

# Unit 1

## Decimals, fractions, percentages

Five daily lessons

National  
**Numeracy Strategy**

Year 6  
Summer term

### Unit Objectives Year 6

- Multiply and divide decimals mentally by 10 or 100 and integers by 1000, and explain the effect.
- Order a mixed set of numbers with up to three decimal places.
- Consolidate rounding an integer to the nearest 10, 100 or 1000.
- Round a number with two decimal places to the nearest tenth or whole number.
- Reduce a fraction to its simplest form by cancelling common factors.
- Use a fraction as operator to find fractions of numbers or quantities.
- Understand percentage as the number of parts in every 100.
- Find simple percentages of small whole-number quantities.

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This Unit Plan is designed to guide your teaching.

You will need to adapt it to meet the needs of your class.

### Resources needed to teach this unit:

- Resource sheet 1.1
- Resource sheet 1.2
- Activity sheet 1.1
- Activity sheet 1.2
- OHT 1.1
- Key Stage 2 National Test questions A and B
- Large sheets of paper
- Timer
- Mental mathematics test questions
- OHP calculator
- Whiteboard
- Calculators

Year 5

### Link Objectives

Year 7

- Multiply and divide any positive integer up to 10,000 by 10 or 100 and understand the effect.
- Use decimal notation for tenths and hundredths.
- Order a set of numbers with the same number of decimal places.
- Recognise when two simple fractions are equivalent.
- Relate fractions to division and use division to find simple fractions, including tenths and hundredths of number and quantities.
- Relate fractions to their decimal representations.
- Begin to understand percentage as the number of parts in every 100, and find simple percentages of small whole-number quantities.

- Understand and use decimal notation and place value; multiply and divide integers and decimals by 10, 100, 1000 and explain the effect.
- Compare and order decimals in different contexts.
- Simplify fractions by cancelling all common factors and identify equivalent fractions.
- Calculate simple fractions of quantities and measurements.
- Calculate simple percentages and use percentages to compare simple proportions.

(Key objectives in bold)

department for  
**education and skills**

Planning sheet	Day One	Unit 1 <i>Decimals, fractions, percentages</i>	Term: <i>Summer</i>	Year Group: 6
Oral and Mental		Main Teaching		Plenary
Objectives and Vocabulary	Teaching Activities	Objectives and Vocabulary	Teaching Activities	Teaching Activities/Focus Questions
Multiply and divide decimals mentally by 10 or 100, and integers by 1000 and explain the effect.  <				

Planning sheet	Day Two	Unit 1 <i>Decimals, fractions, percentages</i>	Term: <i>Summer</i>	Year Group: 6
Oral and Mental		Main Teaching		Plenary
Objectives and Vocabulary	Teaching Activities	Objectives and Vocabulary	Teaching Activities	Teaching Activities /Focus Questions
<p>Recognise equivalent fractions.</p> <p>VOCABULARY equivalent numerator denominator</p> <p>RESOURCES OHT 1.1</p>	<ul style="list-style-type: none"> <li>Briefly remind the children of the key words numerator and denominator. Use <math>\frac{1}{2}</math> to establish the idea of equivalence, e.g. Can you explain how we know <math>\frac{2}{4}</math> and <math>\frac{5}{10}</math> are equivalent to <math>\frac{1}{2}</math>. Can you find some more equivalents of <math>\frac{1}{2}</math>?</li> <li>Collect answers and correct any errors.</li> <li>Display OHT 1.1. Establish that the first row is multiplied by 2 to get the 2nd row, by 3 to get the 3rd row etc. Identify the 1 and 2 in the first two rows and relate to fraction <math>\frac{1}{2}</math>.</li> </ul> <div>Q Can you form any fractions equivalent to <math>\frac{1}{2}</math> from this table?</div> <ul style="list-style-type: none"> <li>Collect the answers and remind the children that the top number, the numerator, is multiplied by 2 to get the denominator. The fractions found are all-equivalent to <math>\frac{1}{2}</math>. Point to rows 1 and 3. What equivalent fractions can we form now?</li> <li>Establish that they are equivalent to <math>\frac{1}{3}</math>, and ensure the children recognise why this is so.</li> <li>Get the children to generate chains of equivalent fractions from adjacent rows such as: <math>\frac{3}{4}</math> <math>\frac{6}{8}</math> <math>\frac{9}{12}</math> <math>\frac{12}{16}</math> Extend for non-adjacent rows such as: <math>\frac{4}{9}</math> <math>\frac{8}{18}</math> <math>\frac{12}{27}</math> <math>\frac{16}{36}</math></li> </ul> <div>Q Can you carry on the pattern beyond the numbers in the table?</div> <ul style="list-style-type: none"> <li>Start with <math>\frac{3}{5}</math>, <math>\frac{6}{10}</math> to <math>\frac{30}{50}</math> and move on to <math>\frac{33}{55}</math>, <math>\frac{36}{60}</math> etc. reminding children that the numerator is the next multiple of 3 and the denominator the next multiple of 5.</li> <li>Identify fractions in the middle of the table such as <math>\frac{10}{35}</math>. What fractions are equivalent to <math>\frac{10}{35}</math>? Establish that the children can identify the two rows and equivalent fractions such as <math>\frac{2}{7}</math>, <math>\frac{8}{28}</math> and <math>\frac{16}{56}</math>. Repeat.</li> <li>Remind the children of the multiplication problems in the table on OHT 1.1. Remove the OHT and ask for equivalences to given fractions such as <math>\frac{6}{10}</math>. Collect answers and replace the OHT to confirm answers. Repeat.</li> </ul>	<p>Reduce a fraction to its simplest form by cancelling common factors.</p> <p>VOCABULARY reduce cancel factor common multiple equivalent</p> <p>RESOURCES Activity sheet 1.2 Large sheets of paper</p>	<div>Q How many twentieths are equivalent to one whole?</div> <ul style="list-style-type: none"> <li>Show OHT 1.1 and ask: How many twentieths are equivalent to <math>\frac{3}{4}</math>?</li> <li>Collect the children's answers. Remove OHT 1.1.</li> </ul> <div>Q Can you explain how to convert <math>\frac{3}{4}</math> to twentieths without our table?</div> <ul style="list-style-type: none"> <li>Stress that we multiply the numerator and denominator by the same amount, in this case 5. Demonstrate and record as: <math display="block">\frac{3}{4} \quad (\times 5) = \quad \frac{15}{20}</math></li> <li>Work through other examples emphasising the multiplication by the same number. How many sixths are equivalent to <math>\frac{35}{42}</math>?</li> <li>Establish that for this, we are reducing the numbers so we divide the numerator and the denominator by 7. Demonstrate and record as: <math display="block">\frac{35}{42} \quad (\div 7) = \quad \frac{5}{6}</math></li> <li>Remind the children that this process is called cancelling. Stress that the number we divide by must be a factor of both the numerator and the denominator.</li> <li>Record the process of cancelling on large sheets of paper.</li> </ul> <div>Q What is a common factor of the numerator and denominator for each of these fractions?</div> $\frac{18}{24} \quad \frac{27}{45} \quad \frac{7}{49}$ <ul style="list-style-type: none"> <li>Use the common factors to cancel the fractions and record the process with the children. Ensure the children recognise when the fraction is in its lowest terms.</li> <li>Give out Activity sheet 1.2.</li> </ul>	<ul style="list-style-type: none"> <li>Work through examples of hundredths from <math>\frac{1}{100} = 0.01</math>, <math>\frac{15}{100} = 0.15</math>, etc.</li> </ul> <div>By the end of the lesson the children should be able to:</div> <ul style="list-style-type: none"> <li>Recognise equivalent fractions.</li> <li>Cancel fractions by dividing the numerator and denominator by the same number.</li> </ul> <p>(Refer to supplement of examples, section 6, page 23.)</p>

