Fraction exam practice:

Problems from the first quiz topics that might be on the exam:

1. If [picture] shows 1 whole, how much shows 2/3?

2. Give good (complete) comparison answers using an appropriate choice of the strategies we have been studying (same denominator, same numerator, transitive or residual). You do not need to give the name of your strategy.

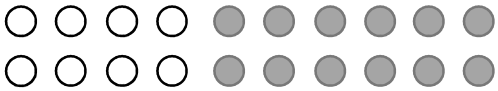
a. $\frac{3}{8}$ and $\frac{3}{10}$ This one should be a same-numerator explanation. It should include that eight pieces are larger than tenth pieces, and there are the same number of pieces (3) in each, so 3/8 is larger because it has the **same number** of **larger** pieces.

b $\frac{3}{8}$ and $\frac{5}{8}$ This once can be done with a same-denominator explanation. That explanation would need to include that both fractions are made from the same size pieces (eighths) so 5/8 is larger because it has **more** of the **same sized** pieces.

3. How do we know that fifteenths are bigger than sixteenths? If need to cut a whole into more pieces, you need to make the pieces smaller, so sixteenths will have to be cut smaller, because we need to make more parts from the whole than with fifteenths.

Problems from the second quiz topics that might be on the exam:

4. Explain how to show $\frac{12}{20}=\frac{3}{5}$ using this discrete model:



Draw a grouping of 4 dots together. Explain that the same group of dots shows 12 out of 20 dots are shaded (12/20), and it shows 3 out of 5 groups of dots are shaded (3/5)

5. a. Explain how to convert $3\frac{2}{5}$ into an improper fraction (in a way that makes sense of the value of a whole)

1=5/5, so 3=5/5+5/5+5/5=15/5 and 3 2/5 = 15/5 + 2/5 = 17/5.

b. Explain how to convert $\frac{11}{4}$ into a mixed numbers(in a way that makes sense of the value of a whole)

You can make a whole out of 4 fourths, so I can make 2 groups of 4 fourths out of 11 fourths, with 3 more fourths left over, so I can make 2 wholes with 3 more fourths, which is 2 3/4.

6. Explain how to add $\frac{2}{3}+\frac{3}{4}$ by making a visual model and multiplying

(for example: you could use fractions squares to show the fractions and visually find equivalent fractions with the same denominator by splitting; then use the fraction squares to explain how to find the numerical value of the equivalent fractions by multiplying)

This is a long(ish) explanation that has finding a common denominator as the most important step.

--explain how to show 2/3 of a whole square (or similar) and 3/4 of a same-sized whole by drawing and shading.

--explain how to make same sized parts by splitting the parts in 2/3 and splitting the parts in 3/4 (in a square area model, this corresponds to drawing in dividing lines in the other direction).

--explain how to rename 2/3 as (2× 4)/(3× 4) because the 2 shaded parts became 2 × 4 parts and the 3 parts in a whole became 3× 4 parts. The explanation should either come from splitting each part into 4 parts, and so 2 parts are split into 2 × 4 parts and 3 parts are split into 3 × 4 parts, or the explanation should come from multiplying parts across by parts down (in a square area model)

--explain how to rename 3/4 as 9/12 in the same way.

--explain that the sum is how many shaded twelfths in all: 8/12 + 9/12 = 17/12

7. Explain how to show $\frac{2}{3}=\frac{8}{12}$ by splitting on a number line.

--tell how to draw 2/3 on a number line.
--explain that you will split each third into 4 parts
--explain that when you split each third into 4 parts, then the 3 thirds in 1 whole will become 3 × 4 parts in a whole, so the parts area twelfths.
--explain that the 2 thirds that show the length become 2 × 4 parts, so the length can be named as 8/12

New questions

8. Write a word problem for $\frac{7}{8}-\frac{2}{3}$ The problem can either be comparison (how many more are in ____ than in ____) or take-away. In both cases, make sure the units are the same. It's a good idea to use standard measurement units: 7/8 of a mile, 7/8 of a lb., 7/8 of a gallon and make sure that you use the **same unit for both fractions**: 2/3 of a mule, 2/3 of a lb., 2/3 of a gallon. Don't take away 2/3 of "it", 2/3 of the remaining…, 2/3 of what there is.

