

Unit 1
Place value

Three daily lessons

National
Numeracy Strategy

Year 4
Autumn term

Unit Objectives
Year 4

- Read and write whole numbers to at least 10 000 in figures and words, and know what each digit represents. Page 2
- Read and write the vocabulary of estimation and approximation. Make and justify estimates up to about 250, and estimate a proportion. Page 10
- Recognise negative numbers in context (e.g. on a number line, temperature scale). Page 14

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/OHT 1.1
- Resource sheet 1.2/OHT 1.2
- Resource sheet 1.3/OHT 1.3
- Activity sheet 1.1
- Activity sheet 1.2
- Activity sheet 1.3
- Activity sheet 1.4
- Transparent pots of counters or dried beans
- Large digit cards
- Place value cards
- Class set of calculators
- Marker pens and chalk
- ICT flash animation
- Timer
- Thermometer

Link Objectives

Year 3

Year 5

- **Read and write whole numbers to at least 1000** in figures and words.
 - **Know what each digit represents** and partition three-digit numbers into a multiple of 100, a multiple of 10 and ones (HTU).
 - Read and begin to write the vocabulary of estimation and approximation.
 - Give a sensible estimate of up to about 100 objects.
 - **Order whole numbers to at least 1000** and position them on a number line.
- Read and write whole numbers in figures and words, and know what each digit represents.
 - Use the vocabulary of estimation and approximation.
 - Make and justify estimates of large numbers, and estimate simple proportions such as one third, seven tenths.
 - **Order a given set of positive and negative integers** (e.g. on a number line, on a temperature scale).
 - Calculate a temperature rise or fall across 0°C.

(Key objectives in bold)

Planning sheet	Day One	Unit 1 <i>Place value</i>	Term: <i>Autumn</i>	Year Group: 4
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 to at least 10 000 in figures and words, and know that each digit represents.</p> <p>Partition into Th, H, T, U.</p> <p>VOCABULARY units, tens, hundreds, thousands digit</p> <p>RESOURCES Large digit cards Place value cards</p>	<ul style="list-style-type: none"> Select four children and give each a large card with a digit written on it. Ask the children to arrange themselves into the largest number, then the smallest number. Ask the class questions such as: <ul style="list-style-type: none"> Q What is the number they have made? Q Is this the largest/smallest number they can make? Why? Which digit helps you to decide? Ask the children to write the number 7585 in the air in front of them and keep it in their heads. Ask the class questions such as: <ul style="list-style-type: none"> Q Which is the units digit, the thousands digit? Q If you swap these digits around, what numbers can you see? Q What other numbers could you make using the four digits? Q What is the largest/smallest number you can see? Use place value cards to make a four-digit number such as 5243. Show the number to the children and get them to read it aloud. Change the number e.g. to 5143. Ask the class: <ul style="list-style-type: none"> Q What number is this? Q Is it a larger or smaller number? Q What is the value of the digit that was changed? <p>Show 5243 again and change another digit. Repeat the activity with other four-digit numbers.</p>	<p>Read and write whole numbers to at least 10 000 in figures and words and know what each digit represents.</p> <p>Partition into Th, H, T, U.</p> <p>Begin to add/subtract 1, 10, 100, or 1000.</p> <p>VOCABULARY one-digit, two-digit, three-digit and four-digit numbers place value partition 1000 more/less than.</p> <p>RESOURCES Resource sheet 1.1/OHT 1.1 Place value cards Marker pens or chalk Activity sheet 1.1 Digit cards 0-9</p>	<ul style="list-style-type: none"> Give out copies of Resource sheet 1.1/OHT 1.1 and display on an OHP or as a large chart on the board. Ask questions such as: <ul style="list-style-type: none"> Q What do you notice about the numbers? Q Are the numbers arranged in a special way? Q What patterns can you see? Point to 9000, 400, 60, 5 on the chart and get children to read them aloud – nine thousand, four hundred, sixty, five. With place value cards make the number 9465 and get children to read the number aloud. Use the cards to check that children can partition the number and say what each digit represents. Show the class how to write the number in words. Repeat using other numbers from the grid. <p>Write some four-digit numbers on the board. Tell children they are to write each four-digit number in their books, partition it using Resource sheet 1.1 and then write the number in words. Work through an example. Explain that when they have finished they should read their numbers to their partner.</p> Review the children's work and correct any misinterpretations. Show the class four one-digit cards 4, 8, 1 and 9. Give each of four children a marker pen or chalk and get them to write on the board and say aloud a four-digit number they can make from these numbers. <p>The class checks that these are said correctly before four more children come to the board. Using the numbers on the board ask the children:</p> <ul style="list-style-type: none"> Q Which number is largest/smallest? Q Which numbers have the most hundreds/tens? Using 0-9 digit cards ask the children to choose four digits and make largest/smallest numbers. <p>Establish for largest number the largest digit is to go in the thousands column etc.</p> 	<ul style="list-style-type: none"> Tell the children you have a four-digit number in your head. You are going to give them clues to help them to guess it quickly. Give clues such as 'it is 1000 more than 4692' or 'it is 100 less than 5792'. Get some children to think of a number and give the class clues. HOMEWORK – Give out Activity sheet 1.1 and explain how the children are to complete it. <p>By the end of the lesson children should be able to</p> <ul style="list-style-type: none"> Write four-digit numbers in figures and words; Partition numbers into thousands, hundreds, tens and units and know what each digit in a four-digit number represents; Identify numbers 1000, 100, 10 and 1 more and less. <p>(Refer to supplement of examples, section 6, page 2, 4.)</p>

