

Unit 1

Place value

Three daily lessons

National
Numeracy Strategy

Year 6
Spring term

Unit Objectives Year 6

- Find the difference between a positive and a negative integer, or two negative integers, in the context such as temperature or a number line, and order a set of positive and negative integers.
- **Order a mixed set of numbers** or measurements **with up to 3 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 nearest whole number.
- Develop calculator skills and use a calculator effectively.

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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
- OHP calculator
- Calculators
- Counting stick
- Related Key Stage 2 national test questions

Year 5

Link Objectives

Year 7

- **Order a given set of positive and negative integers.** Calculate a temperature rise or fall across 0°C.
- Order a set of numbers or measurements with the same number of decimal places.
- Use vocabulary of estimation and approximation.
- Round any integer up to 10 000 to the nearest 10, 100, or 1000.
- **Round a number with one or two decimal places to the nearest integer.**

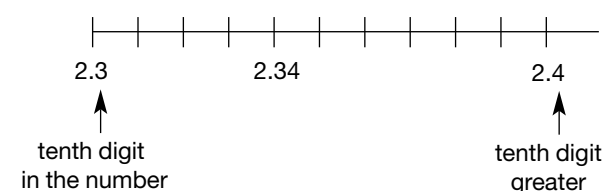

- Understand negative numbers as positions on a number line; order, add and subtract positive and negative integers in context.
- Compare and order decimals in different contexts; know that when comparing measurements they must be in the same units.
- Understand and use decimal notation and place value; multiply and divide integers and decimals by 10, 100, 1000 and explain the effect.
- Round positive whole numbers to the nearest 10, 100, 1000 and decimals to the nearest whole number or one decimal place.

(Key objectives in bold)

department for
education and skills

Planning sheet	Day One	Unit 1 <i>Place value</i>	Term: <i>Spring Term</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>Order positive and negative numbers.</p> <p>RESOURCES Counting stick</p>	<ul style="list-style-type: none"> Using a counting stick vertically, with your finger in the middle marking e.g. zero, ask the children to tell you what would be the positive and negative numbers either side. <div>Q What about if we counted in 2s/4s/5s/10s?</div> <ul style="list-style-type: none"> Ask the children to think of some positive and negative numbers. Each child who says a number comes out and writes it on the board. After a few numbers have been written on the board invite two children out to write them in order on the board. 	<p>Find the difference between a positive and a negative integer, or two negative integers in the context such as temperature or a number line.</p> <p>Order a set of positive and negative numbers.</p> <p>Develop calculator skills: recognise a negative number output and use the sign change key where appropriate.</p> <p>VOCABULARY positive negative</p> <p>RESOURCES OHP calculator Class set of calculators Resource sheet 1.1</p>	<ul style="list-style-type: none"> Give out the digit cards, – 6 to 6, from Resource sheet 1.1 to some children and ask them to come out and sort them into the correct order. Attach the cards to the board vertically. Ask the children lots of questions relating to temperature, e.g. <div>Q The temperature is –2°C but it rises by 3 degrees. What is the temperature now?</div> <p>Model this using the cards on the board.</p> <p>Repeat this.</p> <ul style="list-style-type: none"> Ask the children in pairs to think of temperature questions for others to solve. Ask some pairs for their questions. With an OHP calculator or with children working with calculators, demonstrate how the calculator can do $3 - 7 = -4$. Stress that children need to note where the negative sign is (on some calculators it is next to the digit, on some it is on the far left). <p>Model calculation on a number line to exemplify answer.</p> <ul style="list-style-type: none"> Explain how to use the change sign key $\boxed{+/-}$ so that they can work with negative numbers. Ask the children to investigate: <div>Q What happens when they add and subtract negative numbers on the calculator?</div>	<ul style="list-style-type: none"> Ask the children to give examples of negative numbers in real life other than temperature contexts. Examples: money – debit balance golf scores – under par football – goal differences Choose one example to demonstrate. <div>Q How is it possible to have –£100 in a bank account?</div> <div> <p>By the end of the lesson the children should be able to:</p> <ul style="list-style-type: none"> Use negative numbers in the context of temperature; Use negative numbers in other contexts; Recognise a negative number output and use the sign change key where appropriate. <p>(Refer to supplement of examples, section 6, pages 15 and 71.)</p> </div>

