

Curriculum Standards

- ▶ Number Sense– use expanded notation to represent numbers
- ▶ Algebra & Functions– solve simple problems involving a functional relationship between two quantities
- ▶ Mathematical Reasoning– analyze problems by identifying relationships, distinguishing relevant from irrelevant information, sequencing and prioritizing information and observing patterns
- ▶ Mathematical Reasoning– determine when and how to break a problem into simpler parts

Roman Numerals– The Secret Code

Introduction:

- ◆ Show some pictures of Roman Numerals in everyday use. (clocks, the copyright date in books, dates on monuments or buildings)
- ◆ Introduce the “Secret Code” of Roman Numerals.
- ◆ Post chart of the “Secret Code”.

Through:

- ◆ Have children code and decode their ages or other common numbers. (Example: Age 8 = $5+3 = V+III=VIII$)
- ◆ The Olympic Games are numbered using Roman numerals. The 1996 Olympic Games in Atlanta were called the Games of the XXVI Olympiad. The Olympic Winter Games are also numbered using Roman numerals. The 2002 Winter Olympic Games in Salt Lake City are the XIX Winter Olympic Games.
- ◆ In small groups, allow children complete the worksheet. (Guessing is encouraged!)
- ◆ Review the answers and solve together.

Beyond: Extensions

- ◆ Research Roman Numerals– where else do you find them in use?
- ◆ Why don't we still use Roman Numerals? (Addition and subtraction are very easy, but multiplication, division and fractions are difficult to express in Roman numerals)
- ◆ Have students make individual charts of Arabic numbers and their Roman equivalent.
- ◆ Using their bodies, have groups of students lay on the floor to form Roman numerals.

Resources

- Roman Numerals “Secret Code” worksheet
- Large chart of the Roman Numerals “Secret Code”
- Roman Numerals, by David A. Adler, Thomas Y. Crowell Publishing.
- [Http://www.aafla.org](http://www.aafla.org)
- [Http://www.slc2002.org](http://www.slc2002.org)
- [Http://www.cod.edu/people/faculty/lawrence/romaindx.htm](http://www.cod.edu/people/faculty/lawrence/romaindx.htm)
- [Http://www.olympic.org](http://www.olympic.org)
- [Http://www.naturalmath.com/tool2.html](http://www.naturalmath.com/tool2.html)

ROMAN NUMERALS

Worksheet

1. What is the longest number between 1 and 2000 when depicted in Roman numerals?

2. Find two words that are also correctly formed Roman numbers. (Hint: one is very short!)

3. There are seven letters used as Roman numerals I, V, X, L, C, D, and M.
 - a. What is the smallest correctly formed Roman number using each numeral once?
 - b. What is the biggest?

4. Tom Sexton was born near Angeles Church on May sixth. What year was Tom born? (Hint: find all of the Roman numerals and arrange correctly)

ROMAN NUMERALS

QUIZ - ANSWERS

1. 1888. MDCCCLXXXVIII has 13 characters and is the only 13 character Roman number between 1 and 2000.

2. There are only two common, everyday words which are valid Roman numbers - I (1) and mix
3. Roman numerals I, V, X, L, C, D, and M
 - a. MDCLXVI (1666)
 - b. MCDXLIV (1444)

4. **Solution**

Tom Sexton was born near Angeles Church on May sixth.

Show all the Roman numerals

ToM SeXton was born near Angeles ChurCh on May sIXth

Take them out

MXCCMIX

and rearrange

MCMXCIX

which is

1999

ROMAN NUMERALS

THE SECRET CODE

The Romans depicted numbers using seven letters of the alphabet.
When a bar appears above a letter, multiply the value by 1000

$$I = 1$$

$$V = 5 \quad \bar{V} = 5000$$

$$X = 10 \quad \bar{X} = 10,000$$

$$L = 50 \quad \bar{L} = 50,000$$

$$C = 100 \quad \bar{C} = 100,000$$

$$D = 500 \quad \bar{D} = 500,000$$

$$M = 1000 \quad \bar{M} = 1,000,000$$

ROMAN NUMERALS

THE SECRET CODE

RULES

Rule I. Smaller numerals follow larger numerals (see exception in Rule III). Add up the values of the numerals to determine the quantity represented.

Rule II. I, X, C and M can be repeated up to three times in a row; other numerals cannot be repeated.

Rule III. In certain cases, a smaller numeral may come before a larger one. Subtract the smaller numeral from the larger one. A smaller numeral can precede a larger one if ALL of the following conditions are met:

-- The smaller numeral must be I, X, C or M –AND–

-- The smaller numeral must be either one-fifth or one-tenth the value of the larger one –AND–

-- The smaller numeral must either be the first numeral in the expression, or be preceded by a numeral of at least ten times its value –AND–

-- If another numeral follows the larger numeral, it must be smaller than the one that precedes the larger numeral.

ROMAN NUMERALS

THE SECRET CODE

Background information

Roman numerals are still used today and can be found in many places.

- They are still used in almost all cases for the copyright date on films, television programs, and videos - for example MCMLXXXVI.
- They are also used to show the hours on some clocks and watches. Here, though, the four is almost always depicted as IIII not as IV.
- Intel, the computer chip maker, called the improved version of its Pentium processor the Pentium II.
- They can be used for the preliminary pages of book before the main page numbering gets under way. Here they numerals normally use lower case letters so pages i, iv, xi and so on.
- Monarchs are usually numbered in Roman - eg King Edward VII of England, Louis XIV of France. Popes are also numbered using Roman numerals eg John Paul II. This is also sometimes seen in naming eldest sons where successive generations bear the same first name.

History

The history of Roman numerals is not well documented and written accounts are contradictory. It is likely that counting began on the fingers and that is why we count in tens. A single stroke I represents one finger, five or a handful could possibly be represented by V and the X may have been used because if you stretch out two handfuls of fingers and place them close the two little fingers cross in an X. Alternatively, an X is like two Vs, one upside down.