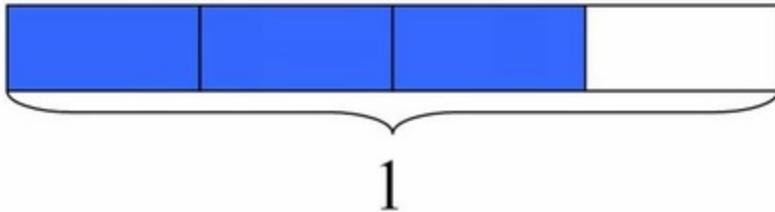
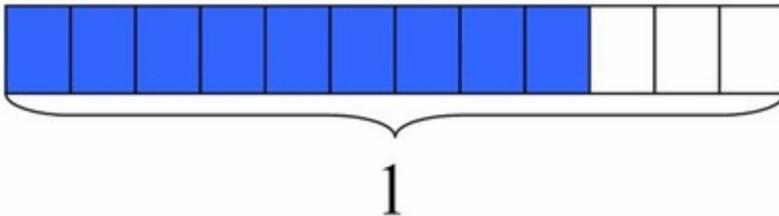


## GRADE 4 - FRACTIONS SOLUTIONS<sup>1</sup>

1. The rectangle below has length 1. What fraction does the shaded part represent? *This is 3 of 4 parts or  $\frac{3}{4}$ .*



The rectangle below has the same length as the rectangle above. What fraction does the shaded part represent? *This is 9 of 12 parts or  $\frac{9}{12}$ .*



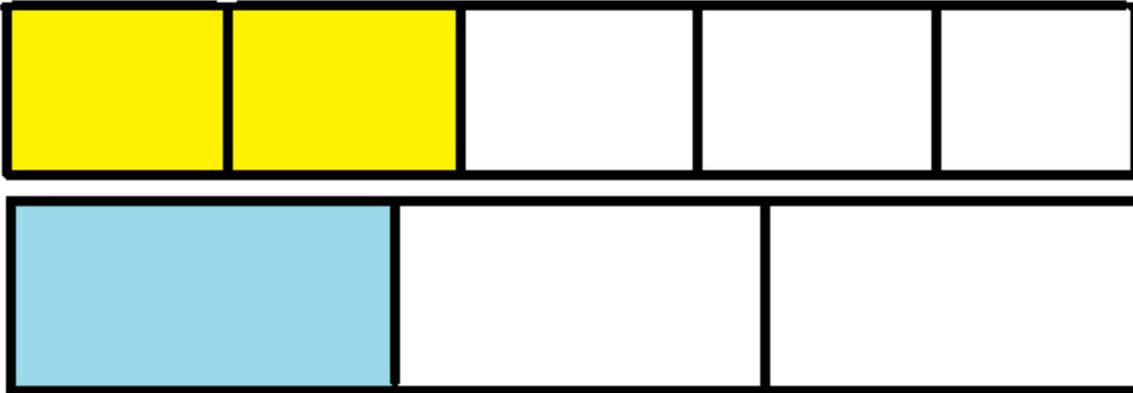
Use the pictures to explain why the two fractions represented above are equivalent. *Because the shaded areas are the same in both areas the fractions are equal. We have shown why  $\frac{9}{12} = \frac{3}{4}$ . To go from the 1<sup>st</sup> picture above to the 2<sup>nd</sup> we divide each 4<sup>th</sup> into 3 parts to get divisions of the whole of 12ths. ( $4 \times 3 = 12$ ).*

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<sup>1</sup> Every attempt has been made to keep these solutions developmentally appropriate but comments and criticisms are welcome at keppelma@unr.edu

Compare Fractions and list if each fraction is ( $>$ ,  $=$ , or  $<$ )  
 Make sure you explain how you figured it out/

2.  $\frac{2}{5} > \frac{1}{3}$



*3 times  $\frac{1}{3}$  gives me 1 whereas 3 times  $\frac{2}{5}$  gives me  $\frac{6}{5} = 1 \frac{1}{5}$  which is more than 1 and thus  $\frac{2}{5}$  is more than  $\frac{1}{3}$ .*

