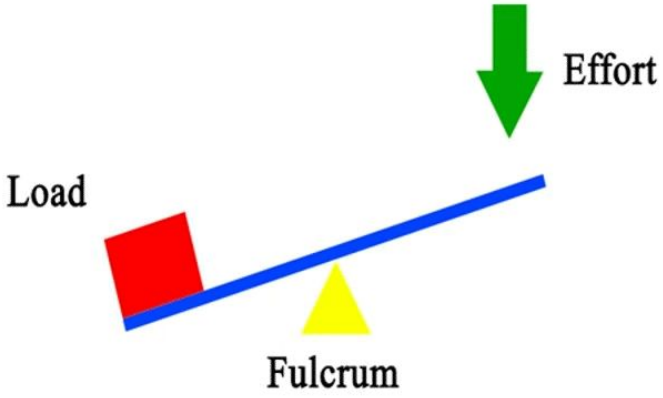
Construction – 1

ROES association

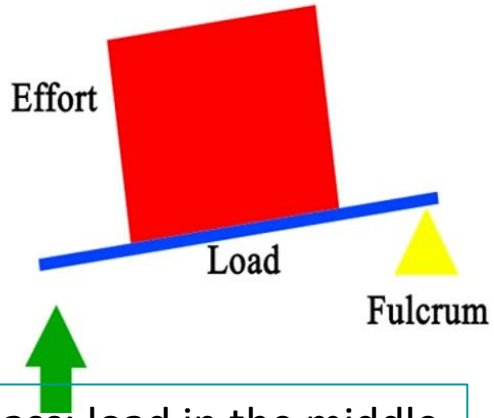
Lever

ROES association

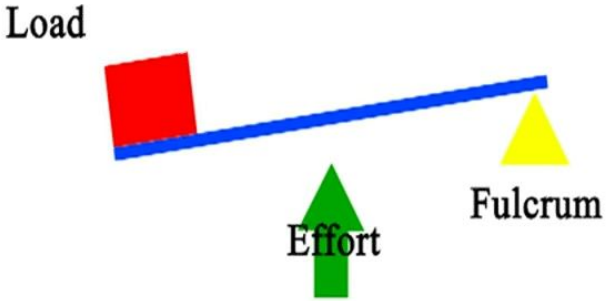
On each lever there is a fixed point, called fulcrum, the effort we apply, and the load (weight) Depending on where they are, there are 3 classes of levers.



