CoEA Module 2 Case Study 3 *Weather*

The resources for this Case Study consist of

Teacher Notes	
OHP1	*Thermometer*
OHP2	*Number Line*
Worksheets WS1.1-1.2	*Thermometers*
Worksheet WS2	*Temperatures Around the World*
Worksheets WS3.1-3.2	*Negatives and Positives*
Resource Sheets 1.1-1.4	*Graphs*
Worksheets WS4.1-4.2	*Temperature Graphs*
Resource Sheet 2	*Sun and Rain!*
Worksheet WS5	*Sunshine*
Worksheet WS6	*Rainfall*
Worksheet WS7	*Temperature Conversion*
Test 1 (3 pages + Resource Sheet)	*Weather*

Case Study 3 *Weather*

Teacher Notes

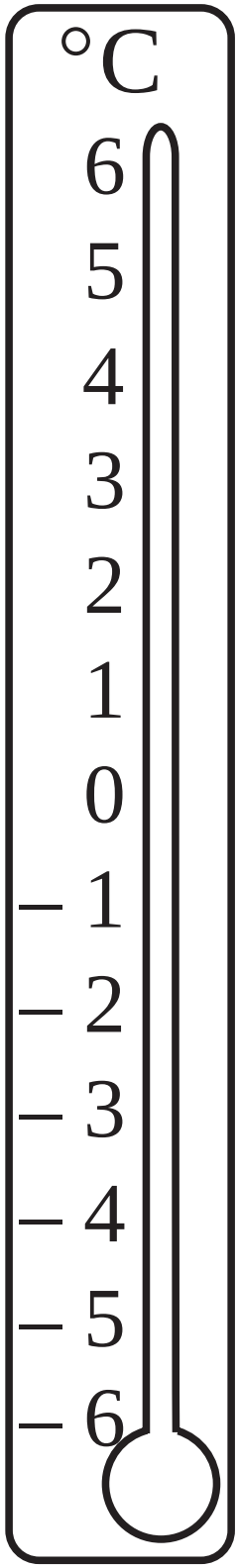
1. Use OHP1 which shows a thermometer with scale from $-6\ ^\circ C$ to $+6\ ^\circ C$. Point to different temperatures and ask what temperature it is. Ask students to come out and point to different temperatures. Extend the scale if necessary; ask questions such as, "What temperature is 2° above $3\ ^\circ C$?" and "What temperature is 2° below $3\ ^\circ C$?", etc. Then do WS1 and WS2.

2. Using the number line on OHP2, give two numbers and ask which is the larger, which the smaller, etc. Using number cards, pick three numbers. Ask students to put them in order, smallest to largest and largest to smallest. Then do WS3. Further explanation may be needed for warmest and coldest. Question 4g is just for fun!

3. Do WS4 using Resource Sheets 1.1 to 1.4 (four graphs). Follow this with WS5 and WS6 using Resource Sheet 2 and OHP 3. An explanation will be needed to enable pupils to draw a line graph of their own. It may be necessary to recap on bar graphs.

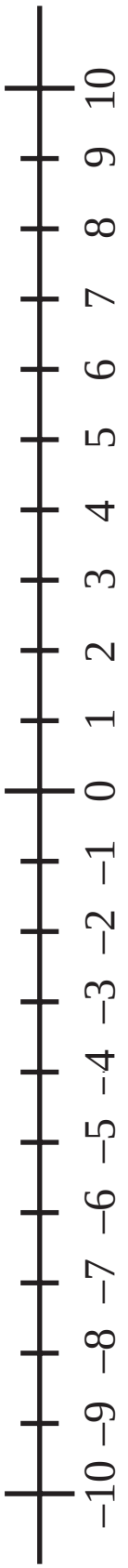
4. Introduce function machines (flow diagrams) as a class exercise. Follow this with WS7 on temperature conversion.