Planning sheet	Day Two	Unit 1 <i>Place value</i>	Term: <i>Autumn</i>	Year Group: 4
Oral and Mental		Main Teaching		Plenary
Objectives and Vocabulary	Teaching Activities	Objectives and Vocabulary	Teaching Activities	Teaching Activities / Focus Questions
<p>Use the vocabulary of estimation and approximation.</p> <p>Make and justify estimates of large numbers.</p> <p>VOCABULARY estimate guess approximate</p>	<ul style="list-style-type: none"> Ask the children to close their eyes and imagine starting at 900 and walking half way along a line towards 1000. What number will they be standing on? Repeat using different intervals. <p>On the board or OHP draw a line such as:</p>  <p>Place an arrow at a point on the number line; in pairs get children to estimate the number marked by an arrow. Ask children to explain their strategies. Emphasise strategies such as identifying the midpoint, and splitting the interval up into steps.</p> <p>Repeat with different number lines, decreasing and increasing the range. For example</p>  <ul style="list-style-type: none"> Emphasise the language of approximation and summarise the children's strategies such as: identifying the midpoint value, using steps and multiples of 10 and 100 to inform their estimates. 	<p>Read and write the vocabulary of estimation and approximation.</p> <p>Make and justify estimates up to about 250 and estimate a proportion.</p> <p>VOCABULARY estimate, approximate predict, nearest proportion</p> <p>RESOURCES Timer Transparent pots of counters or Dried beans Activity sheet 1.2 Activity sheet 1.3</p>	<ul style="list-style-type: none"> Review the children's homework. Remind them that they were using large numbers. Ask them to estimate the number of times they breathe each day or how many bricks there are in the school building. Explain that these are large numbers; they are now going to estimate smaller numbers. <p>Ask the children to predict how many triangles they could draw in 1 minute using a pencil and ruler. Time 1 minute while the children draw their triangles. With a partner, think of 2 different ways of estimating the number of triangles on the page. Check that children understand how to use strategies such as how many in a row and how many rows, how many in half or quarter of the page, to help them to arrive at an estimate. Get children to test one of their methods on their partner's drawings and see how close they were to the real number of triangles. Ask:</p> <p>Q How did your results match your predictions?</p> <p>Q Were your estimates too big or too small?</p> <p>Draw up a list of successful strategies the children used.</p> <ul style="list-style-type: none"> Give groups of children a transparent pot of counters or dried beans. Ask children whether they can use the same strategies for estimating the triangles to estimate the counters/beans. Discuss alternative strategies and get children to estimate and share these with their group. Discuss the range of estimates and their methods. Ask the class: <p>Q What strategies worked best?</p> <p>Q How can we get better at estimating?</p> <p>Q What estimates do we accept?</p> <p>Q Which estimates are sensible? Why?</p> <ul style="list-style-type: none"> Give out the Activity Sheet 1.2. Remind children to think carefully about how they can make suitable approximation in order to estimate. Take feedback reinforcing appropriate strategies. <p>Some possible strategies might be:</p> <p>Counting dots in a quarter of the rectangle and multiplying by 4.</p> <p>Counting along the top (approximately 5 dots) and counting as in the side (approximately 10) and multiplying them.</p> <p>Grouping in approximate groups of 10.</p> <p>Children to use these strategies when estimating on Activity Sheet 1.3.</p> <p>Q Which were easiest to estimate? Why?</p>	<ul style="list-style-type: none"> Show the children a jar of counters or beans approximately half full. Tell them when full the jar held 100. Ask: <p>Q How many are left? What proportion is this?</p> <p>Q What if the jar held 50 when full?</p> <ul style="list-style-type: none"> Repeat with the jar about one-third full, one-fifth full etc. Collect the children's estimates and discuss their methods. Summarise key skills of estimation and approximation. <p>By the end of the lesson children should know how to:</p> <ul style="list-style-type: none"> Estimate and explain the position of a point on a number line; Select and explain strategies for estimating up to 250 objects; Estimate and explain a simple proportion e.g. the proportion of sweets left in a pot. <p>(Refer to supplement of examples, section 6, page 10.)</p>

