

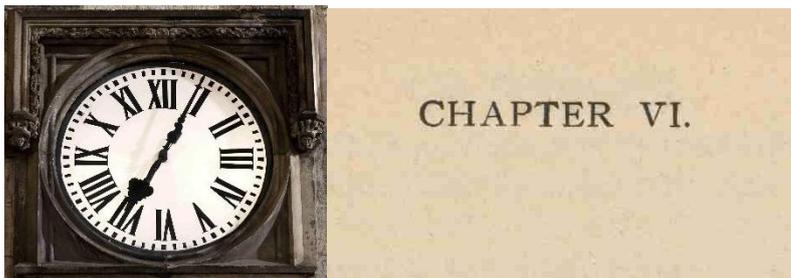
<p>COUNTING LIKE A ROMAN</p>	
<p>Respective blueprint</p>	<p>Roman numerals spinner</p>
<p>Description</p>	<p>Pupils will learn roman numerals, their meaning, and use them in today's context with the creation of a Roman numerals' spinner.</p>
<p>Learning Objectives</p>	<p>Increase the understanding of the sense of numbers.</p> <p>Understand how numbers work.</p> <p>Recognize different numeral systems and their uses.</p> <p>Learning Roman numerals, their meanings and how to calculate with them.</p> <p>Increase engineering and creativity skills with the creation of a spinner.</p>
<p>Related curricular subject(s)</p>	<p>History, Math</p>

<p>Prerequisites / preparatory actions for teachers</p>	<p>Preparing the materials for the construction of the spinner and playing the game.</p> <p>Preparing material for the additional activity to present the importance of counting. Each pupil (or a pair) receives 5 stones, 1-5 bottle caps (teacher chooses the number randomly), and 20 popsicle sticks (or some other similar objects).</p> <p>Preparing pointers for discussion about Roman numerals and different numerical systems. Information derived to pupil's should be adopted for their age and understanding of the topic.</p>
<p>Prerequisites / preparatory actions for students</p>	<p>None.</p>
<p>Age of students</p>	<p>10-12 years old</p>
<p>Duration</p>	<p>2 school hours</p>
<p>Level of difficulty</p>	<p>Medium</p>

Step by step description of the tasks

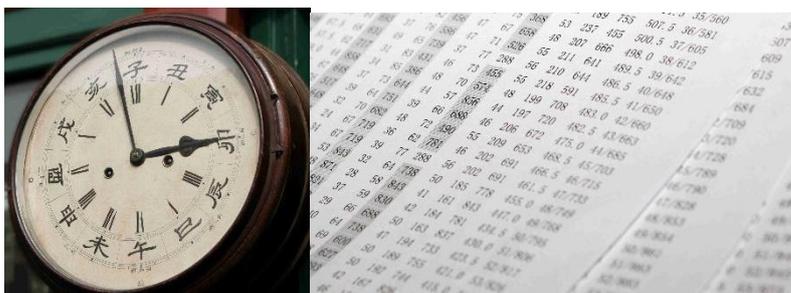
1. Introduction: The Roman numeral system for representing numbers was developed around 500 b.c. in ancient Rome. Their numeral system spread throughout Europe as the Romans conquered much of the world known to them. Roman numerals remained the primary manner for representing numbers for centuries.

Roman numerals are not used frequently today, although pupils will still see them in lots of real-life contexts as they are a rich part of our cultural heritage. Have the pupils seen the Roman numerals already? Can they specify where they are used?



Source: Stock Images

Do you know some other numerical systems? Arabic numerals – regularly used, Egyptian numerals, Chinese numerals...



Source: Stock Images

2. Why have people started counting in the past? How have they counted? The numerals developed out of a need for a common method of counting, essential to communications and trade. Counting on one's fingers got out of hand, so to speak, when you reached 10. A counting system was devised based on a person's hand. Roman numerals employed combinations of letters from the Latin alphabet (I, V, X, L, C, D and M).

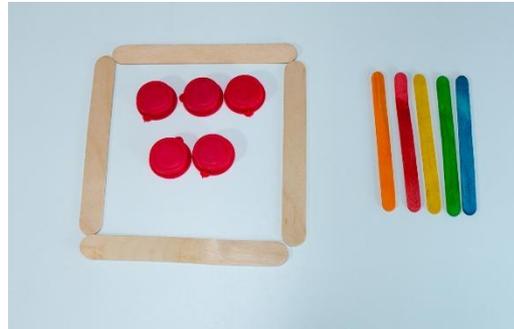
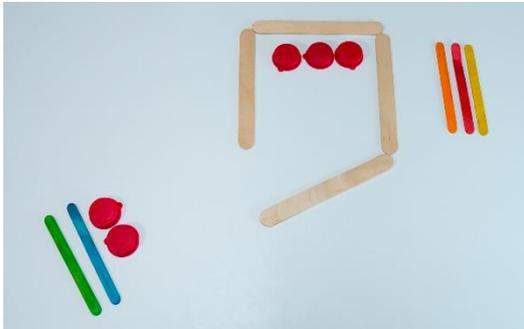
With the story and hands-on activity, pupils get to know the meaning of counting and numerals.