Planning sheet	Day Three	Unit 1 <i>Decimals, fractions, percentages</i>	Term: <i>Summer</i>	Year Group: 6
Oral and Mental		Main Teaching		Plenary
Objectives and Vocabulary	Teaching Activities	Objectives and Vocabulary	Teaching Activities	Teaching Activities/Focus Questions
Rehearsal of recall of facts and consolidation of calculation skills.  <				

Planning sheet	Day Four	Unit 1 <i>Decimals, fractions, percentages</i>	Term: <i>Summer</i>	Year Group: 6
Oral and Mental		Main Teaching		Plenary
Objectives and Vocabulary	Teaching Activities	Objectives and Vocabulary	Teaching Activities	Teaching Activities/Focus Questions
<p>Rehearsal of recall of facts and consolidation of calculation skills.</p> <p>RESOURCES Whiteboards Timer Mental mathematics test questions</p>	<ul style="list-style-type: none"> <li>Give the children five questions to answer, selected from the mental mathematics test questions sheets. Use the ten second questions then collect responses from whiteboards and discuss methods and difficulties.</li> <li>Repeat with other clusters of questions to build up the children's accuracy and speed of response.</li> </ul>	<p>Understand percentage as the number of parts in every 100 and find simple percentages of small whole number quantities.</p> <p>VOCABULARY percentage</p> <p>RESOURCES OHP calculator Calculators Large sheets of paper Related Key Stage 2 National test questions</p>	<div> <p><b>Q</b> What is 50% of £80?</p> <p><b>Q</b> What is 25% of £80?</p> </div> <p>Discuss answers and remind the children per cent means per 100.</p> <ul style="list-style-type: none"> <li>Write 15% of 360 = <input type="text"/> on the board.</li> </ul> <p>Ask the children to work the answer out in pairs, recording on whiteboards. Discuss the children's methods. Highlight the halving of 10% to find 5% and the addition of the 10% to 5% to get 15%.</p> <ul style="list-style-type: none"> <li>Apply similar methods to other 'easy' percentages such as 30%, 35%, 81% etc.</li> </ul> <p>Encourage the children to jot down notes to help them.</p> <ul style="list-style-type: none"> <li>How would you work out 99% of £400?</li> </ul> <p>Agree that finding 1% and subtraction is quickest. Apply similar methods to finding 24%, 74%, 69%, 19% etc.</p> <ul style="list-style-type: none"> <li>Write on the board: 24% of 720.</li> </ul> <p>Use the OHP calculator and show how to find 1% then scale up to 24%. Repeat with another example.</p> <div> <p><b>Q</b> How can we describe this calculator method of finding percentages?</p> </div> <ul style="list-style-type: none"> <li>Collect responses and agree a description. Record on large sheets of paper and display.</li> </ul> <p>Provide the children with examples to do in pairs; remind them to ask themselves: 'Can I do this in my head?'. Collect answers and correct any mistakes.</p>	<ul style="list-style-type: none"> <li>Establish that finding 50%, 25%, 10%, 1%, can be useful starting points. Halving, doubling, adding and subtracting usually helps.</li> </ul> <p>What is 17½% of £120?</p> <ul style="list-style-type: none"> <li>Work through finding 10%, 5%, 2½% with the class and establish that 17½% is found by adding them together.</li> </ul> <p>How would you find 17½% of £120 using a calculator?</p> <p>Discuss and compare methods and confirm the answer.</p> <p>HOMEWORK – Give out samples of related test questions, briefly discuss methods and solutions .</p> <div> <p><b>Q</b> When calculating percentages in your head, what percentage do you usually start from? How do you use this percentage to work out others?</p> </div> <div> <p><b>By the end of the lesson the children should be able to:</b></p> <ul style="list-style-type: none"> <li><b>Find simple percentages of small whole number quantities and describe their strategy for finding the answer.</b></li> </ul> <p>(Refer to supplement of examples, section 6, page 33.)</p> </div>