1st class: fulcrum in the middle



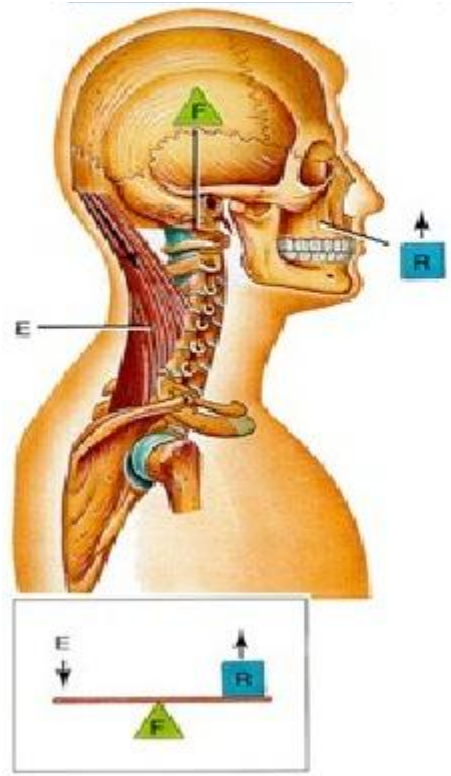
2nd class: load in the middle



3rd class: effort in the middle

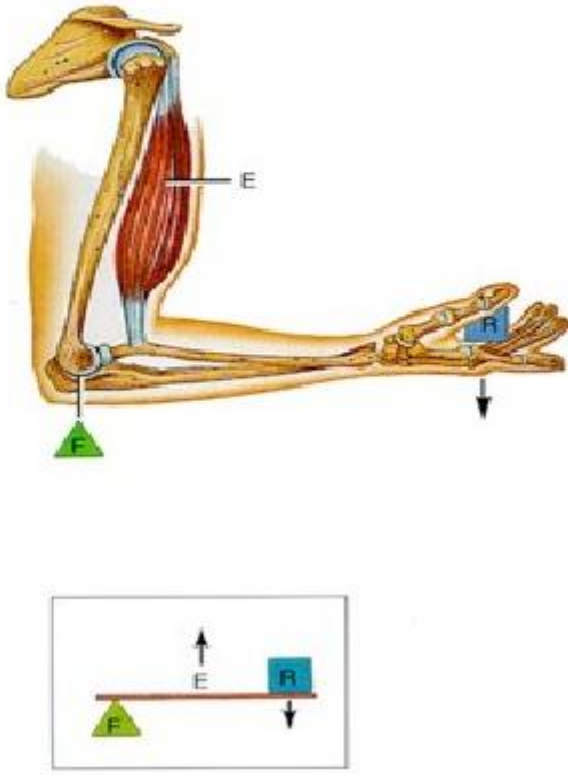
ROES association

Levers in the human body



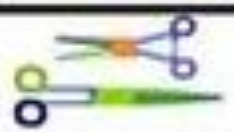
1st class

2nd class



3rd class

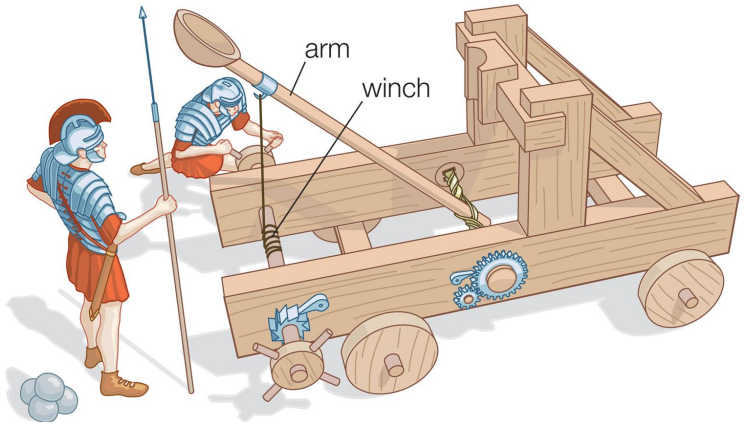