Planning sheet	Day Three	Unit 1 <i>Place value</i>	Term: <i>Autumn</i>	Year Group: 4
Oral and Mental		Main Teaching		Plenary
Objectives and Vocabulary	Teaching Activities	Objectives and Vocabulary	Teaching Activities	Teaching Activities / Focus Questions
<p>Count back in repeated steps of 10.</p> <p>Counting back in 1s through zero.</p> <p>VOCABULARY number line, zero, negative one, negative two...</p> <p>RESOURCES Make cards with integers -3 to 3</p>	<ul style="list-style-type: none"> Write some three-digit starter numbers on the board, e.g. 163, 185, 504, 309. Start with 163, get the class to count back in 10s to 3. Ask the children if they were to count back in 10s from the other starter numbers, how close will they get to 0. Check for 185. Ask whether they can give other three-digit starting numbers that will get closer to 0 and why. <p>Ask the class:</p> <div data-bbox="320 568 741 612" style="border: 1px solid black; padding: 2px;">Q How can we count back through 0?</div> <p>Use a number line to illustrate counting back from 10 through zero to -10. Encourage children to count back as you mark the numbers on the number line using the vocabulary negative one etc.</p> <ul style="list-style-type: none"> Shuffle cards with integers 3 to -3 on them and invite 7 children to come to the front and arrange themselves in order. Get the class to count from the 3 back to -3 and forwards. With the whole class, use the number line to practise counting forwards and backwards in 1s and 2s. <p>Ask the children to close their eyes and visualise the number line from -5 to 5. Ask:</p> <div data-bbox="320 1066 741 1110" style="border: 1px solid black; padding: 2px;">Q What number is before 5, 0, -3?</div> <div data-bbox="320 1129 741 1174" style="border: 1px solid black; padding: 2px;">Q What number is after 5, 0, -3?</div> <div data-bbox="320 1193 741 1238" style="border: 1px solid black; padding: 2px;">Q What number lies between -5 and -3?</div>	<p>Recognise negative numbers in context (e.g. on a number line, on a temperature scale).</p> <p>VOCABULARY integer positive negative above zero below zero</p> <p>RESOURCES Activity sheet 1.4 OHT 1.2 OHT 1.3 ICT flash animation 'Thermometer'</p>	<ul style="list-style-type: none"> Remind children of the human number line from -3 to 3 and say that this line can be extended in both directions, one way for negative numbers and the other way for positive numbers. These numbers are called the integers. Cut Activity sheet 1.4 into sets of cards. Give the children the cards with integers -15 to 5 written on them, and in pairs arrange them in order. Ask children to point to -5 and the other to point to 3. Ask class to read the integers within that range. Give practice using different ranges such as -8 to 1, -3 to 5. <p>Get the children to shuffle the cards and take 10 cards from the pack. Arrange these cards in order. Place the remaining cards face down. In turn, the children take a card and put it in the correct position with the rest. Repeat with the children taking only 6 cards from the pack at the start of the game.</p> <p>Extend the activity asking pairs to shuffle cards and remove 5 or more cards, put the remaining cards in order. They are to identify the missing integers before they look at the cards. Ask:</p> <div data-bbox="1113 743 1794 788" style="border: 1px solid black; padding: 2px;">Q What did you look for first when ordering the cards?</div> <div data-bbox="1113 807 1794 852" style="border: 1px solid black; padding: 2px;">Q Tell me a number that goes between these two integers?</div> <ul style="list-style-type: none"> Explain that negative numbers are used to tell the temperature and appear on a thermometer. Remind the class that 0°C denotes the freezing point of water. Using OHT 1.2 or display, show the class a thermometer. Point to a temperature on the thermometer and ask: <div data-bbox="1113 986 1794 1031" style="border: 1px solid black; padding: 2px;">Q What temperature does the thermometer show?</div> <p>Remind children that temperatures are said to be above and below zero. Show examples of this on the thermometer using ICT flash animation 'Thermometer' as a teaching tool. Give the children practice saying and recording temperatures -3°C, -7°C, 3°C, 0°C. Ask children to choose two temperatures above and below given temperatures for example zero and -5°C on the thermometer.</p>	<ul style="list-style-type: none"> Show the class the Winter weather OHT 1.3. Ask children to discuss in pairs what temperatures the four arrows are pointing to. <p>Take feedback, and discuss the strategies used. Check understanding by asking:</p> <div data-bbox="1830 507 2179 619" style="border: 1px solid black; padding: 2px;">Q Can you tell me two temperatures between 0°C, and -10°C? Which is closer to 0°C?</div> <p>By the end of the lesson children should be able to:</p> <ul style="list-style-type: none"> Count back through zero; Recognise and order negative numbers in the context of a number line or a temperature scale. <p>(Refer to supplement of examples, section 6, page 14.)</p>

