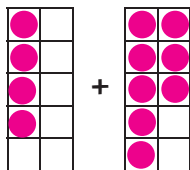


## Activity 2

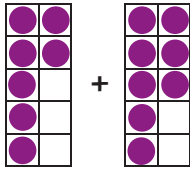
- 1 Add these tenths together.  
Write the answer as a decimal, \_\_\_\_ • \_\_\_\_

a



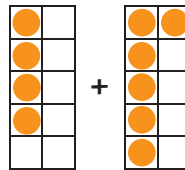
4 tenths + 8 tenths

b



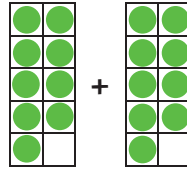
7 tenths + 8 tenths

c



4 tenths + 6 tenths

d



9 tenths + 9 tenths

- 2 There are 10 biscuits in each pack of Minibites.  
Find the answers to these.

a 1 and 3 tenths of a pack + 1 and 4 tenths of a pack

b 3 and 5 tenths of a pack + 1 and 5 tenths of a pack

c  $3\frac{5}{10}$  of a pack +  $3\frac{2}{10}$  of a pack

d  $4\frac{8}{10}$  of a pack +  $3\frac{9}{10}$  of a pack

You could use  
decimats to help.



- 3 Estimate and then work out the answers to these.

a  $4\cdot1 + 3\cdot6$

b  $6\cdot3 + 2\cdot5$

c  $7 + 1\cdot7$

d  $6\cdot3 + 5\cdot3$

e  $9\cdot6 + 2\cdot3$

f  $14\cdot6 + 5\cdot4$

g  $27\cdot3 + 32\cdot4$

h  $5\cdot6 + 2\cdot4$

i  $4\cdot7 + 12\cdot3$

j  $12 + 8\cdot2$

k Double  $12\cdot3$

l Double  $20\cdot5$

- 4 Max got \$12.40 from busking one day and \$10.30 the next.

a Why has Max not written down the zeros?

b How much money did Max get from busking altogether?



$12\cdot4 + 10\cdot3$

- 5 Max gave \$4.60 of the money he earned to the SPCA and \$4.20 to World Vision. How much money did he give to these two charities?

- 6 The temperature was  $12\cdot7^{\circ}\text{C}$  when Max started busking. It got  $5\cdot3^{\circ}$  hotter. What was the temperature then?

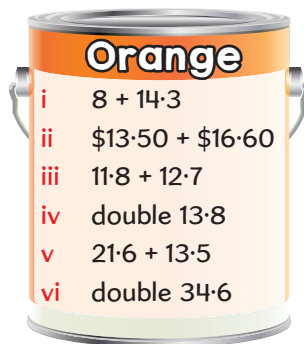




7

On your copy of this grid, shade the answers in the colour indicated.  
Check your answers using estimation.

What picture do you get?



\$31.60	45.6	58.7	\$28.80	17.13	45.6	\$41.70	95.7	\$50.60
47.8	53.3	\$40.30	60.7	75.9	7.6	81.9	93.4	\$33.00
51.4	95.2	27.6	98.4	\$72.80	\$24.30	10.3	\$35.40	\$58.30
\$53.60	\$30.10	69.2	87.3	83.6	9.6	86.5	\$45.00	41.4
86.1	\$24.70	\$33.80	74.3	\$12.20	57	70.7	\$9.50	12.2
92.5	8.4	61.7	16.3	78.1	55.2	\$39.60	80.90	27.5
11.8	4.4	15.1	11.2	83.1	35.1	24.5	58.3	\$16.80
26.1	\$11.20	19.8	18.6	56.3	22.3	\$93.40	33	71.5
32.8	\$18.70	\$41.40	9.5	62.8	51.1	90.3	\$57.40	86.7

**Yellow**

- i  $32.6 + 25.7$
- ii  $20.8 + 32.5$
- iii  $19.6 + 31.5$
- iv  $\$8.90 + \$15.80$
- v  $\$11.70 + \$28.60$
- vi double 16.5
- vii  $37 + 19.3$
- viii  $28.4 + 26.8$
- ix  $\$18.90 + \$34.70$
- x double \$16.90
- xi double 25.7
- xii double \$46.70
- xiii  $34.6 + 39.7$
- xiv  $43.8 + 54.6$
- xv  $36.8 + 46.3$
- xvi  $35.7 + 54.6$
- xvii double \$19.80
- xviii  $49.3 + 28.8$
- xix  $77.5 + 9.8$
- xx  $8.4 + 86.8$

8 Check the answers using estimation.

- a Jess's class travelled to camp by train and bus.  
They travelled 65.7 km by train and then 32.8 km by bus.  
How far did they travel altogether?