Examples of everyday objects that are levers

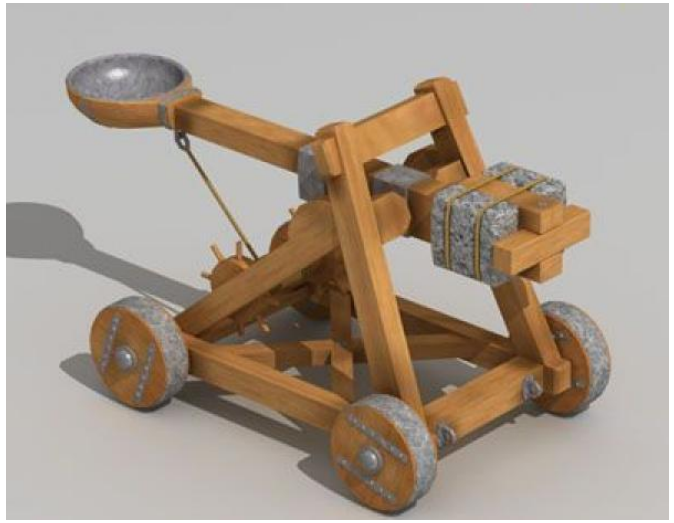
1st Class	2nd Class	3rd Class
		
		
		
		
		

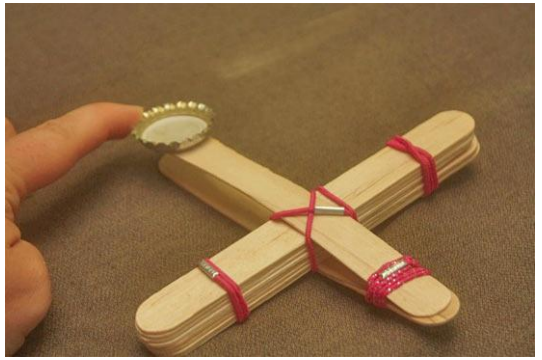
Can you find where the fulcrum, the load and the effort are in every case?

Application: Catapult

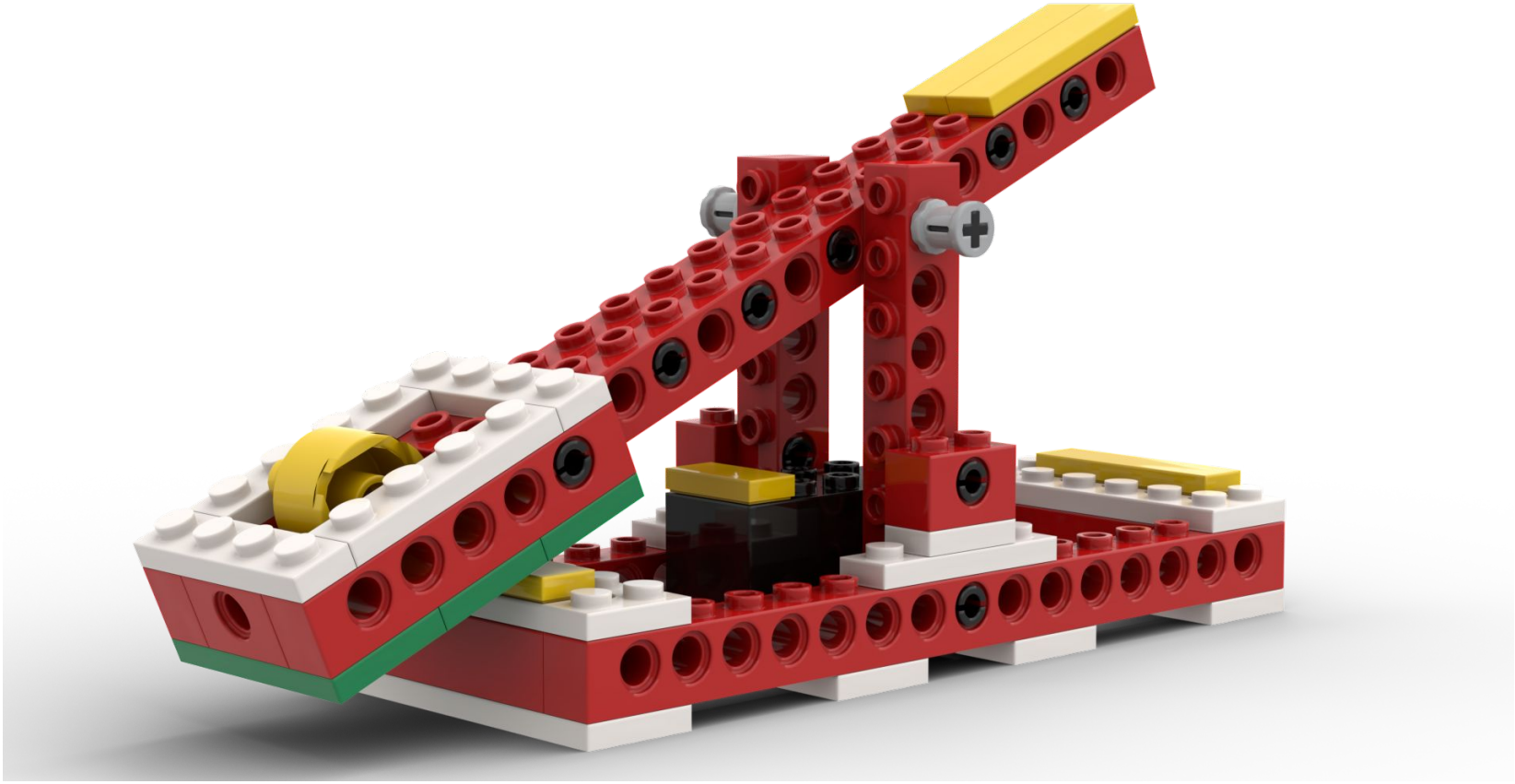
(from the toy to lesson)







