

Division Prior Assessment Question 2

Objective: I use my understanding of relationship of numbers to divide mentally

NC: NASDM4 perform mental calculations, including with mixed operations and large numbers.

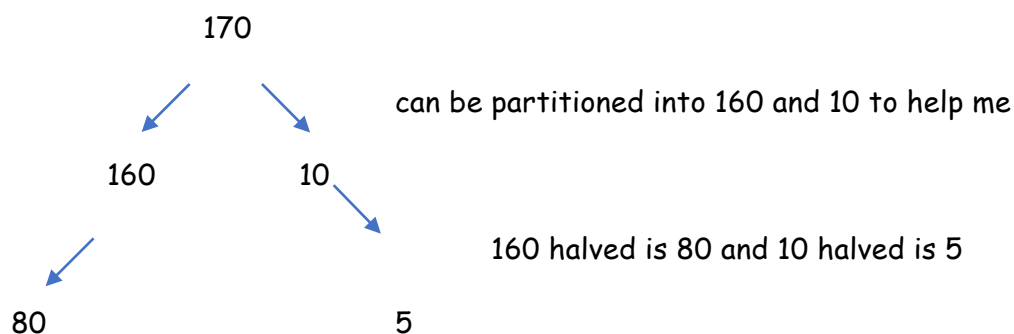
Teacher Input Ideas:

Input for halving (Q2 b and c)

Demonstrate to the children the relationship between 2 and 4. This could be done with a large circle, cake or pizza, which is cut in half and half again to make 4. Encourage the children to suggest that if we wanted to divide something by 4, we could use our \times table facts. Such as $44 \div 4 = 11$. However, for some sums it can be more efficient to halve and halve again. Such as $124 \div 4$ could be done mentally by halving = 62 and halve again = 31. Provide the children a little time to explore this idea. Place on the board 88, 24, 840, 1400, encouraging the children to explore if using knowledge of $4 \times$ table is easy to do mentally or if halving and halving again is more efficient.

Some children find it easy to halve amounts with even numbers in the tens or hundreds place but often find it tricky for example to halve 170. Encourage children to find a number near to the amount that they know how to halve. Such as 160, half is 80. I have 10 left over so half of 10 is 5. Therefore, the answer is 85. Children may need to make jottings to help with their mental method. So, children could jot down 80 and then 5.

Some children may need to visually see the thought process

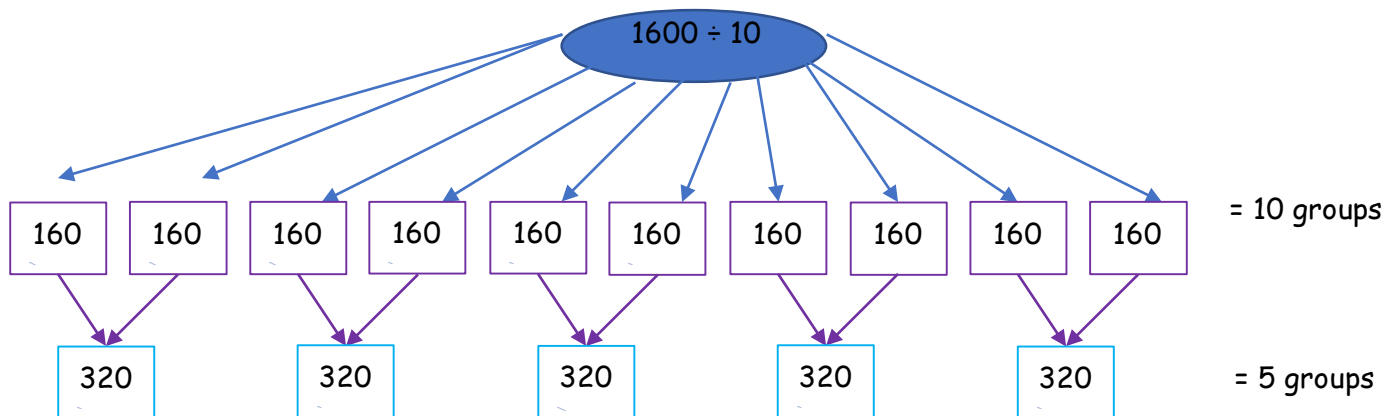


When the children are feeling confident, place $42 \div 4$ on to the board. Allow the children to explore by halving and halving again. Encourage the children to understand that some numbers halved result in a decimal.

