STEM – ERASMUS+ KA2 PROJECT

Cyprus – Bulgaria – Greece – Italy – Lithuania – Poland

SCHOOL: GYMNASIO VALTINOY TRIKALON Date: ……

Learning Process

NAME	DESCRIPTION
Object name	Circumference
Curriculum lessons engaged	Mathematics
Prerequisite Knowledge	What a circle is, radius and diameter of a circle
Learning Goals/Outcomes	Students will be able to - Realize that the circumference and the diameter of a circle are proportional quantities - Find out the ratio - Calculate the circumference of a circle knowing its radius

Lesson Process

Lesson	Mathematics
Class/Age/Grade	2nd Grade (Age 13-14 years old)
Estimated time to complete	1 x 40’
Method of work	Collaborative teams of 2/ Each student alone/Whole class
Procedure	1. Introduction (theory) Remember the theory taught so far: what a circle is, its basic elements. 2. Setting the problem We want to construct a traditional Greek well in the yard and we have to calculate the circumference, knowing the diameter of the well. Using GeoGebra we observe that the circumference and the diameter of a circle are proportional quantities. We discover which the ratio is (the “π” number). Class Discussion Worksheet -Activity 1-Groups of 2 3. Mathematical relation of calculating the circumference of a circle as a function of its diameter and radius Book (pages 186-188) After finding out the ratio in the previous activity we can be led to the mathematical relation between the circumference of a circle and its diameter and radius.

	Class discussion Worksheet -Activity 2- Each student alone 4. Revision, class discussion

Item Construction Process:

Dimensions	**Height (cm)**	**Length (cm)**	**Depth (cm)**
Material(s)	Students' Book (pages 35-38) Paper Worksheets GeoGebra		

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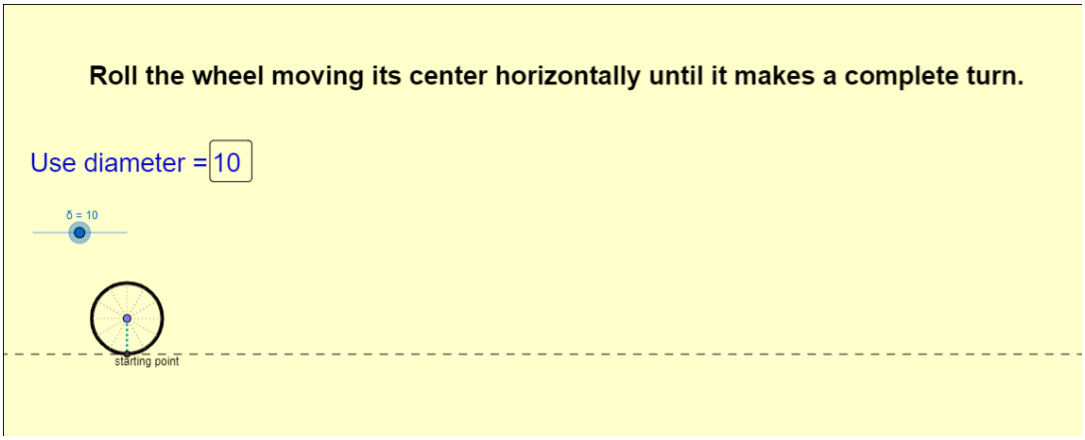
WORKING SHEET

ACTIVITY 1

Use the link below

https://www.geogebra.org/m/w9nnfpnm

Roll the wheel moving its center horizontally until it makes a complete turn.



Fill in the table below

Circle	Diameter	Circumference	Ratio
1st	10		
2nd	12		
3rd	14		
4th	15		
5th	16		

The ratio in the last column is: $ratio = \frac{circumference}{diameter}$. What do you observe?

Give the diameter some more values and observe the ratio. What is the ratio equal to? How many diameters is the circumference equal with?

Conclusion: $\frac{circumference}{diameter} = approximately\ 3{,}14$ for every circle. This ratio was named by the Ancient Greeks as "the π number". It is proved that pi number is an irrational number, meaning that its decimal form neither ends nor becomes repetitive. Its first 40 decimal digits are:

π= 3,14159265358979323846264338327950288419 71…..

If C is the circumference and d the diameter then $\frac{C}{d} = \pi$

ACTIVITY 2

Using $\frac{C}{d} = \pi$ write the relation between the circumference of a circle and its diameter as well as its radius.

Fill in the table below:

Radius R	3 cm		5 cm	7 cm		10 cm
Circumference C		12,56 cm			28,26 cm	