



- | | | |
|------|-----------|-----------|
| 1) | 2) | 3) |
| a) 7 | a) 90 | a) 35 560 |
| b) 7 | b) 900 | b) 34 260 |
| c) 7 | c) 9000 | c) 35 680 |
| d) 7 | d) 90 000 | d) 34 540 |
| | | e) 38 660 |
| | | f) 32 550 |

- | | | |
|--|---|--|
| 1) | 2) | |
| Zeke is correct. | a) This is false. | |
| Elena is incorrect. If she subtracted 300 and then another 1, she would actually be subtracting 301. To subtract 299 she would need to subtract 300 and then add 1. | $4270 + 99 = 4270 + 100 - 1$ | |
| | b) This is true because both sides of the equation = 19 251. | |
| | c) This is true because both sides of the equation = 31 520. | |
| | d) This is false. | |
| | $390 + 17\ 680 = 17\ 680 + 400 - 10$ | |

- 3)
- a) $3410 + 900 = 4310$
- Amrit has mistaken the hundreds and thousands. She added 9000 instead of 900.**
- b) $2000 - 864 = 1136$, $1999 - 862 = 1137$
- Hari should have adjusted 862 to 863 for the answers to be equal.**

- | | | |
|----------------------|--|--|
| 1) | 2) | |
| Emily 63 002 | a) $506 + 202 = 708$ | |
| Bartek 62 051 | b) Open-ended question so children's responses will vary. | |
| Felix 62 003 | c) There are many possible answers. For example: | |
| Drew 64 500 | $5060 + 2020 = 7080$, $50\ 600 + 20\ 200 = 70\ 800$, | |
| | $506\ 000 + 202\ 000 = 708\ 000$, $708 - 202 = 506$, | |
| | $70\ 800 - 20\ 200 = 50\ 600$, $708 - 506 = 202$ | |

Mental Strategies



1) Complete the calculations.

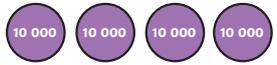
a) 4 ones + 3 ones = _____ ones  +  =

b) 4 tens + 3 tens = _____ tens  +  =

c) 4 hundreds + 3 hundreds = _____ hundreds

 +  =

d) 4 ten thousands + 3 ten thousands = _____ ten thousands

 +  =

2) Use Abi's fact to help complete the calculations.

a) $150 - 60 =$ _____

b) $1500 - 600 =$ _____

c) $15\ 000 - 6000 =$ _____

d) $150\ 000 - 60\ 000 =$ _____

I know that
 $15 - 6 = 9.$



Abi

3) Use the place value chart to complete the calculations.

TTh	Th	H	T	O
				
				
				

a) $34\ 560 + 1000 =$

d) $34\ 560 - 20 =$

b) $34\ 560 - 300 =$

e) $34\ 560 + 4100 =$

c) $34\ 560 + 1120 =$

f) $34\ 560 - 2010 =$

Mental Strategies



1) Zeke and Elena are discussing mental strategies. Do you agree with their statements? Explain your reasoning.



Zeke

To add 999, you can add 1000 and then subtract 1.



Elena

To subtract 299, you can subtract 300 and then subtract 1.

2) Are these statements true or false? Prove it.

a) $4270 + 99 = 4270 + 100 + 1$

b) $19\ 650 - 399 = 19\ 650 - 400 + 1$

c) $32\ 510 - 990 = 32\ 510 - 1000 + 10$

d) $390 + 17\ 680 = 17\ 680 + 400 - 9$

3) Identify and explain the mistakes.



Amrit

$300 + 900 = 1200$ so
 $4310 + 900 = 13\ 310$.



Hari

$2000 - 864 = 1999 - 862$

Mental Strategies



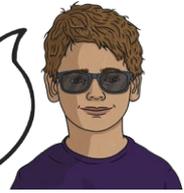
1) Can you work out how many team points each child earned using the clues?



I earned 399 fewer team points than Joseph.