Planning sheet	Day Five	Unit 1 <i>Decimals, fractions, percentages</i>	Term: <i>Summer</i>	Year Group: 6
Oral and Mental		Main Teaching		Plenary
Objectives and Vocabulary	Teaching Activities	Objectives and Vocabulary	Teaching Activities	Teaching Activities/Focus Questions
<p>Rehearsal of recall and consolidation of calculation skills.</p> <p>RESOURCES Whiteboards Timer Mental mathematics test questions</p>	<ul style="list-style-type: none"> <li>Quickly recite 4, 7 and 9 times tables with the class.</li> <li>Repeat and build up speed and accuracy.</li> <li>Select a range of related 10-second questions from the mental test questions sheets.</li> </ul> <p>Explain that you will read out a question twice then give ten seconds for the children to answer the question.</p> <p>The children are to record answers on whiteboards. They can jot down what they like but they should underline the answer.</p> <ul style="list-style-type: none"> <li>Discuss each question and identify and correct any common errors.</li> </ul>	<ul style="list-style-type: none"> <li>Review the week's work and discuss the objectives set out on the front page.</li> </ul> <p>RESOURCES Resource sheet 1.2</p>	<ul style="list-style-type: none"> <li>Ask the children to look over the list of the week's objectives and discuss each in turn, focusing particularly on needs you have identified during the last four days.</li> </ul> <p>Use prompting and probing questions such as: Which of these is the answer to <math>32.4 \times 10</math>? 320.4   324   3.24   3.024   3240   32.04   0.324</p> <p>Explain/justify. Now can you find <math>32.4 \times 100 \div 10 \div 100</math>?</p> <ul style="list-style-type: none"> <li>Order the numbers in the above list, and justify, referring to the value of the digits.</li> </ul> <div>Q What is the value of the three digit in each of the above numbers?</div> <div>Q Which is greater: 0.126 or 0.2?</div> <ul style="list-style-type: none"> <li>Round these numbers to the nearest whole number/nearest tenth: 48.68   53.09   7.67   20.46   309.61</li> <li>Say anything you can about these fractions: <math>\frac{1}{10}</math>   <math>\frac{10}{12}</math>   <math>\frac{4}{8}</math>   <math>\frac{8}{6}</math>   <math>\frac{10}{100}</math>   <math>\frac{5}{5}</math>   <math>1\frac{1}{3}</math>   <math>\frac{5}{6}</math></li> </ul> <p>(expect references to mixed numbers, cancelling common factors, equivalent fractions, top-heavy fractions, and possibly decimal or percentage equivalence).</p> <ul style="list-style-type: none"> <li>Which is greater? <math>\frac{2}{3}</math>   <math>\frac{3}{5}</math>   <math>\frac{2}{5}</math>. Find those fractions of 45.</li> <li>What does 100% mean? What is 150% of £30?</li> <li>If 72 kg is the total mass, what percentages can you tell me? Explain how you worked them out. (Expect 50%, then 25% and 75%, 10%, 5%, 1% and any percentages which can be built up from them, e.g. 20% = 10% + 10%.)</li> </ul> <p><b>Further work where consolidation of the past four days is not required:</b></p> <ul style="list-style-type: none"> <li>Have two sets of cards, one labelled with fractions such as: <math>\frac{2}{5}</math>   <math>\frac{3}{8}</math>   <math>\frac{7}{10}</math>, and the other with amounts or quantities, e.g. 50p, 75 m, £600. Use for two activities: <ul style="list-style-type: none"> <li>Choose one card from each pile and find the fraction of the amount, e.g. <math>\frac{2}{5}</math> of 50p.</li> <li>Choose one card from each pile and find the total if the fraction is the amount, e.g. the total if <math>\frac{2}{5}</math> is 50p.</li> </ul> <p>Model the activities with the whole class, and then have the children play in pairs, recording if appropriate.</p></li> <li>There are 100 (200, 50 ...) sweets in a jar. John has <math>\frac{2}{5}</math>, Sue has <math>\frac{1}{10}</math>, Sharam has <math>\frac{1}{20}</math>.</li> </ul> <p>How many sweets are left? What fraction is this?</p> <p>Express each quantity as a percentage.</p>	<ul style="list-style-type: none"> <li>Collect responses to homework and correct mistakes and misunderstandings.</li> <li>Give the children some time to identify what they can do and what they still need to concentrate on, discussing in pairs.</li> </ul> <p>Provide the children with Resource sheet 1.2 – cut up. The children work in groups of six, and have six cards each. After the starting card has been placed in the centre of the table appropriate cards are placed in order. Give the children a time limit to complete the loop.</p> <div>Q Was it hard to calculate the answer to any question? Why?</div> <ul style="list-style-type: none"> <li>Identify and discuss any misconceptions.</li> </ul> <div> <p><b>By the end of the lesson the children should be able to:</b></p> <ul style="list-style-type: none"> <li><b>Multiply and divide decimals by 10 and 100;</b></li> <li><b>Round numbers with two decimal places to the nearest tenth or whole number;</b></li> <li><b>Find simple percentages of quantities;</b></li> <li><b>Use a fraction as operator to find fractions of numbers or quantities.</b></li> </ul> <p>(Refer to supplement of examples, section 6, pages 7, 25, 31, 33.)</p> </div>

