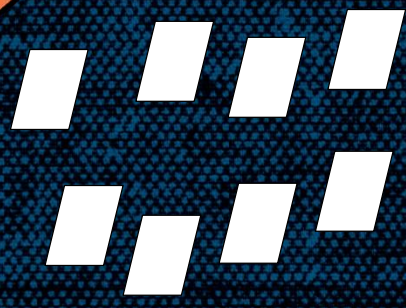
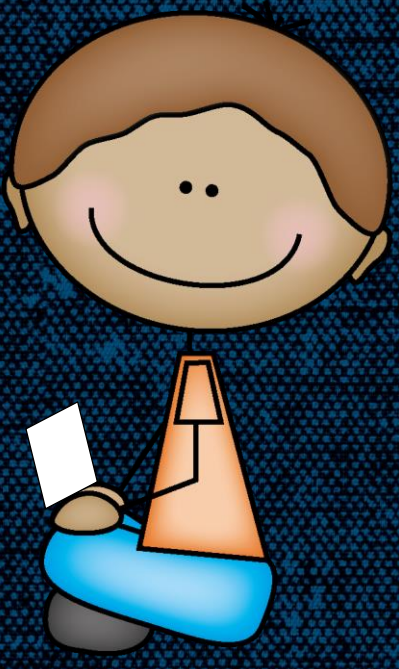
CONCEPT SORTS

Fractions!

5 different sorts!



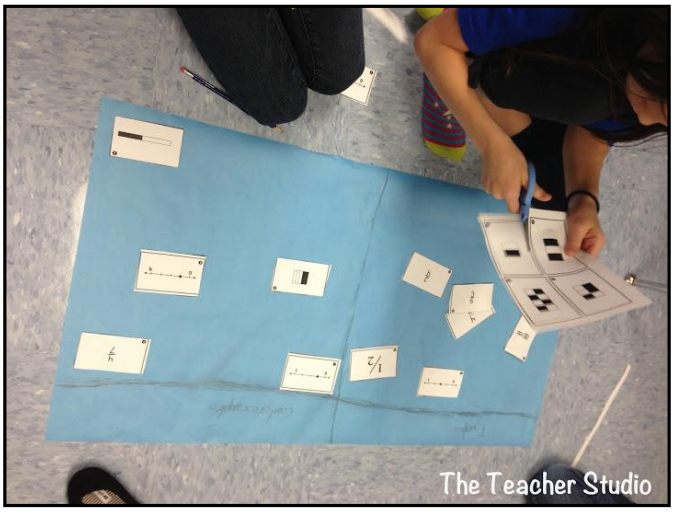


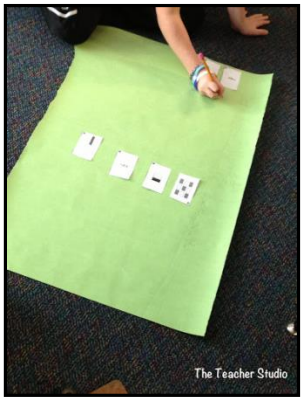
One thing that I really like to work on with my students is organizing their learning in different ways. One method I have found to be very successful is to ask students to take work samples or problem types and sort them into categories. People who use Words Their Way do this all the time with students as they look for sound or letter patterns that help them understand how words are put together.

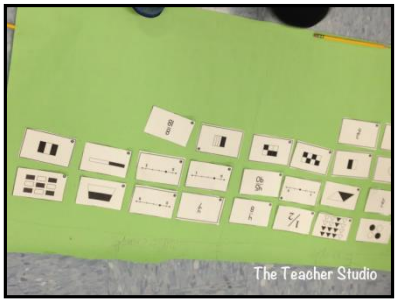
I find concept sorts particularly useful in math and the content areas as well--and I really believe it helps students make connections among ideas and help them to see how things are connected. In fact, two of Marzano's effective teaching strategies--cooperative learning and identifying similarities and differences--are addressed with this activity. If research has shown solid evidence that categorizing and finding similarities and differences works--I'm all for it!

Here is how I tend to use these sorts--although please know that there is no RIGHT way! Get creative and let the students guide you as you go. Here is one example of a sort I did with my students.

I started by splitting my class into groups of 3. (I like trios for lots of reasons...because it allows for better dialogue, it helps strugglers, and also allows for one extra person in case a third person gets pulled out of the group or has to leave for any reason!) For this sort, I gave each group a small piece of bulletin board paper for them to do their sort. They grabbed their sort cards, cut, and started to organize them!

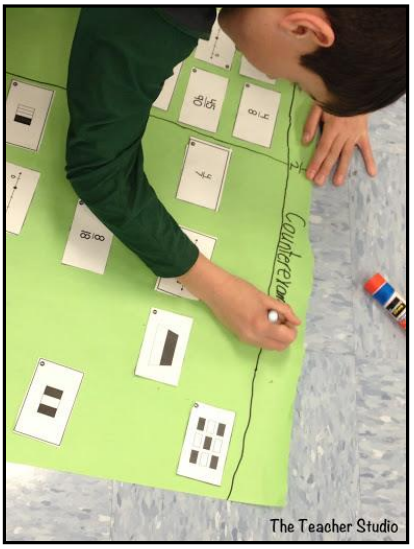






As my students sorted, I simply walked around and eavesdropped! It was a great time to listen for Math language, to listen for any misconceptions, and to see who was feeling confident and who was not.

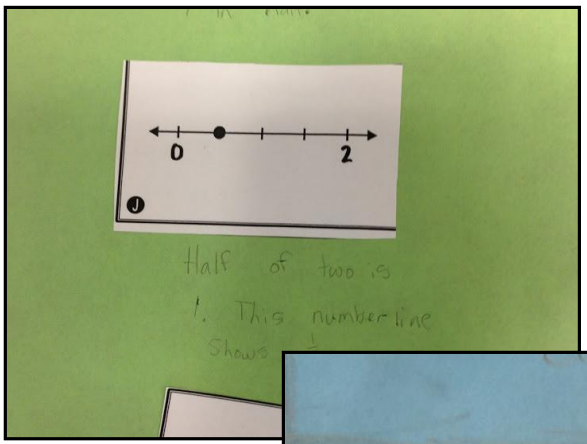
Students begin to question each other, ask questions of each other, and help one another come to higher levels of understanding. My role is simply to be an observer—I really don't get involved at this point...even if I see errors. Trust me on this!

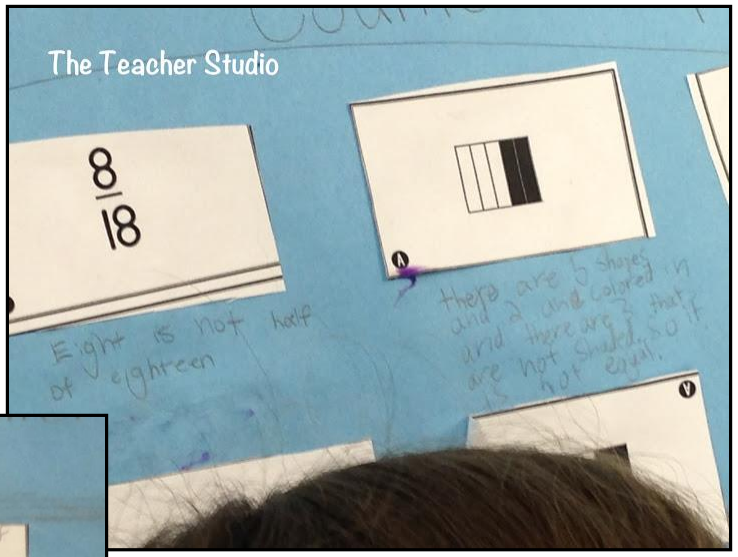


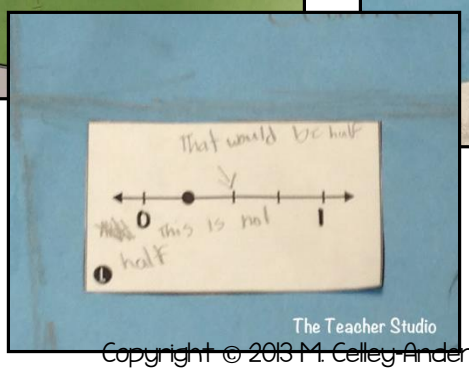
This sort was an example/counterexample sort...I wanted the students to decide if the fraction card I gave them was an "example" of 1/2 or a "counterexample" of 1/2.

This group was getting their T-chart all set up.

Now...it would be plenty easy to have the students stop at this point, but I am working hard with mine on to get them to use their writing skills in math and to work on that "critiquing reasoning" standard. So I had my students actually write on their posters to explain why all their "counterexamples" were NOT 1/2!

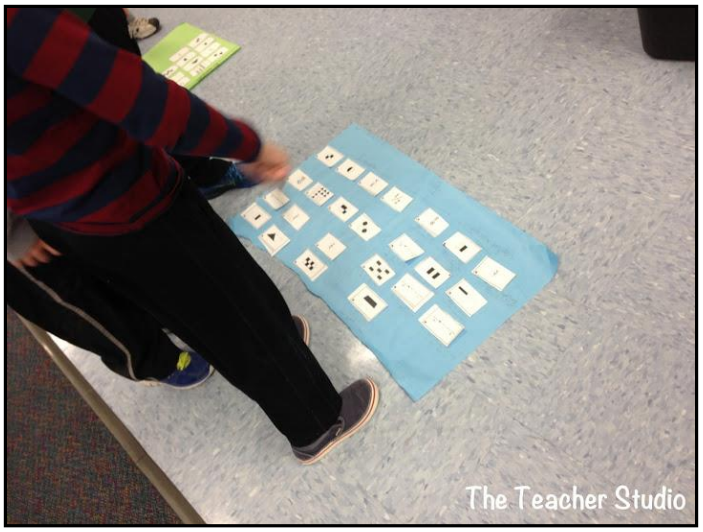


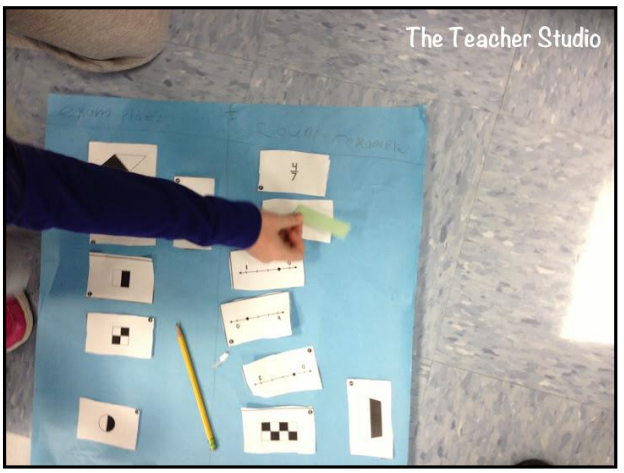


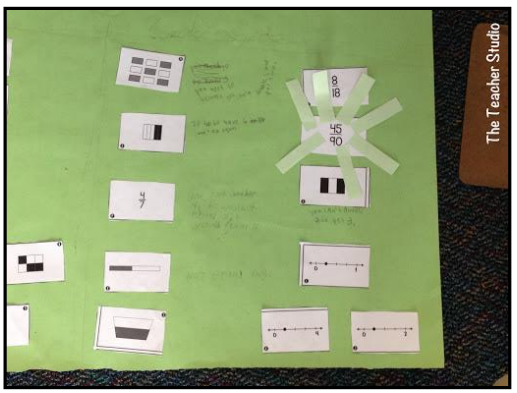


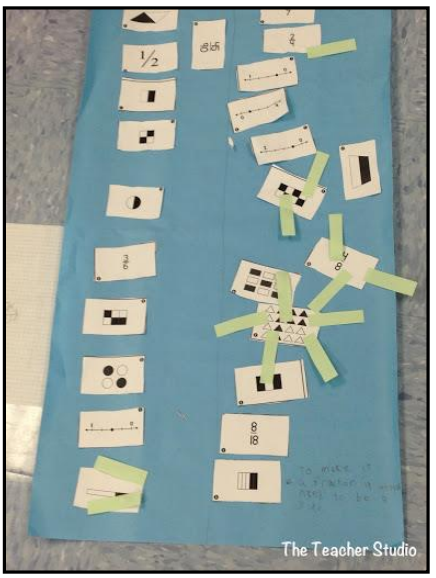
I gave the students a total of 15 minutes to do this job—and there were a few groups that did not get every card sorted. That's okay. If I gave some groups 45 minutes, they may not have finished! I like to keep things moving—I even had a visual timer up on my Smartboard so they know how much time they had left.