Notes

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Point it out grid

1000	2000	3000	4000	5000	6000	7000	8000	9000
100	200	300	400	500	600	700	800	900
10	20	30	40	50	60	70	80	90
1	2	3	4	5	6	7	8	9

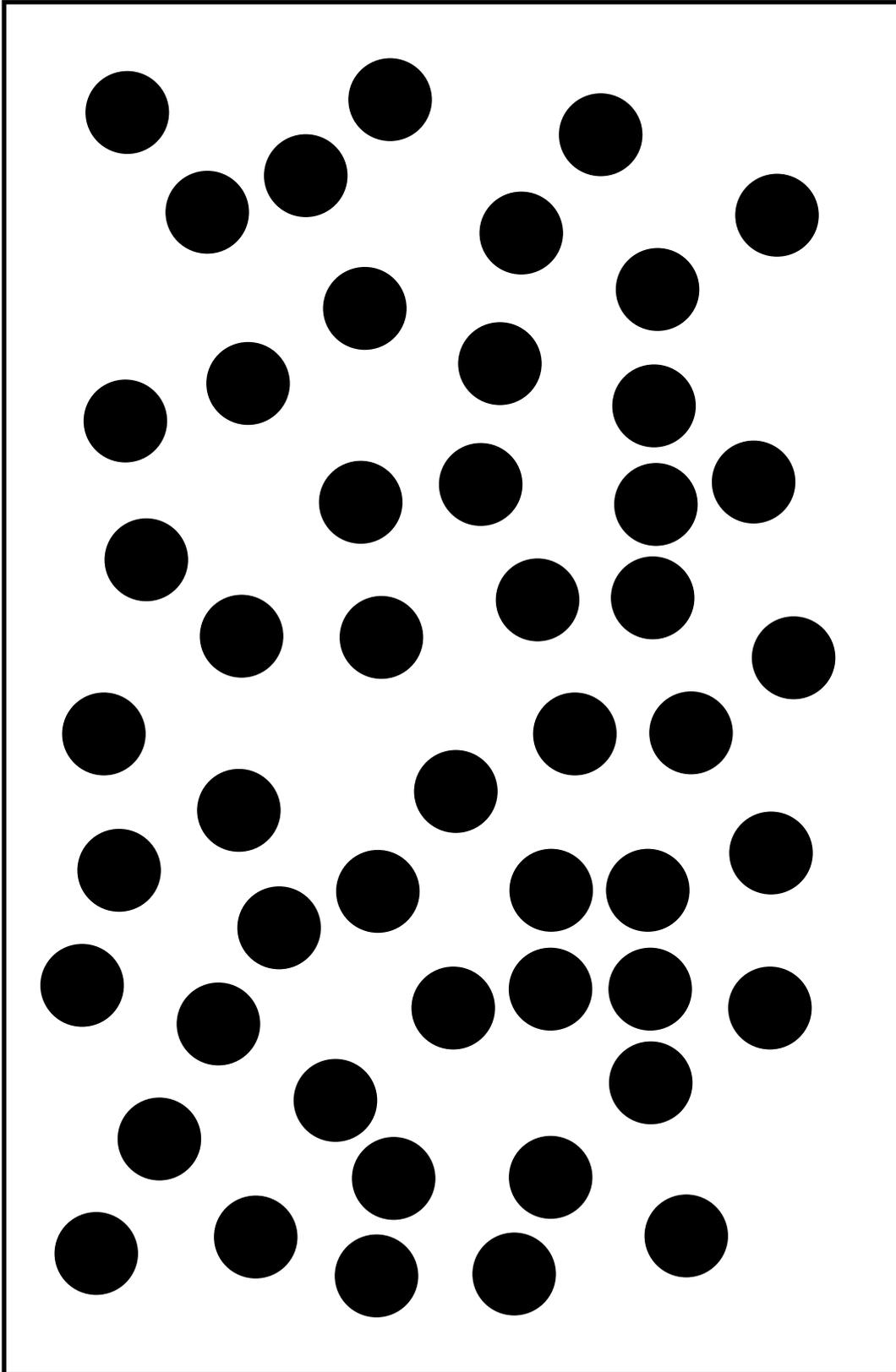
Name

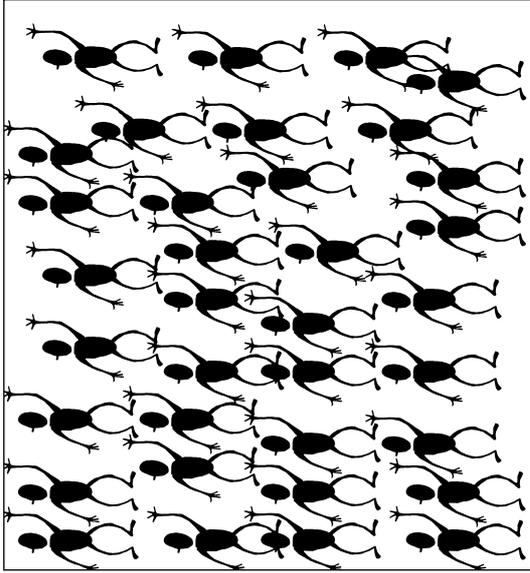
Date.....