Case Study 3, OHP1 *Thermometer*



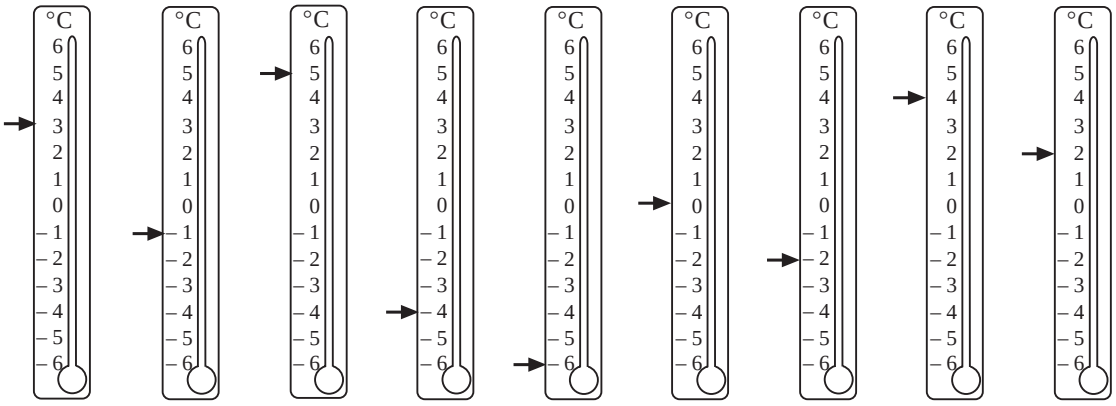
Case Study 3, OHP2

Number Line



Case Study 3, WS1.1 *Thermometers*

1. Under each of these thermometers write the temperature indicated by the arrow.



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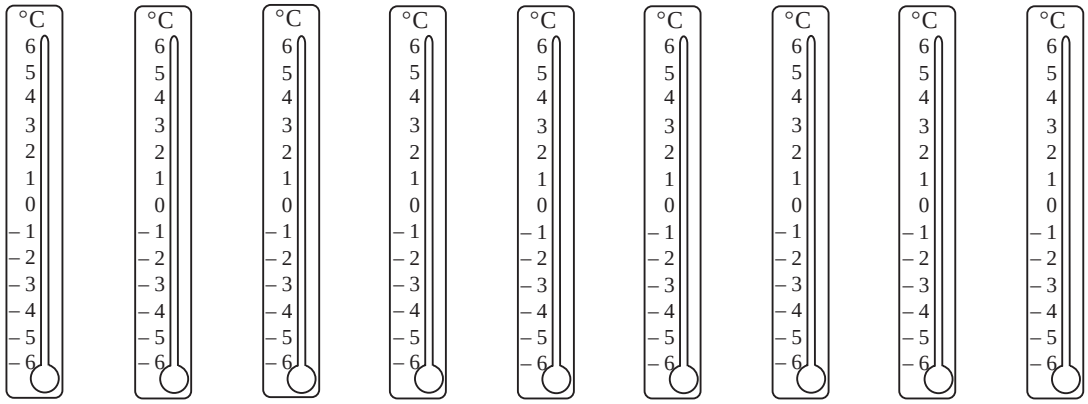
2. Place an arrow against the temperature given for each thermometer.



2 ℃ 5 ℃ –1°C 0 ℃ –4°C 6°C – 3℃ 1°C – 2°C

3. (a) What temperature is 3° above 2°C? .....

(b) What temperature is 2° above 4°C? .....

(c) What temperature is 4° above 1°C? .....

(d) What temperature is 7° above 2°C? .....

(e) What temperature is 8° above 5°C? .....

Case Study 3, WS1.2 *Thermometers*

4. (a) What temperature is 3° below 6°C? .....

   (b) What temperature is 2° below 4°C? .....

   (c) What temperature is 1° below 2°C? .....

   (d) What temperature is 5° below 11°C? .....

   (e) What temperature is 8° below 12°C? .....

5. (a) What temperature is 3° above −2°C? .....

   (b) What temperature is 5° above −1°C? .....

   (c) What temperature is 4° above −3°C? .....

   (d) What temperature is 6° above −2°C? .....

   (e) What temperature is 8° above −5°C? .....

6. (a) What temperature is 1° below −2°C? .....

   (b) What temperature is 2° below −4°C? .....

   (c) What temperature is 3° below −2°C? .....

   (d) What temperature is 3° below −6°C? .....

   (e) What temperature is 8° below −3°C? .....

Case Study 3, WS2 *Temperatures Around the World*

Temperatures vary around the world. They also change during the year at any place. Here is some data to show this. These are average daytime temperatures.

Temperatures in °C		
Place	*January*	*July*
Cape Town	25	20
London	10	20
Moscow	−10	22
New York	5	25
Singapore	35	35
Sydney	20	15

Note that the difference in temperatures between New York and Moscow in January is $5 + 10 = 15°\text{C}$.

1. In January, how much warmer is Cape Town than New York? .....

2. In January, how much warmer is New York than Moscow? .....

3. In January, how much warmer is Cape Town than Moscow? .....

4. What is the difference in temperature between January and July temperatures in

   Cape Town ..... London .....

   Moscow ..... Singapore .....

5. In July, which city has an average temperature 10°C higher than Sydney? .....

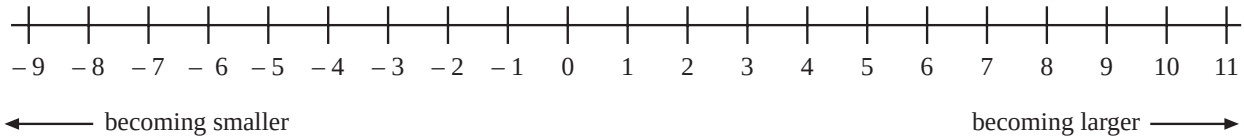
6. In July, which city has an average temperature 13°C less than Singapore? .....

7. Why does temperature change so much throughout the world?

   .....

   .....

Case Study 3, WS3.1 *Negatives and Positives*



1. For each pair of numbers, circle the *larger* number.

(a) 3 1 (b) 2 5 (c) – 2 3 (d) 4 – 5

(e) – 2 1 (f) – 1 – 3 (g) – 5 – 6 (h) 7 – 9

(i) – 7 7 (j) 11 – 4 (k) 0 8 (l) – 7 0

2. For each pair of numbers, circle the *smaller* number.

(a) 4 1 (b) 5 3 (c) – 4 5 (d) 2 – 7

(e) – 6 2 (f) – 8 – 9 (g) – 4 – 2 (h) 11 – 7

(i) – 8 8 (j) –10 – 9 (k) 0 6 (l) – 3 0

3. Write each group of numbers in order with the *smallest* number first.

(a) 2 – 5 3 (b) 1 0 – 1 (c) 6 – 5 2

....

(d) – 1 – 3 – 2 2 (e) – 4 4 6 – 6

....

(f) 1 – 2 3 – 4 (g) 3 5 – 1 0

....

(h) 8 – 3 2 – 1 (i) 5 – 1 9 – 12

....