Input for finding $\div 5$, 20 using knowledge of dividing by 10

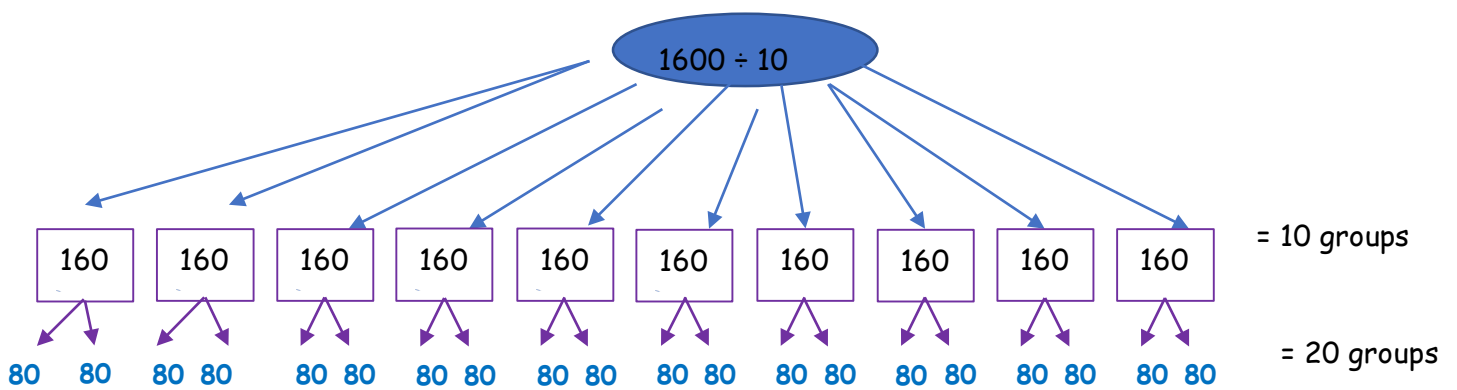
Place $250 \div 5$ on to the board. Encourage the children to work out that this is 50. Ask the children how they worked this out mentally. Hopefully children will be able to say they used their knowledge of their \times tables.

Now place $1600 \div 5$. Ask the children if this is still easily done with the use of $5 \times$ table. Model a quick mental way using knowledge of ten



I know that $1600 \div 10 = 160$. I can do that quickly mentally. I have found too many lots. I know that $5 \times 2 = 10$. So, if I double 160 and group the amounts into 2s I will have I have found 5 lots not 10 lots.

This is a difficult concept to understand. The children may need to see this visually to understand this. You could use bean bags with sticky labels on. Ask for 5 children to help you. First divide the amount by 10, for example $1600 \div 10 = 160$. Place 160 on to 10 bean bags and model that this is because you have shared/divided 1600 by 10. Now give each child a bean bag. What do they notice? They should notice that there are 5 bean bags left. We have divided by too many as we have \div by 10. Can we all have another bean bag each? Give each child another bean bag. How much have I got altogether? So, I shared the 1600 into ten groups as this is easy to do. But I wanted to share it between 5, so each child had 2 lots of the amounts.



Now show the children how you can use dividing by 10 to divide by 20. Encourage the children to notice that if we divide by 10 we haven't found enough lots of this. We need to halve the amounts to divide by each group by 2 as $10 \times 2 = 20$. Some children may compare this with dividing by 2 and then ten ($1600 \div 2 = 800$ but it's divide by 20 so now $800 \div 10 = 80$). Compare both ways.

Practice Activities:

Purple Practice: Most suited for children who made errors in Q2 b and c or relied on a written method and would benefit from developing quicker mental methods to divide numbers by 2 and 4 mentally.

This activity provides the children with the opportunity to halve numbers and halve again. The questions further down the task encourage the children to halve amounts where 5 will be created. Such as 30 will create 15. Some children find it easy to halve amounts with even numbers in the tens or hundreds column but often find it tricky for example to halve 170. Encourage children to find a number near to the amount that they know how to halve as demonstrated in the input. Children may want to make jottings in their books or on whiteboards.

Green Practice: Most suited for children who can find half of amounts in Q2 b and c however would benefit from working with decimals when halving.

The children are to work through the sheet dividing by 2 and 4 by halving and halving again. The answers encourage the children to half whole numbers and decimals to create decimal amounts. If the children are finding this hard, decimal/fraction towers for $\frac{1}{4}$ may help the children to work out the decimal.

Yellow Practice: Most suited for children who made errors in Q 2 a, d and e and would benefit further from exploring mental methods using knowledge of dividing by 10 and 100 to help find other amounts.

The children may benefit from making jottings or diagrams to help them to see the link initially using ideas from the input. Also, practical ways such as using bean bags and labels may benefit some children. However, for the children to perform this efficiently mentally by the end of the task you would expect the children to be less reliant on these.

Encourage the children to answer the top half of the sheet first, solely looking at dividing by 10 to divide by 5 and 20. When the children have answered the top half of the activity sheet, you may want to do another mini input section to encourage the children to use dividing by 100 to find 50 lots. Prompt the children to also use knowledge of dividing by 5 to help see the link that 50 lots can be found by \div by 100 \times 2.

Mastery: For this activity, the children are to apply their halving mental methods for division to find the answer. The problem also provides the opportunity for the children to problem solve and work out algebraic problems.