Complete this table

-1000	-100	-10	-1	Numbers	+1	+10	+100	+1000
	6625			6725				
		4319		4329				
				1234		1244		
				4160				
		4990						
				1909				
				5634				
			3406					
				1099				

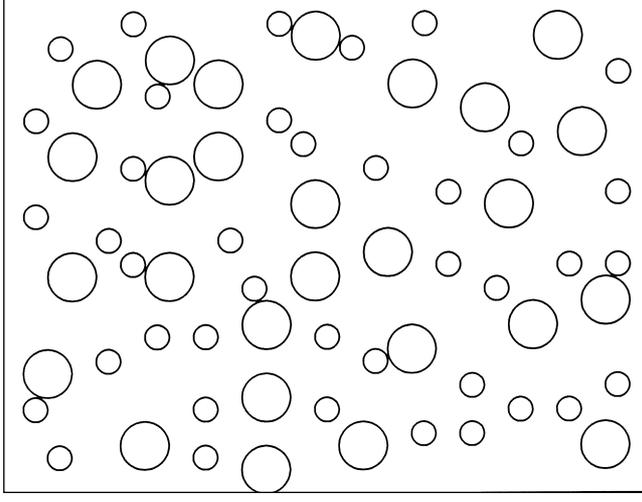
How many dots?





1)

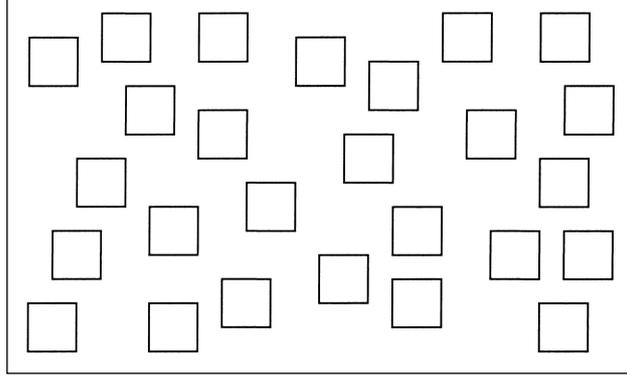
Estimate _____



2)