After the time was up, I continued the activity with a gallery walk. Although actually DOING the sort is a valuable activity, gallery walks can add a whole new level of critique to the lesson! Each trio took a post it note and cut it into three "tags". They were allowed to "tag" up to three spots on other groups' papers where they felt an error was made. Here's what it looked like!









Finished? Not yet! Each group then went back to their "home base" and looked at the results. They then discussed any "flagged" items and we went through some of the most challenging ones as a class. The entire activity took us 25 minutes from start to finish! Are you ready to give it a try? I have included FIVE different fraction sorts for you—including the one pictured above.

So...what is included in this resource?

1. The cards needed to do 5 different sorts with fractions. The concepts covered are:

- ✓ "Is it exactly 1/2?" (understanding of equal parts)
- ✓ "Estimating: Is it closer to 0, 1/2, or 1?" (using benchmarks to estimate)
- ✓ "Is it <, >, or = to 1/2?" (working with greater than, less than, and equivalence)
- ✓ "Does it add/subtract to equal 1?" (addition and subtraction of fractions)
- ✓ "Fractions of sets" (finding equivalent fractions of sets rather than regions)

2. The blog post with photos that explains EXACTLY how I completed a sort with my own students. Feel free to get creative and try different approaches—but I have given one highly effective and efficient way to do this.

3. A "Show What You Know" sheet that follows the rule of the sort. Use as independent practice or as an assessment after you have done a sort to see what the students know and what they still need to learn. Many of these also ask students to explain their thinking—a key part of the CCSS!

4. A page of blank cards if you wish to extend the learning by having students create MORE examples that go in each category. This is a great way to differentiate for more capable learners! See each sort for other differentiation hints!

5. No answer key. Why? The important part about doing these sorts is the discussion rather than making sure every answer is instantly correct. Let the students discuss, prove their ideas, and develop understanding!

6. A CCSS alignment sheet to show how these sorts align to the grades 3-5 CCSS.

CCSS Alignment

Grade 4 (4.NF.3)

Extend understanding of fraction equivalence and ordering

Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.

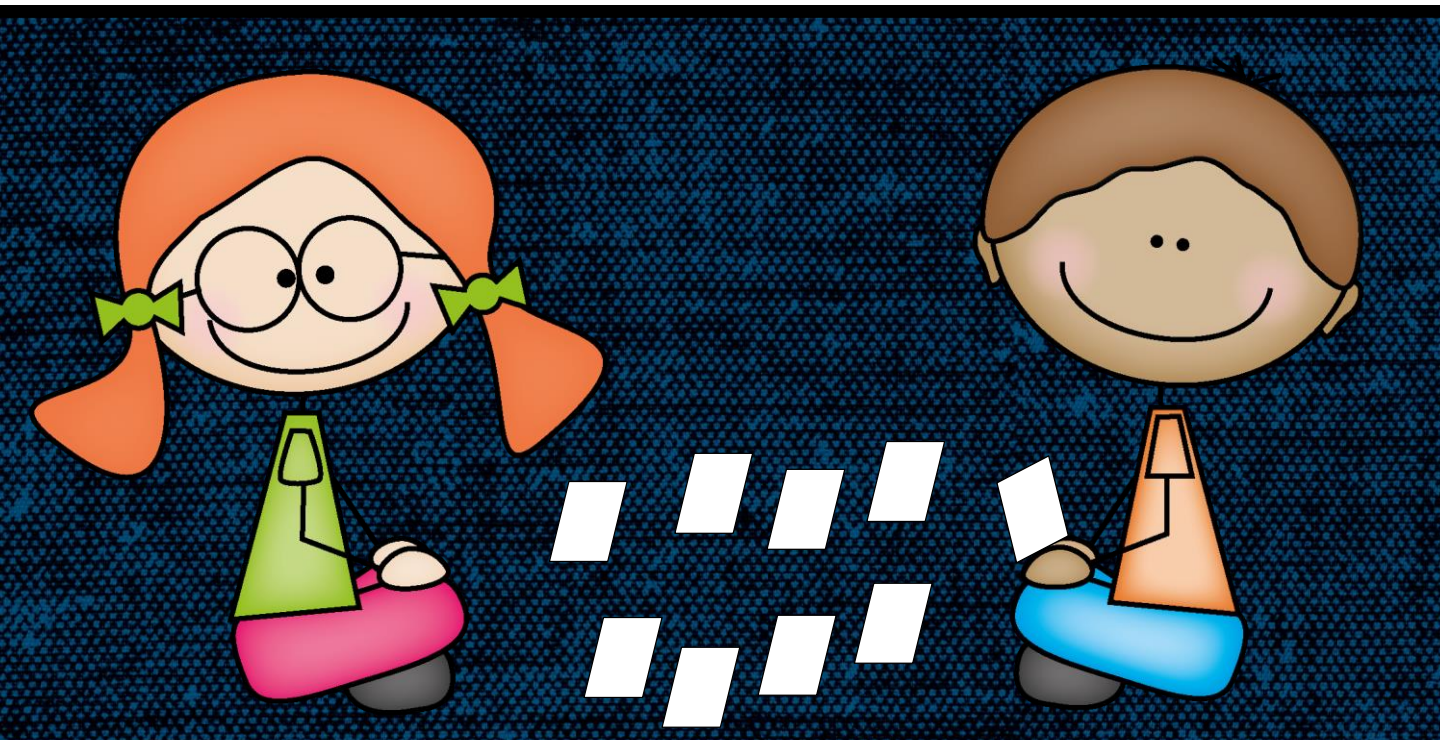
Grade 5 (4NF.1)

Use equivalent fractions as a strategy to add and subtract fractions.

Also a key component of this resource is the application of the Standards for Mathematical Practice. Whether a student be reasoning abstractly, constructing viable arguments, or attending to precision—these sorts truly can provide opportunities for students to practice all 8 of these critical standards!

Fractions:

Is it exactly 1/2?



Is it exactly 1/2?

This sort uses numbers, fractions of regions, number lines, and fractions of sets to ask students to show that they truly understand the concept of "1/2". This is a great sort to do early in a fraction unit or even to pre-assess what they already understand!

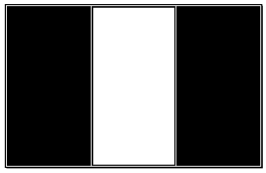
Exactly 1/2

Not 1/2

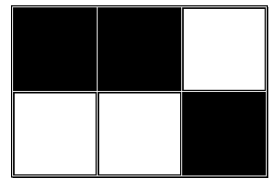
Example of 1/2

Counterexamples

Use either of these sets of "headers" to help with this sort! You can always have the students make up their own headers as well as pictured in my samples.



A



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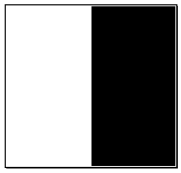
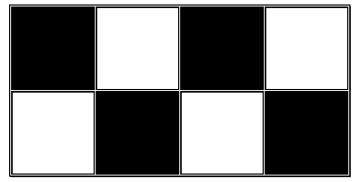


C



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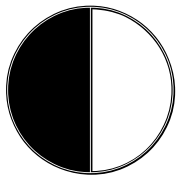

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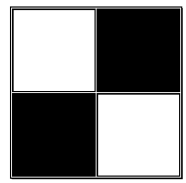
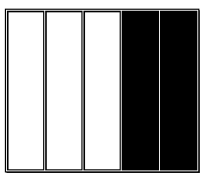


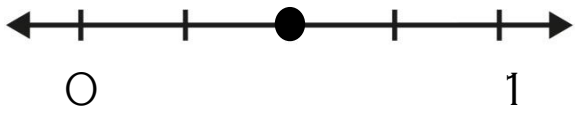
F



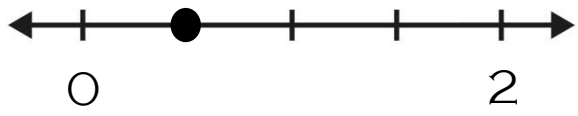
G

$\frac{3}{6}$

H



I



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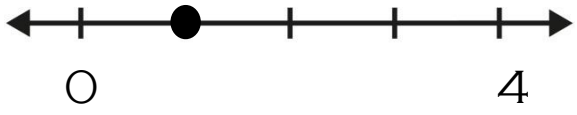


K

L

$\frac{1}{2}$

M

$\frac{4}{8}$

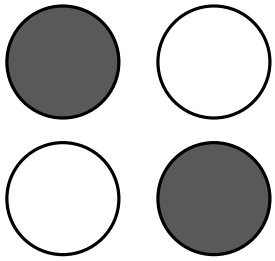
N

$\frac{2}{4}$

O

$\frac{4}{7}$

P



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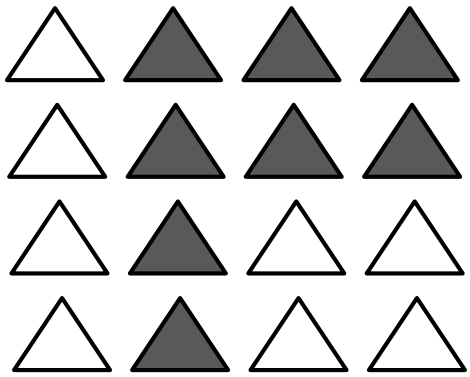
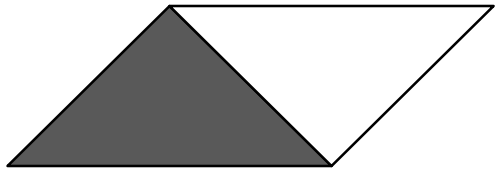


R

S



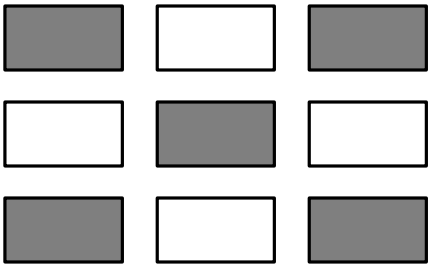
T

$$\frac{45}{90}$$

U

$$\frac{8}{18}$$

V



W

X

Another example!

Another example!

Another example!

Another example!

Another example!

Another example!

Another example!

Another example!

Name _____

Is it exactly 1/2?

