### 20.04.2020

## Multiplying and Dividing by 10,100 and 1000

## Session 1

This is where we are going to recap the fluency of this skill.

## A place value grid is a good tool to use when multiplying or dividing by 10,100 or 1000.



Remember: Going towards the left <- each column gets ten times larger.

## Multiplying

Question: $12 \times 10=$

1) Put the number into the place value grid.
2) Decide and move each digit the correct amount of place value columns.

3) Place a zero digit in the ones column to hold the space open.

## Task 1: Have a go at these multiplication questions

a) $54 \times 10$
b) $45 \times 100$
c) $23 \times 100$
d) $10 \times 48$
e) $98 \times 100$
f) $100 \times 65$
g) $1000 \times 8$
h) $10 \times 90$

## Task 1: ANSWERS

a) $54 \times 10=540$
b) $45 \times 100=4500$
c) $23 \times 100=2300$
d) $10 \times 48=480$
e) $98 \times 100=9800$
f) $100 \times 65=6500$
g) $1000 \times 8=8000$
h) $10 \times 90=900$

## Dividing

We haven't looked at decimals or fractions yet but you have been introduced to these columns.

Question: $120 \times 10=$

1) Put the number into the place value grid.
2) Decide and move each digit the correct amount of place value columns.
3) When dividing you may have to put the last digits into the tenths or hundreds.

than the last column.

Task 2: Have a go at these division questions
a) $54 \div 10$
b) $4500 \div 100$
c) $230 \div 10$
d) $4800 \div 10$
e) $9800 \div 100$
f) $8000 \div 1000$
g) $720 \div 10$
h) $1010 \div 10$

## Task 2: ANSWERS

a) $540 \div 10=54$
f) $8000 \div 1000=8$
b) $4500 \div 100=45$
g) $720 \div 10=72$
c) $230 \div 10=23$
h) $1010 \div 10=101$
d) $4800 \div 10=480$
e) $9800 \div 100=98$

## Session 2

These are your practise questions, you need to use your understanding to unpick these reasoning and problem solving questions.

## How to solve a worded problem.

Tom has 10 boxes of eggs.

There are 12 eggs in each box.
How many eggs does he have altogether?


1) Underline what you know
2) Underline what you need to find out.
3) Use the place value grid to support thinking (or you could draw a picture)
4) Write down your answer.

## Have a go at this similar problem

Eva walks 60 m to school.
Teddy walks 10 times as far as Eva to school.
How far does Teddy walk to school?

Teddy walks $\square \mathrm{m}$ to school.

## ANSWER



If Teddy walks 10 times as far then Eva that means I need to multiply by 10
$60 \times 10=600$

So Teddy walks 600 m to school.

## How to solve a 'What number do I have?' question

| Annie has multiplied a whole number by <br> 10 | I need to divide by 10 | When you trying to solve <br> these types of questions <br> remember you may have <br> Her answer is between 440 and 540 <br> to use the inverse <br> operation. |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| What could her original calculation be? |  |  |
| How many possibilities can you find? |  |  |$\quad 440 \div 10=44 .$| The inverse of multiplying |
| :--- |
| is divide and the inverse |
| of adding is subtracting. |

1) Choose the inverse operation to the one that was used.
2) Start with their answer and use the inverse operation.
3) If the question as for the possibilities you may need to do this for more than once.

## Have a go at this similar problem

Amir thinks of a 2-digit even number.
He multiplies it by 100
His answer is greater than 3,450 but less than 3,750
Write the number that Amir is thinking of.

## ANSWER

Amir thinks of a 2-digit even number.
He multiplies it by 100
His answer is greater than 3,450 but less than 3,750
Write the number that Amir is thinking of.

1) I know I need to do the inverse of multiplication which is divide. So I will divide by 100
2) I also know it needs to be a 2-digit number which means the number Amir has now will need to be followed by two zeros so I can get a whole number when I divide by 100
3) Therefore if I count up from 3450 the next number I get to with only 2 other digits is 3500 but this is not even.
4) If I continue to count I will get to 3600 which would meet all the requirements. $3600 \div 100=36$

## Now have a go at these other practise questions, some will be similar others will be different.

Write $<,>$ or $=$ to compare the statements.
a) $45 \times 100$

$45 \times 10$
b) $36 \times 100$

$100 \times 36$
c) $100 \times 27$

$26 \times 100$
d) $31 \times 100$

$31 \times 10 \times 10$
e) $30 \times 10$

$3 \times 100$

Amir thinks of a 2-digit number.
He multiplies it by 10


My answer is between 755
and 795

Write all the numbers Amir could be thinking of.

Eva and Tommy collect gems in a computer game. Each gem is worth 100 points.

At the end of the game, Eva has 4,300 points and Tommy has 800 points.

