Week 9, Day 1
Mental multiplication and division

Each day covers one maths topic. It should take you about 1 hour or just a little more.

1. Start by reading through the Learning Reminders. They come from our PowerPoint slides.

2. Tackle the questions on the Practice Sheet. There might be a choice of either Mild (easier) or Hot (harder)!
Check the answers.

3. Finding it tricky? That’s OK… have a go with a grown-up at A Bit Stuck?

4. Have I mastered the topic? A few questions to Check your understanding.
Fold the page to hide the answers!
Learning Reminders

Use mental multiplication and division.

List ALL the pairs of factors of 36.

Pair of factors: 4 and 9

If we know $4 \times 9 = 36$, what is $4 \times 90$? $4 \times 900$? $4 \times 9000$?

What is $36 \div 9$? So what is $360 \div 9$? $360 \div 90$? $3600 \div 9$?

Use one other pair of factors to generate a similar list of facts using place value.

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Learning Reminders

Use mental multiplication and division.

Work out $2 \times 456$ and $10 \times 456$.

Now we know these two facts, what others can we work out?

2 $\times$ 456 = **902**
Double to give
4 $\times$ 456 = 1804; 1804 ÷ 456 = 4
10 $\times$ 456 = **4560**
Halve to give
5 $\times$ 456 = 2280; 2280 ÷ 456 = 5
Double to give
20 $\times$ 456 = 9120; 9120 ÷ 20

Find 3 $\times$ 43, then derive other related multiplications and divisions.

3 $\times$ 43 = **129**
E.g. use doubling and halving
6 $\times$ 43 = ? And the related division?
30 $\times$ 43 = ? And the related division?
15 $\times$ 43 = ? And the related division?
Learning Reminders

Use mental multiplication and division.

Today’s tip is don’t launch straight into a written method. Look at the numbers - you may find it more efficient to use a mental strategy!

Think which ones you would solve mentally.

Probably $3 \times 2101$, $2 \times 2.35$, $450 \div 9$ and $3603 \div 3$. 
1. List ALL the factors of 28.

2. Write two common multiples of 3 and 4.

3. Solve these:
   \[36 \times 10 \quad 36 \times 2 \quad 36 \times 3\]

4. Use your answers from question 1 to easily solve:
   \[36 \times 5 \quad 36 \times 20 \quad 36 \times 4 \quad 36 \times 8 \quad 36 \times 6\]

5. Use similar strategies to solve the following:
   \[76 \times 5 \quad 64 \times 20 \quad 53 \times 6 \quad 82 \times 4 \quad 37 \times 8 \quad 153 \times 5 \quad 240 \times 20\]
   In each case note down what you did to find the answer, e.g. ‘Multiplied by 10 and then doubled’.

6. Does 24 x 30 give the same answer as 34 x 20?
   Make a prediction.
   Use mental strategies to solve each multiplication and test your prediction.

**Challenge**

Can you find a strategy for quickly solving these:
\[36 \times 50 \quad 36 \times 200 \quad 36 \times 60\]
*(Hint! Look at what you already know.)*
Practice Sheet Hot
Multiples, factors, multiplication and division

1. Write ALL the factors of 24.
2. If a number has 10 as a factor, what other three factors must it have?
3. If a number has 6 as a factor, what other three factors must it have?
4. Write two common multiples of 4 and 5.
5. Write three common multiples of 2, 3 and 5.
6. \(2 \times 6 \times 5\)
7. \(15 \times 3 \times 2\)
8. \(4 \times 5 \times \square = 120\)
9. \(7 \times \square \times 5 = 350\)
10. \(720 \times 4\)
11. \(\square \times 80 = 480\)
12. \(450 \div 90\)
13. \(7 \times \square = 3500\)
14. \(8 \times 23\)
15. \(5 \times 348\)
16. \(25 \times 36\)
17. \(186 \div 5\)
18. \(284 \div 20\)
Practice Sheets Answers

Using mental strategies to multiply (mild)