Emily

I earned 48 more team points than Felix.



Bartek

I earned 999 fewer team points than Emily.



I earned 1099 more team points than Joseph.

Drew



Felix

I earned 63 401 team points.



Joseph

- 2) a) Find the value of the missing digits. b) Write a missing digits problem for a partner to solve.

$$\square 06 + 20 \square = 7 \square 8$$

- c)
- | | | | | | |
|---|---|---|---|---|---|
| 0 | 2 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|

Use the digit cards to write addition and subtraction calculations and their answers. Each number should have the same number of digits and include at least one zero. The digit cards can be used more than once. Find five possibilities.

Mental Strategies



1) Complete the calculations.

a) 4 ones + 3 ones = _____ ones

$$\begin{array}{cccc} \textcircled{1} & \textcircled{1} & \textcircled{1} & \textcircled{1} \end{array} + \begin{array}{ccc} \textcircled{1} & \textcircled{1} & \textcircled{1} \end{array} =$$

b) 4 tens + 3 tens = _____ tens

$$\begin{array}{cccc} \textcircled{10} & \textcircled{10} & \textcircled{10} & \textcircled{10} \end{array} + \begin{array}{ccc} \textcircled{10} & \textcircled{10} & \textcircled{10} \end{array} =$$

c) 4 hundreds + 3 hundreds = _____ hundreds

$$\begin{array}{cccc} \blacksquare & \blacksquare & \blacksquare & \blacksquare \end{array} + \begin{array}{ccc} \blacksquare & \blacksquare & \blacksquare \end{array} =$$

d) 4 ten thousands + 3 ten thousands = _____ ten thousands

$$\begin{array}{cccc} \textcircled{10\ 000} & \textcircled{10\ 000} & \textcircled{10\ 000} & \textcircled{10\ 000} \end{array} + \begin{array}{ccc} \textcircled{10\ 000} & \textcircled{10\ 000} & \textcircled{10\ 000} \end{array} =$$

2) Use Abi's fact to help complete the calculations.

a) $150 - 60 =$

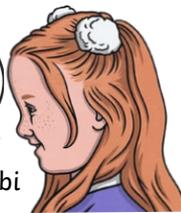
b) $1500 - 600 =$

c) $15\ 000 - 6000 =$

d) $150\ 000 - 60\ 000 =$

I know that
 $15 - 6 = 9.$

Abi



3) Use the place value chart to complete the calculations.

TTh	Th	H	T	O
● ●	● ●	● ●	● ●	
●	● ●	● ●	● ●	
		●	● ●	

a) $34\ 560 + 1000 =$

b) $34\ 560 - 300 =$

c) $34\ 560 + 1120 =$

d) $34\ 560 - 20 =$

e) $34\ 560 + 4100 =$

f) $34\ 560 - 2010 =$

Mental Strategies



1) Complete the calculations.

a) 4 ones + 3 ones = _____ ones

$$\begin{array}{cccc} \textcircled{1} & \textcircled{1} & \textcircled{1} & \textcircled{1} \end{array} + \begin{array}{ccc} \textcircled{1} & \textcircled{1} & \textcircled{1} \end{array} =$$

b) 4 tens + 3 tens = _____ tens

$$\begin{array}{cccc} \textcircled{10} & \textcircled{10} & \textcircled{10} & \textcircled{10} \end{array} + \begin{array}{ccc} \textcircled{10} & \textcircled{10} & \textcircled{10} \end{array} =$$

c) 4 hundreds + 3 hundreds = _____ hundreds

$$\begin{array}{cccc} \blacksquare & \blacksquare & \blacksquare & \blacksquare \end{array} + \begin{array}{ccc} \blacksquare & \blacksquare & \blacksquare \end{array} =$$

d) 4 ten thousands + 3 ten thousands = _____ ten thousands

$$\begin{array}{cccc} \textcircled{10\ 000} & \textcircled{10\ 000} & \textcircled{10\ 000} & \textcircled{10\ 000} \end{array} + \begin{array}{ccc} \textcircled{10\ 000} & \textcircled{10\ 000} & \textcircled{10\ 000} \end{array} =$$

2) Use Abi's fact to help complete the calculations.

a) $150 - 60 =$

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d) $150\ 000 - 60\ 000 =$

I know that
 $15 - 6 = 9.$

Abi



3) Use the place value chart to complete the calculations.