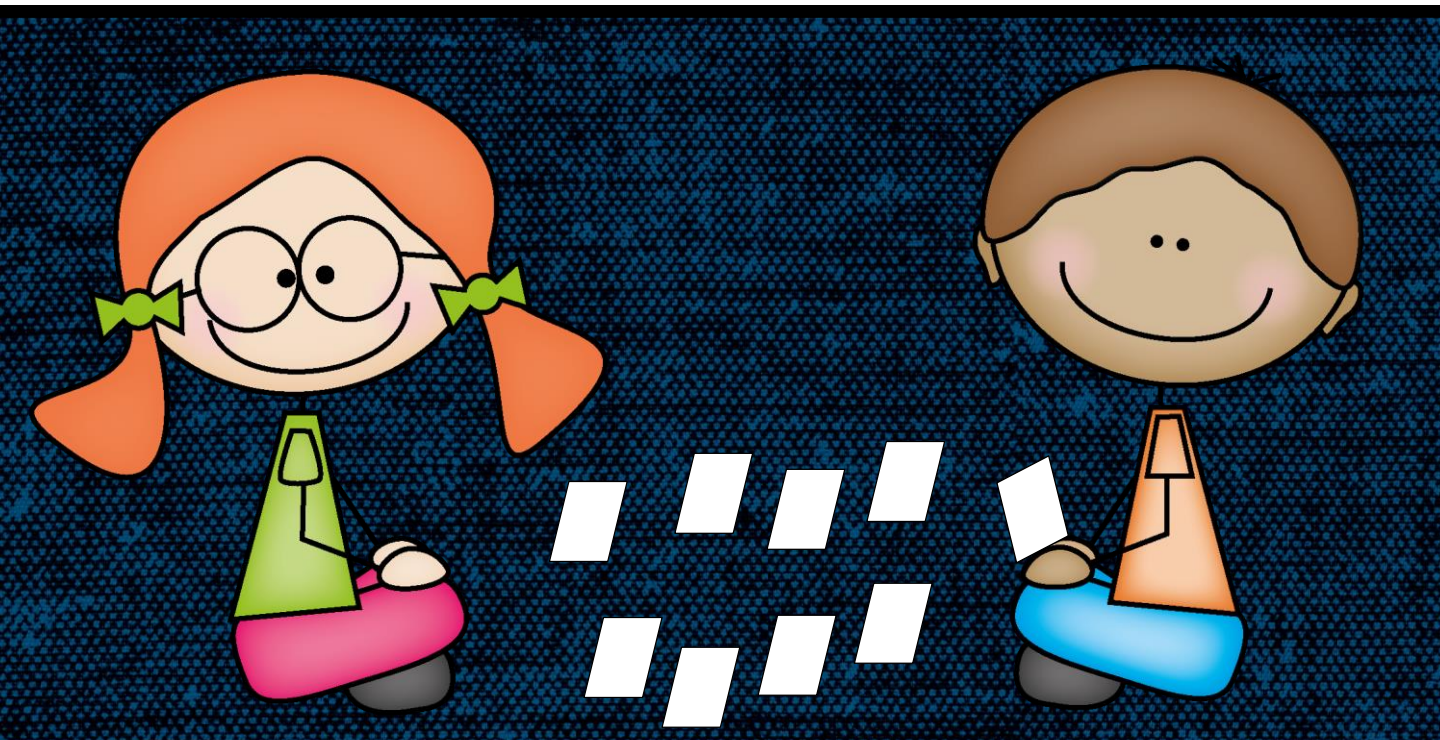
Show what you know! Fill in several examples on both sides of the chart to show that you understand.

Exactly 1/2	Not 1/2

Explain how you decided what to put on each side. Use clear math language!

Fractions:

Estimating: Is it closer to 0, 1/2, or 1?



Is it closer to 0, 1/2, or 1?

This sort uses the benchmarks of "0", "1/2", and "1" to help students work on their estimating skills. Students should be able to use logic and what they know about fractions to determine if a fraction is exactly ½ or is closer to 0 or 1. This sort can really show if students understand the relationship between numerator and denominator and if they can visualize the size of "pieces" in a given fraction.

Benchmark 0

Benchmark 1/2

Benchmark 1

For this sort, I do recommend using the cards as category "headers" since students would have a hard time coming up with the categories on their own. Some sorts DO lend themselves to having students "discover" categories. This isn't one of them! ☺

A

$$\frac{1}{10}$$

B

$$\frac{7}{8}$$

C

$$\frac{3}{5}$$

D

$$\frac{2}{3}$$

E

$$\frac{7}{9}$$

F

$$\frac{1}{12}$$

G

$$\frac{1}{3}$$

H

$$\frac{6}{8}$$

$\frac{11}{12}$

I

$\frac{1}{6}$

J

$\frac{5}{15}$

K

$\frac{4}{6}$

L

$\frac{12}{10}$

M

$\frac{7}{7}$

N

$\frac{1}{9}$

O

$\frac{2}{11}$

P

Q

$$\frac{5}{6}$$

R

$$\frac{6}{10}$$

S

$$\frac{4}{5}$$

T

$$\frac{2}{12}$$

U

$$\frac{6}{5}$$

V

$$\frac{5}{8}$$

W

$$\frac{3}{9}$$

X

$$\frac{8}{10}$$

Another example!

Another example!

Another example!

Another example!

Another example!

Another example!

Another example!

Another example!

Name _____

Is it closer to 0, 1/2 or 1?

Show what you know! Fill in several examples on the chart to show you understand.

Close to 0	Close to 1/2	Close to 1

Select one fraction in each category. Explain why you put it in that column. Use clear math language!

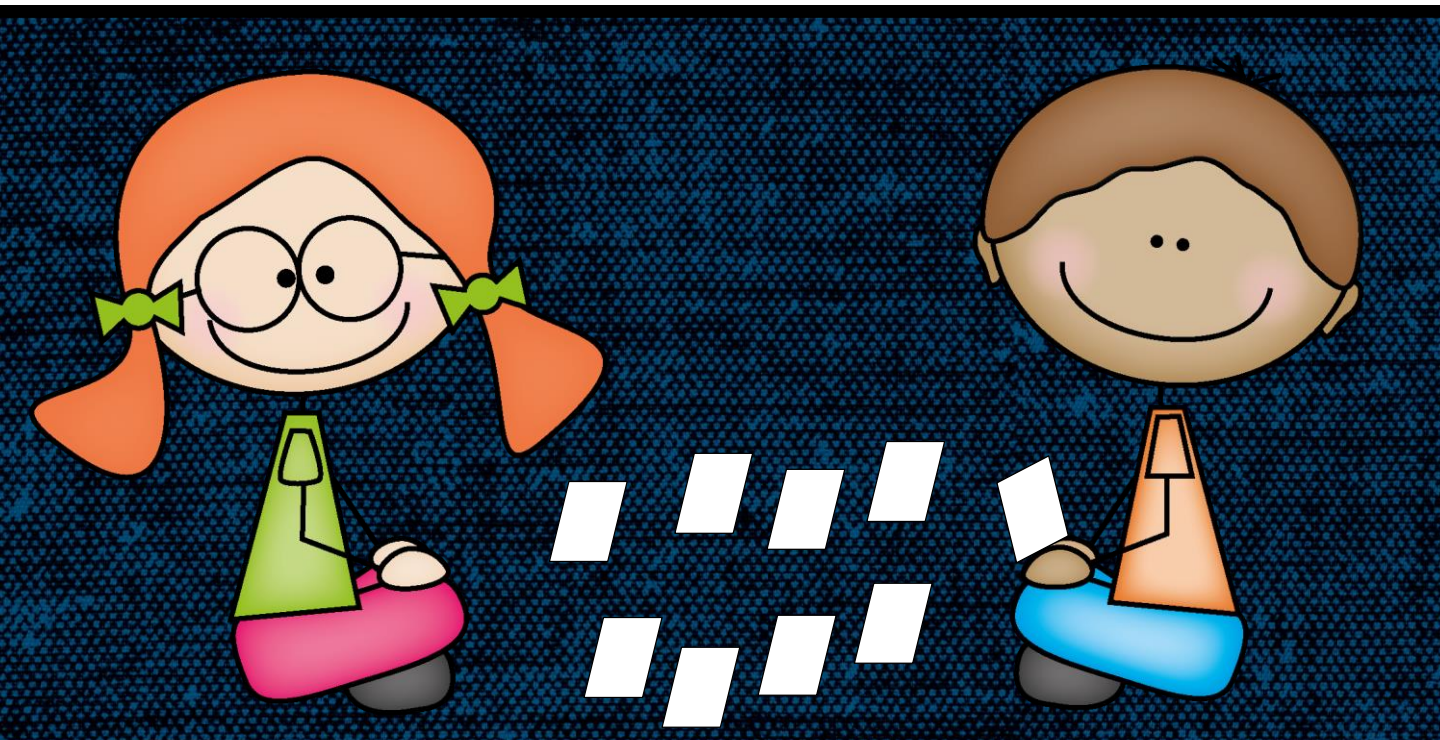
Close to 0 fraction: ____

Close to 1/2 fraction: ____

Close to 1 fraction: ____

Fractions:

Is it <, >, or = to 1/2?



Is it <, >, or = to 1/2?

This sort reinforces the concept of greater than and less than as well as equivalent fractions. Students work to determine if each fraction card is equal to 1/2 ...or if it is NOT equivalent, they must determine whether it is greater than or less than 1/2. This can really show understanding of fraction understanding and would be a great sort to do partway through a unit to see how students are doing.

$< \frac{1}{2}$

$> \frac{1}{2}$

$= \frac{1}{2}$

For this sort, I do recommend using the cards as category "headers" since students would have a hard time coming up with the categories on their own. Some sorts DO lend themselves to having students "discover" categories. This isn't one of them! ☺

A

$$\frac{7}{12}$$

B

$$\frac{3}{9}$$

C

$$\frac{4}{8}$$

D

$$\frac{9}{10}$$

E

$$\frac{1}{3}$$

F

$$\frac{8}{16}$$

G

$$\frac{9}{16}$$

H

$$\frac{1}{5}$$

$\frac{10}{14}$

I

$\frac{1}{8}$

J

$\frac{7}{15}$

K

$\frac{4}{6}$

L

$\frac{6}{5}$

M

$\frac{6}{7}$

N

$\frac{1}{6}$

O

$\frac{10}{11}$

P

Q

$\frac{8}{6}$

R

$\frac{3}{5}$

S

$\frac{4}{9}$

T

$\frac{1}{18}$

U

$\frac{4}{7}$

V

$\frac{5}{8}$

W

$\frac{7}{8}$

X

$\frac{3}{20}$

Another example!

Another example!

Another example!

Another example!

Another example!

Another example!

Another example!

Another example!

Name _____

Is it <, > or = to 1/2?

Show what you know! Fill in several examples on the chart to show you understand.

< 1/2	> 1/2	= 1/2

Select one fraction in each category. Explain why you put it in that column. Use clear math language!