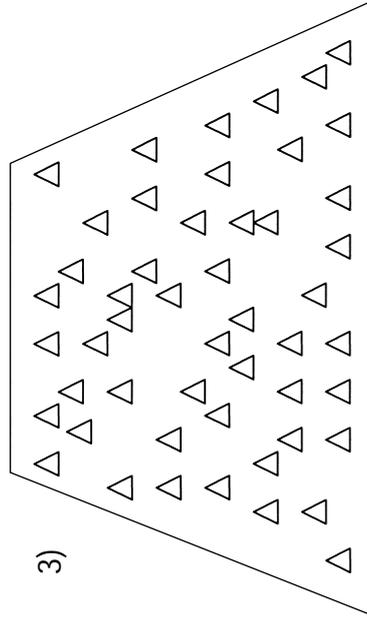
Estimate _____

What strategies did you use?



4)

Estimate _____



3)

Estimate _____

-15

-14

-13

-12

-11

-10

-9

-8

-7

-6

-5

-4

-3

-2

-1

0

1

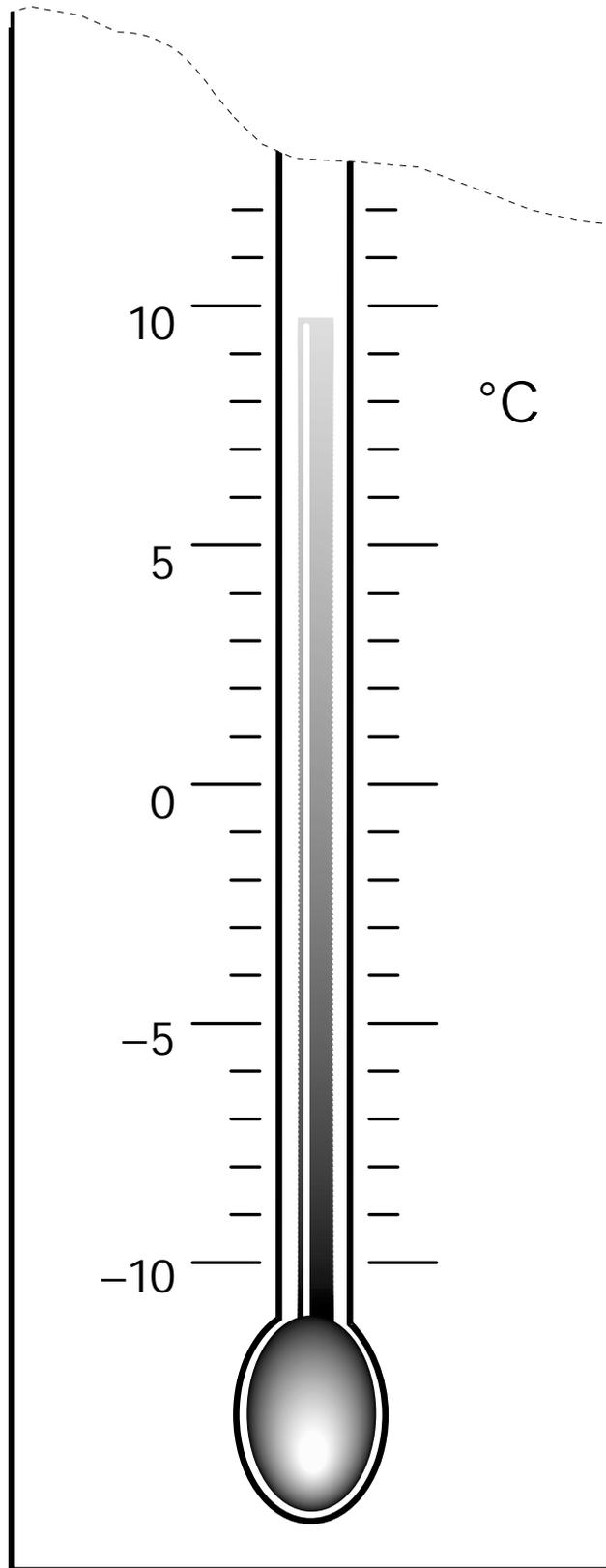
2

3

4

5

Thermometer



Winter Weather