Place Value Chart

0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009
0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
1	2	3	4	5	6	7	8	9
10	20	30	40	50	60	70	80	90
100	200	300	400	500	600	700	800	900
1000	2000	3000	4000	5000	6000	7000	8000	9000

# Ordering Decimals

Put these decimals in ascending order (smallest to largest)

1.	57.86	5.6	5.67	5.607	578.6	57.87
	_____	_____	_____	_____	_____	_____
2.	114.6	11.46	1.146	1.614	1.16	41.16
	_____	_____	_____	_____	_____	_____
3.	723.9	72.39	72.3	72.203	729.3	72.93
	_____	_____	_____	_____	_____	_____
4.	47.506	47.6	457.6	47.65	574.6	574.61
	_____	_____	_____	_____	_____	_____

Put these decimals in descending order (largest to smallest)

1.	5.102	51.20	5.10	510.2	5.2	502.1
	_____	_____	_____	_____	_____	_____
2.	983.4	98.34	9.834	948.3	9.83	943.8
	_____	_____	_____	_____	_____	_____
3.	102.05	120.05	10.2	1.025	10.25	102.5
	_____	_____	_____	_____	_____	_____
4.	767.6	7.766	76.706	76.76	776.6	0.776
	_____	_____	_____	_____	_____	_____



Put  $<$ ,  $>$  or  $=$  between these pairs of numbers.

1.  $3.8$    $3.18$

2.  $41.05$    $41.50$

3.  $6.01$    $60.1$

4.  $1.35$    $1.53$

5.  $7.12$    $21.7$

6.  $620$    $619.99$

Write a number in each box that satisfies the condition.

1.  $6.7 >$

2.   $< 23.4$

3.  $12.05 >$

4.   $> 181.3$

5.  $23.4 <$    $< 35.2$

6.  $812.6 <$    $< 1014.1$

7.  $6 <$    $< 7$

8.  $2.1 <$    $< 2.2$

# Equivalent Fractions

For each fraction find a common factor and cancel until the answer is in its lowest terms.

1.  $\frac{16}{32}$

2.  $\frac{15}{40}$

3.  $\frac{33}{48}$

4.  $\frac{21}{56}$

5.  $\frac{75}{100}$

6.  $\frac{20}{100}$

Fill in the missing numbers so the fractions are equivalent.

1.  $\frac{2}{3} = \frac{\boxed{\phantom{000}}}{12}$

2.  $\frac{5}{8} = \frac{20}{\boxed{\phantom{000}}}$

3.  $\frac{\boxed{\phantom{000}}}{5} = \frac{8}{10}$

4.  $\frac{4}{\boxed{\phantom{000}}} = \frac{36}{63}$

5.  $\frac{\boxed{\phantom{000}}}{45} = \frac{4}{9}$

6.  $\frac{21}{\boxed{\phantom{000}}} = \frac{3}{8}$

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>
<b>2</b>	<b>4</b>	<b>6</b>	<b>8</b>	<b>10</b>	<b>12</b>	<b>14</b>	<b>16</b>	<b>18</b>	<b>20</b>
<b>3</b>	<b>6</b>	<b>9</b>	<b>12</b>	<b>15</b>	<b>18</b>	<b>21</b>	<b>24</b>	<b>27</b>	<b>30</b>
<b>4</b>	<b>8</b>	<b>12</b>	<b>16</b>	<b>20</b>	<b>24</b>	<b>28</b>	<b>32</b>	<b>36</b>	<b>40</b>
<b>5</b>	<b>10</b>	<b>15</b>	<b>20</b>	<b>25</b>	<b>30</b>	<b>35</b>	<b>40</b>	<b>45</b>	<b>50</b>
<b>6</b>	<b>12</b>	<b>18</b>	<b>24</b>	<b>30</b>	<b>36</b>	<b>42</b>	<b>48</b>	<b>54</b>	<b>60</b>
<b>7</b>	<b>14</b>	<b>21</b>	<b>28</b>	<b>35</b>	<b>42</b>	<b>49</b>	<b>56</b>	<b>63</b>	<b>70</b>
<b>8</b>	<b>16</b>	<b>24</b>	<b>32</b>	<b>40</b>	<b>48</b>	<b>56</b>	<b>64</b>	<b>72</b>	<b>80</b>
<b>9</b>	<b>18</b>	<b>27</b>	<b>36</b>	<b>45</b>	<b>54</b>	<b>63</b>	<b>72</b>	<b>81</b>	<b>90</b>
<b>10</b>	<b>20</b>	<b>30</b>	<b>40</b>	<b>50</b>	<b>60</b>	<b>70</b>	<b>80</b>	<b>90</b>	<b>100</b>

## Follow Me Cards

I am 1.05  You are $7 \times 10$	I am 70  You are $4.63 \times 100$	I am 463  You are $560 \div 10$
I am 56  You are $\frac{2}{3}$ of 24	I am 16  You are $\frac{4}{5}$ of 45	I am 36  You are 50% of 148
I am 74  You are 25% of 160	I am 40  You are a fraction equivalent to $\frac{2}{3}$	I am $\frac{4}{6}$  You are 10% of 110
I am 11  You are $515.3 \div 100$	I am 5.153  You are a fraction equivalent to $\frac{2}{5}$	I am $\frac{4}{10}$  You are $4.3 \times 10$