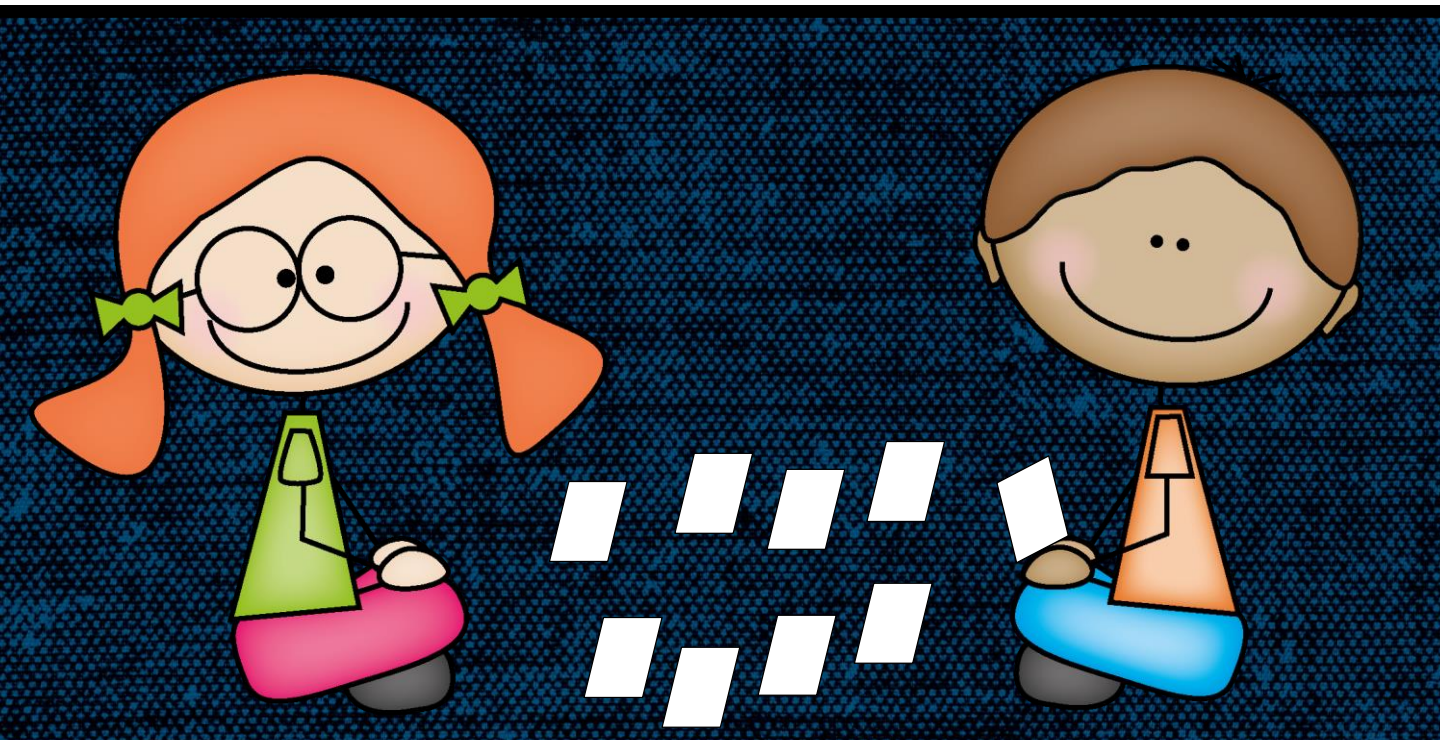
< 1/2 fraction: ____

> 1/2 fraction: ____

= 1/2 fraction: ____

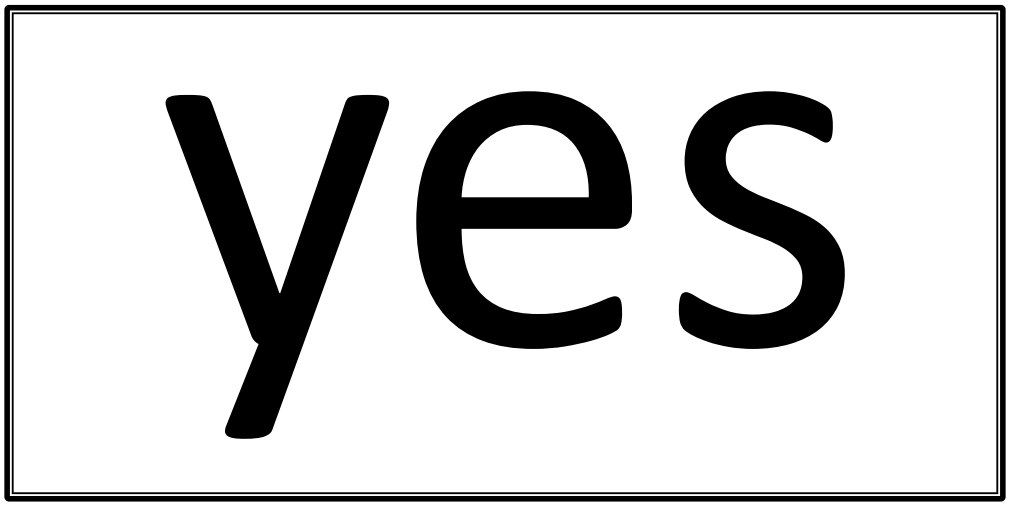
Fractions:

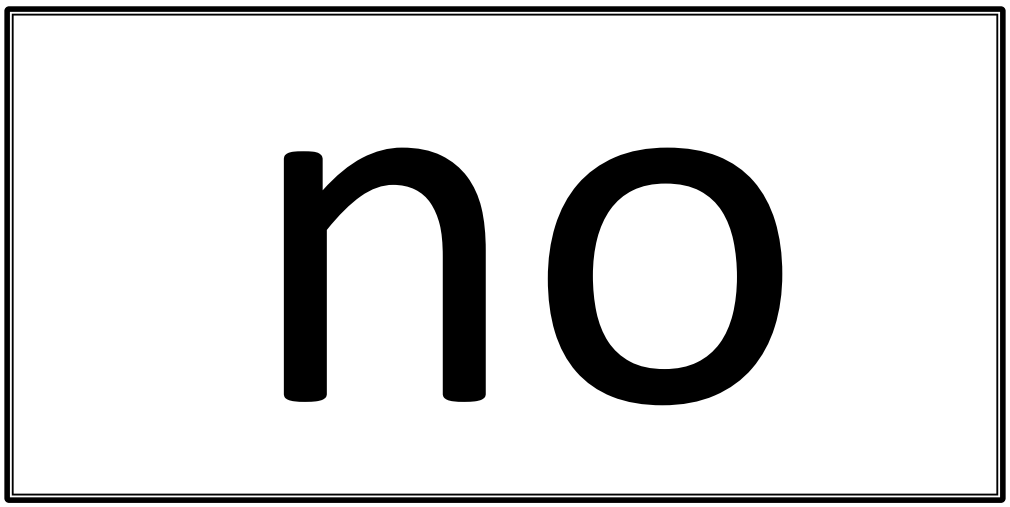
Does it add/subtract to equal "1"?

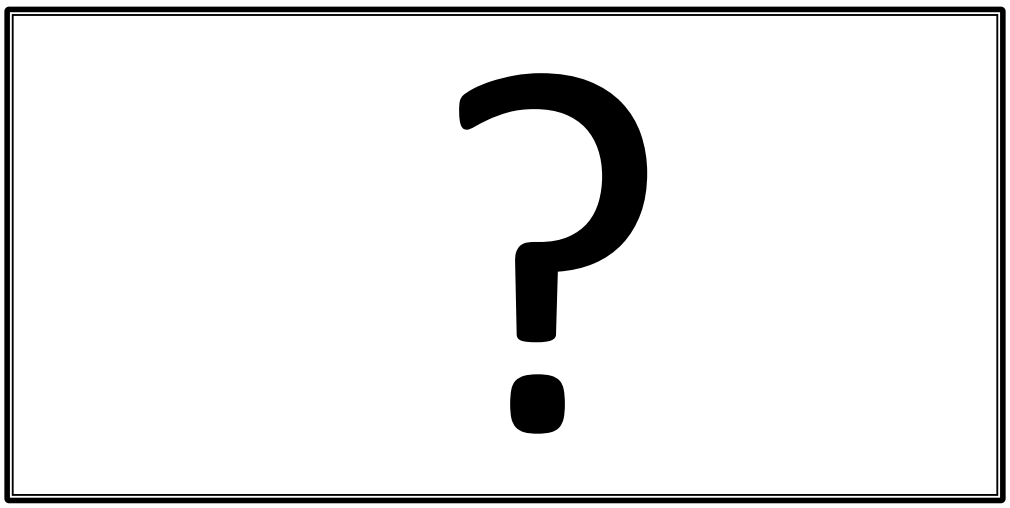


Does it add/subtract to equal "1"?

This sort is a great way to check students' understanding of key concepts related to the addition and subtraction of fractions. This is a time to look for misconceptions (such as adding the denominators), the concept of equivalence, precision errors, and uncertainty! I have deliberately included not just "yes" and "no" category headings but a "?" to help highlight which concepts still might be confusing to your students.







Use these cards as "headers" if you want a more controlled sort. If you want the students to try to determine the categories on their own, they are not necessary. I did use these with my class INCLUDING the question mark because I wanted to get a sense of which problems were tricky for them! The "?" gave them a way to show me which problems caused them issues.

A

$$\frac{3}{6} + \frac{2}{6}$$

B

$$\frac{1}{8} + \frac{7}{8}$$

C

$$\frac{1}{2} + \frac{4}{8}$$

D

$$\frac{9}{8} - \frac{1}{8}$$

E

$$\frac{1}{3} + \frac{2}{6}$$

F

$$\frac{12}{8} - \frac{1}{2}$$

G

$$\frac{9}{10} + \frac{1}{10}$$

H

$$\frac{7}{7} - \frac{0}{7}$$

I

$$\frac{3}{4} + \frac{2}{8}$$

J

$$\frac{5}{8} + \frac{3}{8}$$

K

$$\frac{3}{2} - \frac{2}{4}$$

L

$$\frac{9}{6} - \frac{3}{6}$$

M

$$\frac{8}{12} + \frac{1}{3}$$

N

$$1\frac{2}{3} - \frac{2}{3}$$

O

$$\frac{3}{5} + \frac{1}{5} + \frac{1}{5}$$

P

$$\frac{1}{2} + \frac{1}{3} + \frac{1}{4}$$

Q $\frac{1}{100} + \frac{99}{100}$

R $\frac{10}{4} - \frac{6}{4}$

S $\frac{8}{6} - \frac{1}{3}$

T $\frac{12}{6} - \frac{6}{12}$

U $\frac{1}{3} + \frac{1}{3} + \frac{1}{3}$

V $2\frac{1}{2} - \frac{3}{2}$

W $\frac{6}{10} + \frac{1}{5} + \frac{1}{10}$

X $\frac{6}{7} + \frac{1}{14} + \frac{1}{14}$

Another example!

Another example!

Another example!

Another example!

Another example!

Another example!

Another example!

Another example!

Name _____

Does it add/subtract to equal 1?