Case Study 2, WS3.2 *Negatives and Positives*

4. This table shows the temperatures in some cities in January and April.

City	*Country*	*January*	*April*
Berlin		– 12 °C	5 °C
Brussels		– 4 °C	8 °C
Copenhagen		– 20 °C	0 °C
Helsinki		– 25 °C	– 4 °C
Moscow		– 35 °C	– 8 °C
Oslo		– 28 °C	– 2 °C
Ottawa		– 23 °C	2 °C
Prague		– 10 °C	3 °C
Reykjavik		– 32 °C	– 5 °C
Stockholm		– 27 °C	– 3 °C
Washington		– 16 °C	1 °C

(a) Fill in the names of the countries.

(b) Write the temperatures for January in order with the *coldest* first.

(c) Write the temperatures for April in order with the *warmest* first.

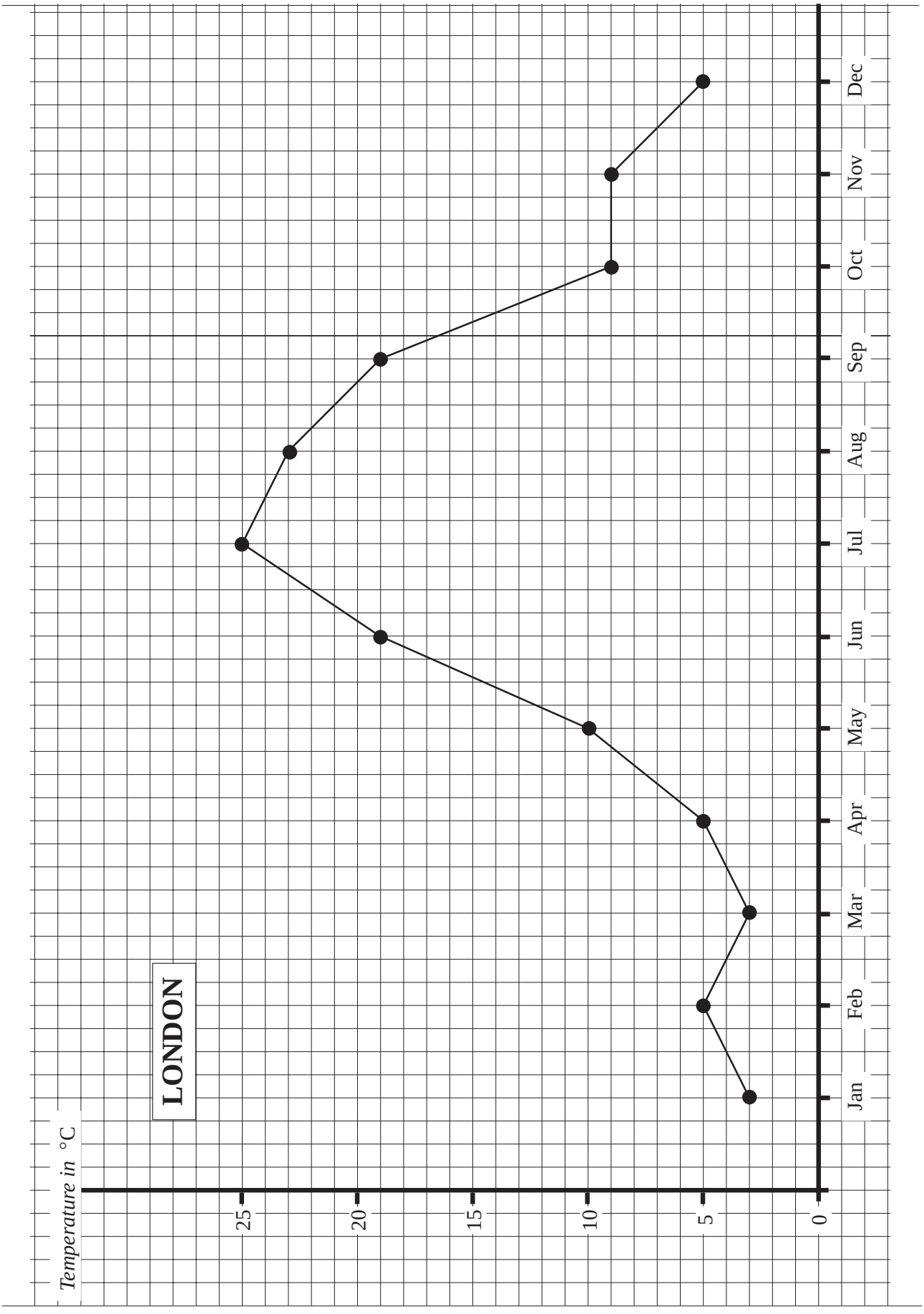
(d) Which country is the *coldest* in January? .....

(e) Which country is the *warmest* in January? .....