## Follow Me Cards

<p>I am 43</p> <p>You are 75% of 16</p>	<p>I am 12</p> <p>You are 5 tenths more than 2.14</p>	<p>I am 2.64</p> <p>You are 3 hundredths less than 26.19</p>
<p>I am 26.16</p> <p>You are <math>1.4 \times 1000</math></p>	<p>I am 1400</p> <p>You are <math>5.6 \div 10</math></p>	<p>I am 0.56</p> <p>You are 25% of 104</p>
<p>I am 26</p> <p>You are <math>56\,000 \div 1000</math></p>	<p>I am 56</p> <p>You are 5% of 20</p>	<p>I am 1</p> <p>You are 4 tenths greater than 15.28</p>
<p>I am 15.68</p> <p>You are <math>120.6 \div 10</math></p>	<p>I am 1.206</p> <p>You are <math>\frac{5}{6}</math> of 30</p>	<p>I am 25</p> <p>You are <math>\frac{3}{4}</math> of 120</p>

## Follow Me Cards

I am 90  You are 10% of 36	I am 3.6  You are $50.08 \div 10$	I am 5.08  You are $\frac{1}{2}$ of 450
I am 225  You are a fraction equivalent to $\frac{3}{8}$	I am $\frac{6}{16}$  You are $43.5 \div 10$	I am 4.35  You are 5% of 50
I am 2.5  You are $\frac{2}{3}$ of 33	I am 22  You are 40% of 80	I am 32  You are 30% of 60
I am 18  You are $\frac{3}{4}$ of 88	I am 66  You are $\frac{1}{8}$ of 1.6	I am 0.2  You are $10.5 \div 10$

# **Mental Mathematics Test Questions**

## **5-Second Questions**

### **A. Money**

- How many fifty-pence pieces in four pounds?
- How many twenty-pence pieces in three pounds?
- How many twenty-pence pieces in one pound eighty?
- How many five-pence pieces in two pounds?
- How many five-pence pieces in ninety pence?
- How many ten-pence pieces in three pounds sixty?
- How many ten-pence pieces in five pounds ninety?
- How many two-pence pieces in one pound?
- How many two-pence pieces in eighty pence?
- How many two-pence pieces in one pound forty?

### **B. Addition and Subtraction**

- Add seventy to one hundred and ninety.
- Subtract thirty from one hundred and ten.
- Add eighty to two hundred and fifty.
- Subtract forty from two hundred and twenty.
- Add ninety to three hundred and twenty.
- Subtract fifty from five hundred and forty.
- Add fifty to two hundred and seventy.
- Subtract seventy from one hundred and thirty.
- Add sixty to four hundred and forty.
- Subtract ninety from one thousand.

### **C. Doubling and Halving**

- Double fifty-five.
- Halve thirty-six.
- Double forty-seven.
- Halve seventy-two.
- Double thirty-eight.
- Halve fifty-four.
- Double sixty-five.
- Halve ninety.
- Double seventy-six.
- Halve fifty-eight.

## Unit 1 Year 6 (Summer Term)

### 5-Second Questions cont.

#### D. Multiplication and Division

- Multiply eight by seven.
- Multiply twenty by forty.
- How many sixes are there in one hundred and eighty?
- What is thirty multiplied by seven?
- What is twelve point four divided by ten?
- Write down the product of six and nine.
- What is nought point five five divided by ten?
- Multiply four point three two by ten.
- Divide twenty-one by seven.
- What is zero point eight two multiplied by ten?
- How many eights are there in three hundred and twenty?
- Multiply six by nine.
- Divide four hundred and seventy by ten.
- Write down the product of fifteen and eight.

#### E. Time

- How would quarter to five in the afternoon be shown on a twenty-four-hour digital clock?
- Represent fifteen-twenty using am and pm in twelve-hour time. Write down half-past two in the afternoon in twenty-four-hour time.
- What is twenty-thirty as twelve-hour time?
- How is twenty minutes to eight in the evening represented in twenty-four-hour time?
- How is eighteen-fifty represented in twelve-hour time?
- Write two hours past noon in twenty-four hour time.
- Write three hours past midnight in twelve-hour time.
- The last bus is one hour before midnight, write this in twenty-four-hour time.
- The first train of the day is half-an-hour after midnight, write this in twelve-hour time.

#### F. Rounding

- Write three hundred and fifty-nine to the nearest ten.
- Write eighty-seven point two to the nearest whole number.
- What is four thousand, seven hundred and forty to the nearest hundred?
- What is ten point eight four to the nearest whole number?
- Write five hundred and nine to the nearest hundred.
- Write fifty-three point one nine to the nearest whole number.



## Unit 1 Year 6 (Summer Term)

### 5-Second Questions cont.

#### G. Measures

- How many metres in two point four kilometres?
- How many grams in six point five kilograms?
- How many centilitres in four litres?
- Write down the number of centimetres in five and a half metres.
- Write down the number of centilitres in one and a quarter litres.
- Write down the number of grams in three-quarters of a kilogram.
- How many millimetres in two metres?
- How many centilitres in ten litres?
- Write three thousand centigrams in grams.
- Write two thousand five hundred centilitres in litres.
- Write six thousand millimetres in metres.
- Write four thousand grams in kilograms.
- Write one thousand two hundred and fifty metres in kilometres.
- Write two kilometres in centimetres.
- Write three point five litres in millilitres.
- Write zero point six kilograms in grams.

#### H. Fractions and Decimals

- What is nine-tenths as a decimal?
- Write one and a half as a decimal.
- Write two and a quarter as a decimal.
- Write ten and three quarters as a decimal.
- What is zero point seven as a fraction?
- Write two point three as a fraction.
- Write zero point three nine as a fraction.
- What is zero point nought seven as a fraction?
- What is five and one tenth as a decimal?
- What is thirteen hundredths as a decimal?
- What is forty-six hundredths as a decimal?
- What is one and one hundredth as a decimal?

#### I. Miscellaneous

- Sandra buys a magazine for one pound sixty-five. She pays with a two pound coin, how much change does she get?
- How many minutes in half-an-hour?
- How much does a fifty pence, a twenty pence and a ten pence coin come to?
- How many days in six weeks?
- How many minutes between three o'clock and a quarter to four?
- If a CD costs thirteen pounds ninety-nine, how much change from a twenty pound note?

