

Fractions & Decimals Boards

MATERIALS

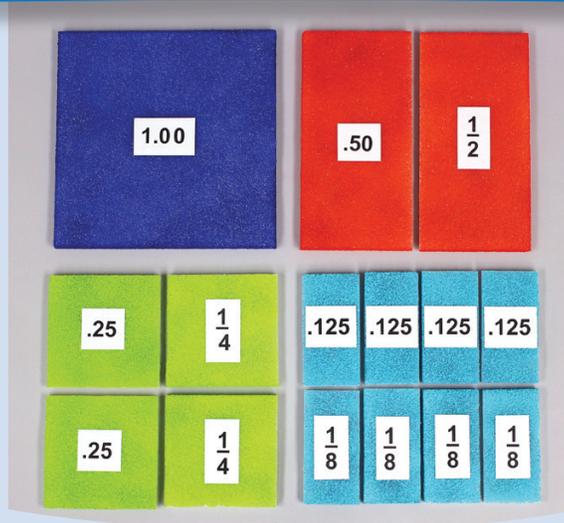
FOR STUDENT:

(one per student unless otherwise noted)

- FloraCraft® Make It: Fun® Foam Block, 7/16" x 11 7/8" x 11 7/8"
- Paintbrushes, large
- Plastic cup of water
- Glue stick
- Paper plate, small
- Paper towel
- 12" x 12" paper (under foam while painting)
- Ziploc bag
- Paint apron per student

FOR TEACHER:

- Acrylic paint: Turquoise, Blue Bright, Tangerine, Olive Bright (green)
- Serrated knife
- Paper cutter
- Glue stick
- Ruler
- Pencil
- Old newspapers or plastic tablecloth (optional)
- Cutting mat or stack of newspapers
- Plastic-lined garbage can
- Paper towels
- Bucket of water
- Wet wipes
- Drying area
- Copy paper
- Computer and printer
- White board or chalk board or large paper



MATH

GRADE LEVEL
FOURTH – FIFTH

COMPLETION TIME

- 45 minute session (2 hours minimum drying time)
- 30 minute session



OBJECTIVES

Students learn to:

- Understand the difference between fractions and decimals
- Recognize the equivalent values of both
- Create 3-D examples of the various amounts

STANDARDS

- Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers
- Understand addition and subtraction of fractions as joining and separating parts referring to the same whole
- Understand decimal notation for fractions and compare decimal fractions

TEACHER PREPARATION

Note: Read through all the instructions first and check out the TIPS! Students can work together in groups of four to create one complete set. This way each student can paint one of the following: 1 and 1.00 (dark blue); 1/2 and .50 (orange); 1/4 and .25 (green) and 1/8 and .125 (turquoise blue). It is also recommended that you make samples first, before preparing the materials for any others, since knowing the process, first hand, might affect how you prepare.

[1] For each set consisting of four foam blocks: Use a ruler and pencil to measure and make small marks as ruler guides to cut one sheet in half, another in fourths, another in eighths and leave one whole. (Note: Pencil will show on foam if you go over the mark a couple of times. However it's not necessary to draw the entire line – just measure and mark in a couple of places as a guide for placing the ruler.) Then, on a cutting mat or stack of newspapers, use a serrated knife against the edge of the ruler to cut the foam block with several passes of the knife for each cut.

[2] On the computer, print the labels for each set making the correct number for the number of pieces. Example: Type eight .125 and eight 1/8. Type them far enough apart to be able to cut them apart on

the paper cutter and put them in one plastic bag per group. (Wait to give them to students until the second session.)

(Alternative: Instead of having students go through their bag of labels to find the right ones for their blocks, have them write the fractions and the decimals on pieces of pre-cut copy paper.)

[3] On the board write the list of decimals and their fraction equivalent for students to reference while they work.

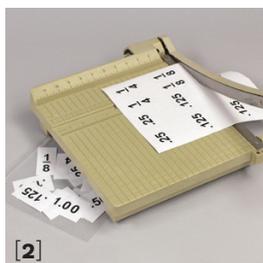
[4] Prepare the paint area with four of each: Brushes, paper towels, plates, water cups, and 12" x 12" paper (to put under the foam while being painted). Just before students arrive, squeeze the four colors of paint onto the paper plates for each group.