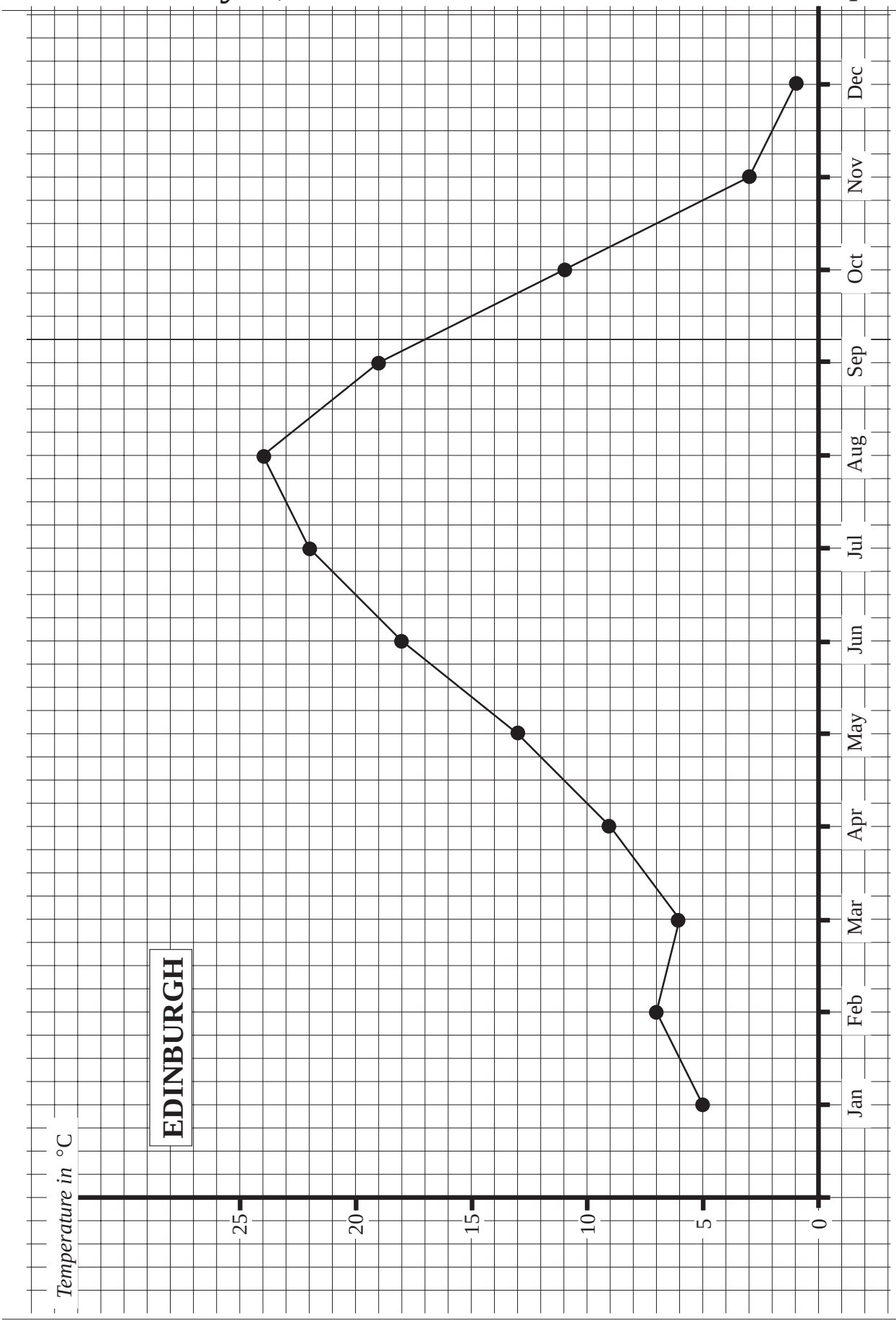
(f) Which country is the *coldest* in April? .....

(g) Which country is the *warmest* in April? .....

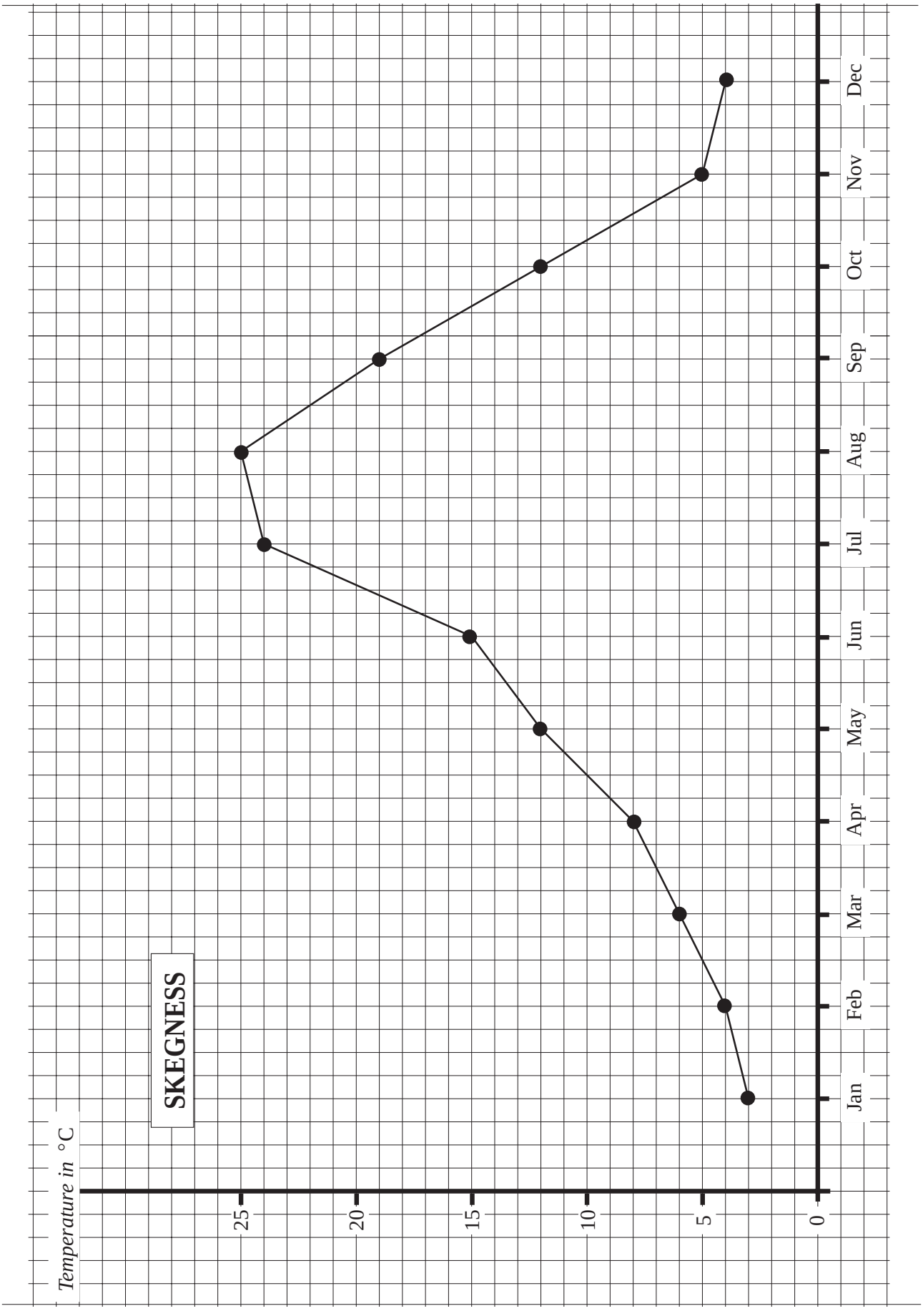
Case Study 3, Resource Sheet 1.1 *Graphs*