## Unit 1 Year 6 (Summer Term)

### 5-Second Questions cont.

- Sheena buys chocolate bars costing ninety-nine pence each. How much must she pay for five bars of chocolate?
- Zak cycles for two and a half hours at a speed twelve miles per hour. How far does he travel?
- Sharing ten pounds equally between four people, how much does each get?
- How many sides has a pentagon?
- How many vertices has an octagon?
- The angles of a triangle sum to how many degrees?
- The angles about a point sum to how many degrees?
- It is two degrees Celsius. What is the temperature if it falls four degrees?

### 10-Second Questions

#### A. Addition

- Add thirty-six and forty-four.
- What is the sum of fifty-seven and nineteen?
- Add five hundred and seven hundred.
- What is the sum of ninety and three hundred and sixty?
- What is two point six added to three point six?
- Sum one and a quarter and two and a quarter.
- What is the sum of two hundred and sixty and three hundred and forty?
- Sum three and a half and five and a half.
- What is the sum of four point four and six point six?
- Add two and three quarters to three and one quarter.
- Add together twenty, thirty and forty.
- Write down the sum of seven point four and nought point nine.

#### B. Subtraction

- Calculate the difference between eight hundred and one hundred and sixty.
- What is one hundred subtract fifty-five?
- Write down two hundred minus eleven.
- Write down the difference between four hundred and twenty and three hundred and fifty.
- Subtract seventy-six from five hundred.
- Subtract zero point eight from three.
- Calculate the difference between ten and two point five.
- Write down four point five minus one point nine.
- What is one thousand subtract six hundred and fifty?
- Write down eighty-six minus sixty-eight.
- Take thirty-nine from one thousand.
- Work out six hundred subtract three hundred and five.

### 10-Second Questions cont.

#### C. Multiplication

- What is twice four hundred and seventy?
- What is double six point five?
- What is thirty-two multiplied by eight?
- What is six multiplied by two point five?
- Write down eight multiplied by twenty-five.
- Write down double four hundred and sixty.
- Write down the product of forty-one and nine.
- Multiply four by five point five.
- Write down twice six point six.
- What is the product of four and three point four?
- Multiply twenty-five by twenty-four.
- Write down twenty-three multiplied by eleven.
- Write down the product of nineteen and six.
- What is the product of ninety-nine and eight?

#### D. Division

- What is two hundred and ten divided by five?
- Calculate three hundred and sixty divided by four.
- What is half of five hundred and forty?
- What is a quarter of six hundred and twelve?
- Calculate three hundred and twelve divided by six.
- What is two hundred and sixteen divided by eight?
- Three times a number is two hundred and one. What is the number?
- Five times a number is four hundred and ten. What is the number?
- Four times a number is one hundred and eight. What is the number?
- What is one-quarter of one thousand?
- What is three-quarters of six hundred?
- What is three-quarters of one hundred and twenty?

#### E. Time

- My watch shows three-forty pm. What time will it show in forty minutes?
- Anna's alarm is set for seven-thirty am. She needs to get up forty-five minutes earlier. What time must her alarm be set for?
- How many minutes in one and a quarter hours?
- How many minutes in four and a half hours?
- A train is fifty-five minutes late. It was to arrive at eight-twenty. At what time will it arrive?
- Alan's train leaves at five-ten pm. He arrives at the station fifteen minutes early. What time does he arrive at the station?
- It takes Lim twenty-five minutes to walk home from school. He leaves school at three-forty. When does he arrive home?
- My clock shows a quarter to seven. What time will it show in thirty-five minutes?

### 10-Second Questions cont.

#### F. Measures and Rounding

- What is four hundred and sixty-five centilitres to the nearest litre?
- What is three hundred and twenty-four centimetres to the nearest metre?
- What is five thousand and ninety grams to the nearest kilogram?
- An equilateral triangle has perimeter of forty-five centimetres. How long is one of its sides?
- Each side of a hexagon is twenty centimetres, what is the perimeter of the hexagon?
- A regular pentagon has perimeter of one hundred and twenty centimetres. How long is one of its sides?
- Each side of a square playground is eighteen metres. What is the perimeter of the playground?
- Is the approximate weight of a calculator: one gram, ten grams, one hundred grams, one kilogram or ten kilograms?
- Is the approximate length of a calculator: five centimetres, fifteen centimetres, fifty centimetres, one hundred centimetres or five hundred centimetres?
- Is the approximate capacity of a plastic drinking beaker: two millilitres, twenty millilitres, two hundred millilitres or two thousand millilitres?

#### G. Fractions, decimals, percentages

- Write down the decimal equivalent of three-fifths.
- What is zero point two as a fraction in fifths?
- Write down the decimal equivalent of three-quarters.
- What is zero point four as a fraction in fifths?
- What is four percent of six hundred?
- What is ten percent of seventy-five pounds?
- What is thirty percent of three hundred?
- Write down a tenths fraction equivalent to seventy percent.
- Write down a tenths fraction equivalent to thirty percent.
- Write down a decimal equivalent to twenty-five percent.

#### H. Visualisation

- Imagine a square-based pyramid. How many faces does it have?
- Imagine a triangular-based pyramid. How many vertices does it have?
- Imagine a triangular prism. How many edges does it have?
- Imagine a cube. How many edges does it have?
- Imagine a pentagonal prism. How many faces does it have?
- Imagine a hexagonal-based pyramid. How many edges does it have?
- Imagine a cuboid. How many vertices does it have?
- Imagine an octagonal prism. How many faces does it have?