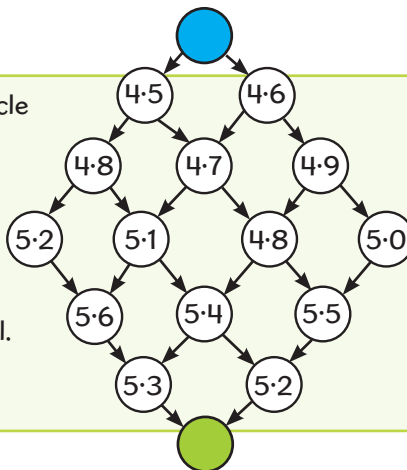
Max ran around the perimeter of the campsite.  
How far did he run altogether?



**Puzzle**

Follow the arrows to move from the blue circle to the green circle.  
Add the numbers as you go.

- a Find the path with the highest total.
- b Find the path with the lowest total.
- c Find two paths that have the same total.



- 5 Make the **biggest** number you can with each of these sets of cards.

a i



ii



iii



- b Make the **second smallest** number you can with each of the sets of cards in **part a**.

You can't start your number with a zero.



## Puzzle

Find the smallest number that Jess could be thinking of.

I am thinking of a number that has four digits.



The number of ones is four more than the number of thousands  
and  
the number of tens minus the number of hundreds equals the number of thousands  
and  
the number of hundreds minus the number of thousands equals the number of ones.

## Game



- five 10-sided dice (numbered 0 to 9)

### In the middle

A game for 3, 5 or 7 players

- 1 Roll the five dice.

**Example** Jess rolled 8, 7, 9, 3, 6.

- 2 Each player makes a 5-digit number in secret.

- 3 The numbers made in **step 2** are put in order from largest to smallest.

**Example** The students in Jess's game put their numbers in order to get

93 678    89 376    78 963    73 698    69 873

- 4 The player whose number is the middle number takes ten points.

**Example** The middle number is 78 963.

- 5 The winner is the player with the most points after ten rounds.



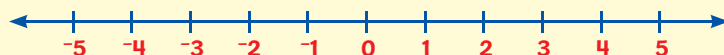
## Adding and subtracting integers

**Integers** are the positive and negative numbers, and zero.

They are often used in real life to describe temperatures below zero.

**Example**  $-4^{\circ}\text{C}$  is 4 degrees below zero.

Integers can be shown on number lines like these.



## Investigations

1 Write down the three lines that would come before and after each of these number patterns.

**adding**

$$\begin{aligned} 4 + +1 &= 5 \\ 4 + 0 &= 4 \\ 4 + -1 &= 3 \\ 4 + -2 &= 2 \\ 4 + -3 &= 1 \\ 4 + -4 &= 0 \\ 4 + -5 &= -1 \end{aligned}$$

**adding**

$$\begin{aligned} -3 + +5 &= 2 \\ -3 + +4 &= 1 \\ -3 + +3 &= 0 \\ -3 + +2 &= -1 \\ -3 + +1 &= -2 \\ -3 + 0 &= -3 \\ -3 + -1 &= -4 \end{aligned}$$

**subtracting**

$$\begin{aligned} 2 - +2 &= 0 \\ 2 - +1 &= 1 \\ 2 - 0 &= 2 \\ 2 - -1 &= 3 \\ 2 - -2 &= 4 \\ 2 - -3 &= 5 \\ 2 - -4 &= 6 \end{aligned}$$

**subtracting**

$$\begin{aligned} -3 - +2 &= -5 \\ -3 - +1 &= -4 \\ -3 - 0 &= -3 \\ -3 - -1 &= -2 \\ -3 - -2 &= -1 \\ -3 - -3 &= 0 \\ -3 - -4 &= 1 \end{aligned}$$

2 Use your patterns from question 1 to answer these.

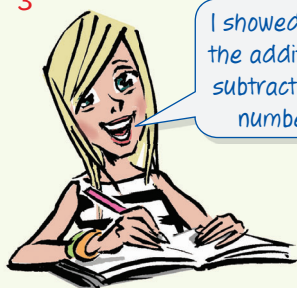
a  $4 + +8$

b  $-3 + -5$

c  $2 - -10$

d  $-3 - -9$

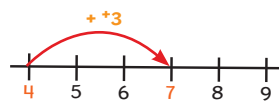
3



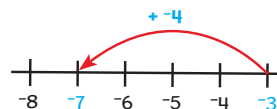
I showed some of the additions and subtractions on a number line.