Planning sheet	Day Two	Unit 1 <i>Place value</i>	Term: <i>Spring Term</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>Read and write whole numbers in figures and words.</p> <p>RESOURCES OHP calculator Class set of calculators</p>	<ul style="list-style-type: none"> Using an OHP calculator or the children using their own calculator, give the children numbers to enter in the calculator. Compare the different ways of explaining this e.g. one, two, three; one hundred and twenty three; a hundred plus twenty three. Write on the board: ___ thousand ___ hundred and _____. Get children to write, in words, numbers in the spaces and to read this for other children to enter on their calculators. 	<p>Order a mixed set of numbers as measurements with up to three decimal places.</p> <p>VOCABULARY decimal point decimal places</p>	<ul style="list-style-type: none"> Ask the children to say some decimal numbers with up to two decimal places. Write them on the board. Take about six numbers and then ask the children to put them in order starting with the smallest. Ask how they decided. <div>Q (Pointing to the various digits) What is the value of this digit?</div> <ul style="list-style-type: none"> Ask for decimals relating to measurement. Repeat the above but ask the children to put them in order. Ask how they did it. Discuss decimals to three decimal places. Ask the children to tell you some. Write them on the board. Ask the children to order them. Write 0.111 on the board. Ask children to write the number 4 hundredths, 3 thousandths and 2 tenths bigger. Collect and check results. Repeat, ask children to set the problems. Use e.g. 0.947 and include smaller and bigger decimal questions crossing the boundary into units. Collect results and correct any errors and misconceptions. 	<ul style="list-style-type: none"> Write four digits on the board e.g. 5678. Put the decimal point between two digits e.g. 6 and 7 and ask children to read the resulting number. Repeat. <div> <p>By the end of the lesson the children should be able to:</p> <ul style="list-style-type: none"> Put decimals in order largest/smallest first; Respond to questions such as 'What does the digit 5 in 3.645 represent?' <p>(Refer to supplement of examples, section 6, page 29.)</p> </div>

Planning sheet	Day Three	Unit 1 <i>Place value</i>	Term: <i>Spring Term</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>Round an integer to the nearest 10, 100 or 1000.</p>	<ul style="list-style-type: none"> Present a four-digit number, e.g. 4729. Ask children in pairs to round up or down to: <ol style="list-style-type: none"> the nearest 10 the nearest 100 the nearest 1000 <p>Repeat with other four-digit numbers. Encourage children to explain their answers.</p> Use examples on p.13, Supplement of Examples Section 6 of real life situations and discuss the size of the estimation needed. 	<p>Round a number with two decimal places to the nearest tenth or nearest whole number.</p> <p>VOCABULARY round up round down nearest</p>	<ul style="list-style-type: none"> Explain that we are going to round 2.34 to the nearest tenth. We must decide whether to round down to the tenth which is part of the number, or to round up to the next tenth. Model this on a number line. <div style="text-align: center;">  </div> <p>Discuss. Explain that 2.35 would be rounded up.</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p>Q Which other numbers (with 2 decimal places) on this line would round down to 2.3? Which would round up to 2.4?</p> </div> <p>Repeat with another example which would be rounded up. Give the children four more examples to practise in pairs.</p> Now return to 2.34 and explain how to round it to the nearest whole number. We must use either the unit digit in the number, or the digit which is one more. Model on a number line: <div style="text-align: center;">  </div> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p>Q Which other numbers (with 2 decimal places) would round down to 2? up to 3?</p> </div> <p>Children practise in pairs selecting a number with two decimal places to be rounded to the nearest tenth.</p> 	<ul style="list-style-type: none"> Round these lengths to the nearest 10cm / whole metre: <div style="text-align: right;"> 45.46m 24.73m 49.08m </div> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p>Q If these were the lengths of the sides of the school field, would we need to round up or down when ordering new fences?</p> </div> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>By the end of the lesson the children should be able to:</p> <ul style="list-style-type: none"> Round any whole number to the nearest multiple of 10, 100, 1000; Round a number with two decimal places to the nearest tenth or nearest whole number. <p>(Refer supplement of examples, section 6, pages 13, 31.)</p> </div>

Digit cards

-1	-2
-3	-4
-5	-6
0	1
2	3
4	5
6	

Related Key Stage 2 national test questions:

2000 Test A

18

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



10 100 1000 10 000 100 000

18

1 mark

2001 Test B

11

Circle **two numbers** which have a **difference of 2**.



-1 -0.5 0 0.5 1 1.5

11

1 mark

2002 Test A

9

3

8

9

1

Choose **three** of these number cards to make an **even** number that is **greater than 400**.



