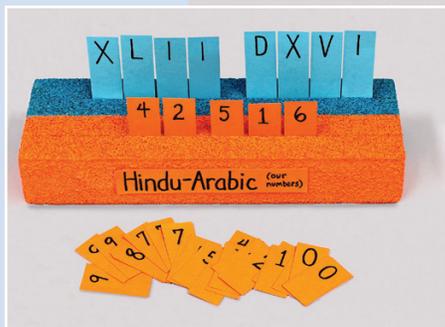


Counting With The Romans

MATERIALS

FOR STUDENT:
(one per student unless otherwise noted)

- FloraCraft® Make It: Fun® Foam Block, 1 15/16" x 3 7/8" x 11 7/8"
- Cardstock strips: Turquoise: Twenty-one 1" x 3", and one 1" x 6" Orange: Thirty 1" x 2", and one 1" x 6"
- Pencil
- Washable black fine tip marker
- Ruler
- Scissors



FOR TEACHER:

- FloraCraft® Make It: Fun® Foam Block, 1 15/16" x 3 7/8" x 11 7/8"
- Cardstock, 12" x 12", one sheet of each: Turquoise and orange per two students
- Sheet of white address labels
- Pencil
- Black marker
- Ruler
- Serrated knife
- Paper cutter
- Scissors
- Acrylic paint: Desert Turquoise and Bright Orange
- Paintbrush, medium size
- Water bucket
- Paper towels
- Old newspapers or plastic tablecloth (optional)
- Plastic-lined garbage can
- Wet wipes
- Drying area
- Glue stick
- Glue gun (for teacher only)

TEACHER PREPARATION

Note: Read through all the instructions first and check out the TIPS! Plan for three class sessions with drying time after the first and second. After the second session, have a glue gun plugged in and ready to use (ideally set on low temperature) but out of student reach. This can give you immediate adhesion when you're in a hurry to help students. It is also recommended that you make one sample first, before preparing the materials for any others, since knowing how the parts fit, might affect how you prepare the rest of them.

[1] Open the packages of foam blocks, one per student. Place blocks flat on table. On each, use a ruler and pencil to measure and mark three long lines, 1" apart, that divide the block into fourths. Use the ruler and a serrated knife to cut 1/2" deep slits along the two outside lines, but do not cut the center line. (That shows the students where to paint.)

[2] Use the paper cutter to cut the 12" x 12" turquoise cardstock into twelve 1" strips. Cut one strip in half (1" x 6" for title strips) and the rest into forty-four 1" x 3" cards. Also cut 12" x 12" orange cardstock into twelve 1"

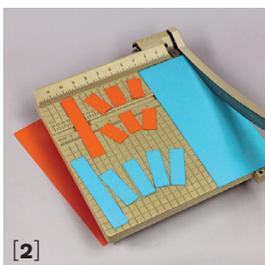
strips. Cut one strip in half. Cut the rest into sixty-six 1" x 2" cards. The amount you cut will serve two students (and provide a few extras). Repeat cutting for the rest of the students.

[3] Cut apart address labels. On a paper plate for each student, set: Ruler, marker, glue stick, address label, two 6" cardstock strips, and cup with turquoise and orange cards in it. Set those aside for now.

[4] On the other paper plate, for each student, place: Foam block, pencil, paintbrush, cup of water and paper towel. Have paint ready to go.



[1]



[2]



[3]



[4]

MATH

GRADE LEVEL
FOURTH – FIFTH

COMPLETION TIME

- 20 minute session
 - 20 minute session
 - 40 minute session
- (2 hours minimum drying time between sessions)



OBJECTIVES

Students learn:

- The name of our number system: Hindu-Arabic
- Alternative number system and how to use it: Roman numerals
- How to convert from one system to the other

STANDARDS

- Use concrete materials and symbolic notation to represent numbers in bases other than base ten
- Identify Roman numerals from 1 – 1000 (I – M)
- Compare decimal number system to the Roman numeral system (using the Roman numerals I, V, X, L, C, D, and M)

LESSON INTRODUCTION

- After going over the lesson on Roman numerals, explain to the students that it's easier to understand if they can practice converting from Hindu-Arabic (our numbers) to Roman numerals. Explain that they will each be able to make a block that holds one type of number on one side and the other type of number on the other side when they are quizzing each other. Or, they can put them both facing the same side, since the Roman numeral cards are cut larger, they show above the Hindu-Arabic cards. Also, mention that by making them colored, it helps us remember.