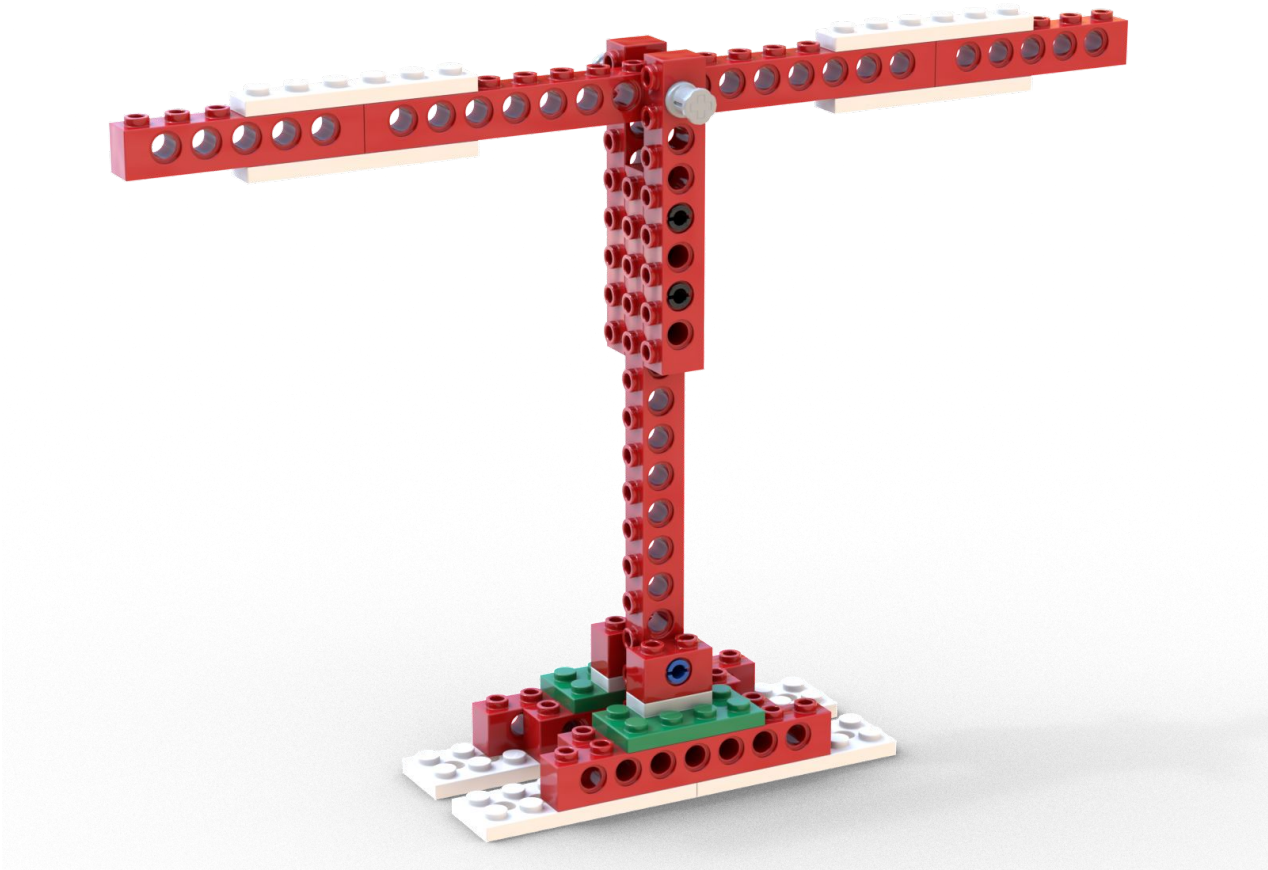
Construction – 2



Application: Scale

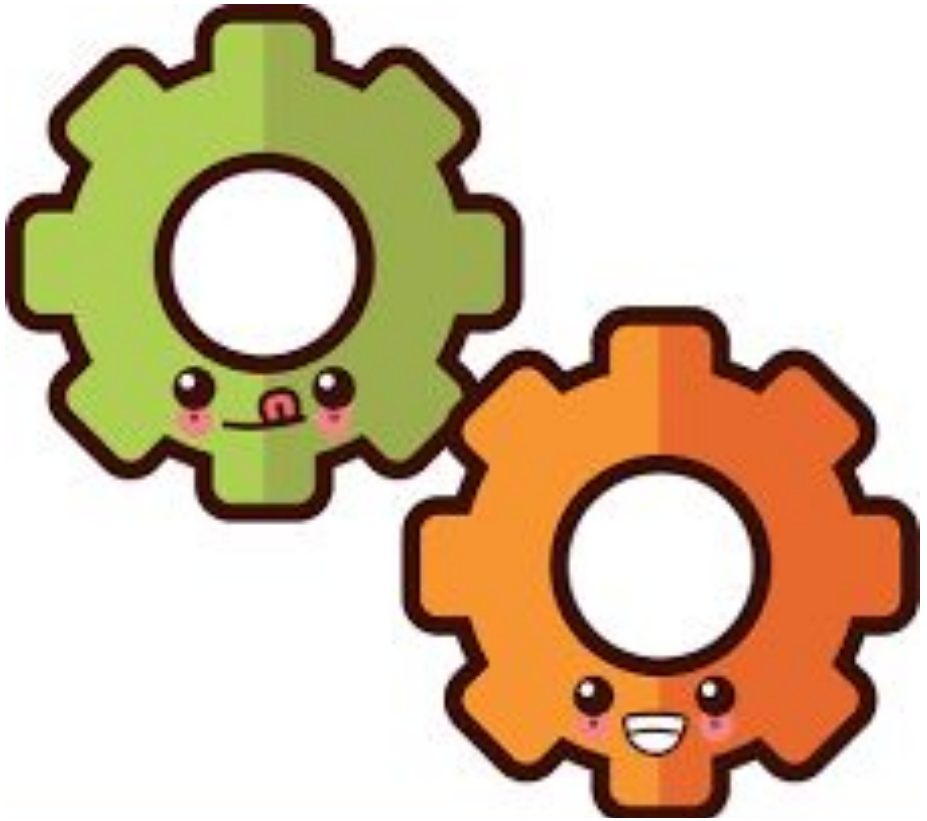
Known to students from their toys, used from the ancient times till today

