

# Maths Show

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**Subject:** Mathematics.

**Country of creation:** France.

**Countries of testing:** Czech Republic, Portugal and Belgium.



## Aims of the GP

Students learn about Archimedes' approximation of Pi in a fun way. They practice calculating with fractions, describing geometrical figures and calculating with powers.

## Age of the students

12-13

## Time involved in preparing and teaching this GP

Preparation: 1 h. Class time: 3 periods.

## Lesson Plan / Worksheets

	1 <sup>st</sup> lesson	2 <sup>nd</sup> lesson	3 <sup>rd</sup> lesson
<p><b>Group 1</b>            "Fifteen minutes of good time" by Nicolas Boileau.            Original title: "Le quart d'heure de bon temps"</p>	<p>The students read the text and show that they understand it. Then they try to find in it all the mathematical words.</p> <p>"A man who is ninety-six years old sleeps a third of his career (that is, thirty-two years).</p> <p>Let us add for diseases, trials, trips, accidents, at least a quarter of his life (that is, twice twelve years).</p> <p>Per day, two hours of study or work (make eight years).</p> <p>Sorrows, anxiety and stress for double the amount of time per day (make sixteen years).</p> <p>For business he spends half an hour per day (so, another two years).</p> <p>Five quarters of an hour for using</p>	<p>The students translate the text into maths and do the calculations to have the same result as in the text.</p>	<p>Students prepare the poster to explain the calculations to the class.</p> <p>Example:            "Life = 96 years.            Sleep = one third of life = 1/3 ..."</p>

	<p>the bathroom, shaving, etc. (five years).</p> <p>Per day, to eat and drink he spends two hours (eight years) [...] Per day, the man has therefore on Earth a quarter of an hour of good time. “</p>		
	<p>Original poem: Le quart d'heure de bon temps (Nicolas Boileau)</p>		
	<p>L'homme, dont la vie entière Est de quatre-vingt-seize ans, Dort le tiers de sa carrière, C'est juste trente-deux ans.</p> <p>Ajoutons pour maladies, Procès, voyages, accidents Au moins un quart de la vie, C'est encore deux fois douze ans.</p> <p>Par jour deux heures d'études Ou de travaux -- font huit ans, Noirs chagrins, inquiétudes -- Pour le double font seize ans.</p>	<p>Pour affaires qu'on projette Demi-heure, -- encore deux ans. Cinq quarts d'heures de toilette : Barbe et caetera -- cinq ans.</p> <p>Par jour pour manger et boire Deux heures font bien huit ans. Cela porte le mémoire Jusqu'à quatre-vingt-quinze ans.</p> <p>Reste encore un an pour faire Ce qu'oiseaux font au printemps. Par jour l'homme a donc sur terre Un quart d'heure de bon temps.</p>	
	<b>1<sup>st</sup> lesson</b>	<b>2<sup>nd</sup> lesson</b>	<b>3<sup>rd</sup> lesson</b>
<b>Group 2</b> “The story of the seven cats”	<p>The teacher gives the problem to the students and he lets them search for the solution: “In a school bus, during a trip, there are seven children. Each child has seven bags. In each bag, there are seven cats. And each cat has seven little cats. How many legs are there in the bus?”</p> <p>Tip: in the calculation, don't forget the two legs of the driver!!</p>	<p>They have to find a way to explain their calculation... If they can't think about a tree structure, the teacher may help them.</p>	<p>The students prepare a poster with the tree to show the solution to the class.</p> <p>If there is more time, they can invent a similar problem which requires a mathematical tree.</p>

	1 <sup>st</sup> lesson	2 <sup>nd</sup> lesson	3 <sup>rd</sup> lesson
<b>Group 3</b> “Describe figures”	One student of the group describes a figure for the others, and the others try to draw it without looking at each others’ drawings. They will probably not end up with the same figure.	The children will come up with their own figures. They have to repeat the same exercise as in the first lesson but using their own figures.	

### Questionnaire

A fraction is

- A proportion.
- An operation.
- A division.

Which phrases can replace this one: “I spent 20 minutes in the supermarket.”

- I spent one third in the supermarket.
- I spent one third of one hour in the supermarket.
- I spent two sixths of one hour in the supermarket.
- I spent one third of my time in the supermarket.

Which calculation can be replaced by a power?

- $8 \times 8 \times 8$
- $8 + 8 + 8$
- $8 - 8 - 8$

$6 \times 6 \times 6 \times 6 \times 6$  is the same as

- $6 \times 5$
- Five to the power six.
- Six to the power five.

Do you think that a mathematical tree could simplify a problem?

Yes / No

Do we say

- “The perpendicular bisector of a segment”?
- “A perpendicular bisector of a segment”?

## Teacher reviews

This GP had initially been planned for students aged 12-13, and as such it was a great success in the Czech Republic. The teacher said that “pupils were working very hard, they found out the results easily. Each group solved a different problem. The one which solved the cats’ problem made the bus some meters long, then they drew themselves, cats, kittens and the result of their calculation into each bus window. Then they played drama to show the maths problem to other pupils.” The Belgian teacher who intended to implement this GP in a class to students aged 15-16 had to adapt the exercises a bit by including some more difficult mathematical concepts, such as freeze patterns, gothic windows and Escher tessellations. Nevertheless, the method of the “mathematical show” worked very well and it motivated students to find solutions to their problems and present their group activities to the other students in the class.

## The SPICE project

SPICE was a two-year project (December 2009 – November 2011) carried out by **European Schoolnet** (<http://europeanschoolnet.org>) together with **Direção Geral de Inovação e Desenvolvimento Curricular** (<http://sitio.dgicd.min-edu.pt/Paginas/default.aspx>) from Portugal and **Dum Zahranicnich Sluzeb MSMT** (<http://www.dzs.cz/>) from the Czech Republic.

The primary objective of the SPICE project was to collect, analyse, validate and share innovative pedagogical practices, particularly those using inquiry-based learning, whilst enhancing pupils' interest in the sciences. SPICE supported this objective by singling out, analysing and validating good practice pedagogies and practices in maths, science and technology (mostly ICT-based) and disseminating them across Europe. SPICE involved 24 teachers from 16 different educational systems (from 15 different countries). This teachers’ panel helped the SPICE partners in defining good practices that were then tested in classes by 41 teachers during the school year 2010-2011.

For more information see: <http://spice.eun.org>



Lifelong Learning Programme



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