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INSTRUCTIONS

[1] Have the students put on their aprons and roll up their sleeves, letting them know that this paint will not wash out of clothes. Ask them to use the pencil to put their name on their plates. Pour orange paint onto their plates and have them paint one half of the top and sides of the foam block. Point out that the slits are already cut, but they can paint right over them. As students paint, squeeze more paint onto their plates and distribute wet wipes as needed.

When they are finished, collect the brushes and put them into the bucket of water (until after class when they can be washed out). Have them put their plate with the foam block into the drying area.



SESSION TWO

[2] Repeat session one, with students painting the opposite side and edges with turquoise and return their plates to the drying area.

SESSION THREE

[3] Distribute plates with cardstock strips and cards, etc. Demonstrate and have students make three light guidelines using their pencil and ruler on their 6" long turquoise strip. Then, have them neatly print in pencil, "Roman Numerals". When they are satisfied, have them trace over the letters in marker. Demonstrate and have them generously apply glue stick to a 1" x 6" area on the long, turquoise side of their foam

block. Also apply glue stick to the back of their cardstock strip and press the title in place.

Repeat with the orange strip, printing "Hindu-Arabic". Also have the students write their name on the address label and attach it to the bottom of the foam block.



[4] Demonstrate and have the students place their turquoise cards vertically and print on the top end the Roman numerals, making three cards of each: I, V, X, L, C, D, and M. Then they can return them to their cup on their plate.



[5] Similarly, demonstrate and have the students place their orange cards vertically and print on the top end the Hindu-Arabic numbers, making three cards of each: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9.



[6] Show the students how the cards fit into the slits in their foam blocks and can be used in practicing the number conversions.



MODIFICATIONS

To simplify project:

- Don't paint the foam block, but still glue on colored cardstock labels that correspond with the card colors.
- Limit the size of the Roman numerals that can be made.

To expand project:

- Have students put their blocks together, end to end, to work on longer (higher) numbers.
- Ask the students to research two other number systems. Paint foam blocks and cut cardstock from two additional colors.

For multiple ages:

- Younger and older students can work side-by-side, making their own blocks, and use them to convert numbers, on different levels. (Younger students can work with I, V and X, while the older students work with all of the numerals.)
- Younger students can paint the first color and older students can paint the second color, and "clean up" any irregular edges by painting over them.

ADDITIONAL IDEAS

- So that the students can check themselves, have them lightly write in pencil on the back of each Roman numeral, the Hindu-Arabic equivalent: I-1, V-5, X-10, L-50, C-100, D-500, and M-1000.
- Use the foam block and other color cards to practice other memorized learning.
- Make larger size foam blocks with large cardstock cards, that can set on a table at the front for class lessons.
- Create Roman Numeral competitions between teams of students to see who can convert the largest number.



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TIPS

- When cutting the slits in the foam, use a permanent marker to mark 1/2" down on the knife blade so that you know how far you're cutting.
- Prepare the painting area, covering the tables if needed. Allow for plenty of space for each student. Have large plastic-lined garbage can ready.
- If the acrylic paint seems too thick, walk around with a squeeze bottle (not a squirt bottle) of water and put a few drops of water on each student's puddle of paint. Or, if you know it in advance, add a little water to the paint in the container and shake well, to thin the paint to the consistency of cream. This will go down into the pores of the foam more easily.
- Have wet wipes and additional paper towels ready to distribute to any messy fingers.
- To help the students remember that we use the Hindu-Arabic system, they can write "our numbers" on the label strip.

REFERENCES

Fun With Roman Numerals by David A. Adler
Roman Numerals I To MM by Arthur Geisert
Roman Numerals and Ordinals by Kylie Burns
The Hindu-Arabic Numerals by David Eugene Smith