Construction – 3

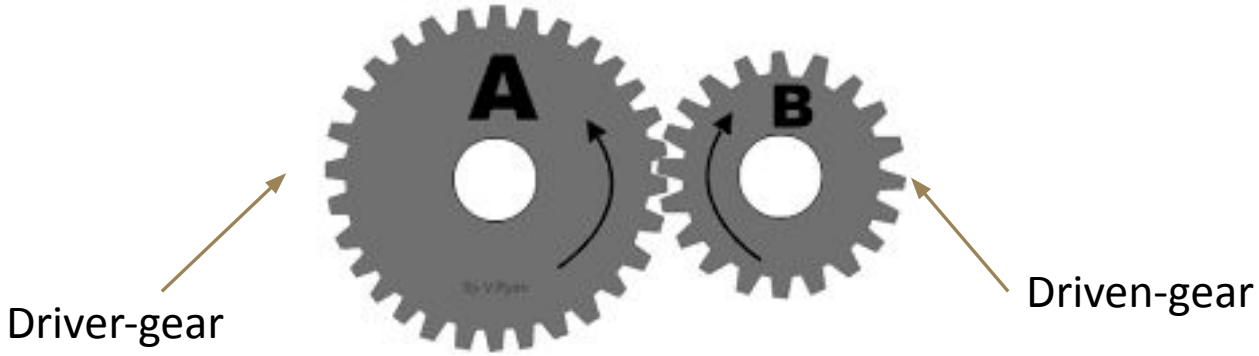


ROES association

Gears

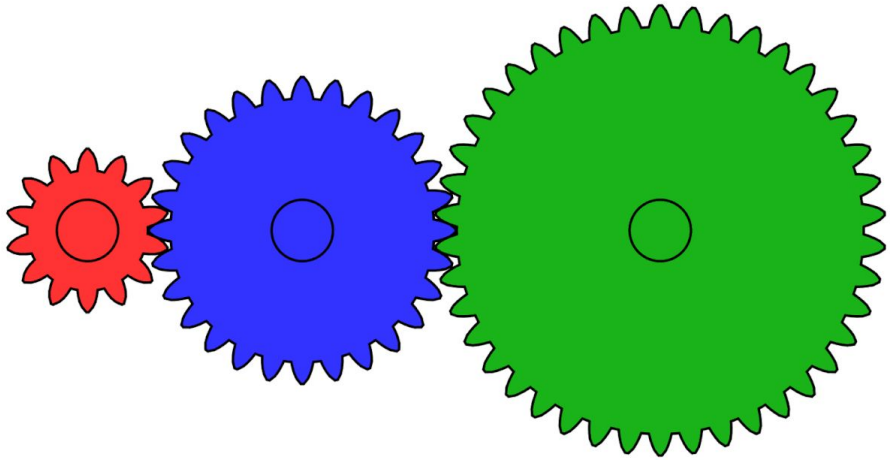


Gear meshing and transmission of motion



Speed ratio depending on the number of teeth of both gears

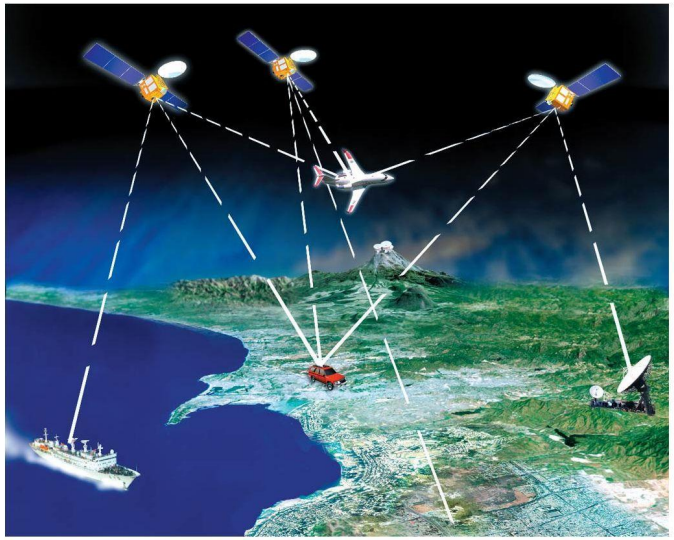
Opposite direction of gears that mesh with each other



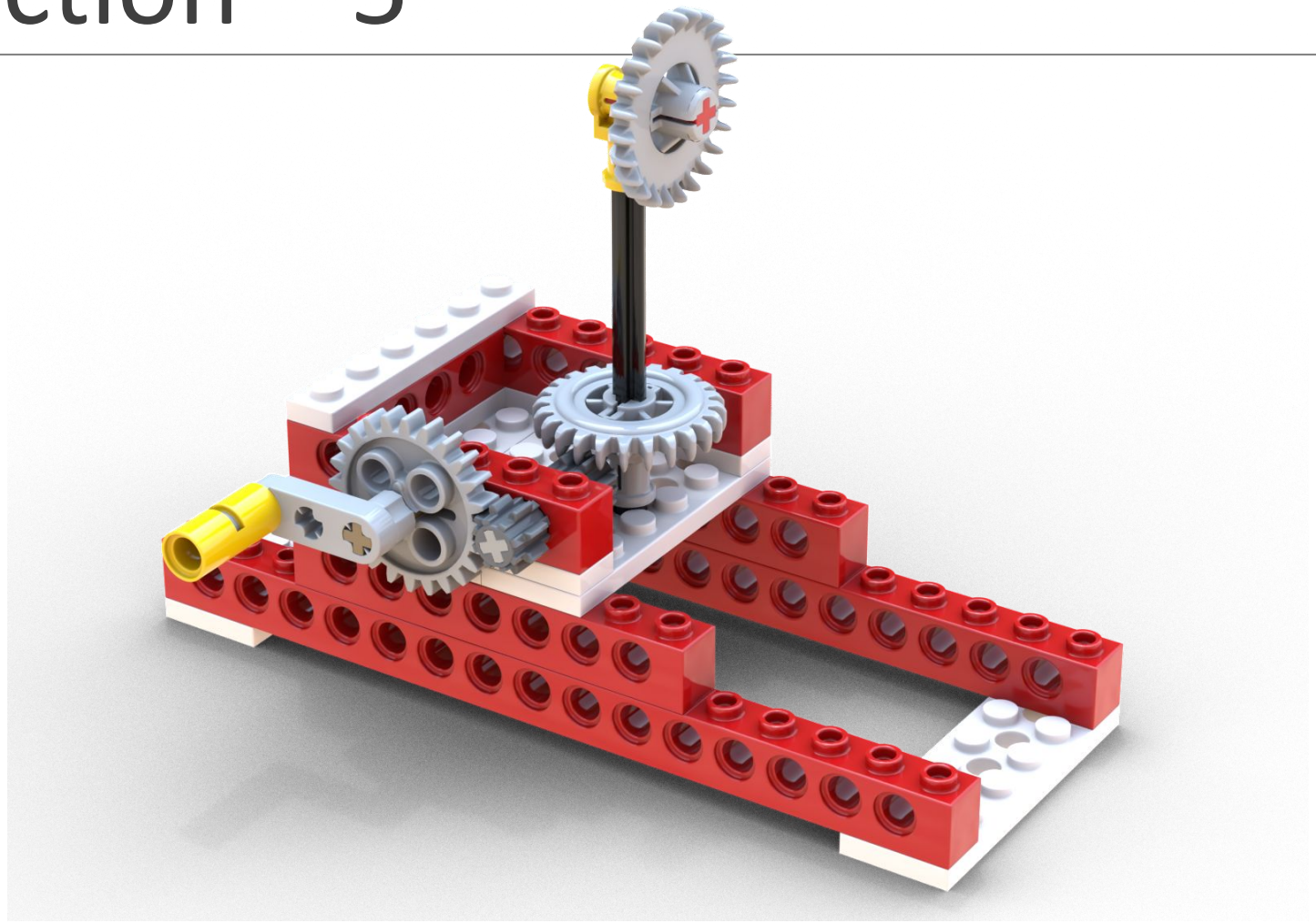
Fan (linear motion transmission)