### 10-Second Questions cont.

#### I. Miscellaneous

- Susan buys a newspaper for ninety pence, and pays with a ten pound note. How much change does she get?
- Abdul buys a train ticket for one pound seventy-five. He pays with a five pound note. How much change does he get?
- A sequence of numbers follows the rule double the last number and add one. If twenty-three is a number in the sequence, what is the next number?
- Lucy halves a number. She then thirds her answer to get seven. What number did she start with?
- Dave doubles a number. He adds five to his answer to get nineteen. What number did he start with?
- Imagine an isosceles triangle. The two equal angles are each seventy degrees. What size is the third angle?
- Write down the multiple of twelve between forty and fifty.
- A number has factors two, three and five. What is the smallest number this could be?
- Imagine a triangular prism sitting on one of its rectangular faces. How many other faces are there?
- Sarah counts from twenty-four backwards in sevens. She stops when she reaches the smallest positive number she can. What is this number?

### 15-Second Questions

#### Miscellaneous

- Add together sixteen, twenty-five and nine.
- Add together thirty-seven, twenty-six and fifty-two.
- What number is half-way between thirty-six and fifty?
- What number is half-way between ten and forty-eight?
- What is the remainder when seventy-seven is divided by five?
- What is the remainder when one hundred and twenty-eight is divided by six?
- Which number is a factor of forty: five, six, seven, twelve or eighty?
- Which number is a multiple of fifteen: five hundred, six hundred, seven hundred or eight hundred?
- A sale has twenty-five per cent off all prices. A coat costs sixty pounds in the sale. How much was it before the sale?
- In a sale Bennie buys a CD for six pounds fifty. There was fifty percent off all prices. How much did the CD cost before the sale?
- A right-angled triangle has an angle of sixty-five degrees. What size is the other acute angle?
- An isosceles triangle has an angle of one hundred and ten degrees. What size are the other two angles?

## 15-Second Questions cont.

- Write down the smallest number of zero point three five, three point nought five, nought point five three or nought point nought three five.
- Multiply eighty by fifty.
- Multiply seventy by forty.
- Divide nine hundred by forty-five.
- Divide one thousand five hundred by two hundred and fifty.
- Calculate four minus three point five nine.
- Calculate ten minus five point six five.
- How much smaller is one point nine than three point four?
- Tickets to a concert are: adults six pounds fifty, children four pounds. What is the total cost of two adults and one child?
- A fair ride costs eighty pence per adult, sixty pence per child. What is the total cost of three children and one adult?
- Six eggs cost eighty pence. What will a dozen eggs cost?
- A bag of five apples costs seventy-five pence. What will twenty apples cost?
- A packet of four chocolate biscuits costs ninety-nine pence. How much do twelve biscuits cost?
- Three cans of cola cost one pound eighty. What will five cans cost?
- Is the calculation  $5.9 \times 3.8$  approximately: two, ten, twenty-five or forty?
- Is the calculation  $19.7 \div 4.2$  approximately: eighty, fifteen, five or two?
- A bag has exactly three times as many red bricks as blue bricks. There are eighteen blue bricks. How many red bricks are there?
- A packet of sweets has exactly four times the number of green sweets as white sweets. There are twenty-four green sweets. How many white sweets are there?
- A school has exactly twice the number of girls as boys. There are one hundred and twenty boys. How many boys and girls are there?
- A bus leaves the church at ten fifty-three. It arrives at the Post Office at eleven sixteen. How long was the journey?
- There are three angles on a straight line. Two of the angles are forty degrees and seventy degrees. What is the third angle?
- There are three angles about a point. Two of the angles are two hundred and ten degrees and eight degrees. What is the third angle?

## Related Key Stage 2 National test questions:

### 1996 Test A

1

Write in the **missing** numbers.



$$4 \times 20 = \boxed{\phantom{00}}$$

$$\boxed{\phantom{00}} + 79 = 91$$

$$60 - \boxed{\phantom{00}} = 26$$

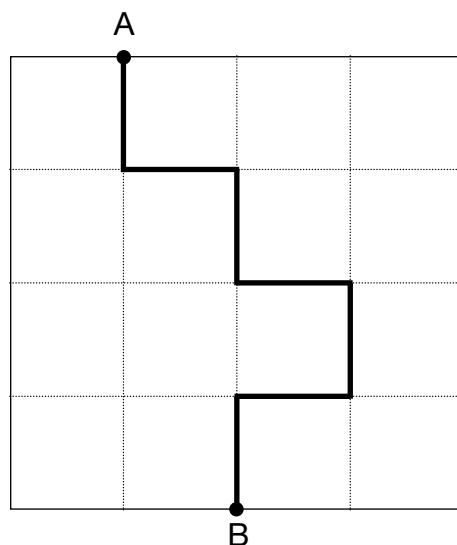
1

3 marks

8

A line starts at **A** and goes along the dotted lines to **B**.

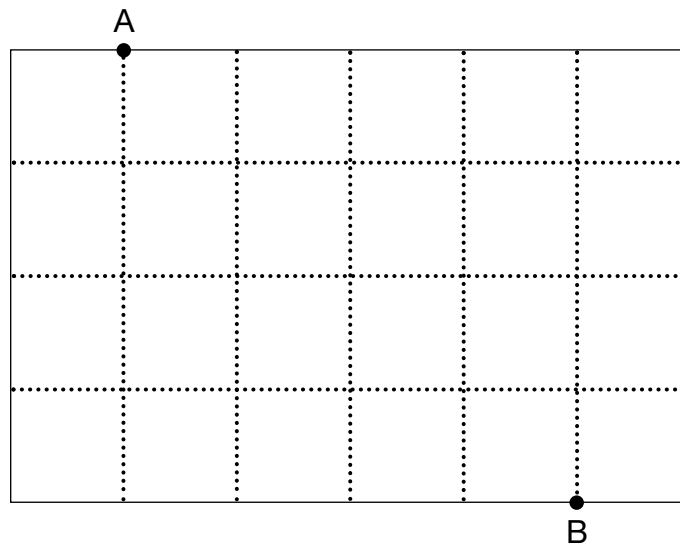
It divides the area of the grid into **halves**.