**Addition**

$4 + +3$

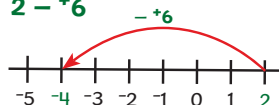


$-3 + -4$

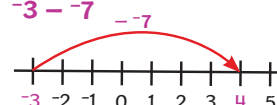


**Subtraction**

$2 - +6$



$-3 - -7$



From the patterns and Jess's number lines, what do you notice about where to move on the number line when doing these?

a adding a positive integer

b adding a negative integer

c subtracting a positive integer

d subtracting a negative integer



**Adding a positive integer** or **subtracting a negative integer** results in a move to the **right** on the number line.

**Subtracting a positive integer** or **adding a negative integer** results in a move to the **left** on the number line.

## Discussion

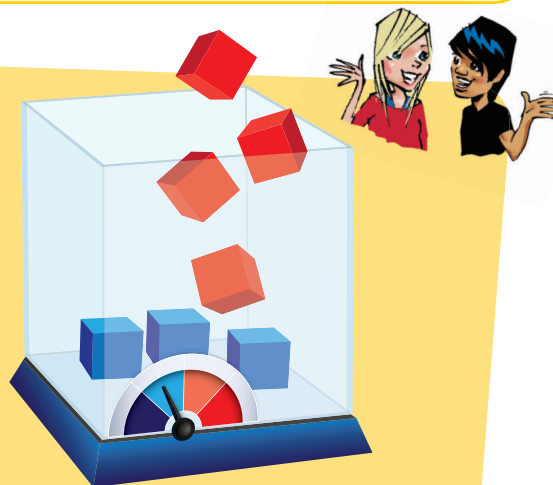
- Imagine you have some hot and cold blocks in water.

When you add 1 hot block (+1) it heats up the water by 1 unit.

When you add a cold block (+ -1) it cools down the water by 1 unit.

**Example** If you had -3 (3 cold blocks) and you added 4 hot blocks (+4) how many units of heat would you now have?

$$-3 + +4 = ?$$



- Think about what would happen if you added or subtracted hot or cold blocks and use this to explain the rules of adding and subtracting integers. Use the additions and subtractions in the investigation on the previous page to help.

## Activity 1

- Find the answers to these and write an equation to show each one.

- 4 hot blocks (+4) take away 3 hot blocks ( $- +3$ )
- 3 cold blocks (-3) add 5 hot blocks (+ +5)
- 4 cold blocks take away 4 hot blocks
- 3 hot blocks take away 5 cold blocks
- 2 cold blocks take away 4 cold blocks



- Write each of these subtractions as an addition that will have the same answer. Explain why it has the same answer.

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



- Use a number line like this one to help you find the answers to these.



- |             |              |               |             |               |
|-------------|--------------|---------------|-------------|---------------|
| a $-3 + +4$ | b $-5 + +2$  | c $-4 + -4$   | d $-2 + +6$ | e $+2 + -5$   |
| f $+3 - +2$ | g $-2 - +5$  | h $+4 - +1$   | i $+3 - -5$ | j $-2 - -5$   |
| k $0 - +4$  | l $-4 + -5$  | m $-7 - -4$   | n $-1 - -2$ | o $-9 - -4$   |
| p $+6 - -7$ | q $-12 + +7$ | r $-16 - -11$ | s $-9 + -8$ | t $+12 - +17$ |

- 4 Choose from these number cards to make the number sentences true.



a  $3 + -6 + \square = -7$

b  $-2 + \square - -2 = +4$

c  $\square + \square - -4 = +6$

- 5 a Choose a number from the drum that will go in each gap to make these true. Find as many ways as you can for parts iii and iv.



i  $-3 + \square = 2$

ii  $2 + \square = -3$

iii  $\square + \square = -4$

iv  $\square + \square - \square = -2$

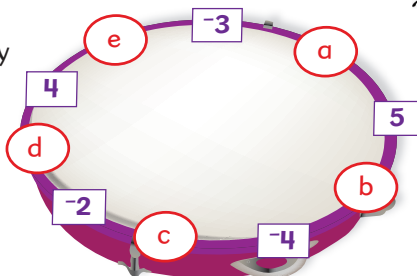
- b What is the largest total you can make by adding two of the numbers from the drum together and then subtracting one of them?

- c What is the smallest total you can make by adding two of the numbers from the drum together and then subtracting one of them?