How many gems did they collect in total?

How did you work this out?

Mr Smith has this amount of money.


He buys some rulers costing 10p each.


Mr Smith spends all of his money. How many rulers does he buy?

Write <, > or = to compare the statements.
a) $45 \times 100$

$45 \times 10$
b) $36 \times 100 \backsim 100 \times 36$
c) $100 \times 27 \longrightarrow 26 \times 100$
d) $31 \times 100 \backsim 31 \times 10 \times 10$
e) $30 \times 10$


Eva and Tommy collect gems in a computer game.
Each gem is worth 100 points.
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How many gems did they collect in total?

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He multiplies it by 10


Write all the numbers Amir could be thinking of.

Mr Smith has this amount of money.


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## Session 3

Treat these like your prove it questions. Use your resources to help you but can you do it without any adult support?

## Have a go at these prove it questions

## True or False?

Explain your reasoning

$$
6,720 \div 10=672
$$

| Th | $H$ | $T$ | 0 |
| :---: | :---: | :---: | :---: |
| 6 | 7 | 2 | 0 |
|  |  |  |  |

To divide by 10 , each of the digits moves one place to the right.

## True or False?

Explain your reasoning
Ron has more sweets than Eva.

I have 30 packets of sweets with
10 sweets in each pack.
Ron

I have 10 packets of sweets with 30 sweets in each pack.


The number becomes ten times smaller.

## False

They both have the same amount of sweets.
$10 \times 30=300$

Four children are in a race. The numbers on their vests are:


Use the clues to match each vest number to a child.

- Jack's number is ten times smaller than Mo's.
- Alex's number is not ten times smaller than Jack's or Dora's or Mo's.
- Dora's number is ten times smaller than Jack's.

Which representation does not show multiplying by 100 ?
Explain your answer.


Four children are in a race. The numbers on their vests are:


Use the clues to match each vest number to a child.

- Jack's number is ten times smaller than Mo's.
- Alex's number is not ten times smaller than Jack's or Dora's or Mo's.
- Dora's number is ten times smaller than Jack's.

Which representation does not show multiplying by 100 ?
Explain your answer.


The part-whole model does not represent multiplying by 100
Part-whole models show addition (the aggregation structure) and subtraction (the partitioning structure), so if the whole is 300 and there are two parts, the parts added together should total 300 (e.g. 100 and 200 , or 297 and 3). If the parts are 100 and 3 , the whole should be 103.

To show multiplying 3 by 100 as a partwhole model, there would need to be 100 parts each with 3 in.

There are 400 pins altogether.
The pins are packed in jars of 100
How many jars are there? $\square$
Aisha has a bag of 10 p coins.
She has $£ 3$ and 40 p altogether.
How many 10p coins does Aisha have?

Aisha has $\square$ 10p coins.

Complete the calculations.
a) $45 \times 10=\square$
e) $10 \times \square=140$
b) $36 \times 10=\square$
c) $\square=10 \times 78$
g) $32 \times 10=10 \times \square$
d) $31 \times \square=310$
h) $670=2 \times 5 \times$ $\square$

There are 400 pins altogether.
The pins are packed in jars of 100
How many jars are there? 4

Complete the calculations.
a) $45 \times 10=450$
b) $36 \times 10=360$
c) $780=10 \times 78$
d) $31 \times 10=310$
e) $10 \times 14=140$
f) $400=40 \times 10$
g) $32 \times 10=10 \times 32$
h) $670=2 \times 5 \times 67$

Aisha has a bag of 10 p coins.
She has $£ 3$ and 40 p altogether.
How many 10p coins does Aisha have?

Aisha has 34 10p coins.

Four children are making numbers using base 10
The table shows how many of each piece they use.

|  | Number of 100s | Number of 10s |
| :--- | :---: | :---: |
| Eva | 17 | 0 |
| Ron | 15 | 8 |
| Dexter | 16 | 15 |
| Whitney |  |  |

a) What number has Eva made? $\square$
b) Who has made the biggest number?
c) Whitney has made the same number as Eva.

She used 100 s and 10s.
What pieces could Whitney have used?
Write your answer in the table.
Are there any other answers? Talk about it with a partner.

Four children are making numbers using base 10
The table shows how many of each piece they use.

## Various answers ${ }^{\text {e.g }}$

|  | Number of 100s | Number of 10s |
| :--- | :---: | :---: |
| Eva | 17 | 0 |
| Ron | 15 | 8 |
| Dexter | 16 | 15 |
| Whitney | 15 | 20 |

a) What number has Eva made?

```
1,700
```

b) Who has made the biggest number?

## Dexter

c) Whitney has made the same number as Eva.

She used 100 s and 10 s.
What pieces could Whitney have used?
Write your answer in the table.
Are there any other answers? Talk about it with a partner.