2.1. The teacher leads the discussion about counting. Before there were written numbers, people kept count through items. For instance, if a farmer sent 30 sheep out to pasture, he had a stone for every sheep. He did not know the number 30, but he did know to put one stone aside for every sheep. When they returned, he transferred these stones one by one as the sheep came in. If there were stones left over, he did not know a number, he just knew that however many stones he had left were however many sheep did not come home.

2.2. Exploring counting in the Roman era with a hands-on activity. Each pair of pupils should get a set of materials. One of the pairs makes the "fence" from popsicle sticks. Let the pupils use their imagination to create it. The bottle cap represents the sheep. When one of the "sheep" goes through the fence (one of the pupils puts the bottle cap in the fence), the other pupil takes one stone and puts it in the selected place. Repeat this until all the sheep are moved through the fence. Now, if the



pupils count the stones in the selected place, the number of the sheep in the fence should be equal.



2.3. Furthermore, this **method of counting evolved into markings**, with the most common marking being a slash mark. The **activity in 2.2 can be recreated** and instead of using stones for counting sheep, pupils can use popsicle sticks.

3. Roman numerals

The Romans were very active traders and had many sheep. It would have been too difficult for them to keep track of things using only slash marks, so they came up with a system that is presumed to be based on counting on the fingers.





3.1 With fingers

Roman's unique numerals system is based on simple signs. Note that the "I" in Roman numerals is "1" and can be symbolized by a finger.

The "V" in Roman numerals represents "5" and is said to be a symbol of the hand outstretched.

The "X" in Roman numerals means "10" and is said to be derived from both hands crossing each other. Teachers and pupils can try to do this with their fingers.



3.2 With popsicle sticks

Explain to the pupils how to write and read numbers with Roman numerals – first with the numbers 1-10, then with the higher numbers.

Use popsicle sticks to create different Roman numerals. Give them to the pupils. The teachers should write Roman numerals on the board and pupils have to write them with popsicle sticks. Then, the teacher can write an Arabic numeral and pupils write an equivalent Roman numeral.



I=1

V=5

X=10

L=50

C=100

D=500

M=1000

3.3 Additional questions for pupils. The teacher can decide which ones to use in class.

The teacher waits for the pupils to answer. Guide them to find the right answer.

How does the Roman numeral system work?

A system of subtraction is used: when a smaller number appears in front of a larger one, that needs to be subtracted, so IV is 4 (5 – 1) and IX is 9 (10 – 1).

On the contrary, the Arabic numerical system is based upon ten (originally nine) glyphs and is a positional decimal numeral system.

Why is there no 0 in Roman numerals?

Roman numerals started to count from one and had no symbol to represent “0”. This happens because the Romans did not need to have a zero in their additive system.

What are the advantages or disadvantages in comparison to Arabic numerals? Why do we not use them so much anymore?

The roman numeral system does not have zero and furthermore, it is complicated to write higher numbers with them. With evolving mathematics, economy, trading, money values and other real-life issues, humans had the need for a more practical numeric system – Arabic numerals, which is a positional decimal system, based on 10 numeral signs.

4. Implementing the blueprint: activity. Individual pupils or pairs of pupils can create a spinner. Then divide them into groups to play a game. This allows pupils to have fun while playing and learning Roman numerals at the same time.

Assessment activities

1. Which numeral system do we use regularly? Do you know any others?

2. Why do people need to count?

3. Why is there no zero in Roman numerals?

4. Convert the following Roman numerals to standard numbers.

(Answers are in the brackets)

XX (20)

IX (9)

VII (7)

LV (55)

CXXIII (123)

5. Convert standard numerals into a list of Roman numerals.

(Answers are in the brackets)

52 (LII)

290 (CCXC)

4 (IV)

25 (XXV)

510 (DX)

6. Correct these numbers. (Answers are in the brackets)

IM (DCDXCIX)

VCI (XCVI)

VVV (XX)

DD (M)

IIII (IV)



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