9. Write a word problem for $\frac{3}{4}+\frac{5}{6}$ Again, make sure you use the same measurement unit for both fractions. make sure that while the fractional amounts are fractions of the **same sized whole** that they are not fraction of the same whole (because the sum is greater than 1)

10. Write a word problem for $\frac{3}{4}\times\frac{5}{6}$ Identify all of something as being 5/6 of a unit (eg. a box is 5/6 of a lb. or the trail is 5/6 of a mile). Ask how much 3/4 of that thing is (how much does 3/4 of the box weigh? How long is 3/4 of the trail?

11. Write a partitive word problem for $\frac{3}{4}\div\frac{2}{3}$ Describe a 2/3 of a set (the candy fills the bowl 2/3 full, the distance is 2/3 of the way to school). Tell what measured amount 2/3 of a set is (there is 3/4 lb of candy in the bowl, the distance is 3/4 of a mile). Ask how much is in 1 whole set (how much can a full bowl hold? how far is it to school?

12. Write a measurement word problem for $\frac{7}{8}\div\frac{1}{3}$ Describe an amount that 7/8 of some measured amount (7/8 of a pound of rice). Describe a way of grouping that amount into sets of size 1/3 (my rice is in 1/3 lb bags). Ask how many sets there are (how many bags of rice do I have?)

13. Show how to solve $\frac{3}{4}\times\frac{5}{6}$ using a square area diagram. Explain how to get the multiplication steps $\frac{3\times5}{4\times6}$ from your diagram.
Describe and show the process of showing 5/6 of a whole (split a square into 6 parts and shade 5—using dividing lines that all go in the same direction).
Describe and show the process of finding 3/4 of the previous diagram (split the square into 4 parts going the other direction. Shade 3/4 of the previously shaded area).
Describe the product as the size of the shaded area as a fraction of the whole square.
The numerator is the number of parts in the shaded area, which is found by multiplying the number of parts across by the number of parts down.
The denominator is the number of parts in the whole square, which is found by multiplying the number of parts across by the number of parts down.

14. Show how to solve $\frac{3}{4}\div\frac{2}{3}$ using a bar diagram. Explain how to get the multiplication steps $\frac{3\times3}{4\times2}$ from your bar diagram solution process.
Draw a bar diagram showing 2/3. Label the 2 sections as 2/3 of a set = 3/4 of a unit. Label the 3 sections as 1 set = ? units?

Explain/label that 1 section is half of 3/4 = $\frac{1}{2}\times\frac{3}{4}=\frac{3}{2\times4}$

Explain that the whole set is 3 sections, so the amount is $3\times\frac{3}{2\times4}=\frac{3}{1}\times\frac{3}{2\times4}=\frac{3\times3}{2\times4}$ (note: the middle version can be omitted, but you should be ending with $\frac{3\times3}{2\times4}$)

Explain/label that the $2\times$ in the denominator comes from the 2 sections in 2/3, and the $3\times$ in the numerator comes from the 3 parts in the $2/3$)

15. Decide whether each of these is multiplication or division and write the equation for each:

a. Janet walked 2/3 of a block. A block is 1/4 of a mile. How many miles did she walk?

Multiplication $\frac{2}{3}\times\frac{1}{4}$ (2/3 of 1/4)

b. Kylie only has 2/3 as much ribbon as she needs for the present she is wrapping. She has 3/4 of a yard of ribbon. How many yards of ribbon does she need for the present?

(Partitive) Division $\frac{3}{4}\div\frac{2}{3}$ (3/4 is 2/3 of a set, how much is in a whole set?)

c. Mandy has 7/8 of a gallon of milk. She is pouring glasses that each hold 3/16 of a gallon of milk. How many glasses-full does she have?

(Measurement) Division $\frac{7}{8}\div\frac{3}{16}$ (How many sets of 3/16 can you make from an amount of 7/8?