LESSON INTRODUCTION

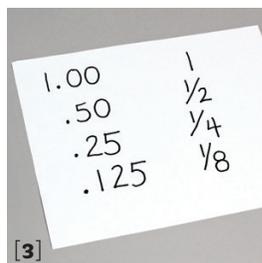
- Remind students of the lessons on fractions that they've studied, as well as the lessons on decimals. Explain that both fractions and decimals can be used to name parts of a whole. Review previous information and refer to the notes that you will have made on the board.



[1]



[2]



[3]



[4]



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INSTRUCTIONS

[1] Refer to the board where the fractions and decimals are written. Hold up a sample of the whole foam and explain that the full foam sheet represents the decimal 1.00 and the fraction equivalent which is the number 1, a whole number. Then, show the two pieces, indicating that they each represent the decimal .50 and the equivalent fraction $\frac{1}{2}$ but that together they would make a whole sheet. Similarly continue, showing the quarter and eighth sheet pieces.

[2] Have students put on their aprons and roll up their sleeves, explaining that this paint will not wash out of clothes. Ask each group to have one student paint one color and not mix the colors or the brushes. (If it matters to you which colors are which foam pieces, explain that to the students.) Distribute one set of foam pieces and one whole sheet to each group.

Ask them to work on their paper, painting the foam front and then the back, but not getting any paint on the edges. Explain that if the paint seems too thick, that they should dip just the tip of the brush into the water and mix it into the paint on their plate.

While 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 the students write their names on the papers and move them into the drying area.



NEXT SESSION

[3] Place a bag of labels and the glue sticks in each group's area. Have students collect their dried foam pieces and lay them out on the tables in the square formation (like the whole sheet). Have the members of the group work together to sort the labels, with each student taking the correct labels for the foam pieces they painted.



[4] Set the fractions aside. On one side of their foam pieces, have each student set all the decimals. Have the rest of the group check them to be sure they are correct before gluing them. Then glue the labels to the foam. (Suggestion: The student who painted the whole piece, can help the one with the eighths.)



[5] Then have students turn over their foam pieces and repeat the process, using the decimal equivalents. Caution them to be sure to check each other's labels for accuracy before gluing.

Return pieces to the drying area and "teepee" them again so that the glue can dry.

When dry, you can use them with students, indicating whether you want them to work with the fractions, or the decimals, or both.



MODIFICATIONS

To simplify project:

- Only do the whole, half and quarter panels.
- Divide the whole foam sheets into fourths and use one fourth as a whole, cutting everything else, accordingly smaller.

To expand project:

- Also make boards that are cut into sixteenths and thirty secondths.
- Give students rulers and plastic knives and let them measure and cut apart the pieces after painting the solid sheets.
- Use panels to add and subtract in both fractions and decimals.

For multiple ages:

- Younger and older students can work side-by-side with the older students measuring amounts that use eights and sixteenths.
- Younger students can come up with their own groupings of panels with which to add and subtract, while the older students can work with converting from fractions to decimals and back again.

ADDITIONAL IDEAS

- Have several groups of students (or all of them) combine their panels to create larger numbers.
- Create teams that can quiz each other by giving a number that the other team needs to show in terms of sheets. (Example: "Please show us $2\frac{3}{8}$.")
- Have students find examples of other things around the room that could be identified in terms of fractions or decimals.
- Save the sets that are made each year so that eventually, you'll have enough for each student to use their own set.



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TIPS

- When you cut the foam, keep the serrated knife blade perpendicular to the table so that the foam edges are straight. Score lightly first and then press more firmly to cut deeper with several passes of the knife.
- Prepare the painting area, covering the tables if needed. Allow for plenty of space for each student. Have a large plastic-lined garbage can ready.
- In the drying area, have students create a "teepee" from putting two pieces up on end but leaning on each other, so that neither the front or the back is flat on the paper. This will allow them to dry without sticking to the paper.
- Have students apply a generous amount of glue stick to the their foam and set the label onto the glue. This allows there to be a build up of glue on the surface, and gives the best adhesion.
- Have paper towels ready to distribute to any gluey fingers.

REFERENCES

Go Math! Student Edition by Houghton Mifflin Harcourt
My Lemonade Stand: Number Patterns by Andrew Einspruch
Math Olympics by Gabrielle O'Rourke
Mathiator by Emmanuel Gutierrez