

Fractions, Decimals and Percentages Prior Assessment Question 11:

Objective: I can multiply whole numbers by fractions.

NC (Year 5 objective): NFD5: multiply proper fractions and mixed numbers by whole numbers.

Teacher Input Ideas: Although this is a year 5 objective, it is important that children have understanding of multiplying fractions by whole numbers before moving on to multiplying fractions by fractions.

Show the children pizzas all cut into the same size, for example 6ths. Give 4 children a pizza each and take 3 slices away from each. Inform the children that they have eaten 3 slices each. $\frac{3}{6}$ is the same as Encourage children to spot this.

Now show the children how we would record this: we have 4 people with $\frac{3}{6}$ of a pizza left or 4 people with $\frac{1}{2}$ a pizza left. We want to find out how much altogether we have. We have $4 \times \frac{3}{6}$. What is the denominator? What is the numerator? The denominator will not change here because the size of the slices are staying the same. The denominator shows how much the whole pizza was shared by. It was cut in 6 slices. When I'm combining all the pizza slices together the size of the slice of pizza is not changing.

I am finding 4 lots of $\frac{3}{6}$. Model counting in 3's through the objects or images. So, I am to find 3 slices 4 times. So, I now can see I have 12 slices of pizza which is $\frac{12}{6}$. How many whole pizzas have I made by combining the pizza slices back together. Show that this is 2 whole pizzas.

Repeat for other amounts such as $7 \times \frac{2}{6}$ or $5 \times \frac{3}{7}$. Encourage the children to use images or models to help them to work this out. Then prompt the children to notice that we can multiply the numerator by the whole number as this is to find out how many slices we have. The denominator will remain the same as the slices are staying the same size.

If children are finding it hard, encourage to draw images to help as modelled in the starter so that they have a strategy. Then encourage the children to see if they get the same answer when they multiply the whole number by the numerator.

Introduce multiplying mixed numbers by whole numbers. Encourage the children to multiply the whole number by the whole number of the mixed number and then work out the fraction part by multiplying by the whole number. Start with something simple such as $2 \times 3 \frac{1}{6}$, then look at sums that will make a whole number when multiplied such as

$4 \times 2 \frac{3}{12}$. Show this alongside images of cakes/pizzas to ensure they understand multiplying with mixed numbers.

Practice Activities

Purple Practice: Most suited for children that made errors in Question 9 and demonstrate little understanding of multiplying fractions by whole numbers.

The purple activity requires the children to multiply whole numbers by proper fractions. The children have space provided to draw images and make jottings to help them to work the answers out. The children should also be encouraged to multiply the numerator by the whole number. The children are challenged to work out the answers as a mixed number too.

Green Practice: Most suited for children that answered Question 9 accurately and show understanding of multiply proper fractions by whole numbers.

This activity requires the children to multiply whole numbers by mixed numbers. The children have space to make drawings or jottings to help them to work this out. The children are also encouraged to find the answers as mixed numbers and improper fractions. This encourages the children to explore different strategies for multiplying with mixed numbers. Such as multiplying as a mixed number (modelled in the input) and converting the mixed number into an improper fraction and multiplying.

Yellow Practice: most suited for children that show a good understanding of multiplying whole numbers by proper fractions and mixed numbers.

This activity provides the opportunity for the children to work out the calculations that they need to perform. The children should be encouraged to work out how much of each type of food is left by performing whole number by fraction calculations. Once the children have found how much of each type of food is left, the children should be encouraged to work out if the food can be equally shared by the four children. This is an introduction to dividing fractions by whole numbers, however the children may work this out by creating their own images, using fraction towers, objects or making jottings to help. The children may not yet record this as a division sum and calculate this.

Mastery: Practical:

Provide the children with resources such as: images of chocolate bars, pizzas or cakes; paper to make own images; or fraction towers. Encourage the children to create a presentation to be used in the future for revision or a poster for the classroom in small groups to explain how to multiply whole numbers by fractions. Prompt the children to

explain how to do this and why we can multiply the numerator by the whole number. Why does the denominator stay the same? Encourage use of key vocabulary such as:

multiply, whole number, mixed number, proper fraction, improper fraction, converting, denominator, numerator.

Answers:

Purple

- 1) $12/5$ or $2 \frac{2}{5}$
- 2) $8/2$ or 4
- 3) $15/4$ or $3 \frac{3}{4}$
- 4) $18/3$ or 6
- 5) $55/6$ or $9 \frac{1}{6}$
- 6) $120/9$ $13 \frac{3}{9}$ or $13 \frac{1}{3}$
- 7) $35/12$ or $2 \frac{11}{12}$

Green

- 1) $2 \frac{4}{5}$ or $14/5$
- 2) 13 or $156/12$
- 3) $21 \frac{7}{8}$ or $175/8$
- 4) $14 \frac{8}{11}$ or $162/11$
- 5) $60 \frac{1}{2}$ or $121/2$
- 6) 20 or $80/4$.
- 7) $49 \frac{2}{5}$ or $247/5$

Yellow: encourage the children to explain their working out and reasoning for which items in the fridge can be shared easily between 4.

Oranges: $3 \times 3 \frac{2}{7} = 9 \frac{6}{7}$ or $69/7$ cannot be shared between 4 without creating a new denominator.

Vanilla cake: $6 \times \frac{2}{3} = \frac{12}{3} = 4$ whole cakes so 1 cake each

Marshmallows: $1 \frac{2}{6} \times 2 = 2 \frac{4}{6}$ or $\frac{16}{6}$ / shared by 4 = $\frac{4}{6}$ each (4 marshmallows each)

Chocolate sticks: $1 \frac{3}{7} \times 2 = 2 \frac{6}{7} = \frac{20}{7}$ = shared by 4 = $\frac{5}{7}$ (5 sticks each).