Construction – 4

Satellite dish (transmission of motion at an ar



Construction – 5

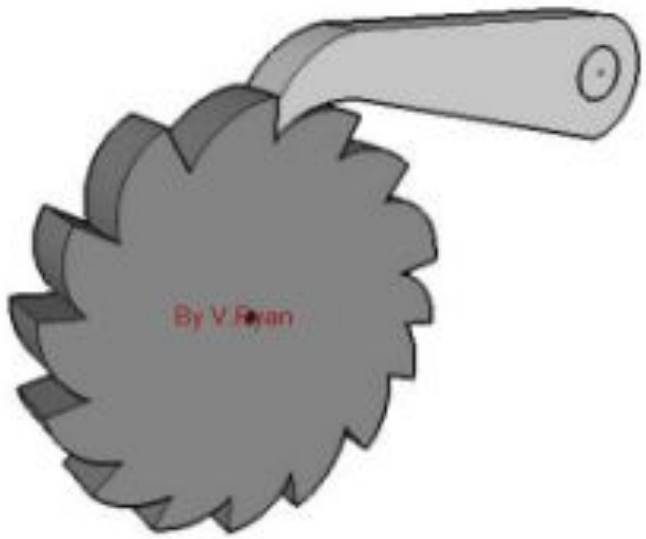


Two or more simple machines combined: Fishing rod

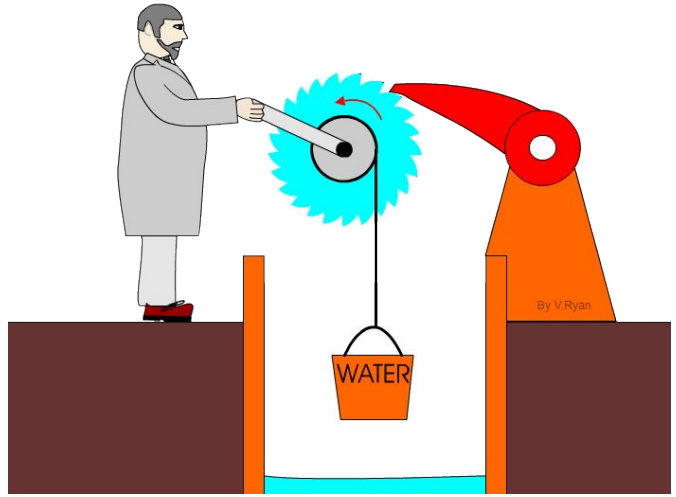
Which simple machines do we use?