1. Factors of 28: 1, 28; 2, 14; 4, 7
2. Common multiples of 3 and 4, e.g. 12 and 24, i.e. multiples of 12
3. 
   \[ 36 \times 10 = 360 \]
   \[ 36 \times 2 = 72 \]
   \[ 36 \times 3 = 108 \]
4. 
   \[ 36 \times 5 = 180 \]
   \[ 36 \times 20 = 720 \]
   \[ 36 \times 4 = 144 \]
   \[ 36 \times 8 = 288 \]
   \[ 36 \times 6 = 216 \]
5. 
   \[ 76 \times 5 = 380 \]
   \[ 64 \times 20 = 1280 \]
   \[ 53 \times 6 = 318 \]
   \[ 82 \times 4 = 328 \]
   \[ 37 \times 8 = 296 \]
   \[ 153 \times 5 = 765 \]
   \[ 240 \times 20 = 4800 \]
6. 
   \[ 30 \times 24 = 720 \]
   \[ 20 \times 34 = 680 \]

**Challenge**

\[ 36 \times 50 = 1800 \]
\[ 36 \times 200 = 7200 \]
\[ 36 \times 60 = 2160 \]

Students should notice that these multiplications are similar to the first three multiplications in Question 2, except the second number has been multiplied by ten. This means that students simply need to add on a zero to the answers they already have.

Multiples, factors, multiplication and division (hot)

1. 1, 2, 3, 4, 6, 8, 12, 24
2. 1, 2, 5
3. 1, 2, 3
4. 20, 40
5. 30, 60, 90
6. \[ 2 \times 6 \times 5 = 60 \]
7. \[ 15 \times 3 \times 2 = 90 \]
8. \[ 4 \times 5 \times 6 = 120 \]
9. \[ 7 \times 10 \times 5 = 350 \]
10. \[ 720 \times 4 = 2880 \]
11. \[ 6 \times 80 = 480 \]
12. \[ 450 \div 90 = 5 \]
13. \[ 7 \times 500 = 3500 \]
14. \[ 8 \times 23 = 184 \]
15. \[ 5 \times 348 = 1740 \]
16. \[ 25 \times 36 = 900 \]
17. \[ 186 \div 5 = 37.2 \]
18. \[ 284 \div 20 = 14.2 \]
Things you will need:
- A pencil
- A large piece of paper

What to do:
- Work in pairs to write out the 6 times table on the left of the piece of paper.
- Next to this write out the 60 times table. Remember - you can multiply by 10 to get the answers.
- Now write out the 600 times table!

<table>
<thead>
<tr>
<th>1 x 6 = 6</th>
<th>1 x 60 = 60</th>
<th>1 x 600 = 600</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 x 6 = 12</td>
<td>2 x 60 = 120</td>
<td>2 x 600 = 1200</td>
</tr>
<tr>
<td>3 x 6 = 18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 x 6 = ...</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S-t-r-e-t-c-h:
Use more Mammoth tables facts to find the missing numbers:
8 x □ = 160  7 x □ = 2100  □ x 5 = 4000  □ x 9 = 630

Learning outcomes:
- I can use known times tables and place value to multiply, e.g. 6 x 3, 6 x 30, 12 x 300.
- I am beginning to use known times tables and place value to solve problems.
Check your understanding

Questions

Write the correct symbol (<, > or =) in each box to make the statements correct:

12 × 12  □  14 × 10
80 ÷ 20  □  90 ÷ 30
240 ÷ 6  □  270 ÷ 9
800 × 5  □  70 × 50

Sophia has the digit cards 6, 7 and 5.
She makes a 2-digit number and a 1-digit number.
She multiplies them together.
Her answer is a multiple of 10.
What could Sophia’s multiplication be?

Fold here to hide answers

Check your understanding

Answers

Write the correct symbol (<, > or =) in each box to make the statements correct:

12 × 12  >  14 × 10
80 ÷ 20  >  90 ÷ 30
240 ÷ 6  >  270 ÷ 9
800 × 5  >  70 × 50

A child consistently using < rather than > is most likely reading the symbol ‘the wrong way around’.

Sophia has the digit cards 6, 7 and 5.
She makes a 2-digit number and a 1-digit number.
She multiplies them together.
Her answer is a multiple of 10.
What could Sophia’s multiplication be?
76 × 5 or 75 × 6. Since 7 × 6 = 42 and 7 × 5 = 35 the 6 and 5 must each be 1s digits for the answer to be a multiple of 10.