

Multiplication Prior Assessment Question 1 (a, b, and c)

Objective: I use my knowledge of doubling to multiply by 2, 4 or 8.

NC NMD5: multiply and divide numbers mentally drawing upon known facts

Teacher Input Ideas:

Review question 1 of the prior learning assessment. You may want to ask these questions or similar ones with a 10 second time limit on each one to promote using efficient mental methods. Allow the children time to review their answers and share how they worked them out.

Place 2 on the board and ask the children to explain how would they find 2 lots of something.

What if I now wanted to find four lots of something?

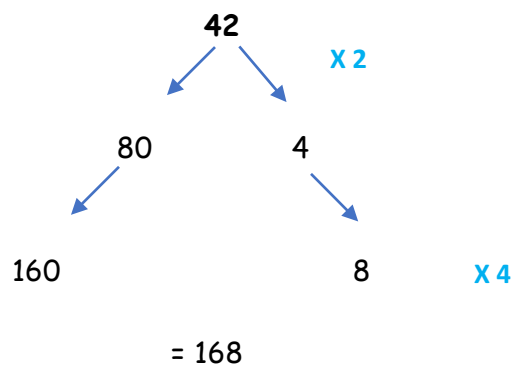
For example, $6 \times 2 = 12$. What is I wanted to find 4 lots of something? Model how four lots can be found by doubling and doubling again.

Inform the children that sometimes it is quicker to find 4 lots of something to double and double again. Place a few sums for the children to practise using this mentally.

30×4 , 16×4 , 42×4 , 65×4 . Compare with using the four x table and discuss which is the most efficient method to use here, for example 30×4 may be quicker for some children to use 4 x table and place value knowledge, whereas 42×4 would be more efficient to double and double again.

Once the children are confident, finding 8 lots could be introduced by doubling, doubling and doubling again. Also compare to using $\times 8$ facts, demonstrating which method is more efficient for different sums. Model jotting amounts down each time doubled to help keep the trail of calculations and to model the mental thoughts and process.

For example



Practice Activities

Purple Practice: Most suited for children who made errors in Question 1a, b and c as they need to secure using doubling to find 2, 4 and 8 lots mentally starting with simpler amounts.

The questions encourage the children to use doubling to multiply by 2 and 4 initially. The children should be able to find the answers by doubling to \times by 2. Then this fact can be doubled again to multiply by 4. The questions get progressively trickier and the children are later presented with \times by 8.

Look out for children who are consistently making errors when doubling numbers that make a new ten (for example double 26).

Green Practice: Most suited for children who did not use efficient mental methods in question 1 a, b and c and will benefit from securing the use of doubling to multiply by 2, 4 and 8.

The questions encourage the children to use doubling to multiply by 2 and 4 initially. The questions are slightly trickier than in the purple task as the children will need to cross boundaries of ten when doubling (such as 29×2). The questions get progressively trickier and the children are later presented with \times by 8.

Yellow Practice: Most suited for children who would benefit from exploring different efficient mental multiplication methods.

This activity provides the children with the opportunity to use their knowledge of doubling and multiplying by 10 and 100 to find 20 and 40 lots of amounts. The children are to look at each question and select methods they feel are the most efficient. Some children may use their knowledge of their \times tables, some may use repeated doubling and some will also be able to use their knowledge of place value when \times by 10 and 100.

Encourage the children to discuss their strategies whilst working out the answer with a partner so that the children can share methods and discuss which methods retrieved the answer quickly.

Mastery Investigation.

For this investigation, the children could be provided with a dice if they suggest this. Encourage the children to think of their own starting point, how to explore different options and how to record their results.

Key questions:

What are you being asked to find out? How will you find this out? Do you need any equipment? What do you know about dice? How many different options will there be? How are you going to record your working out and answers? What patterns do you notice? Which options can you rule out? How do you know this? Do any numbers give you the same answers? Why do you think that is?