- Lever
- Pulley
- Gear
- Pawl and ratchet

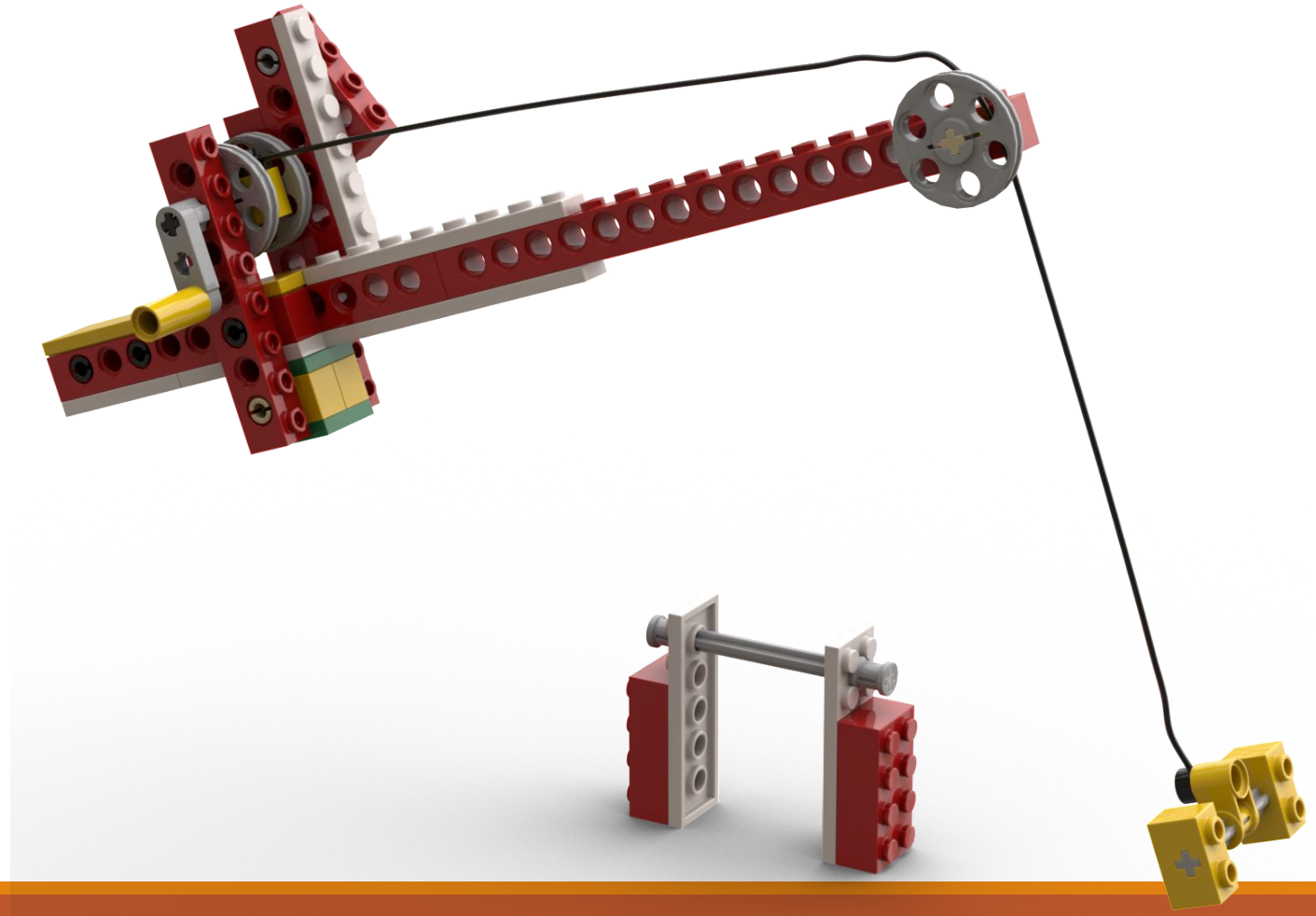
Pawl and ratchet



The pawl and ratchet consists of a wheel with teeth (like a gear) and a pawl, that follows as the wheel rotates. Its role is to block the rotation of the wheel on the other direction.