9

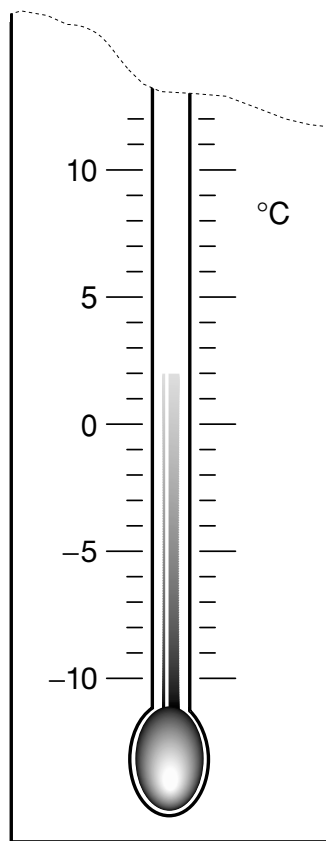
1 mark

Total

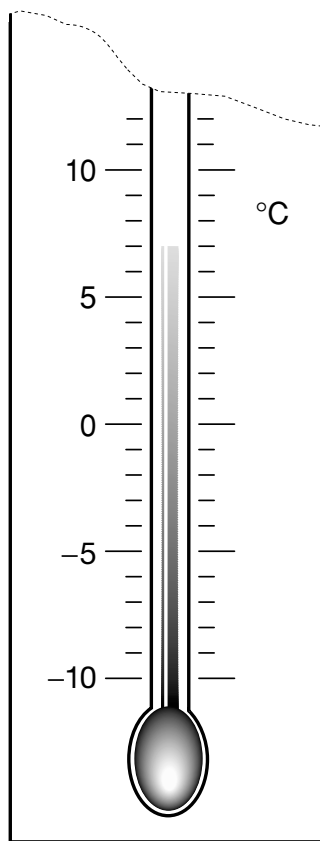
2001 Test A

8

These are the temperatures in York and Rome on a day in winter.



York



Rome

How many degrees **colder** is it in York than in Rome?


 °C

8a

1 mark

On another day, the temperature in York is **4°C**

Rome is **7 degrees colder** than York.

What is the temperature in **Rome**?


 °C

8b

1 mark

Total

2002 Test B

16

Use a calculator to work out $49.3 \times (2.06 + 8.5)$



16

1 mark

18

Circle the number **closest** in value to **0.1**



0.01 0.05 0.11 0.2 0.9

18

1 mark

2002 Mental Arithmetic

2

Write in figures the number six thousand and fifty-eight.

18

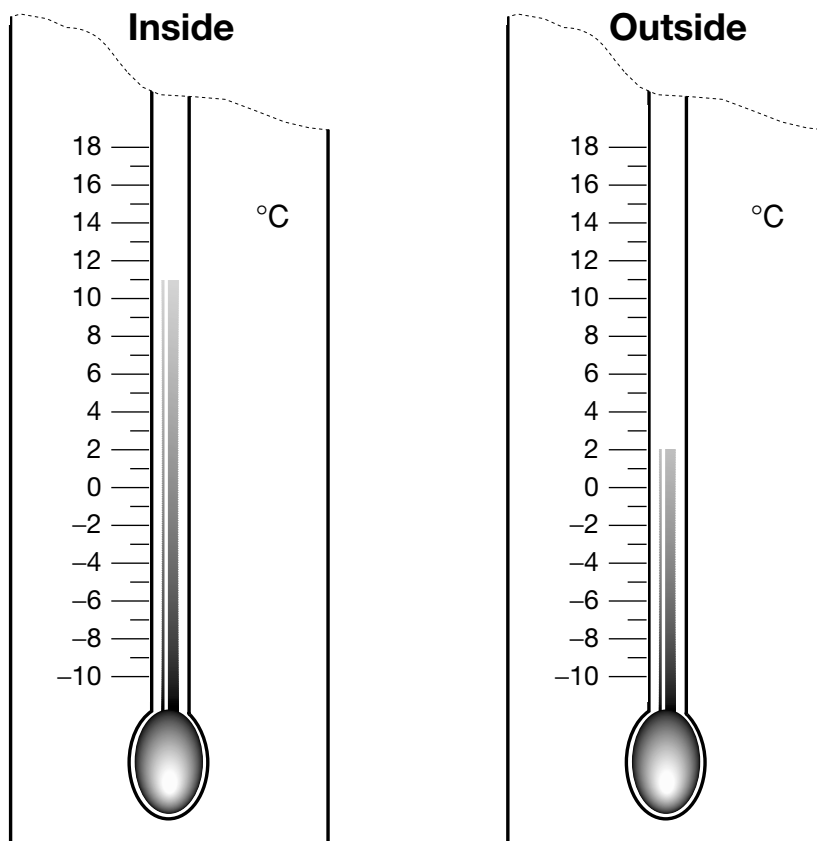
1 mark

Total

2002 Test B

8

Two thermometers show the temperature inside and outside a greenhouse on a day in January.



How many degrees **warmer** was it inside the greenhouse than outside?


 °C

8a

1 mark

Later the temperatures were

inside	outside
-1°C	-8°C

What is the difference between these two temperatures?


 °C

8b

1 mark

Total