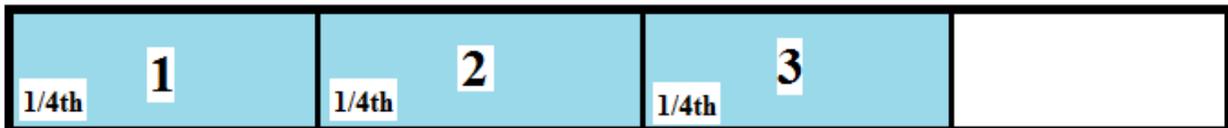
3.  $\frac{6}{5} < \frac{7}{5}$ . *The denominators are the same and  $6 < 7$ .*

4.  $\frac{4}{8} = \frac{1}{2}$



5. Draw a number line or an area model to explain how  $\frac{3}{4}$  is made up of 4 one-fourth parts

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



6. Solve the following problem. Draw a picture to show how you got the answer.

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

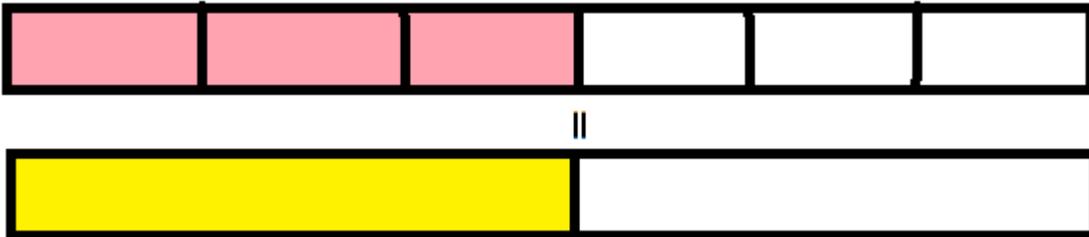
*This is  $\frac{3}{4}$  as the diagram in problem 5 precisely shows.*

7. What fractions could be combined to make  $\frac{5}{8}$

- *Since  $1+1+3=5$  we could use  $\frac{1}{8}+\frac{1}{8}+\frac{3}{8}=\frac{5}{8}$*
- *Since  $\frac{1}{8}+\frac{1}{8}=\frac{2}{8}=\frac{1}{4}$  we could also use  $\frac{1}{4}+\frac{3}{8}=\frac{5}{8}$*
- *Subtracting from  $1=\frac{8}{8}$  we could do  $1-\frac{1}{8}-\frac{1}{8}-\frac{1}{8}=\frac{8}{8}-\frac{3}{8}=\frac{5}{8}$*
- *Multiplying (4<sup>th</sup> graders won't!) we have  $\frac{5}{4} \times \frac{1}{2}=\frac{5}{8}$*
- *Dividing (4<sup>th</sup> graders definitely won't!) we have  $\frac{1}{8} \div \frac{1}{5}=\frac{5}{8}$*

8.  $1 \frac{2}{6} + 3 \frac{1}{6} =$

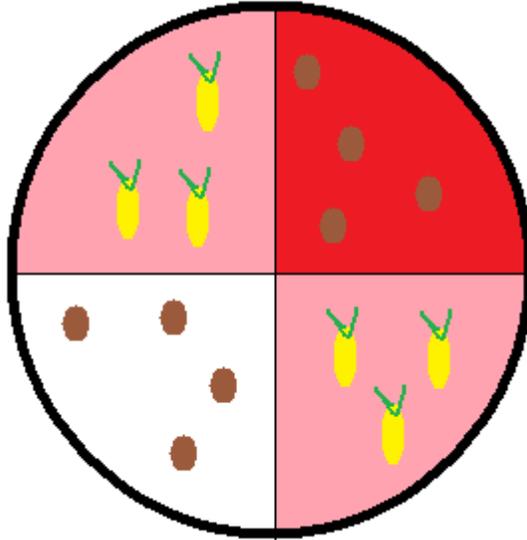
- *Adding the whole numbers gives  $1+3=4$ .*
- *Adding the fractional parts is  $\frac{2}{6}+\frac{1}{6}=\frac{3}{6}$  (which is also  $\frac{1}{2}$ )*
- *The total is  $4 \frac{3}{6}=4 \frac{1}{2}$ .*