Total

# 1996 Test A cont.

Divide the area of the grid below into **halves**. Start at **A** and go along the dotted lines to **B**.



8

1 mark

Total





## Unit 1 Year 6 (Summer Term)

### 1996 Test B

1

Write what the **missing** numbers could be.



$$\boxed{\phantom{00}} - \boxed{\phantom{00}} = 77$$

$$\boxed{\phantom{00}} \times \boxed{\phantom{00}} = 54$$

1

2 marks

5

Write in the missing **three-digit** number.



$$\boxed{\phantom{00}}\boxed{\phantom{00}}\boxed{\phantom{00}} \div 10 = 20$$

5

1 mark

18

Here are some number cards.



Use **two** of the cards to make a fraction which is **less than**  $\frac{1}{2}$ .




How much **less than 1** is your fraction?



18

1 mark

Total

1997 Test A

1

Write these numbers in **order of size**.

456

299

901

472

575



smallest

1

1 mark

16

Write what the **four missing digits** could be.



<input type="text"/>	<input type="text"/>	<input type="text"/>
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÷ 10 =

3	<input type="text"/>
---	----------------------

16

1 mark

Total

## Unit 1 Year 6 (Summer Term)

### 1997 Test B

5

Write what the **missing** numbers could be.



is an **odd** number, and **is greater than 15**.

is a number **greater than 100** and can be **divided by 4**, with **no remainder**.

5

2 marks

9

Write what the **two missing** numbers could be.



÷

= 8

9

1 mark

Write what the **two missing** numbers could be.



$$(4 + \boxed{\phantom{00}}) \times \boxed{\phantom{00}} = 100$$

9

1 mark

Write the missing number.



$$30 - 16 = 9 + \boxed{\phantom{00}}$$

9

1 mark

Total

## 1998 Test A

14

Here is a grid made of squares.

Shade 10% of this grid.






14

1 mark

15

Draw **one** line to join **two fractions** which have the **same value**.

	$\frac{4}{7}$	
$\frac{1}{2}$		$\frac{2}{8}$
$\frac{2}{5}$		$\frac{1}{3}$
	$\frac{1}{4}$	



15

1 mark

Total

## Unit 1 Year 6 (Summer Term)

### 1998 Test B

20

Calculate 24% of 525



20

1 mark

Total

19

Calculate  $\frac{7}{8}$  of 5000



19

1 mark

Total

## Unit 1 Year 6 (Summer Term)

### 2000 Test A

13

Calculate  $\frac{3}{4}$  of 840



13

1 mark

18

Circle two different numbers which **multiply** together to make **1 million**.



10

100

1000

10 000

100 000

18

1 mark

Total

## Unit 1 Year 6 (Summer Term)

### 2000 Test B

2

Circle the number which is **nearest in value to 750**.



570

699

810

852

1050

2

1 mark

16

Calculate **60%** of **765**.



16

1 mark

Total



2001    Test A

5

Circle the number **nearest to 1000**.



1060    1049    1100    960    899

5

1 mark

8

Put a tick (✓) in **each row** to complete this table.

One has been done for you.



	greater than $\frac{1}{2}$	less than $\frac{1}{2}$
0.9	✓	
0.06		
$\frac{11}{20}$		
0.21		

8

2 marks

2001 Test A cont.

19

Complete these fractions to make each equivalent to  $\frac{3}{5}$ .



10

20

12

24

Calculate 15% of 460.



19

1 mark

24

1 mark

Total

2001 Test B

2

Write in the **missing** number.



8 ×

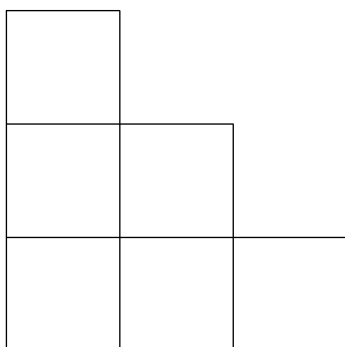
= 400

2

1 mark

12

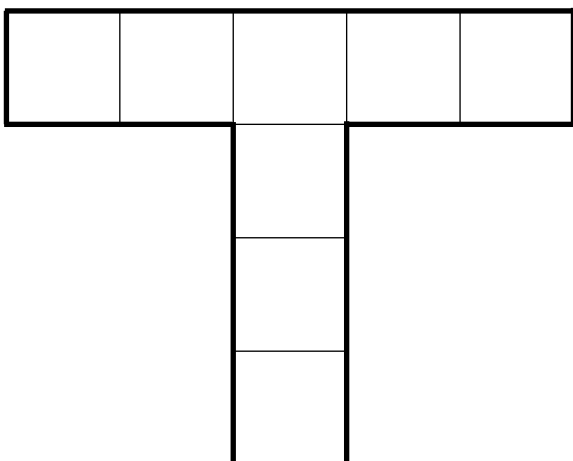
Shade **one third** of this shape.



12

1 mark

Shade **one quarter** of this shape.



12

1 mark

Total

2001 Test B cont.

14

Match each box to the correct number.

One has been done for you.



$\frac{1}{2}$  of 30

$\frac{1}{3}$  of 75

$\frac{1}{5}$  of 150

45

40

35

30

25

20

15

14

1 mark

24

1 mark

24

Calculate  $\frac{5}{12}$  of 378.