Answers:

Purple:

- | | | | |
|--------|-------|--------|--------|
| a) 24 | b) 48 | c) 44 | d) 88 |
| e) 30 | f) 60 | g) 50 | h) 100 |
| i) 200 | j) 52 | k) 104 | l) 84 |
| m) 168 | n) 32 | o) 64 | p) 128 |

Green:

- | | | | |
|---------|---------|--------|---------|
| a) 34 | b) 68 | c) 500 | d) 1000 |
| e) 122 | f) 244 | g) 76 | h) 152 |
| i) 2000 | j) 58 | k) 116 | l) 232 |
| m) 620 | n) 1240 | o) 350 | p) 1400 |

Yellow:

- | | | | |
|----------|----------|---------|---------|
| a) 600 | b) 3000 | c) 260 | d) 7600 |
| e) 64000 | f) 36000 | g) 840 | h) 480 |
| i) 380 | j) 760 | k) 7000 | l) 1400 |

Mastery:

3 and 6

1 = 2, 4, 8, 16, 32, 64 (128)

2 = 4, 8, 16, 32, 64 (128)

3 = 6, 12, 24, 48, 96

4 = 8, 16, 32, 64 (128)


5 = 10, 20, 40, 80

6 = 12, 24, 48, 96

The children should have spotted that rolling a 3 or a 6 will be the best option, as when you keep doubling the amount, you get 96 and this is the closest amount to 100. Also, the children should be able to explain the pattern they have noticed between the numbers 1, 2 and 4 and the numbers 3 and 6.


To multiply amounts by 2, 4 and 8, we can use doubling to help us to do this quickly.

X 2




double

X 4




double and double again

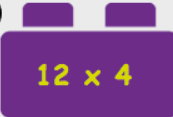
X 8

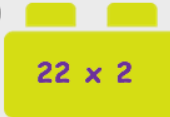



double, double and double again

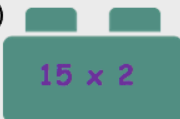
Now try these sums:


a) 
 12×2


b) 
 12×4


c) 
 22×2

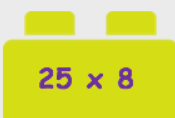
d) 
 22×4

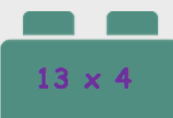
e) 
 15×2


f) 
 15×4


g) 
 25×2


h) 
 25×4

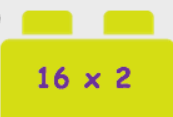
i) 
 25×8

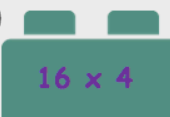
j) 
 13×4


k) 
 13×8

l) 
 21×4

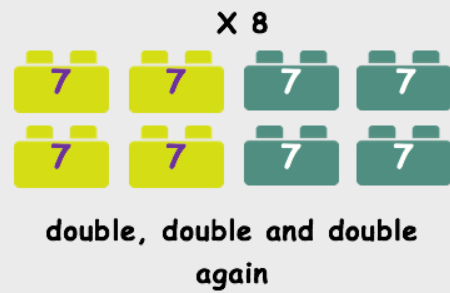
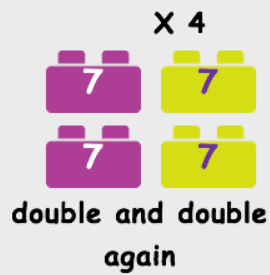
m) 
 21×8

n) 
 16×2

o) 
 16×4

p) 
 16×8

To multiply amounts by 2, 4 and 8, we can use doubling to help us to do this quickly.




Now try these sums:

a) 
 17×2

b) 
 17×4


c) 
 250×2

d) 
 250×4

e) 
 61×2

f) 
 61×4

g) 
 38×2

h) 
 38×4

i) 
 250×8

j) 
 29×2

k) 
 29×4

l) 
 29×8

m) 
 155×4

n) 
 155×8

o) 
 175×2

p) 
 175×8

Look at the sums below. Decide how you can mentally work out the answer. Discuss your methods with a partner and decide which way is the most efficient.

Tip:

You could use:

- doubling
- multiplying by 10,100, etc.
- times table facts
- partitioning

a) $15 \times 40 =$



b) $150 \times 20 =$



c) $13 \times 20 =$



d) $76 \times 100 =$



e) $1600 \times 40 =$



f) $90 \times 400 =$



g) $21 \times 40 =$



h) $12 \times 40 =$



i) $19 \times 20 =$



j) $19 \times 40 =$



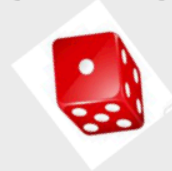
k) $35 \times 200 =$



l) $35 \times 40 =$



Peter rolls a dice. He takes that number and keeps doubling it until he gets as close to 100 as possible.



Investigate which number on the dice will give him the closest answer to 100 when repeatedly doubled.

Key Questions:

- How will you find this out?
- How many different options will there be?
- What is the best way of recording your working out and answers? What patterns do you notice?
- Do any numbers give you the same answer? Why do you think that is?