9.  $2 \frac{3}{4} + 2 \frac{2}{4} =$

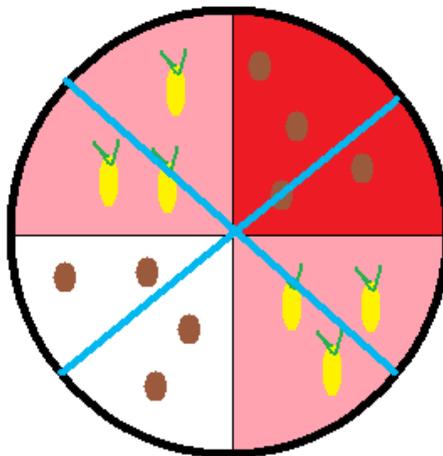
- *First we add the whole numbers  $2+2=4$*
- *We add the fractional parts  $\frac{3}{4}+\frac{2}{4}=\frac{5}{4}=1 \frac{1}{4}$*
- *So the total is  $4+1 \frac{1}{4}=(4+1)+\frac{1}{4}=5+\frac{1}{4}=5 \frac{1}{4}$*

10. Tony ate  $\frac{1}{4}$  of a pizza and Melissa ate  $\frac{2}{4}$  of the same pizza. How much pizza did they eat? Explain how you got your answer. *Tony ate the red pepperoni piece of Pizza and Melissa had two pieces of the pink Hawaiian pizza. Together they ate 3 of the 4 equal sized pieces of the whole pizza so together they ate  $\frac{3}{4}$ ths of the pizza.*



11.  $\frac{5}{8} - \frac{3}{8} =$

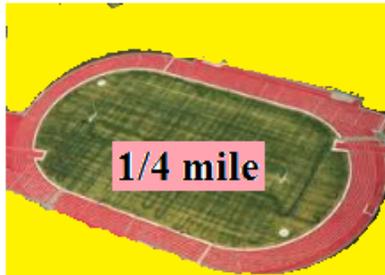
*This is  $(5-3)/8 = 2/8 = 1/4$ .*



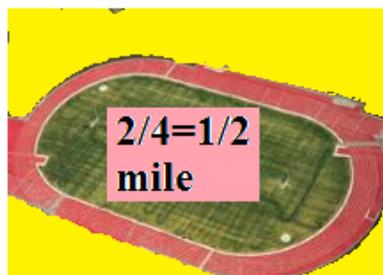
**Each of the 4ths above has been divided into 2 equal parts so we now have 8 equal parts. Two of these is  $\frac{2}{8}$ ths which is one of the original  $\frac{1}{4}$  ths.**

12. Jason ran a path that is  $\frac{1}{4}$  of a mile in length. He ran the path 3 times. What the total distance he ran? *The total distance ran is  $\frac{3}{4}$  mile.*