-3 is a smaller number than +2.

- 6 The number in each oval is found by adding the numbers in the squares on either side of it.

Find the values of a, b, c, d and e.



- 7 Find the answers to these.

a  $-17 + +14$

b  $-23 + -27$

c  $+63 - -25$

d  $-37 - -52$

e  $+74 - -31$

f  $-84 - +57$

g  $+159 - -142$

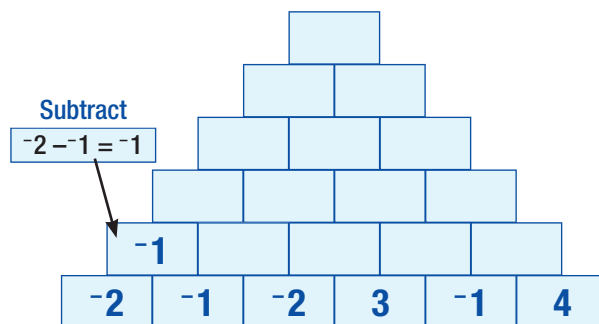
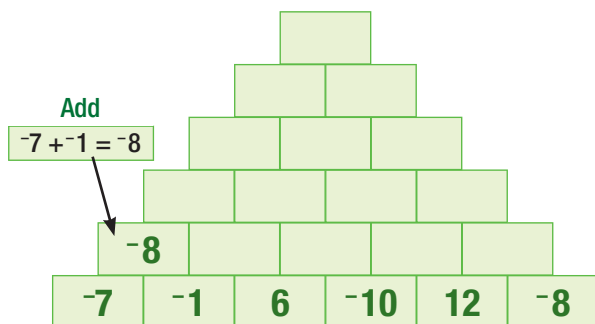
h  $-213 - +68$

i  $-173 + -205$

j  $-354 - -237$



- 8 On the green pyramid, each pair of numbers is **added** to get the number above. On the blue pyramid, each pair of numbers is **subtracted** to get the number above.



- a What number will be at the top of the green pyramid?  
b What number will be at the top of the blue pyramid?



- 9 This chart gives the number of hours some places are ahead of or behind the time in Auckland.

a If it is 0200 hours in Auckland, New Zealand, what time will it be in these places?

- i Los Angeles      ii Rome  
iii Hong Kong      iv Toronto

**b Challenge**

If it is 1500 hours in Los Angeles, what time will it be in these places?

- i Brisbane      ii Chatham Islands      iii Toronto      iv London

**L O N D O N**

Los Angeles	-19 h
Hong Kong	-4 h
London	-11 h
Brisbane	-2 h
Chatham Islands	+45 mins
Toronto	-16 h
Rome	-10 h



- 10 What numbers were Janna and Hemi thinking of?

a

I think of a negative number.  
I add 7 then subtract  
-4 and I get 9.

Janna



b

I think of a negative number.  
I subtract 5 and then  
add -2 and I get -11.

Hemi



11

I used my integer  
knowledge to work out  
these subtractions.



$$\begin{aligned} 82 - 47 &= (80 - 40) + (2 - 7) \\ &= 40 + -5 \\ &= 35 \end{aligned}$$

$$\begin{aligned} 723 - 67 &= (720 - 60) + (3 - 7) \\ &= 660 + -4 \\ &= 656 \end{aligned}$$

Find the answers to these using Jess's way.

- a 73 - 37      b 81 - 58      c 73 - 46      d 94 - 58  
e 112 - 67      f 263 - 86      g 472 - 138      h 569 - 382  
i 474 - 288      j 5373 - 387      k 4723 - 1809      l 6532 - 4864

**12 Challenge**

James found the mean of these numbers by adding and subtracting integers.

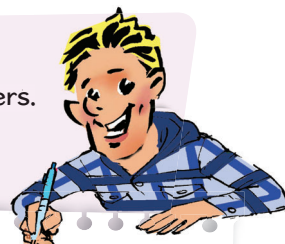
9    10    8    3    6    12    15    10    11    6

He guessed the mean was 10 and then wrote this.

- a Explain why James wrote this.  
Finish what he wrote to find the mean.

- b Find the mean of these numbers using James's way.

- i 14, 16, 17, 12, 16, 18, 13, 14      ii 29, 37, 40, 38, 42, 36  
iii 29, 32, 34, 27, 36, 30, 32, 31



9 is 1 less than 10 so I write -1 for that.  
-1 + 0 + -2 + -7 + -4 + 2 + 5 + 0 + 1 + -4 =