TTh	Th	H	T	O
● ●	● ●	● ●	● ●	
●	● ●	● ●	● ●	
		●	● ●	

a) $34\ 560 + 1000 =$

b) $34\ 560 - 300 =$

c) $34\ 560 + 1120 =$

d) $34\ 560 - 20 =$

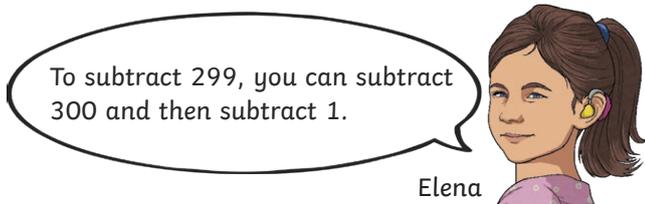
e) $34\ 560 + 4100 =$

f) $34\ 560 - 2010 =$

Mental Strategies



- 1) Zeke and Elena are discussing mental strategies. Do you agree with their statements? Explain your reasoning.



- 2) Are these statements true or false? Prove it.

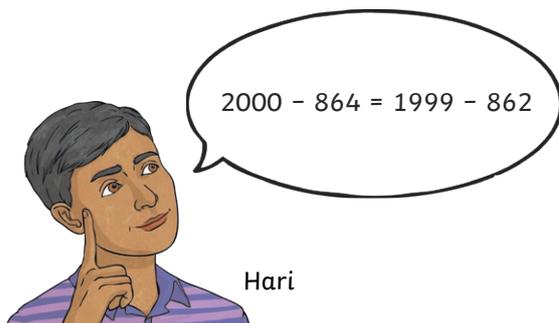
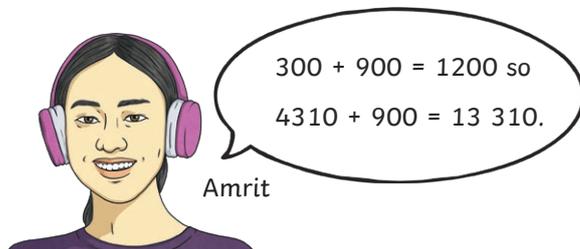
a) $4270 + 99 = 4270 + 100 + 1$

b) $19\ 650 - 399 = 19\ 650 - 400 + 1$

c) $32\ 510 - 990 = 32\ 510 - 1000 + 10$

d) $390 + 17\ 680 = 17\ 680 + 400 - 9$

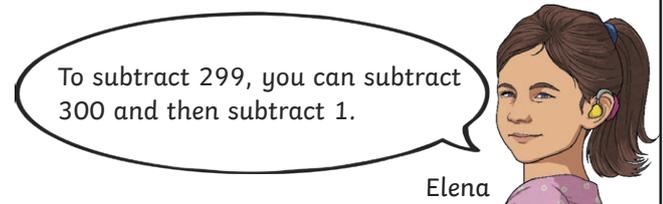
- 3) Identify and explain the mistakes.



Mental Strategies



- 1) Zeke and Elena are discussing mental strategies. Do you agree with their statements? Explain your reasoning.



- 2) Are these statements true or false? Prove it.