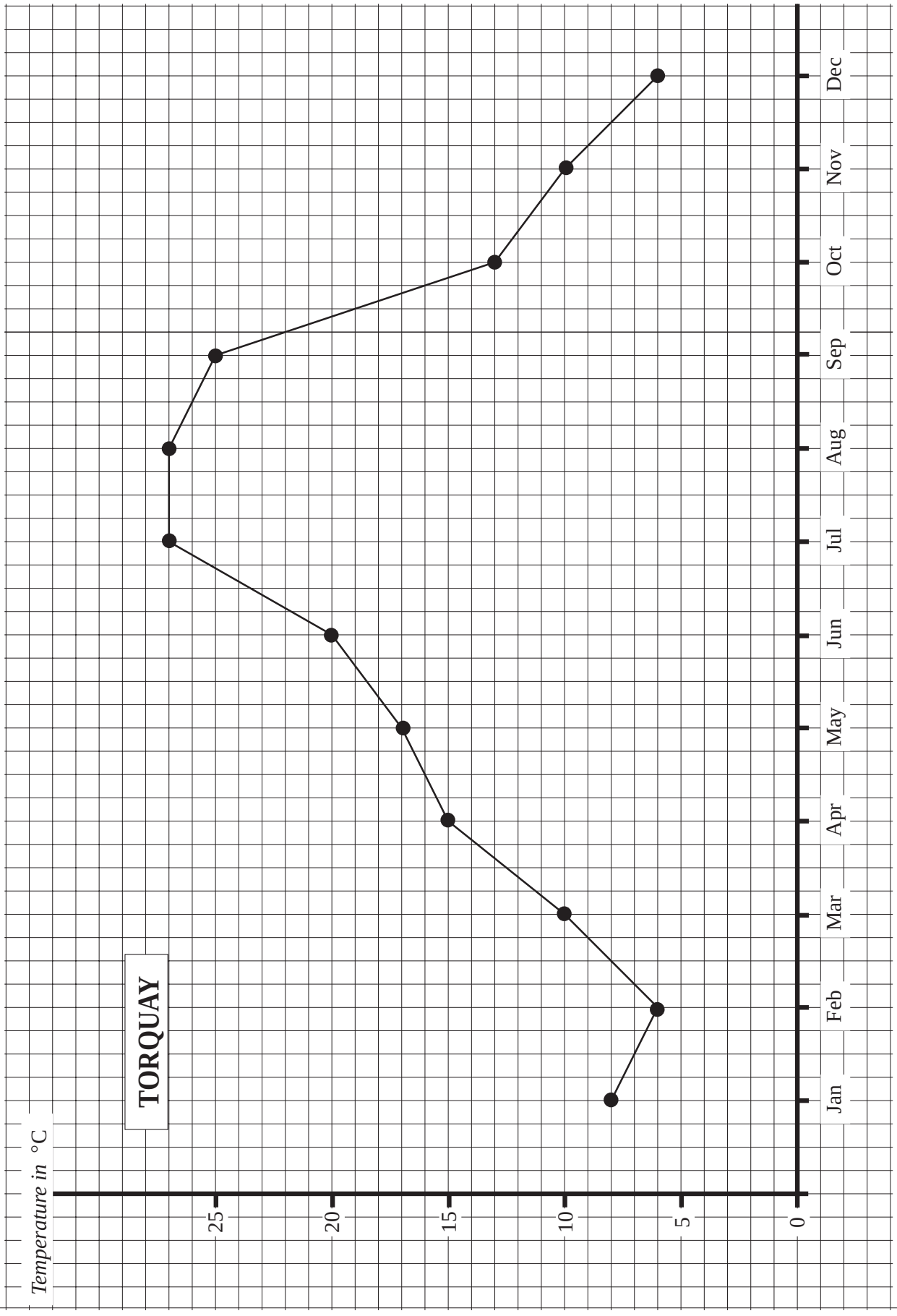
Case Study 3, Resource Sheet 1.2 *Graphs*



Case Study 3, Resource Sheet 1.3 *Graphs*

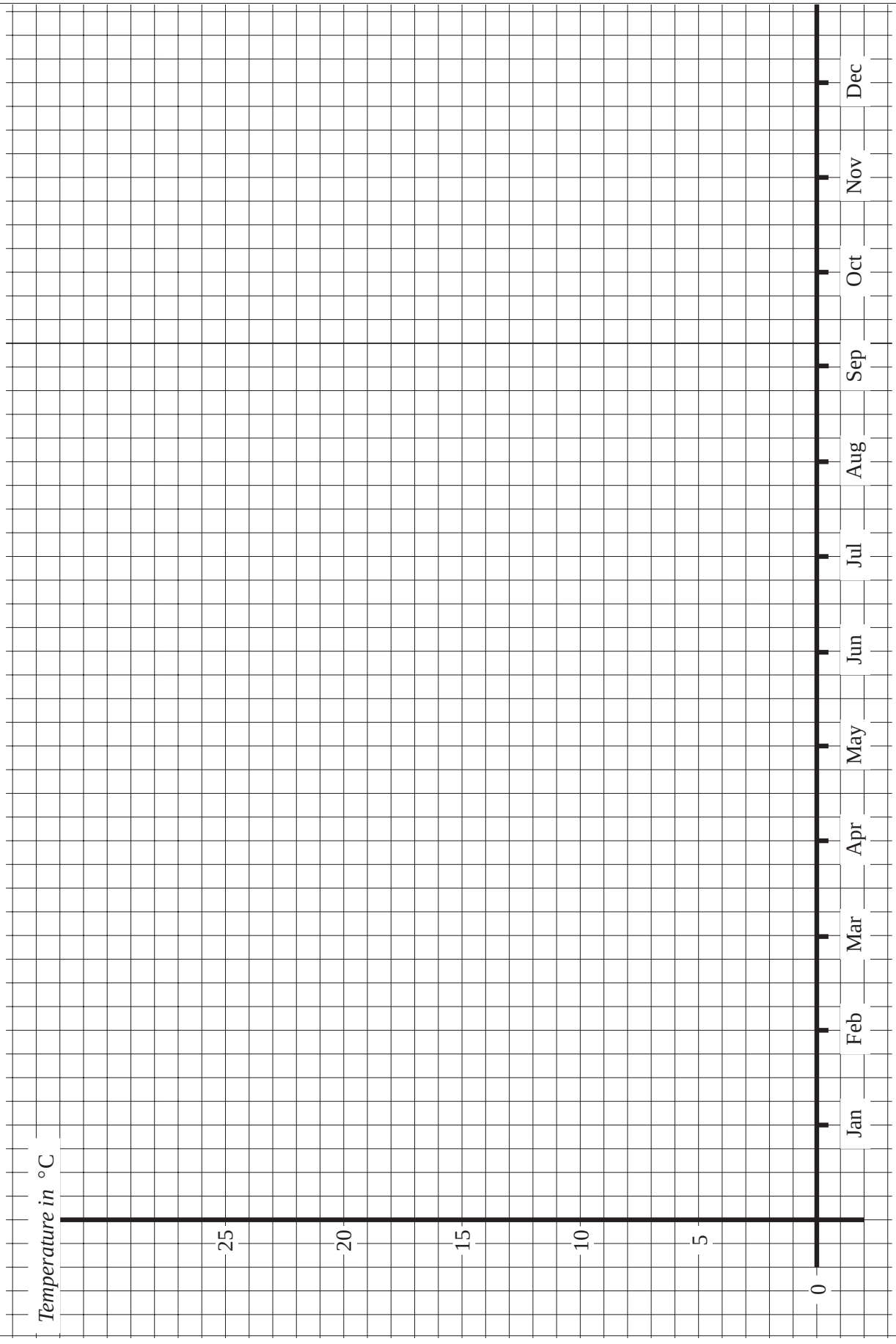


Case Study 3, Resource Sheet 1.4 *Graphs*



Case Study 3, OHP3

Graphs



Case Study 3, WS4.1 *Temperature Graphs*

Use the information on Resource Sheets 1.1 to 1.4 to answer these questions.

1. (a) What was the temperature in London in January? .....

   (b) What was the temperature in Torquay in January? .....

   (c) What was the temperature in Skegness in January? .....

   (d) What was the temperature in Edinburgh in January? .....

   (e) Which was the *warmest* of these towns in January? .....

   (f) Which was the *coldest* of these towns in January? .....

2. (a) What was the temperature in London in August? .....

   (b) What was the temperature in Torquay in August? .....

   (c) What was the temperature in Skegness in August? .....

   (d) What was the temperature in Edinburgh in August? .....

   (e) Which was the *warmest* of these towns in August? .....

   (f) Which was the *coldest* of these towns in August? .....

3. (a) Which was the warmest month or months in London? .....

   (b) Which was the warmest month or months in Torquay? .....

   (c) Which was the warmest month or months in Skegness? .....

   (d) Which was the warmest month or months in Edinburgh? .....

4. (a) Which was the coldest month or months in London? .....

   (b) Which was the coldest month or months in Torquay? .....

   (c) Which was the coldest month or months in Skegness? .....

   (d) Which was the coldest month or months in Edinburgh? .....

Case Study 3, WS4.2 *Temperature Graphs*

5. Complete the table by reading the temperatures from the graphs on Resources Sheets 1.1 to 1.4.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
London												
Torquay												
Skegness												
Edinburgh												

Case Study 3, Resource Sheet 2 *Sun and Rain!*

The following tables show the average number of hours of sunshine (S) and the average amount, in mm, of rainfall (R) per month in four places.

(A) *London*

	Jan	*Feb*	*Mar*	*Apr*	*May*	*Jun*	*Jul*	*Aug*	*Sep*	*Oct*	*Nov*	*Dec*
S	4	4	5	5	6	8	10	12	11	9	7	2
R	40	50	55	60	55	40	30	30	45	50	45	35

(B) *Torquay*

	Jan	*Feb*	*Mar*	*Apr*	*May*	*Jun*	*Jul*	*Aug*	*Sep*	*Oct*	*Nov*	*Dec*
S	5	4	7	9	10	12	14	13	10	9	7	6
R	55	60	65	75	50	25	10	15	30	40	50	50

(C) *Skegness*

	Jan	*Feb*	*Mar*	*Apr*	*May*	*Jun*	*Jul*	*Aug*	*Sep*	*Oct*	*Nov*	*Dec*
S	4	4	6	8	9	12	12	12	11	9	7	5
R	30	30	40	70	80	70	60	60	50	40	50	40

(D) *Edinburgh*

	Jan	*Feb*	*Mar*	*Apr*	*May*	*Jun*	*Jul*	*Aug*	*Sep*	*Oct*	*Nov*	*Dec*
S	3	3	4	7	8	13	13	14	12	10	5	3
R	65	75	80	85	70	55	30	25	35	45	50	60

Case Study 3, WS5 *Sunshine*

Use the information in the tables on Resource Sheet 2 to answer these questions.

1. (a) Which place has the most sunshine in July? .....

   (b) Which place has the most sunshine in August? .....

   (c) Which place has the most sunshine in December? .....

   (d) Which place has the most sunshine in April? .....

   (e) Which place has the most sunshine in July? .....

2. (a) Which place has the least sunshine in July? .....

   (b) Which place has the least sunshine in January? .....

   (c) Which place has the least sunshine in April? .....

   (d) Which place has the least sunshine in November? .....

   (e) Which place has the least sunshine in September? .....

3. (a) During which month does London have the most sunshine? .....

   (b) During which month does Torquay have the most sunshine? .....

   (c) During which month does Skegness have the most sunshine? .....

   (d) During which month does Edinburgh have the most sunshine? .....

4. (a) During which month does London have the least sunshine? .....

   (b) During which month does Torquay have the least sunshine? .....

   (c) During which month does Skegness have the least sunshine? .....

   (d) During which month does Edinburgh have the least sunshine? .....

5. (a) Draw a *line graph* to show the number of hours of sunshine each month in each place.

   (b) Draw a *bar graph* to show the number of hours of sunshine each month in each place.

Case Study 3, WS6 *Rainfall*

Use the information in the tables on Resource Sheet 2 to answer these questions.

1. (a) Which place has the largest amount of rainfall in July? .....

   (b) Which place has the largest amount of rainfall in August? .....

   (c) Which place has the largest amount of rainfall in December? .....

   (d) Which place has the largest amount of rainfall in April? .....

   (e) Which place has the largest amount of rainfall in January? .....

2. (a) Which place has the smallest amount of rainfall in July? .....

   (b) Which place has the smallest amount of rainfall in January? .....

   (c) Which place has the smallest amount of rainfall in April? .....

   (d) Which place has the smallest amount of rainfall in November? .....

   (e) Which place has the smallest amount of rainfall in September? .....

3. (a) During which month does London have the largest amount of rainfall? .....

   (b) During which month does Torquay have the largest amount of rainfall? .....

   (c) During which month does Skegness have the largest amount of rainfall? .....

   (d) During which month does Edinburgh have the largest amount of rainfall? .....

4. (a) During which month does London have the least rainfall? .....

   (b) During which month does Torquay have the least rainfall .....

   (c) During which month does Skegness have the least rainfall? .....

   (d) During which month does Edinburgh have the least rainfall? .....

5. (a) Draw a *line graph* to show the number of mm of rainfall each month in each place.

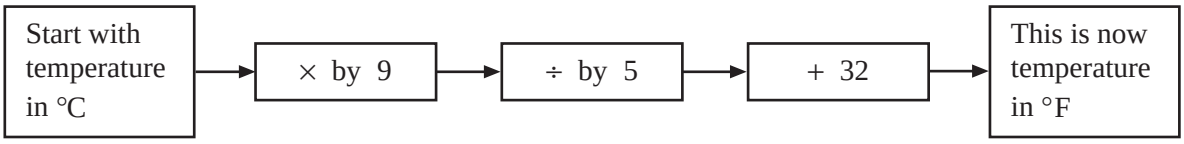
   (b) Draw a *bar graph* to show the number of mm of rainfall each month in each place.

Case Study 3, WS7 *Temperature Conversion*

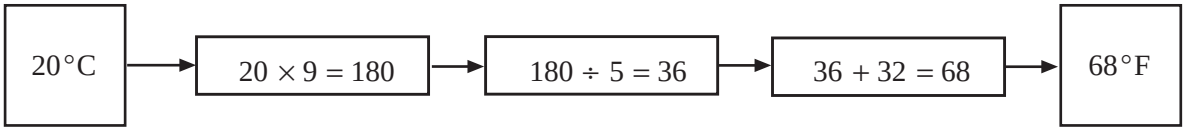
Most countries now measure temperatures in degrees Celcius (°C).

Degrees Fahrenheit (°F) are still widely used in Britain.

You can use this flow diagram to change temperatures from °C to °F.

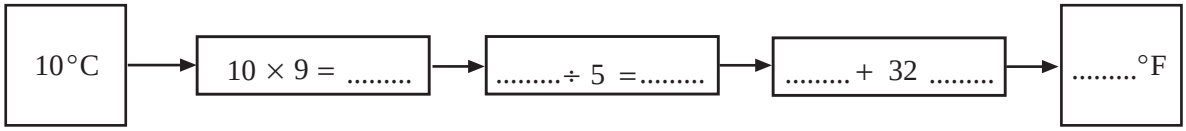


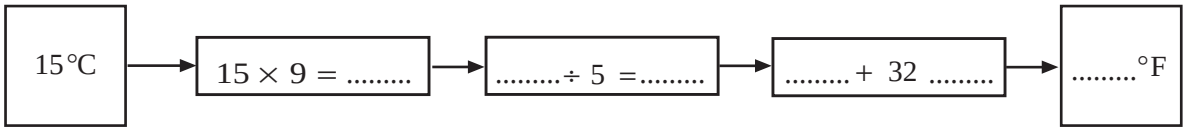
For example,

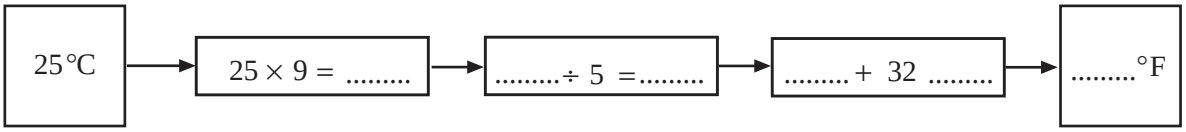


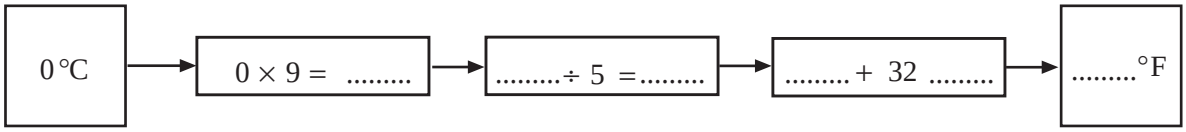
so 20°C = 68°F.

1. Convert these temperatures from °C to °F.

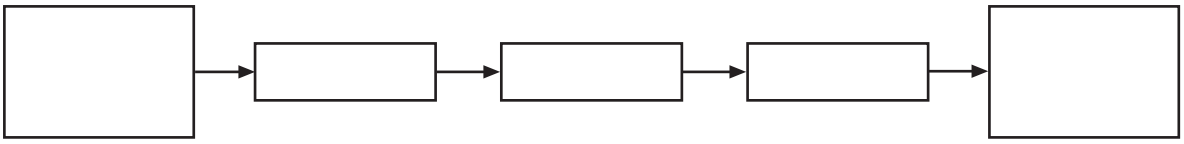








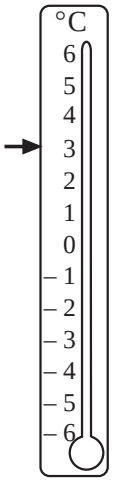
2. Fill in this flow diagram to show the method for converting °F to °C.



3. Use it to convert 68°F to 32°C.

Case Study 3, Test 1 *Weather*

1. Read the temperatures from each of these thermometers.

(a) 

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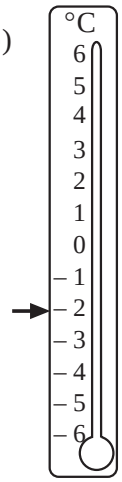
(b) 

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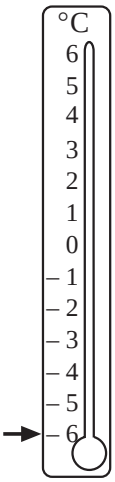
(c) 

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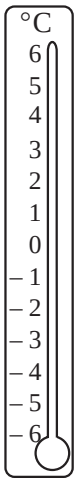
2. Place an arrow against the temperature given for each thermometer.

3°C



–5°C

0°C

3. What temperature is

(a) 5° above 8°C .....

(b) 6° below 12°C .....

(c) 6° above –3°C .....

(d) 3° below –6°C? .....

4. Which is larger, – 5 or – 3?

Case Study 3, Test 1

5. Which is smaller, – 11 or 7?

6. Write this list of numbers in order with the *smallest* number first.

   2 – 1 6 1 – 4

   ....

7.

City	*February*	*May*
Berlin	– 11 °C	6 °C
Brussels	– 3 °C	9 °C
Copenhagen	– 19 °C	1 °C
Helsinki	– 24 °C	– 3 °C
Moscow	– 34 °C	– 7 °C
Oslo	– 27 °C	– 1 °C
Ottawa	– 22 °C	3 °C
Prague	– 9 °C	4 °C
Reykjavik	– 31 °C	– 4 °C
Stockholm	– 26 °C	– 2 °C

   (a) Write the February temperatures in order with the *coldest* first.

   ....

   (b) Write the May temperatures in order with the *warmest* first.

   ....

   (c) Which city is the *coldest* in February? .....

   (d) Which city is the *warmest* in February? .....

   (e) Which city is the *coldest* in May? .....

   (f) Which city is the *warmest* in May? .....

Case Study 3, Test 1

8. Look at the line graph on Resource Sheet 3 for monthly temperatures in Leicester during one year.

   (a) What was the temperature in January? .....

   (b) What was the temperature in August? .....

   (c) Complete this table by reading the temperatures from the graph.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Temp												

9. This table shows the average sunshine in hours and the average rainfall in mm for each month in Leicester.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Sun	3	3	4	4	5	7	9	11	10	8	6	1
Rain	45	55	60	65	60	45	35	35	50	55	50	40

   (a) In which month does Leicester have the *most* sunshine?

   (b) In which month does Leicester have the *least* sunshine?

   (c) Draw a bar graph to show the annual sunshine.

   (d) In which month does Leicester have the *most* rainfall?

   (e) In which month does Leicester have the *least* rainfall?

   (f) Draw a line graph to show the annual rainfall.

Case Study 3, Resource Sheet 3

Graph showing average temperatures in Leicester