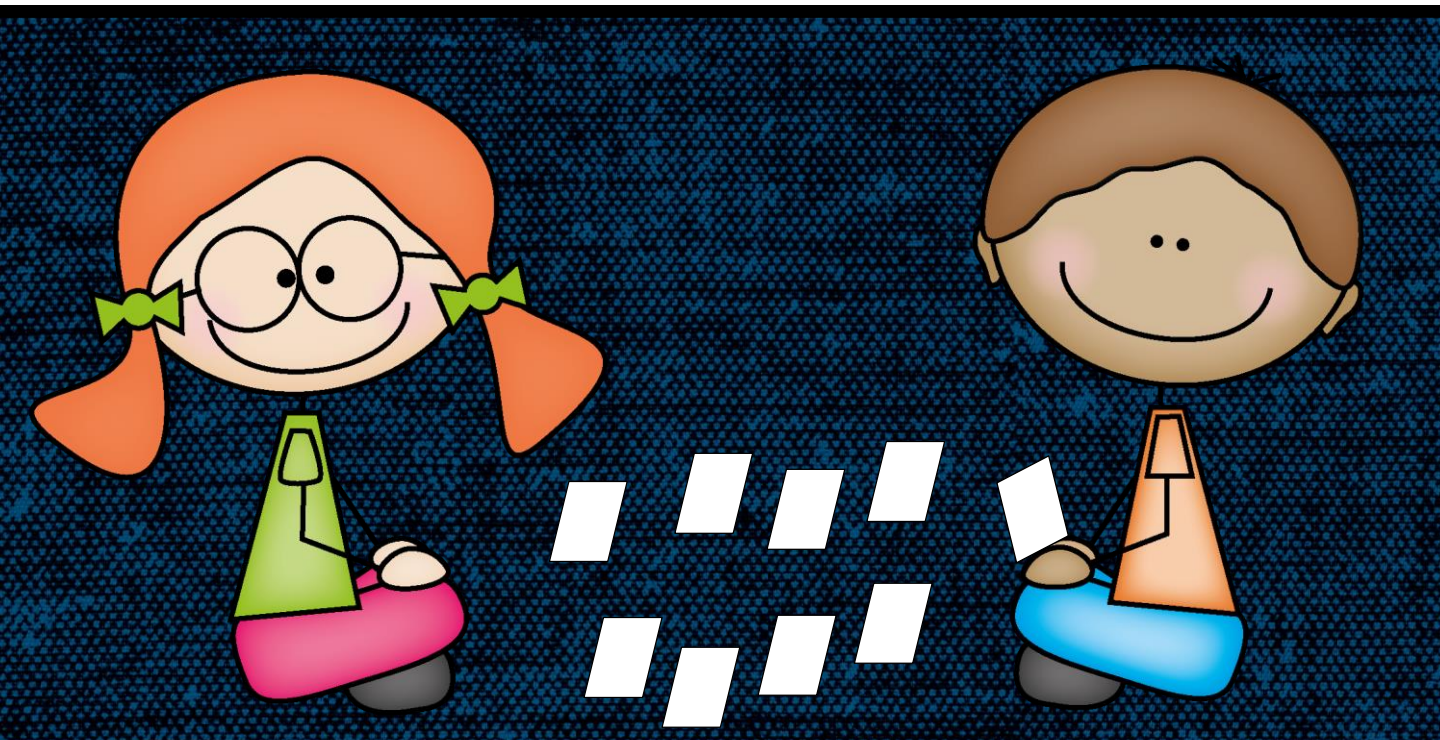
Show what you know! Write 4 addition and 4 subtraction equations that each equal 1.

addition	subtraction

Explain how someone could check your work to make sure each problem really does equal 1. What should they do?

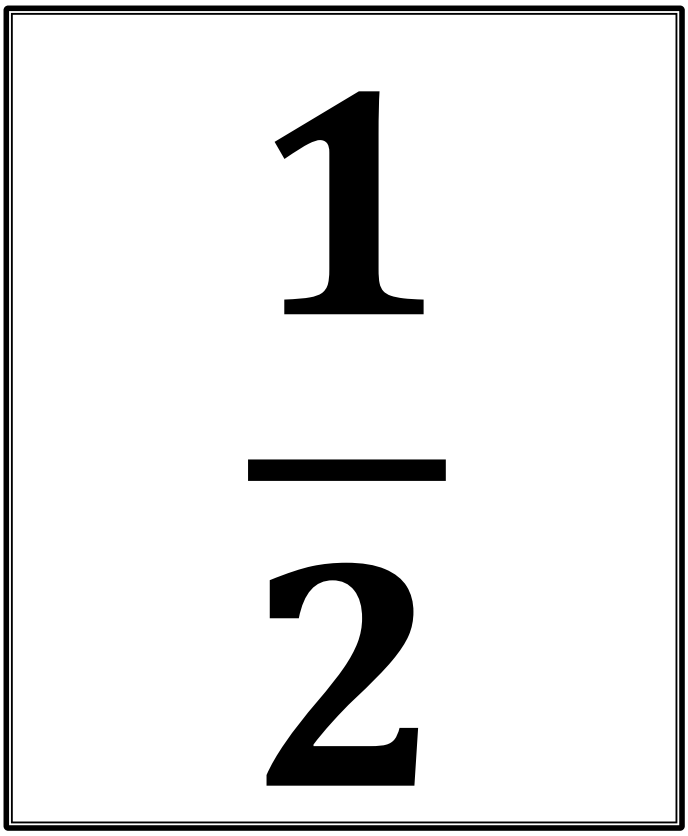
Fractions:

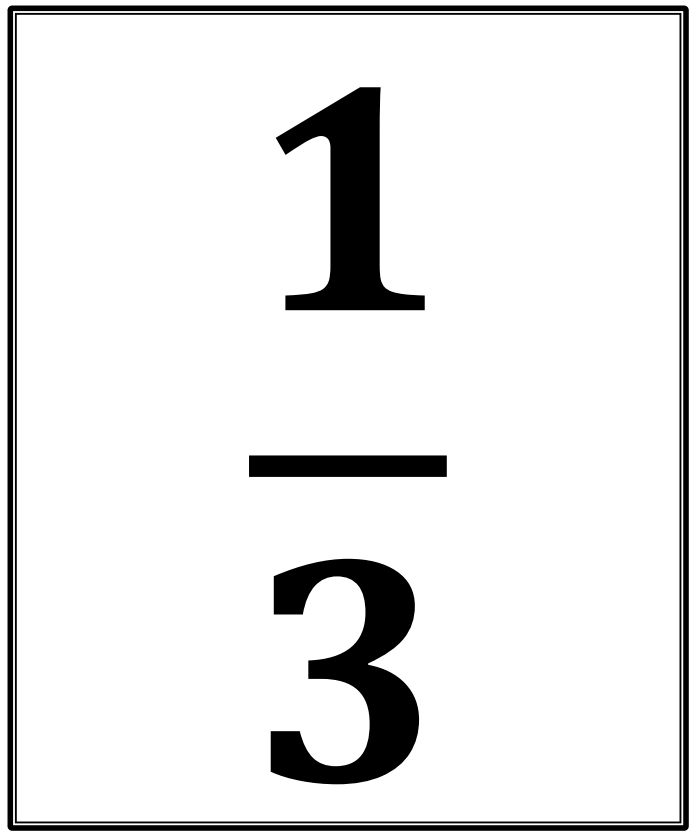
Fractions of sets

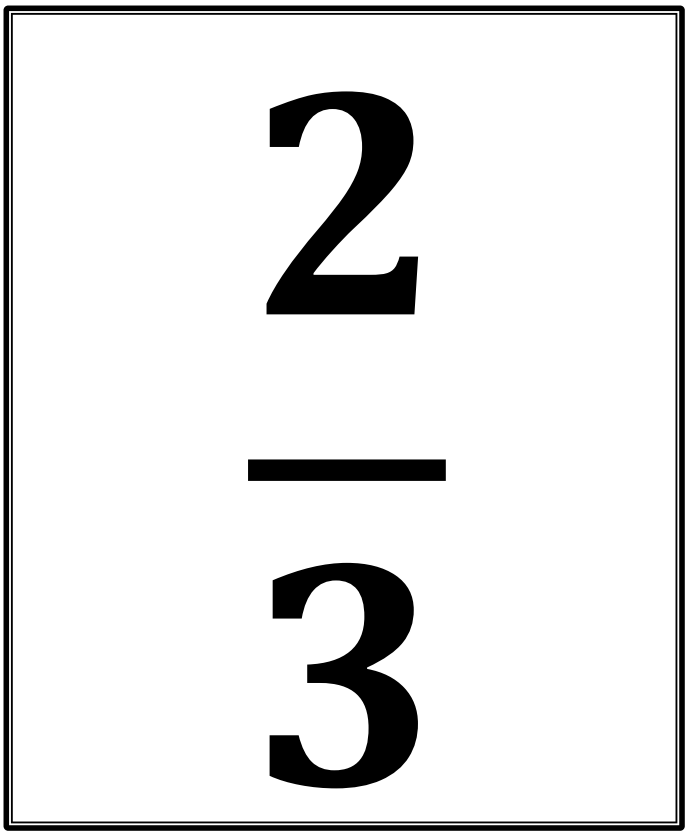


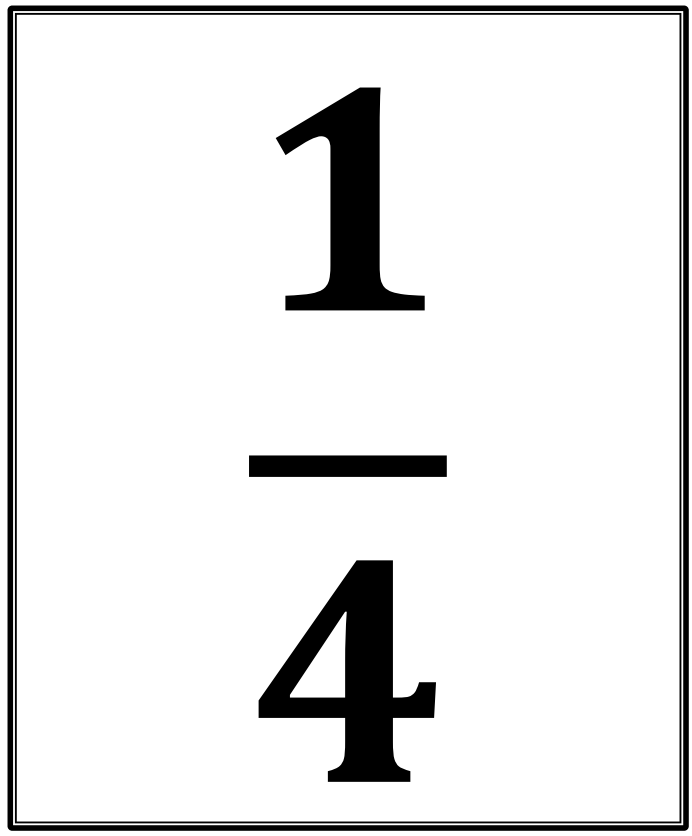
Fractions of Sets

Math textbooks and teachers tend to overstress fractions of regions or areas and pay less attention to fractions of sets and number lines. This sort asks students to sort cards with fractions of sets that represent some common fractions in different ways. For example, ¼ can be represented with 1 out of 4 items shaded—but can also be shown with 2 out of 8 shaded. We sometimes forget about teaching equivalent fractions of sets! Let this sort help you with that.

