The Fibonacci Project

DISSEMINATING INQUIRY-BASED SCIENCE
AND MATHEMATICS EDUCATION IN EUROPE

SEVENTH FRAMEWORK PROGRAMME

This learning environment was created within the European project Fibonacci, a project focused on inquiry based science and mathematics education.	
Age:	12 - 15
Subject:	Mathematics
Topic:	Circumference of a circle
Target:	The discovery of the Ludolphine number
Form:	Experimental group work, individual work on PC
Time needed:	35 min
Tools:	<u>Items with a round cross section</u> (paper wheel, coin, cylinder, cup, plate, pot, thick marker, tube, water pipe, bracelet, hoop, ...); <u>measuring devices</u> (ruler, set square, tape measure, carpenter's ruler, caliper, string, strip of paper, compass, ...); PC – GeoGebra
Sources:	
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Twin Centre:	TC1 České Budějovice, http://www.pf.jcu.cz/stru/katedry/m/fibo.html

TASK No. 1 How can you accurately measure the radius or diameter of an object? Suggest at least two different methods.
What tools are used for these measurements in practice?
What is easier: measure the radius or diameter?
In geometry, why we usually use the radius?

TASK No. 2 Choose six different objects. For each of them measure its circumference and its diameter. Write results to a table.
With help of calculator add the values to the last two columns of the table (with two decimal places).
What happens if we change centimeters to different measure units?
Formulate a hypothesis based on the data in the table.

Object	Circumference c (in cm)	Diameter d (in cm)	$c \cdot d$	$c : d$

Hypothesis:

TASK No. 3 Open the file Lud.ggb. We shall model the same situation with help of dynamic geometry software GeoGebra.

Points A, B are moving around a circle and determine the circular arc, whose length is measured and mentioned in the interactive text beside. Watch the results of the measurement.

You may also change the radius of the circle, using the green slider in the upper left corner.

Conclusion:

METHODOLOGICAL COMMENT

Task No. 1: teamwork with final discussion
Task No. 2: teamwork with written reports
Task No. 3: individual work with written reports

All objects and measuring instruments (each in several exemplars) are placed on a separate table. Students may freely choose items to work with.