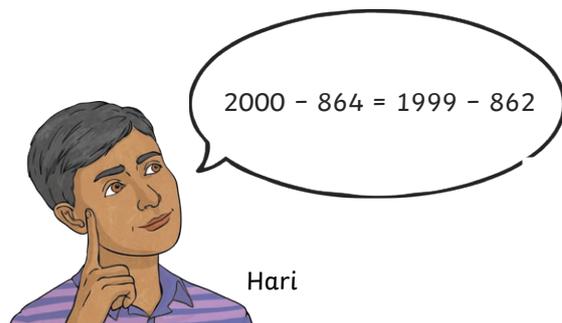
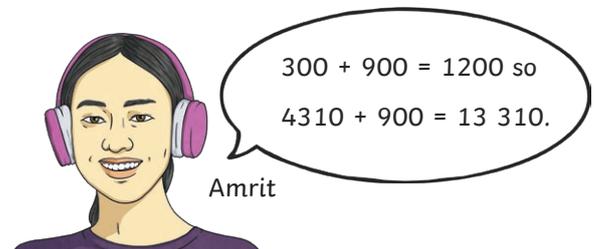
a) $4270 + 99 = 4270 + 100 + 1$

b) $19\ 650 - 399 = 19\ 650 - 400 + 1$

c) $32\ 510 - 990 = 32\ 510 - 1000 + 10$

d) $390 + 17\ 680 = 17\ 680 + 400 - 9$

- 3) Identify and explain the mistakes.



Mental Strategies



- 1) Can you work out how many team points each child earned using the clues?

Drew

I earned 1099 more team points than Joseph.

Emily

I earned 399 fewer team points than Joseph.

Bartek

I earned 48 more team points than Felix.

Felix

I earned 999 fewer team points than Emily.

Joseph

I earned 63 401 team points.

2)

- a) Find the value of the missing digits.

$$\square 06 + 20 \square = 7 \square 8$$

- b) Write a missing digits problem for a partner to solve.

c)

0	2	5	6	7	8
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Use the digit cards to write addition and subtraction calculations and their answers. Each number should have the same number of digits and include at least one zero. The digit cards can be used more than once. Find five possibilities.

Mental Strategies



- 1) Can you work out how many team points each child earned using the clues?

Drew

I earned 1099 more team points than Joseph.

Emily

I earned 399 fewer team points than Joseph.

Bartek

I earned 48 more team points than Felix.

Felix

I earned 999 fewer team points than Emily.

Joseph

I earned 63 401 team points.

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$$\square 06 + 20 \square = 7 \square 8$$

- b) Write a missing digits problem for a partner to solve.

c)

0	2	5	6	7	8
---	---	---	---	---	---

Use the digit cards to write addition and subtraction calculations and their answers. Each number should have the same number of digits and include at least one zero. The digit cards can be used more than once. Find five possibilities.

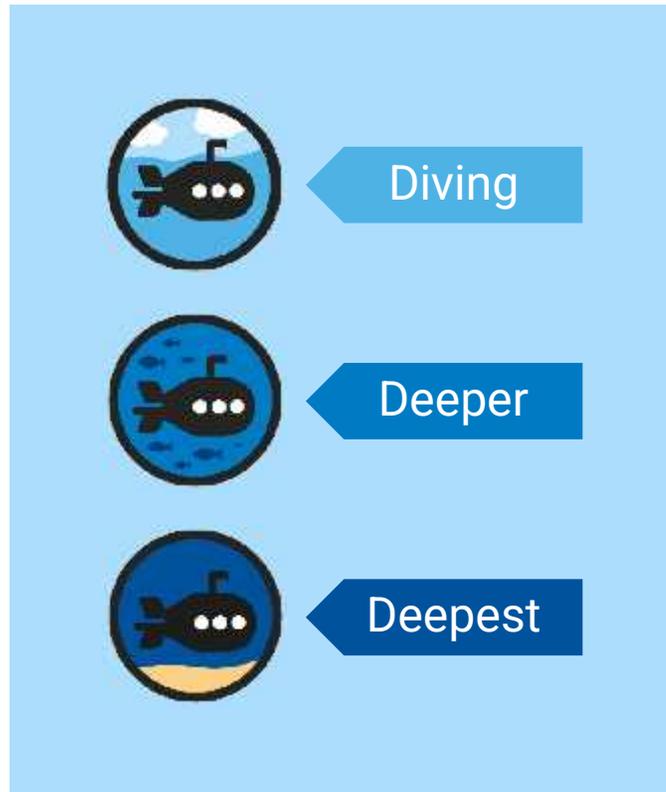
Diving into Mastery



Mental Strategies

Diving into Mastery Guidance for Educators

Each activity sheet is split into three sections, diving, deeper and deepest, which are represented by the following icons:



These carefully designed activities take your children through a learning journey, initially ensuring they are fluent with the key concept being taught; then applying this to a range of reasoning and problem-solving activities.

These sheets might not necessarily be used in a linear way. Some children might begin at the 'Deeper' section and in fact, others may 'dive straight in' to the 'Deepest' section if they have already mastered the skill and are applying this to show their depth of understanding.

National Curriculum Aim

Add and subtract numbers mentally with increasingly large numbers

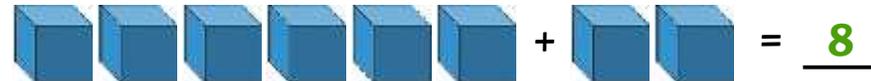
Mental Strategies

Diving

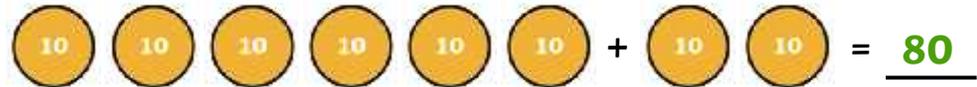


Complete the calculations.

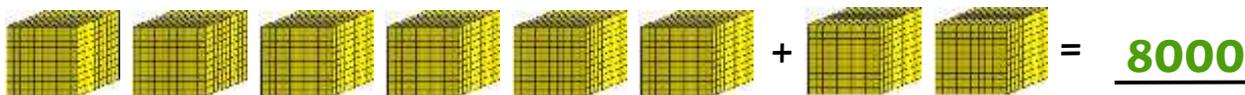
$$6 \text{ ones} + 2 \text{ ones} = \underline{8 \text{ ones}}$$



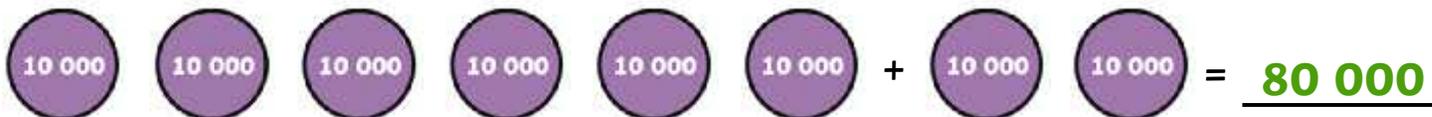
$$6 \text{ tens} + 2 \text{ tens} = \underline{8 \text{ tens}}$$



$$6 \text{ thousands} + 2 \text{ thousands} = \underline{8 \text{ thousands}}$$

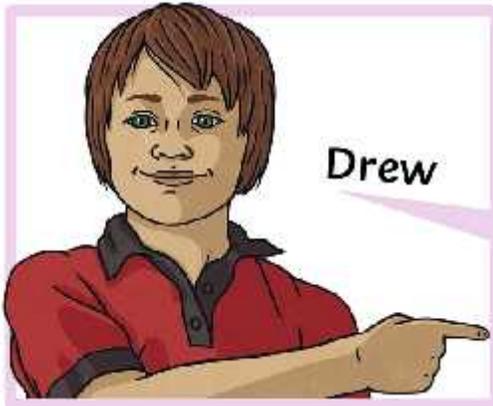


$$6 \text{ ten thousands} + 2 \text{ ten thousands} = \underline{8 \text{ ten thousands}}$$



Mental Strategies

Diving



Drew

I know that $17 - 9 = 8$.