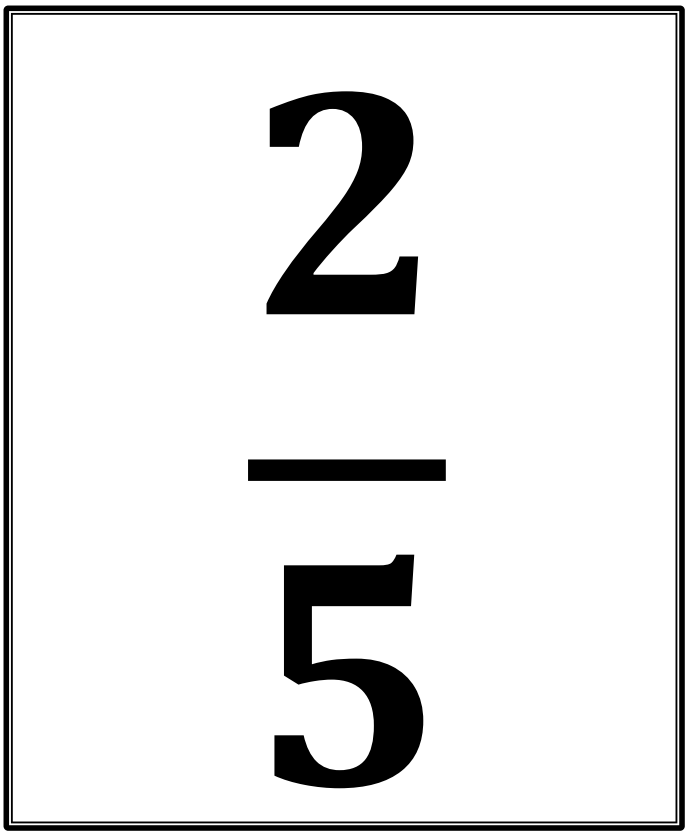


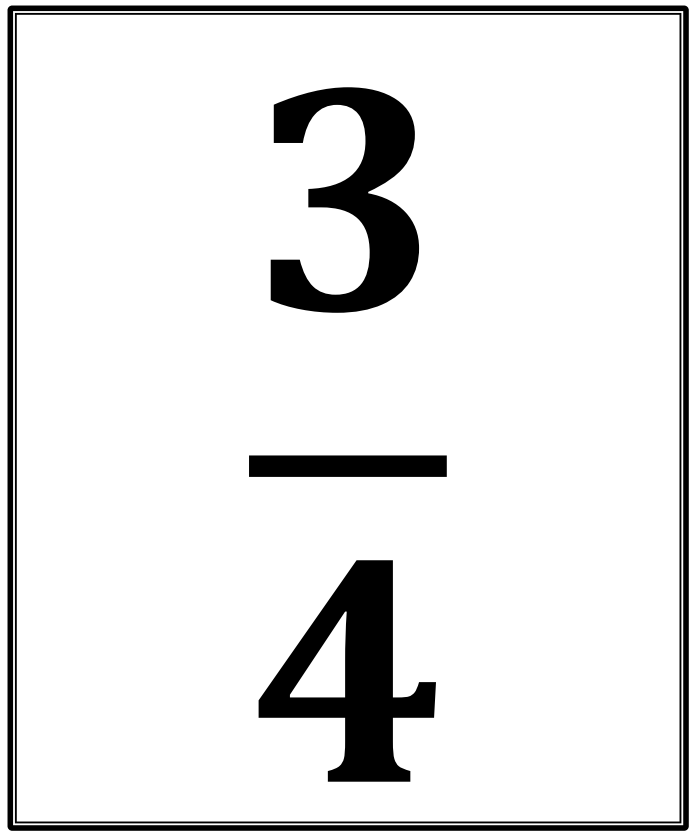


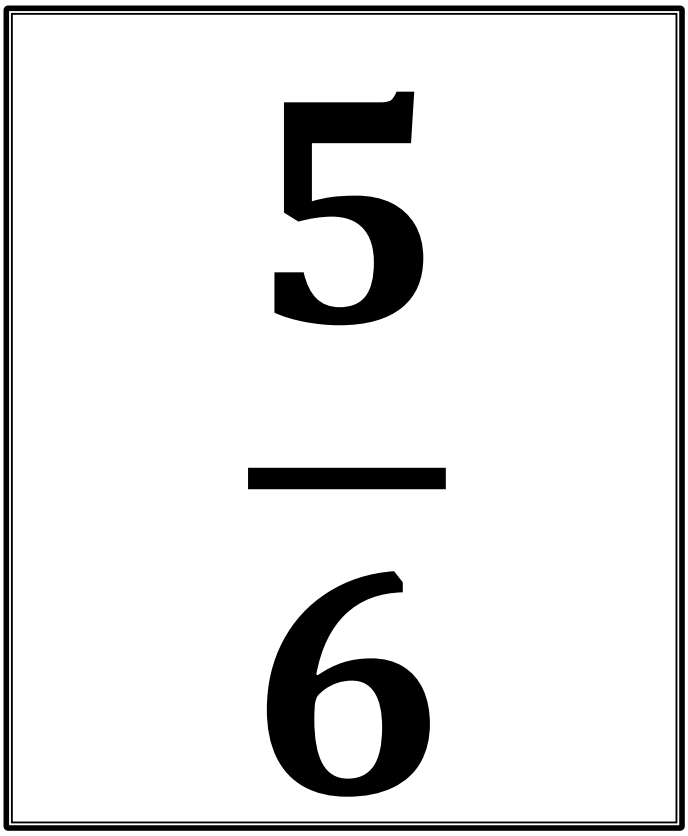


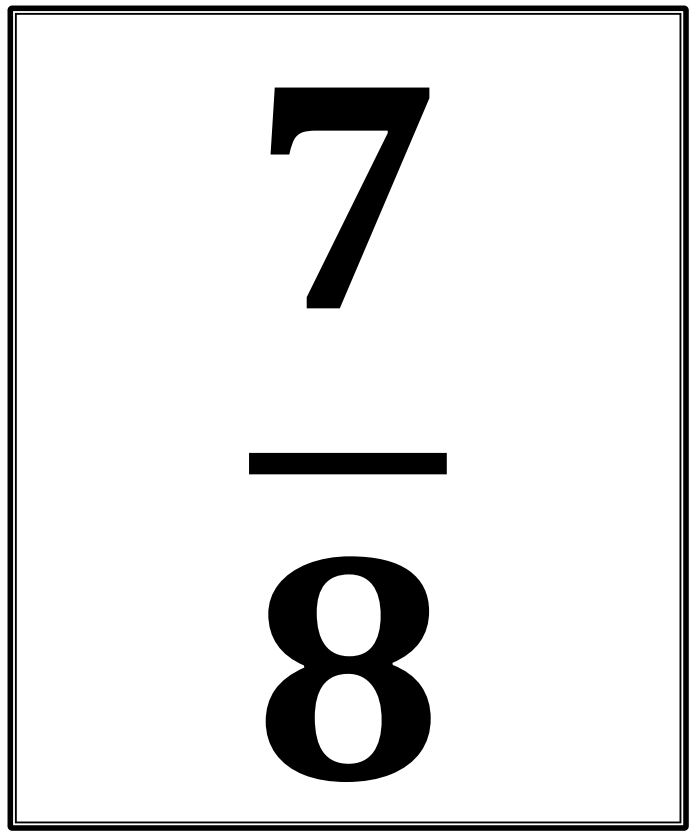


Use these cards as "headers" if you want a more controlled sort. If you want students to look for common categories without the headings, it makes the sort more challenging. Differentiate by giving the headers to students who need them and challenging those who don't!









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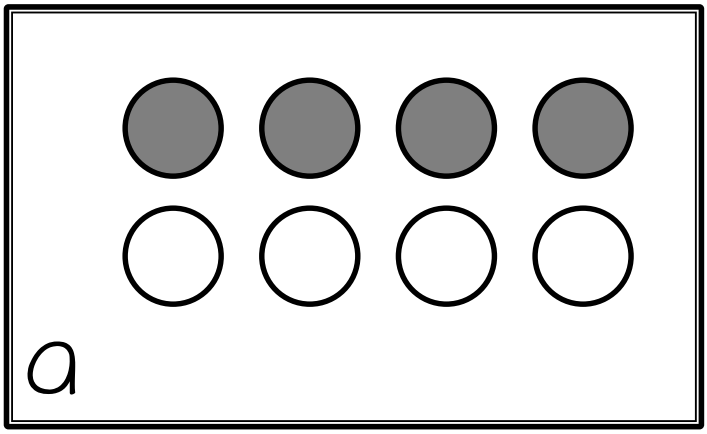
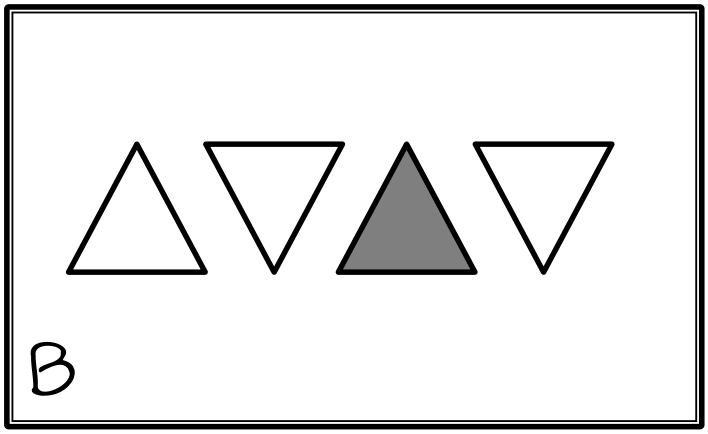
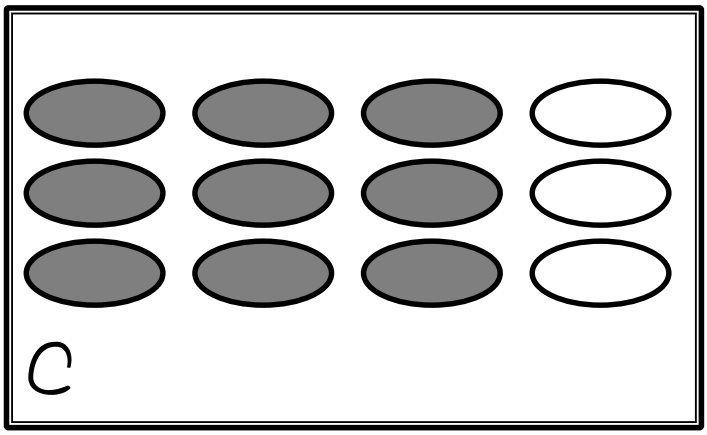
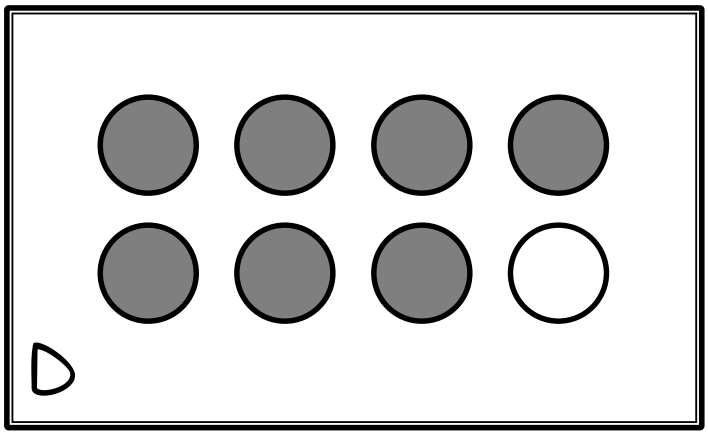
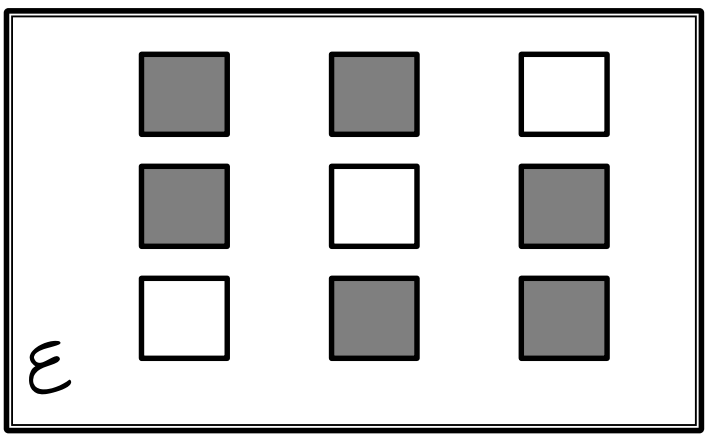
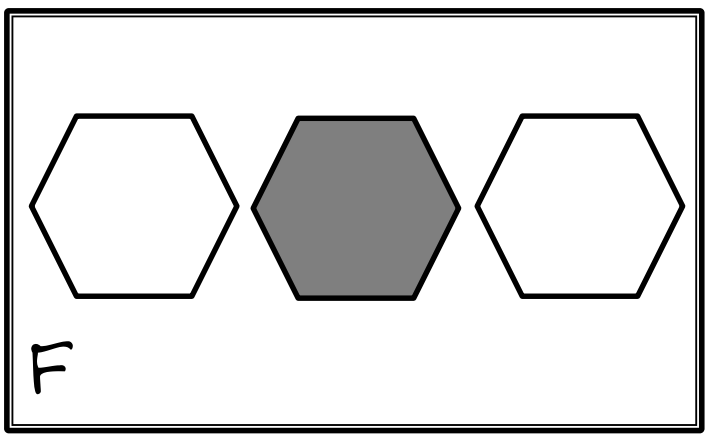