Grapes: $13 \times 2 \frac{1}{2} = 32 \frac{1}{2}$ Or $\frac{65}{2}$ (65 cannot be shared between 4 without creating a new denominator).

Pizza: $\frac{3}{5} \times 5 = 3$ whole pizzas or $\frac{15}{5}$ (15 cannot be shared between 4 without creating a new denominator)

Juice: $2 \frac{1}{2} \times 2 = 5$ cups or $\frac{10}{2}$. Some children may notice that the children could have $1 \frac{1}{4}$ cups each.

Answer each question. If you are finding the questions difficult, draw images to help you. **Challenge:** record the answer as a mixed number in the yellow box.

1.

$$4 \times \frac{3}{5} = \boxed{}$$

2.

$$8 \times \frac{1}{2} = \boxed{}$$

3.

$$3 \times \frac{5}{4} = \boxed{}$$

4.

$$9 \times \frac{2}{3} = \boxed{}$$

5.

$$11 \times \frac{5}{6} = \boxed{}$$

6.

$$15 \times \frac{8}{9} = \boxed{}$$

7.

$$7 \times \frac{5}{12} = \boxed{}$$

Look at each question and work out the answer. Use the space provided to calculate the answer or make jottings/drawings to help.

Challenge:

- Once you have finished, can you work out the answers as both mixed number fractions and improper fractions.

1) $2 \times 1 \frac{2}{5} = \boxed{}$

2) $4 \times 3 \frac{3}{12} = \boxed{}$

3) $5 \times 4 \frac{3}{8} = \boxed{}$

4) $9 \times 1 \frac{7}{11} = \boxed{}$

5) $11 \times 5 \frac{1}{2} = \boxed{}$

6) $16 \times 1 \frac{1}{4} = \boxed{}$

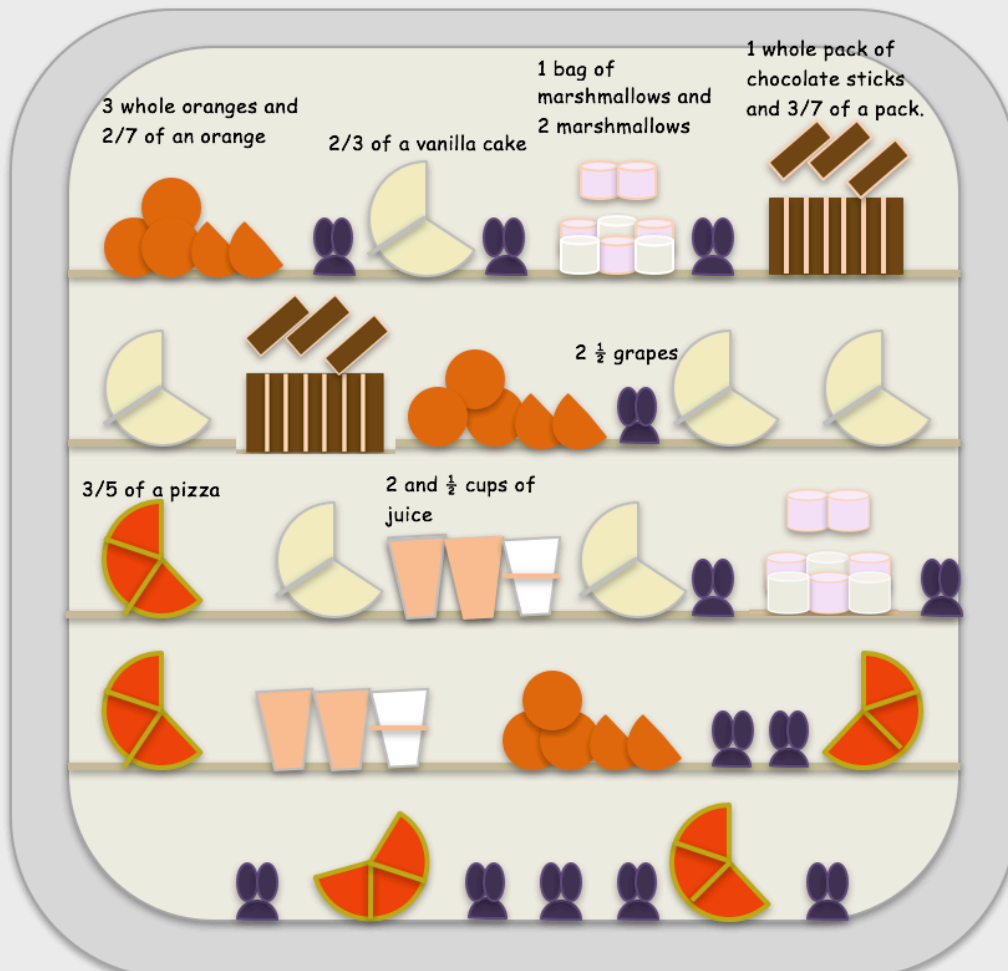
7) $13 \times 3 \frac{4}{5} = \boxed{}$

Yellow Practice

I can calculate with whole numbers and fractions.

Charlie, Harry, Priyesh and Saffron are playing at Saffron's house. They are very hungry so they go to the fridge to search for food they can eat. There is lots of left-over food from a family party.

Work out how much of each type of food there is left over using the images and information below. Which food can be shared out equally between the four children?



Record the calculations you have used and write the food that can be shared equally by the children below: