Directed Numbers

Here are some examples of activities, games or puzzles which can be used to support mathematics learning.

These examples are taken from the ordering and rounding pack. The mathematical demand increases as you work through the pack. The complete packs can be downloaded at https://www.stem.org.uk/rxzdu

Answers to cards can be found at https://www.stem.org.uk/rxxo5

Smile Worksheet **1799**

Boxes

This game is played exactly like ordinary "Boxes" except that when you complete a box you add (or take away) the score in the box to (or from) your score so far.

If you can carry on, then you *must*.

The winner is the one with the most points when all boxes are complete.

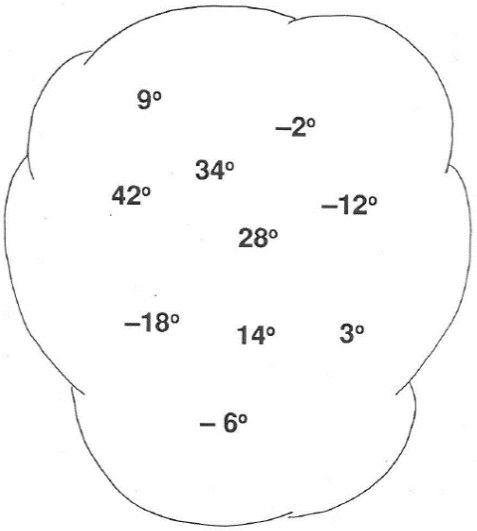
+3	0	-1	+1	+2	-2
0	-3	-1	+1	0	-2
-1	-2	+1	-2	+1	-3
+3	0	-3	+5	-1	-2
+1	0	+1	-2	+1	+1
+4	-7	+2	-1	0	+1

If you want to play again get another copy of the worksheet or make up a grid of your own.

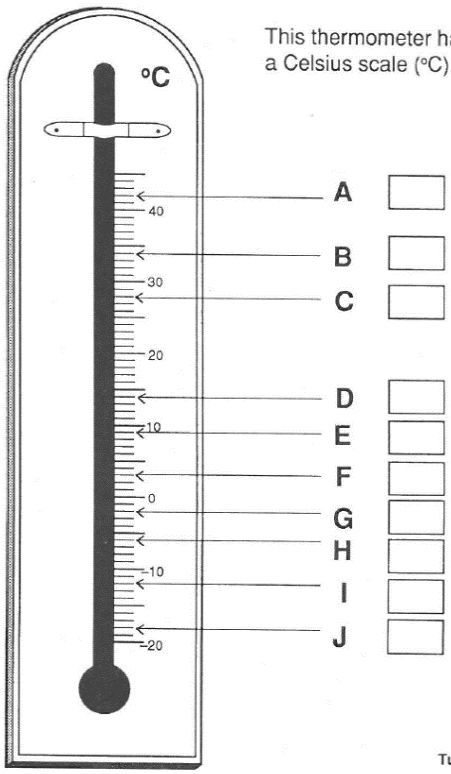
HOT and COLD

Smile Worksheet **2045**

Match the temperatures below with the letters on the scale.



This thermometer has a Celsius scale (°C).



Turn over

Here are some temperatures from around the world, taken on the same day.

Place	Temperature
Alice Springs	38°C
Delhi	14°C
Kingston	26°C
London	4°C
Moscow	–12°C
New York	–1°C
Beijing	– 6°C
Rome	8°C
Winnipeg	–19°C

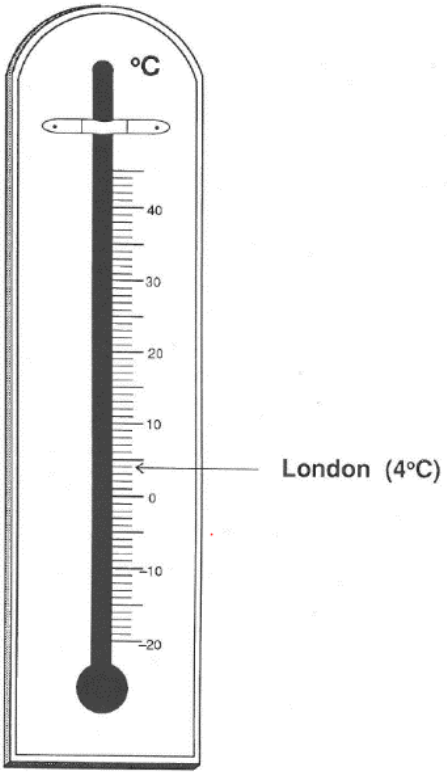
1) Label the temperatures on this thermometer. (London has been done for you.)

2) In which month of the year do you think these temperatures were taken?

3) Which city is colder, Moscow or Beijing?

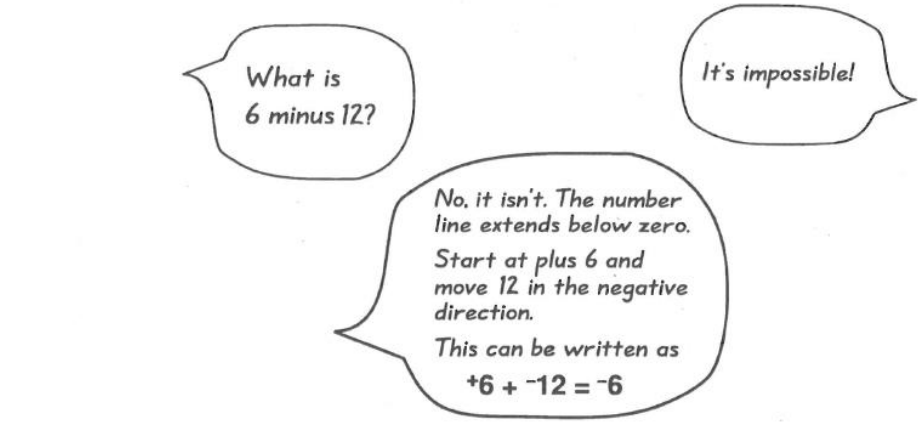
4) How much colder is New York than London?

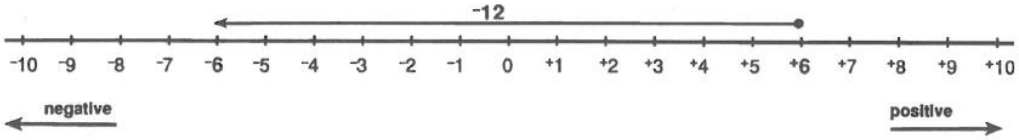
5) Which is colder, – 6°C or –10°C?



Smile 0516

Adding Directed Numbers

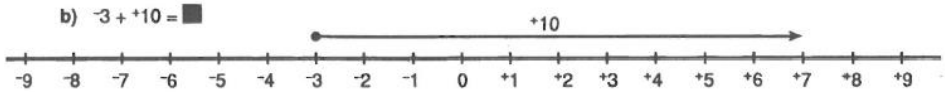




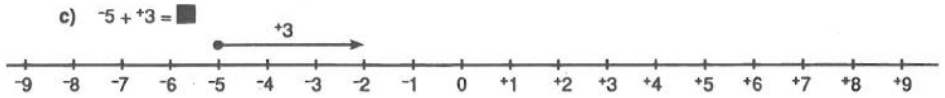
Use the number lines to answer these additions:

a) $^{+}7 + {}^{-}4 =$ ■

b) $^{-}3 + {}^{+}10 =$ ■

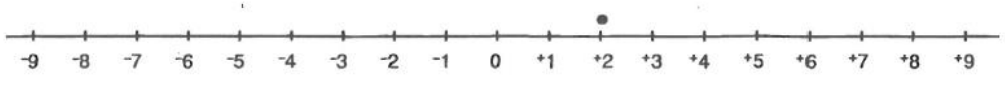


c) $^{-}5 + {}^{+}3 =$ ■



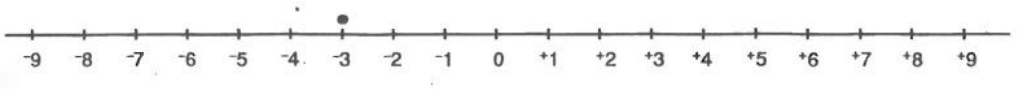
1. Use a number line, starting at $^{+}2$, to answer these additions:

a) $^{+}2 + {}^{+}3 =$ ■ b) $^{+}2 + {}^{-}3 =$ ■ c) $^{+}2 + {}^{-}5 =$ ■ d) $^{+}2 + {}^{+}6 =$ ■ e) $^{+}2 + {}^{-}4 =$ ■



2. Use a number line, starting at $^{-}3$, to answer these additions:

a) $^{-}3 + {}^{+}5 =$ ■ b) $^{-}3 + {}^{-}2 =$ ■ c) $^{-}3 + {}^{+}2 =$ ■ d) $^{-}3 + {}^{-}4 =$ ■ e) $^{-}3 + {}^{+}3 =$ ■

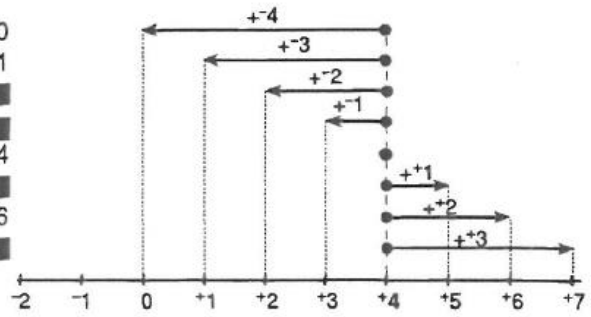


Subtracting Directed Numbers

Copy and complete the following patterns:

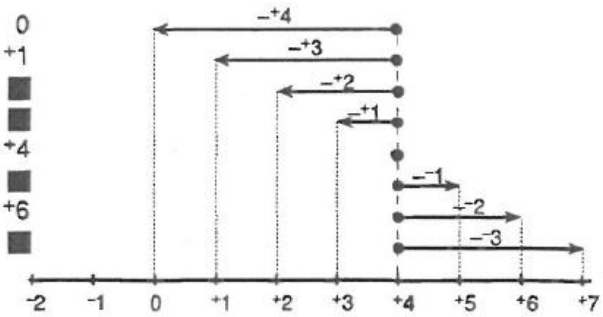
Pattern 1 **Adding to $^{+}4$**

$^{+}4 + {}^{-}4 = 0$
$^{+}4 + {}^{-}3 = {}^{+}1$
$^{+}4 + {}^{-}2 =$ ■
$^{+}4 + {}^{-}1 =$ ■
$^{+}4 + 0 = {}^{+}4$
$^{+}4 + {}^{+}1 =$ ■
$^{+}4 + {}^{+}2 = {}^{+}6$
$^{+}4 + {}^{+}3 =$ ■



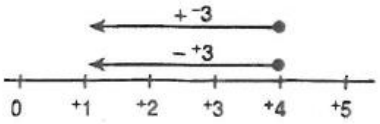
Pattern 2 **Subtracting from $^{+}4$**

$^{+}4 - {}^{+}4 = 0$
$^{+}4 - {}^{+}3 = {}^{+}1$
$^{+}4 - {}^{+}2 =$ ■
$^{+}4 - {}^{+}1 =$ ■
$^{+}4 - 0 = {}^{+}4$
$^{+}4 - {}^{-}1 =$ ■
$^{+}4 - {}^{-}2 = {}^{+}6$
$^{+}4 - {}^{-}3 =$ ■



From **Pattern 1** $^{+}4 + {}^{-}3 = {}^{+}1$
From **Pattern 2** $^{+}4 - {}^{+}3 = {}^{+}1$

Adding $^{-}3$ is the same as subtracting $^{+}3$.

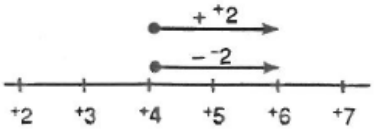


Give an example to show adding $^{-}4$ is the same as subtracting $^{+}4$.

Summary For any numbers **n** and **m**, **n + $^{-}$m** is the same as **n − $^{+}$m**.

From **Pattern 1** $^{+}4 + {}^{+}2 = {}^{+}6$
From **Pattern 2** $^{+}4 - {}^{-}2 = {}^{+}6$

Adding $^{+}2$ is the same as subtracting $^{-}2$.



Give an example to show adding $^{+}3$ is the same as subtracting $^{-}3$.

Summary For any numbers **n** and **m**, **n + $^{+}$m** is the same as **n − $^{-}$m**.