Use Drew's fact to help complete the calculations.

$$170 - 90 = \underline{80}$$

$$1700 - 900 = \underline{800}$$

$$17\ 000 - 9000 = \underline{8000}$$

$$170\ 000 - 90\ 000 = \underline{80\ 000}$$



Jia and Felix are discussing mental strategies. Do you agree with their statements? Explain your reasoning.



To add 99, you add 100 and then subtract 1.

Jia is correct.



To subtract 49, you subtract 50 and then subtract 1.

Felix is incorrect. If he subtracted 50 and then another 1, he would actually be subtracting 51. To subtract 49, he would need to subtract 50 and then add 1.



Are these statements true or false? Prove it.

$$4270 + 99 = 4270 + 100 - 1$$

This is true because both sides of the equation equal 4369.

$$12\,170 - 399 = 12\,170 - 400 - 1$$

This is false. $12\,170 - 399 = 12\,170 - 400 + 1$

$$24\,520 - 290 = 24\,520 - 300 + 10$$

This is true because both sides of the equation equal 24 230.

$$590 + 13\,290 = 13\,290 + 600 - 9$$

This is false. $590 + 13\,290 = 13\,290 + 600 - 10$

Mental Strategies

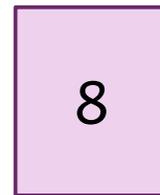
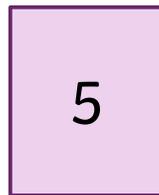
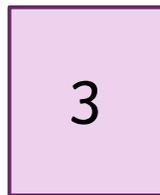
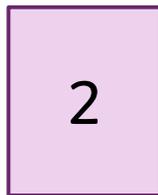
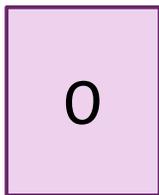
Deepest



Find the value of the missing digits.

$$\boxed{7}05 + 20\boxed{3} = 9\boxed{0}8$$

Use the digit cards to write addition and subtraction calculations and their answers. Each number should have the same number of digits and include at least one zero. The digit cards can be used more than once. Find five possibilities.



There are many possible answers. For example:

$$7050 + 2030 = 9080$$

$$705\ 000 + 203\ 000 = 908\ 000$$

$$908 - 705 = 203$$

$$9080 - 2030 = 7050$$

Mental Strategies



Dive in by completing your own activity!



Mental Strategies

1) Circle and label any interesting mental strategies. Do you agree with their comments? Explain your reasoning.

Mental Strategies

1) Complete the calculations:

a) $6 \text{ ones} + 2 \text{ ones} = \text{ones}$

b) $4 \text{ tens} + 2 \text{ tens} = \text{tens}$

2) Are these statements true or false? Explain your reasoning.

a) $4 \text{ hundreds} + 3 \text{ hundreds} = 7 \text{ hundreds}$

b) $4 \text{ ten thousands} + 2 \text{ ten thousands} = 6 \text{ ten thousands}$

3) Use what you know to help complete:

a) $200 + 30 =$

b) $1000 + 600 =$

c) $15\,000 + 6\,000 =$

d) $100\,000 + 80\,000 =$

4) Use the place value chart to see:

100	10	1
●	●	●

a) $15\,999 + 5000 =$

b) $34\,500 - 300 =$

c) $45\,600 + 720 =$

Mental Strategies

1) Can you work out how many more points each child scored using the chart?

Emily: I scored 199 fewer house points than Joseph.

Harry: I scored 42 more house points than Felix.

Oliver: I scored 100 more house points than Emily.

Grace: I scored 83 more points than Joseph.

How many points did each child score?

2) Put the value of the missing digits. Write a missing digit position for a number to solve:

□	□	□	□	□
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Use the digit cards to write addition and subtraction equations. Each number should have the same number of digits, not all 1 zero, one. Find 2 possibilities.