For children that are finding this hard, this could be done practically with boxes and weights. The children could be given 5 boxes. They could weigh the large box to reveal it weighs 1400 grams. You could then look at the link, this is half of 2800? Why do you think this? So, if we know that this box weighs the same as these 4 small boxes, how can we work out 1 small box? What could we do? Encourage the children to divide by 4 applying halving and halving again.

Answers:

Purple

- | | | | |
|---------------------------|------------------------|------------------------|---------------------|
| 1) $280 \div 2 = 140$ | $280 \div 4 = 70$ | 2) $600 \div 2 = 300$ | $600 \div 4 = 150$ |
| 3) $140 \div 2 = 70$ | $140 \div 4 = 35$ | 4) $900 \div 2 = 450$ | $900 \div 4 = 225$ |
| 5) $1500 \div 2 = 750$ | $1500 \div 4 = 375$ | 6) $340 \div 2 = 170$ | $340 \div 4 = 85$ |
| 7) $560 \div 2 = 280$ | $560 \div 4 = 140$ | 8) $1820 \div 2 = 910$ | $1820 \div 4 = 455$ |
| 9) $60000 \div 2 = 30000$ | $60000 \div 4 = 15000$ | | |

Green

- $50 \div 2 = 25$ $50 \div 4 = 12.5$
- $82 \div 2 = 41$ $82 \div 4 = 20.5$
- $74 \div 2 = 37$ $74 \div 4 = 18.5$
- $210 \div 2 = 105$ $210 \div 4 = 52.5$
- $830 \div 2 = 415$ $830 \div 4 = 207.5$
- $89 \div 2 = 44.5$ $89 \div 4 = 22.25$
- $63 \div 2 = 31.5$ $63 \div 4 = 15.75$

Yellow:

1a) $500 \div 10 = 50$

$500 \div 5 = 100$

$500 \div 20 = 25$

b) $140 \div 10 = 14$

$140 \div 5 = 28$

$140 \div 20 = 7$

c) $280 \div 10 = 28$

$280 \div 5 = 56$

$280 \div 20 = 14$

d) $90 \div 10 = 9$

$90 \div 5 = 18$

$90 \div 20 = 4.5$

2a) $2000 \div 100 = 20$

$2000 \div 50 = 40$

b) $3200 \div 100 = 32$

$3200 \div 50 = 64$

c) $6800 \div 100 = 68$

$6800 \div 50 = 136$

d) $450 \div 100 = 4.5$

$450 \div 50 = 9$

Mastery

$2800 \div 2$ to find the large box = 1400.

That means that the 4 boxes = 1400

$\div 4$ to find 1 box

1400 halve and halve again = **350 g**

Look at the amounts below. Use halving to help you to divide by 2 and 4.



The sums I have made are: $280 \div 2 =$ $280 \div 4 =$



The sums I have made are: $600 \div 2 =$ $600 \div 4 =$



The sums I have made are:



The sums I have made are:



The sums I have made are:



The sums I have made are:



The sums I have made are:

Look at the amounts below. Use halving to help you to divide by 2 and 4.



The sums I have made are: $50 \div 2 =$ $50 \div 4 =$



The sums I have made are:



The sums I have made are:



The sums I have made are:



The sums I have made are:



The sums I have made are:



The sums I have made are:

LO: I use my knowledge of dividing by 10 and 100 to help me work out other calculations.

Divide each number by 10, 5 and 20.

1.

500

140

280

90

÷ 10

÷ 5

÷ 20

Explain the strategies you have used.

Divide each number by 100 and 50

2.

2000

3200

6800

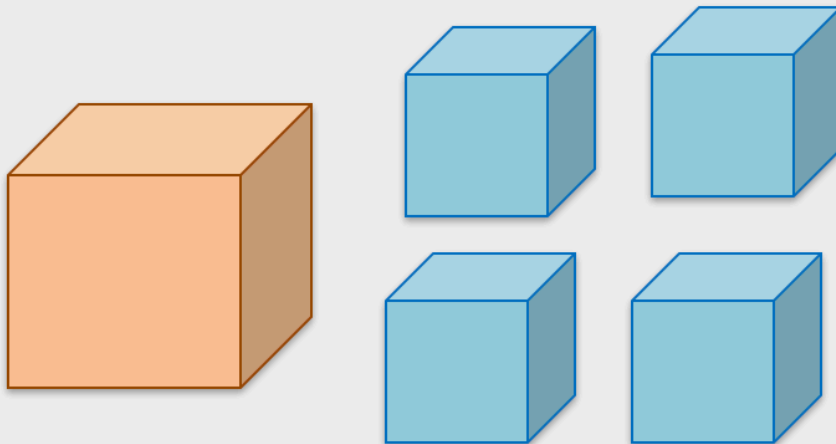
450

÷ 100

÷ 50

Review: look back at the method you used to work out each sum. Is there another way you could have worked this out? Which methods do you find the most efficient for each sum?

A large box and 4 small boxes weigh 2800 grams altogether.



The large box weighs the same as 4 small boxes.

How much does one small box weigh?

grams