**Once around**



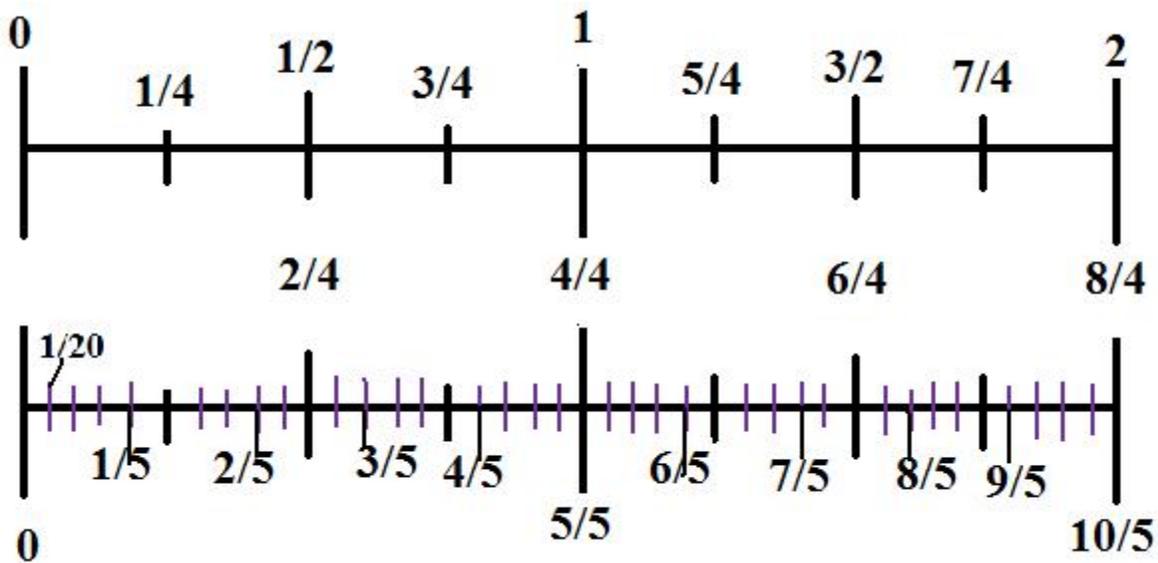
**Twice around**



**Three times around**



13. How many fifths make up  $\frac{5}{4}$ ? Use the number line to explain your thinking.  
*Below we have two number lines. The first is divided into 4ths. The second then divides each 4<sup>th</sup> into 5 parts to give 20ths.  $\frac{1}{5}$ <sup>th</sup> can then be represented by 4/20ths and  $\frac{1}{4}$ <sup>th</sup> by 5/20ths as shown. Thus  $\frac{5}{4}$  is  $5 \times 5 = 25$  20ths. So our question is equivalent to asking how many times 4 goes into 25. It goes 6 times with 1 left over – that's 1 of 4 needed parts so  $\frac{5}{4} \div \frac{1}{5} = 6 \frac{1}{4}$*

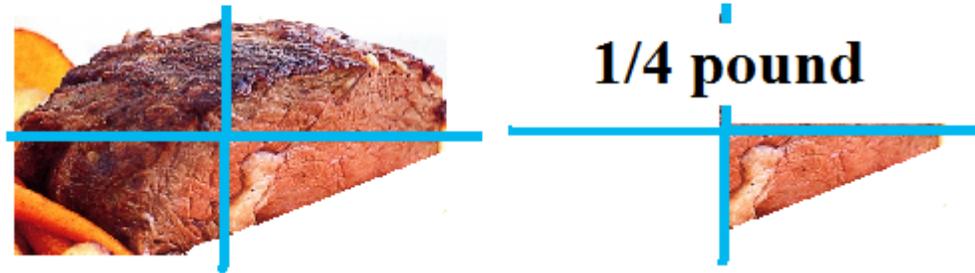


14. Using the Number line, show 3 times  $\frac{2}{5}$  can be thought of as 6 times  $\frac{1}{5}$

*We can see from above that  $\frac{2}{5}$ ths is  $\frac{8}{20}$ ths so 3 of these is  $8 \times 3 = 24$  20ths or  $\frac{24}{20}$ . We also see from above that  $\frac{1}{5}$ <sup>th</sup> is  $\frac{4}{20}$ ths so 6 of these is  $6 \times 4 = 24$  20ths or  $\frac{24}{20}$  as well.*

15. If each person at a party will eat  $\frac{1}{4}$  of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? *We need 5 quarter pounds of beef which is the same as  $1\frac{1}{4}$  pounds of beef or  $\frac{5}{4}$  of beef.*

**1 lb Beef = 4  $\frac{1}{4}$ th pounds**



16.  $\frac{2}{4} \times 6 =$

*We showed that  $\frac{2}{4} = \frac{1}{2}$  above. 6 of these is 3 as shown.*



17.  $\frac{4}{10} = ?/100$

*If we divide  $\frac{1}{10}$  into ten parts then each part will have size of  $\frac{1}{100}$ . So each  $\frac{1}{10}$  will be 10  $\frac{1}{100}$ ths and thus 4 of these will be 40  $\frac{1}{100}$ ths. So the question mark is 40.*

18.  $\frac{3}{10} + \frac{5}{100} =$

*As above we can argue that  $\frac{3}{10}$ ths is  $3 \times 10 = 30$   $\frac{1}{10}$ ths. Thus 30  $\frac{1}{100}$ ths +  $\frac{5}{100}$ ths is  $30 + 5 = 35$   $\frac{1}{100}$ ths so the answer is  $\frac{35}{100}$ ths.*

19. Write as Decimal

$\frac{52}{100}$

*This is 50  $\frac{1}{100}$ ths plus 2  $\frac{1}{100}$ ths. 50  $\frac{1}{100}$ ths is 5  $\frac{1}{10}$ ths so we have using decimal place value 5 tenths and 2 hundredths which gives 0.52.*

20. Write as fraction

.85

*This is 8 tenths and 5 hundredths. Thus this is  $8/10+5/100$ . However,  $8/10=80/100$  so this is  $80+5=85$  hundredths or just  $85/100$ .*

21. Compare the numbers below and indicate which one is bigger or smaller using the  $>$  and  $<$  than symbols. Draw a model to help you explain your reasoning.

**.089  $>$  .01**

*0.089 is 89 thousandths and  $0.01=0.010$  is only 10 thousandths (which is the same as 1 hundredth).*

**.02  $<$  .1**

*$0.1=0.10$  is 10 hundredths and this is more than 2 hundredths.*