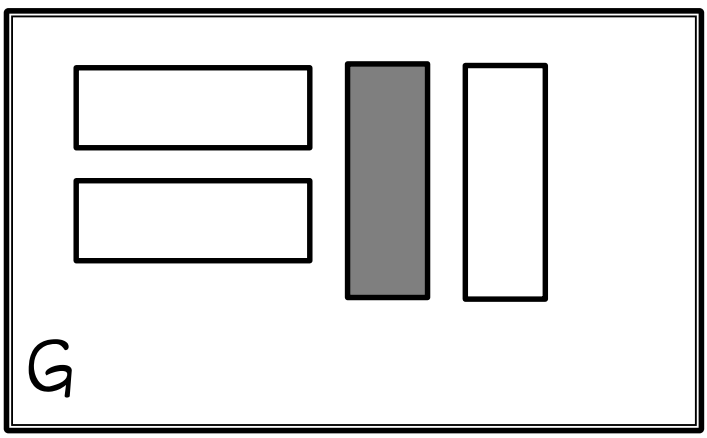


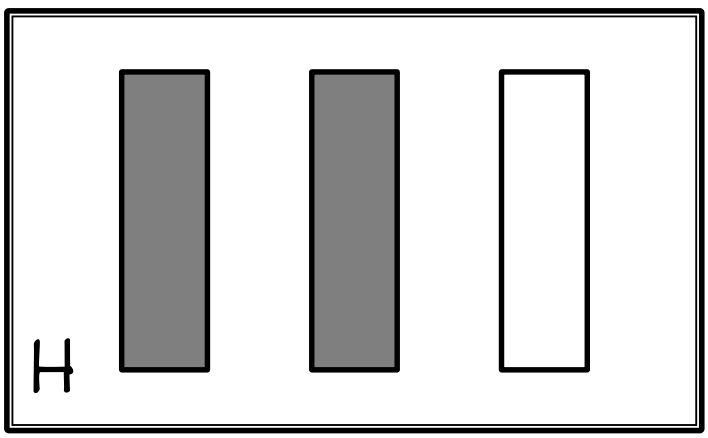


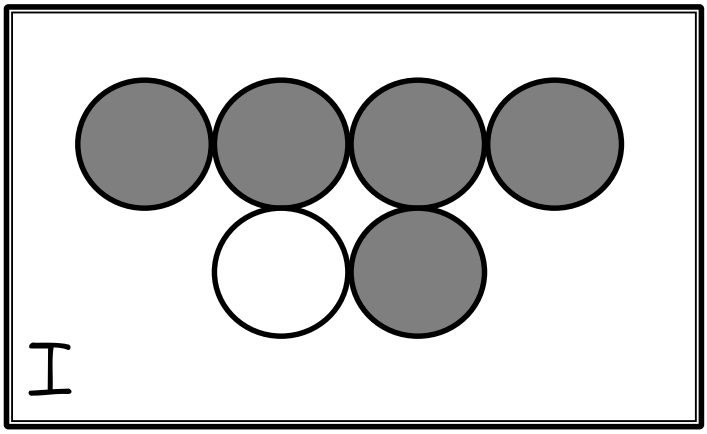


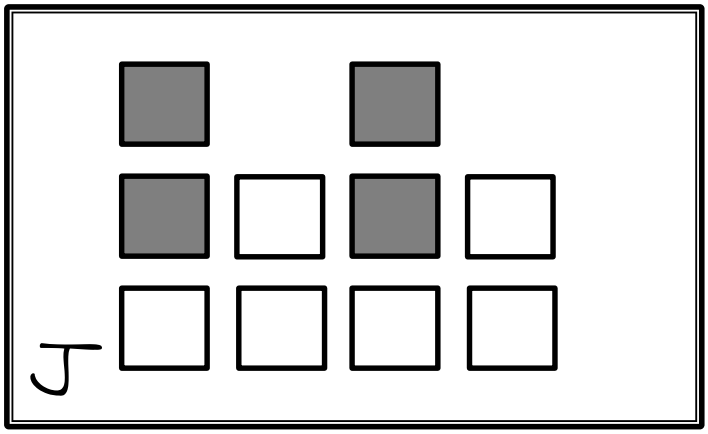


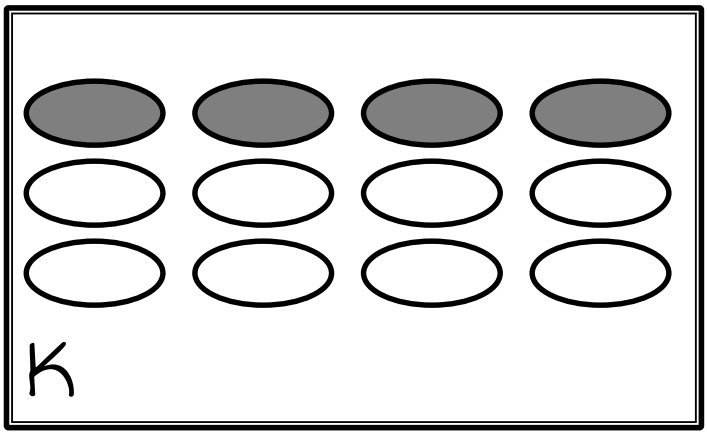


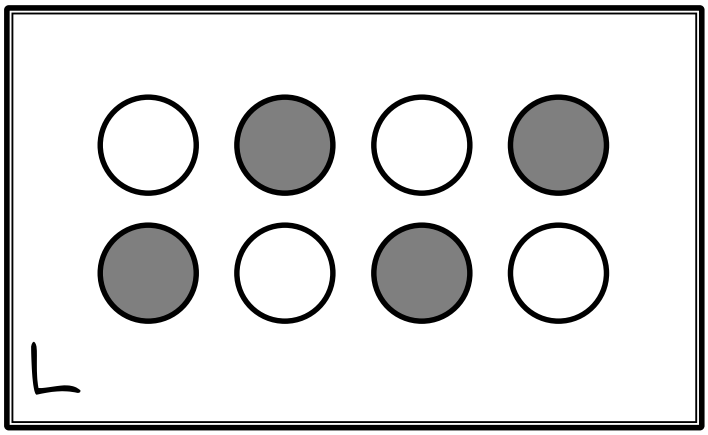


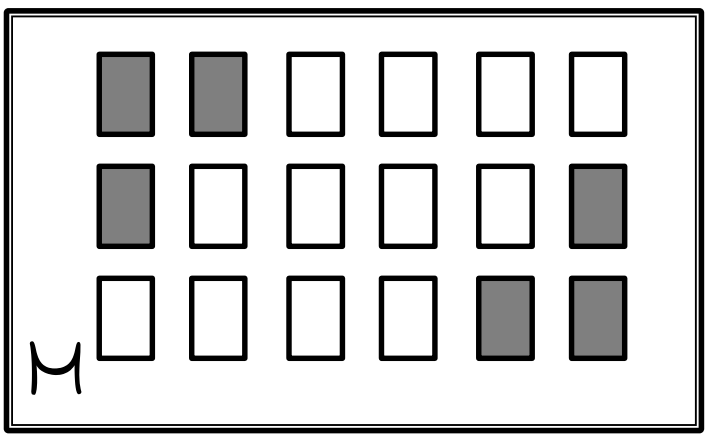


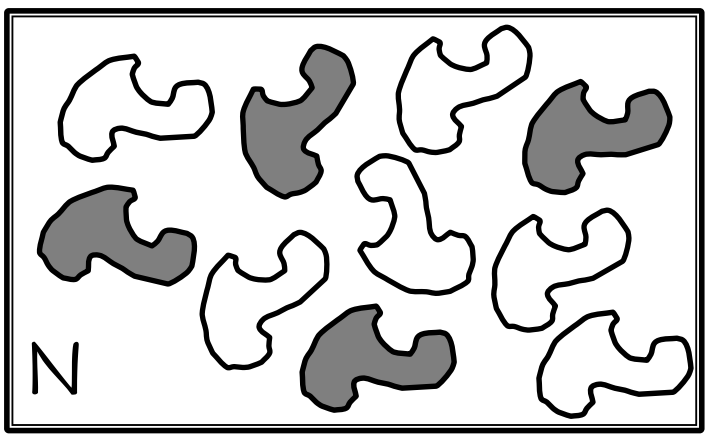


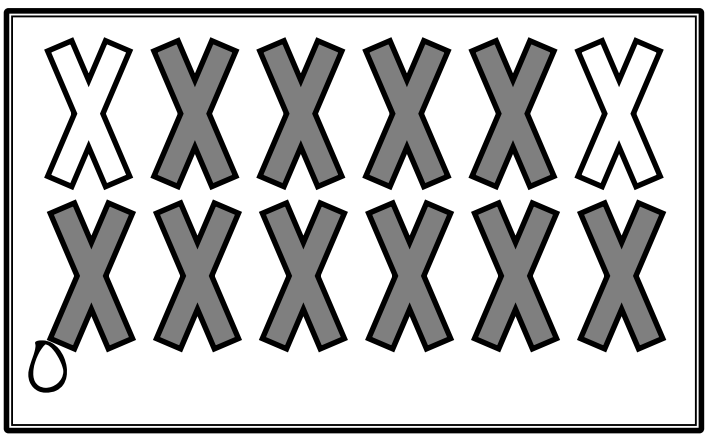


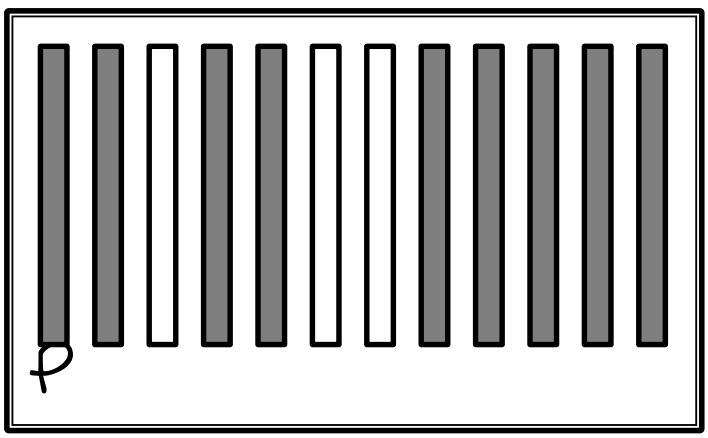


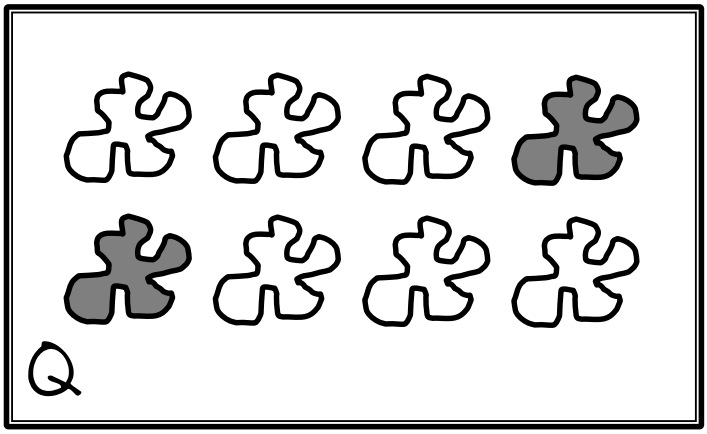


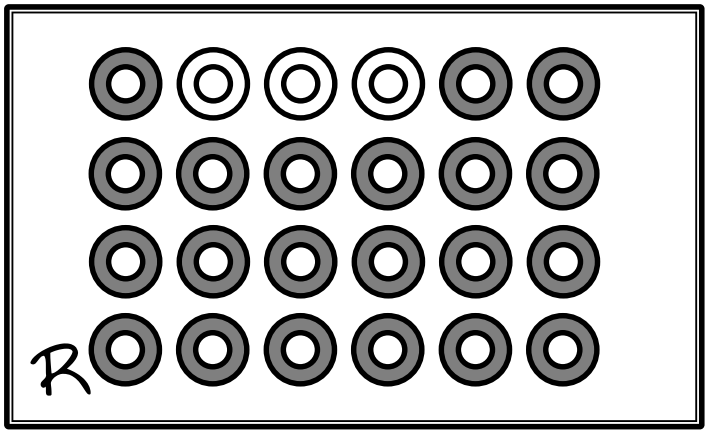


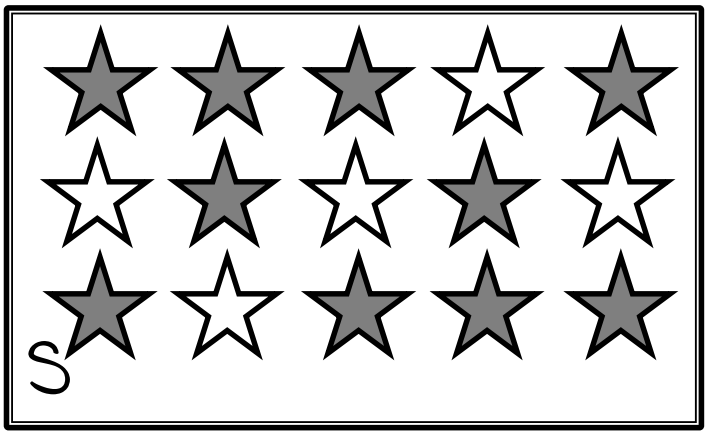


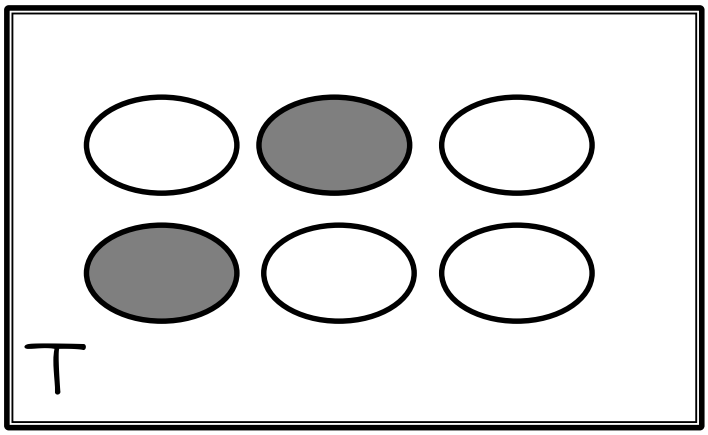


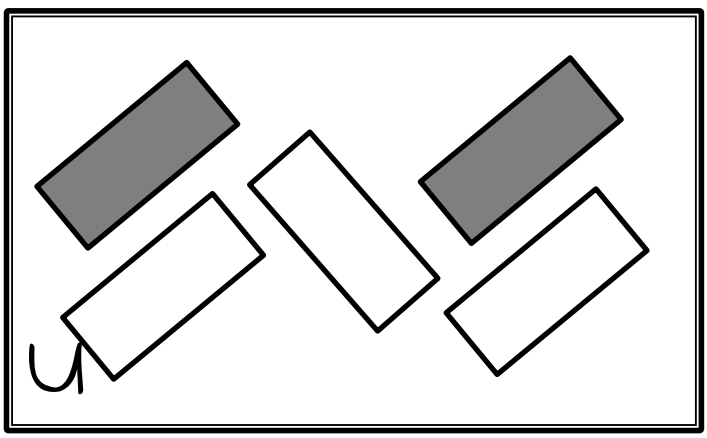


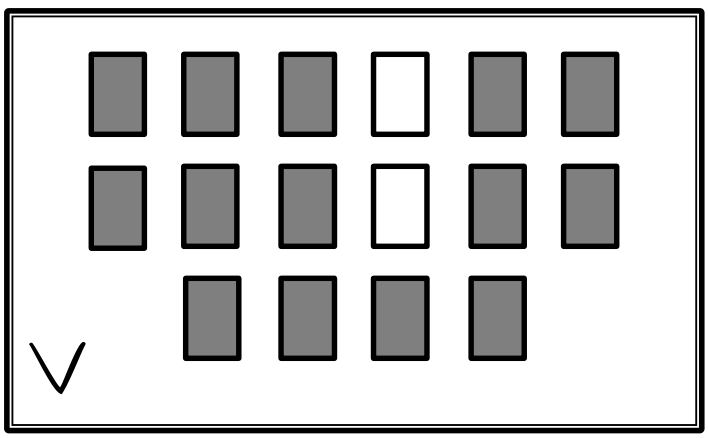


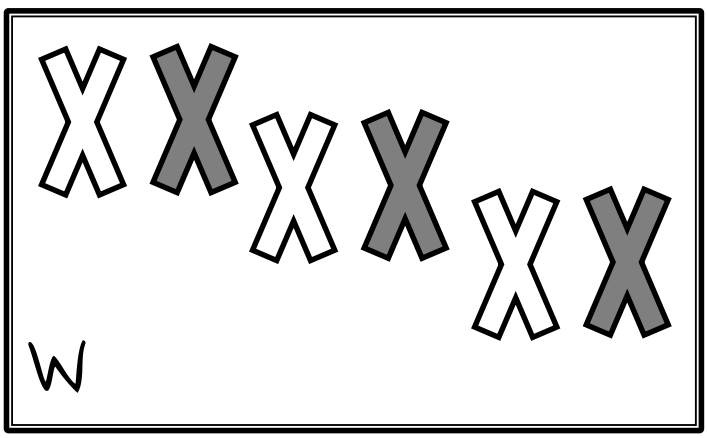


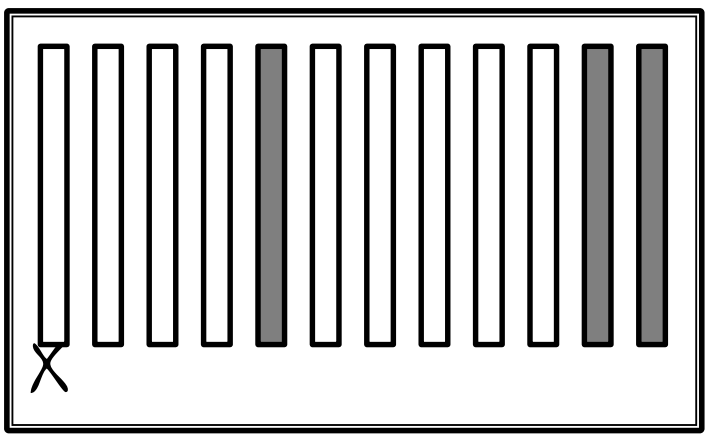












Another example!

Another example!

