

# Explain why an addition or subtraction strategy works

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| NAME | DATE | SCORE / 10 |
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**1** Maya adds  $49 + 23$  like this:  $40 + 20 = 60$  and  $9 + 3 = 12$ , then  $60 + 12 = 72$ . Why does this work?

- ☐ Adding the tens first always makes the sum bigger.
- ☐ 49 is 40 and 9, and 23 is 20 and 3, so every part is added.
- ☐ Tens and ones are the same, so they can be added together.
- ☐ The answer is close to 70, so it must be right.

**2** Leo finds  $91 - 59$  like this:  $91 - 60 = 31$ , then  $31 + 1 = 32$ . Explain why Leo adds 1.

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**3** Ben finds  $69 - 48$  like this:  $69 - 50 = 19$ , then  $19 + 2 = 21$ . Why does Ben add 2?

- ☐ Taking away 50 takes away 2 too many, so 2 is added back.
- ☐ You always add 2 after you take away.
- ☐ Adding 2 makes the answer a whole ten.
- ☐ Taking away 50 takes away 2 too few, so 2 more is added.

**4** Leo finds  $1 + 41 + 9$  by adding  $1 + 9$  first. Explain why this gives the right sum.

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**5** Ben finds  $7 + 22 + 3$  by adding  $7 + 3$  first. Why does this give the right sum?

- ☐ The first and last numbers must always be added first.
- ☐ Numbers can be added in any order, and the sum stays the same.
- ☐ Adding 22 last makes the sum bigger. ☐  $7 + 3 = 10$ , and 10 is the answer.
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**6** Emma adds  $62 + 17$  like this:  $60 + 10 = 70$  and  $2 + 7 = 9$ , then  $70 + 9 = 79$ . Explain why this works.

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**7** Ivy adds  $44 + 34$  like this:  $40 + 30 = 70$  and  $4 + 4 = 8$ , then  $70 + 8 = 78$ . Why does this work?

- ☐ 44 is 40 and 4, and 34 is 30 and 4, so every part is added.
- ☐ The answer is close to 80, so it must be right.
- ☐ Tens and ones are the same, so they can be added together.
- ☐ Adding the tens first always makes the sum bigger.
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**8** Ivy finds  $32 - 18$  like this:  $32 - 20 = 12$ , then  $12 + 2 = 14$ . Explain why Ivy adds 2.

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**9** Maya finds  $31 - 19$  like this:  $31 - 20 = 11$ , then  $11 + 1 = 12$ . Why does Maya add 1?

- ☐ Taking away 20 takes away 1 too few, so 1 more is added.
- ☐ Taking away 20 takes away 1 too many, so 1 is added back.
- ☐ You always add 1 after you take away. ☐ Adding 1 makes the answer a whole ten.

- 10** Maya finds  $97 - 39$  like this:  $97 - 40 = 57$ , then  $57 + 1 = 58$ . Explain why Maya adds 1.

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# Explain why an addition or subtraction strategy works

**1** 49 is 40 and 9, and 23 is 20 and 3, so every part is added.

**3** Taking away 50 takes away 2 too many, so 2 is added back.

**5** Numbers can be added in any order, and the sum stays the same.

**7** 44 is 40 and 4, and 34 is 30 and 4, so every part is added.

**9** Taking away 20 takes away 1 too many, so 1 is added back.

## **2** A written explanation

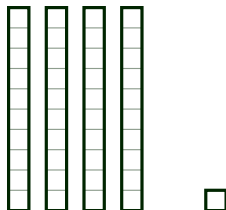


**A model answer:** 60 is 1 more than 59. Taking away 60 takes away 1 more than Leo needed to, so 1 has to be added back:  $31 + 1 = 32$ .

**What counts as right:** Counts as right if it makes these points: (1) 60 is 1 more than 59; (2) so taking away 60 takes away 1 too many, and adding 1 back gives the right answer. “You always add after you take away” does not count.

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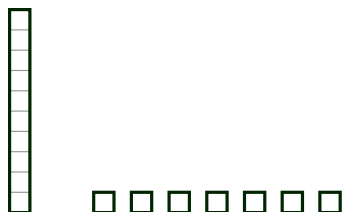
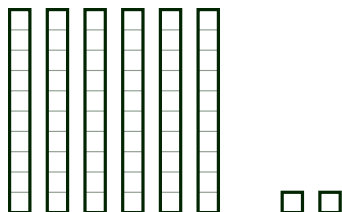
## A written explanation



**A model answer:** Numbers can be added in any order, and the sum stays the same.  $1 + 9 = 10$ , and  $10 + 41 = 51$ , the same as adding them in the order they are written.

**What counts as right:** Counts as right if it makes these points: (1) numbers can be added in any order, or grouped any way, without changing the sum; (2) so adding  $1 + 9$  first still adds all three numbers. “ $1 + 9 = 10$ , so 10 is the answer” does not count.

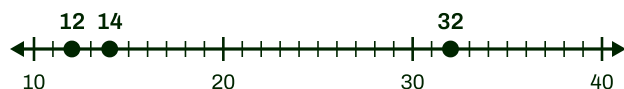
## 6 A written explanation



**A model answer:** 62 is 60 and 2, and 17 is 10 and 7. Emma adds the tens together and the ones together, so every part of both numbers is added once, and  $70 + 9$  is the whole sum, 79.

**What counts as right:** Counts as right if it makes these points: (1) each number is split into its tens and its ones ( $62 = 60 + 2$ ,  $17 = 10 + 7$ ); (2) adding the tens and then the ones adds every part once, so nothing is left out or added twice. Working the sum out another way, or “because the answer is right”, does not count.

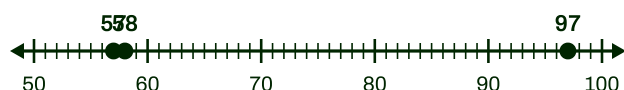
## 8 A written explanation



**A model answer:** 20 is 2 more than 18. Taking away 20 takes away 2 more than Ivy needed to, so 2 has to be added back:  $12 + 2 = 14$ .

**What counts as right:** Counts as right if it makes these points: (1) 20 is 2 more than 18; (2) so taking away 20 takes away 2 too many, and adding 2 back gives the right answer. “You always add after you take away” does not count.

## 10 A written explanation



**A model answer:** 40 is 1 more than 39. Taking away 40 takes away 1 more than Maya needed to, so 1 has to be added back:  $57 + 1 = 58$ .

**What counts as right:** Counts as right if it makes these points: (1) 40 is 1 more than 39; (2) so taking away 40 takes away 1 too many, and adding 1 back gives the right answer. “You always add after you take away” does not count.