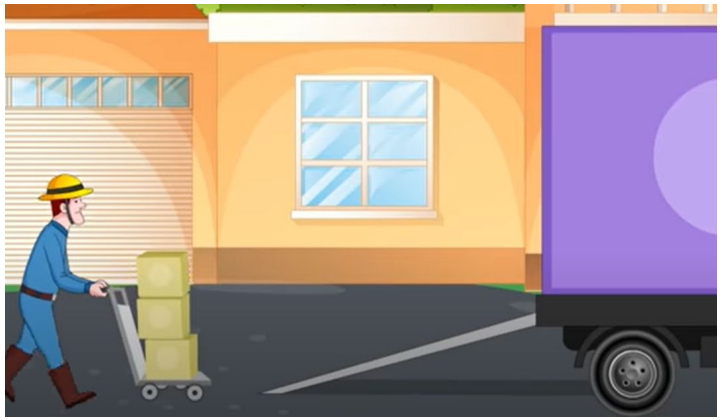
Construction – 6

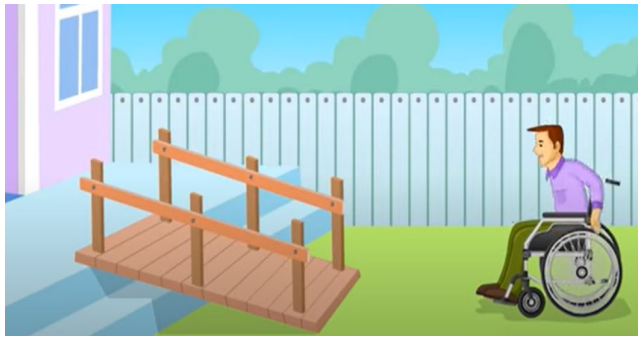


ROES association

Inclined Plane

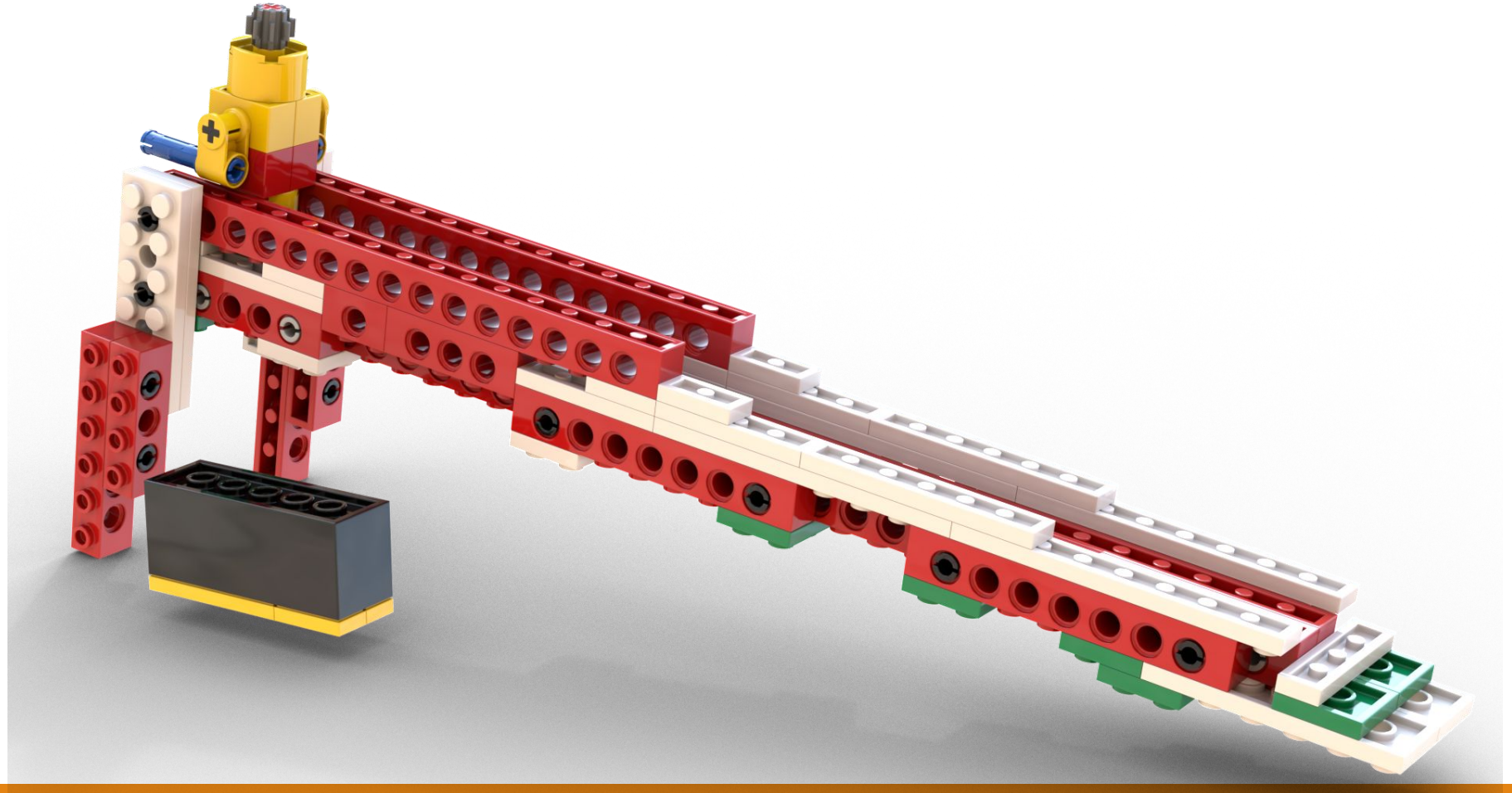
Applications of the inclined plane





ROES association

Construction – 7



Moving with electricity

Advantages to use a motor:

- Faster
- More stable
- Don’t need to touch your construction

Construction – 8

See the possible ways to connect the motor to the wheels

Panhellenic STEM Competition 2024


A28


ΠΑΡΑΓΩΓΗ ΕΛΑΙΟΛΑΔΟΥ ΑΠΟ ΤΟΝ ΠΟΛΥΓΥΡΟ ΧΑΛΚΙΔΙΚΗΣ

Team's Portfolio (part 1/2)

Required portfolio contents:

Inside the cloud folder you will create 6 separate folders named in bold and will contain the files described below. On the day of the competition and during the presentation, each group of judges must be given a folder containing in A4 size the contents of folders 2, 4 and selectively material from 3 and 6.

1. **Consent Documents**: Documents with the consent of the parents for the use of the photos or videos in which the faces of the students may be seen (special printable forms that will be posted on the WRO Hellas website)
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 rules)
3. **Photographs**: Clear photographs where the stages of construction can be seen, and the construction of the mechanisms

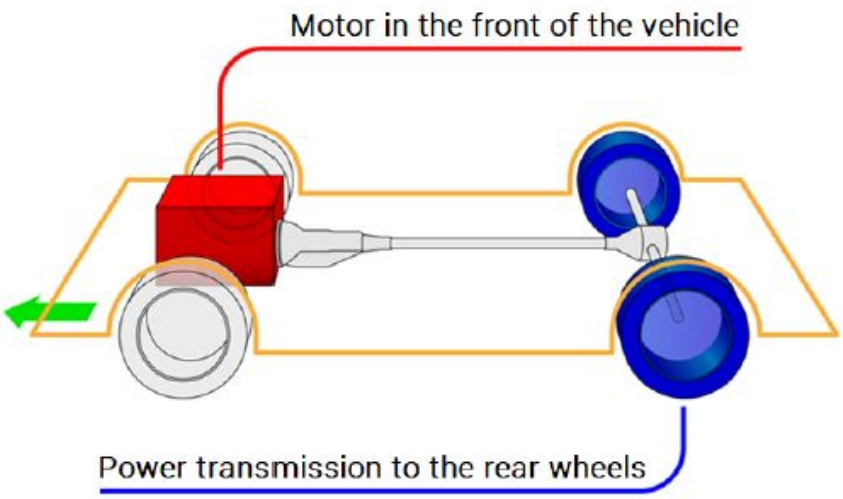


Figure 11 Example of a digital Build Sketch with the simple machines used highlighted

Team's Portfolio (part 2/2)

4. **Sketches**: The Sketches of the simple machines of the mechanisms either in electronic form (pdf, jpg, png) or in a digital photo or imprint on rice paper (Information in the webinars that you can watch live or asynchronously).
5. **Video**: At least one video where the students will show and describe the operation of the mechanisms, focusing on the simple machines they used. To zoom-in, to see the construction details in pause and in operation!!! Its size should not exceed 7 minutes and 200MB
6. **Other material**: posters, presentation and any other material related to the project!

Technical specifications of the presentation area

In the competition, each team will be allocated:

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

Judge's Evaluation Board

Categories	#	Criteria	Points
Concept & Innovation	A	**Category's total points: 60**	
	1	Idea and creativity	15
	2	Research and evolution of the idea	15
	3	Applicable and fine solution of the challenge	15
	4	Innovation of the project	15
Educational Mechanics	B	**Category's total points: 60**	
	1	Structural integrity and tastefulness	15
	2	Mechanical advantage / efficiency	15
	3	Correctly pointing out and naming the simple machines	15
	4	Mechanism's functionality	15
Mechanism sketches	C	**Category's total points: 30**	
	1	Accurate depiction of the construction's chassis/frame	10
	2	Accurate depiction of the construction's simple machines	20
Presentation & team spirit	D	**Category's total points: 50**	
	1	Presentation assessment	15
	2	Communicational skills and collaboration	20
	3	Booth's decoration, videos, posters, etc	15
		Maximum Score:	**200**

Thank you very much!