Another example!

Another example!

Another example!

Another example!

Another example!

Another example!

Name _____

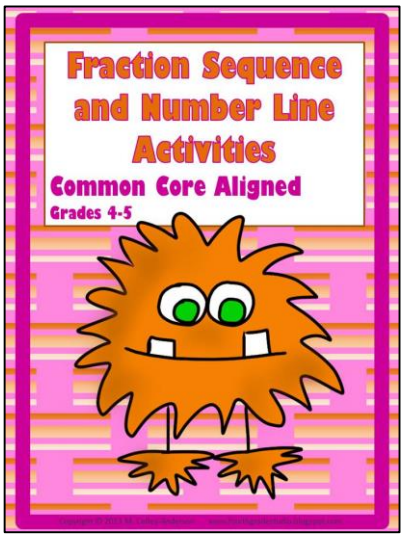
Fractions of sets

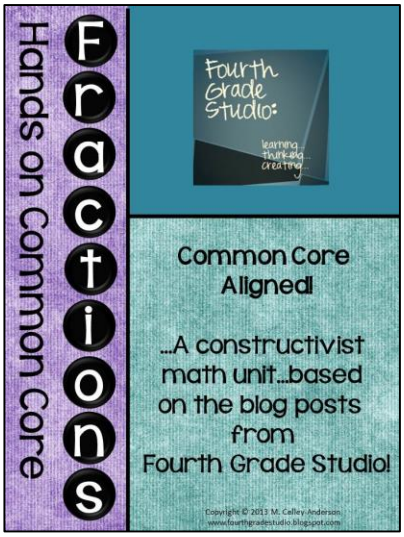
Show what you know! Represent each of these fractions with 3 different drawings of "sets"

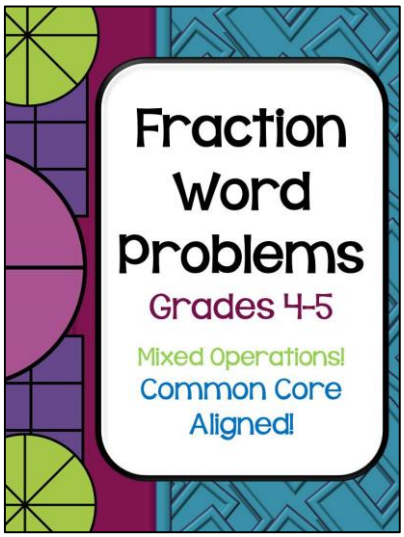
3/5 1/6

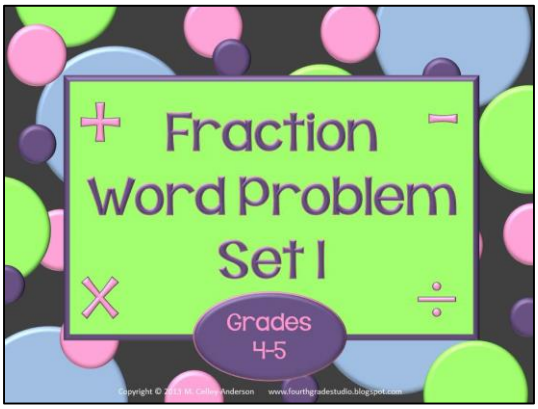
The Teacher Studio

Looking for other fraction resources? Check these out!









I have taught grades 1, 2, 3, 4, and 6 for the past twenty years and pride myself on my creativity and ability to engage students in meaningful learning. I have my masters in educational leadership and curriculum and look forward to sharing many of my ideas with all of you!

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