

## Addition: 43 + 28

Keep the calculation fixed. Compare two valid methods, explain a value-preserving correction and check a fresh problem.

$$43 + 28 = 71$$

### Method 1: Partition tens and ones

1.  $40 + 20 = 60$
2.  $3 + 8 = 11$
3.  $60 + 11 = 71$

### Method 2: Make 30, then compensate

1.  $43 + 30 = 73$
2.  $30 - 28 = 2$
3.  $73 - 2 = 71$

### Compare and correct

Partitioning splits both numbers into tens and ones. Compensation adds 2 more than 28, then removes those 2. Both preserve  $43 + 28$  and give 71.

**Draft to check:**  $43 + 28 = 43 + 30 = 73$

Replacing 28 with 30 adds 2, so 73 answers the changed calculation.

**Correction:**  $43 + 28 = 43 + 30 - 2 = 71$

### Teacher prompts

**Class/context:** Year 4 maths: compare two addition methods.

**Opening question:** How can you work out  $43 + 28$  mentally? Be ready to explain your method.

**Compare prompt:** What changed when 28 became 30, and why does subtracting 2 restore the original sum?

**Follow-up:** Try  $46 + 27$  independently. Explain the correction if you make 30.

### Fresh check

$$46 + 27$$

The new problem requires subtracting 3 after making 30. Copying the earlier correction of 2 would change the value.

# Plan a number talk

Keep the problem visible. Record two methods and ask learners to explain how each keeps the value.

| Class/context                  | Problem        |
|--------------------------------|----------------|
| Opening question               | Method 1       |
| Method 2                       | Compare prompt |
| Draft misstep and correction   | Fresh problem  |
| Correct answer and explanation |                |

## Notebook practice

Write your answers in your notebook. Show the steps and the reason for each compensation or common-unit change. All required problems are supplied.

1. **Task 1.** Use  $43 + 28$ . Show partitioning and compensation. Explain why the draft  $43 + 28 = 43 + 30 = 73$  needs a correction.  
  

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2. **Task 2.** Solve  $46 + 27$  independently in two ways. Explain why its compensation correction differs from the correction for  $43 + 28$ .  
  

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3. **Task 3.** Correct  $19 \times 5 = 20 \times 5 - 1 = 99$ . Explain the group removed. Then solve  $21 \times 5$  and explain the added group.  
  

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4. **Task 4.** Show two methods for  $\frac{1}{2} + \frac{3}{4}$  and explain why  $\frac{4}{6}$  is incorrect. Then use common tenths to solve  $\frac{3}{5} + \frac{1}{2}$ .  
  

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# Worked answers and explanations

## Task 1

Partitioning:  $40 + 20 = 60$ ;  $3 + 8 = 11$ ;  $60 + 11 = 71$ . Compensation:  $43 + 30 = 73$ ;  $30 - 28 = 2$ ;  $73 - 2 = 71$ . The draft added two extra ones by replacing 28 with 30. Subtracting 2 restores  $43 + 28$ . Both corrected methods give 71.

## Task 2

Partition:  $40 + 20 = 60$ ;  $6 + 7 = 13$ ;  $60 + 13 = 73$ . Compensate:  $46 + 30 = 76$ ;  $30 - 27 = 3$ ;  $76 - 3 = 73$ . This time making 30 adds 3, so subtract 3. Reusing subtract 2 would produce 74 and change the sum.

## Task 3

$20 \times 5 = 100$  includes one extra group of 5. Correct  $19 \times 5$  to  $100 - 5 = 95$ . Splitting gives  $10 \times 5 + 9 \times 5 = 50 + 45 = 95$ . For  $21 \times 5$ , add one group of 5 to  $20 \times 5$ :  $100 + 5 = 105$ . The correction concerns a group, not one individual object.

## Task 4

Common quarters:  $1/2 = 2/4$ , so  $2/4 + 3/4 = 5/4 = 1 \frac{1}{4}$ . Regroup:  $3/4 = 1/2 + 1/4$ , so the two halves make 1 and leave  $1/4$ . Adding the denominators to produce  $4/6$  changes the units. Fresh check:  $3/5 = 6/10$ ;  $1/2 = 5/10$ ;  $6/10 + 5/10 = 11/10 = 1 \frac{1}{10}$ .

## Three fixed comparison examples

**Addition:  $43 + 28 \cdot 43 + 28 = 71$**

**Method 1: Partition tens and ones**

1.  $40 + 20 = 60$
2.  $3 + 8 = 11$
3.  $60 + 11 = 71$

**Method 2: Make 30, then compensate**

1.  $43 + 30 = 73$
2.  $30 - 28 = 2$
3.  $73 - 2 = 71$

**Multiplication:  $19 \times 5 \cdot 19 \times 5 = 95$**

**Method 1: Use 20 groups, then remove one group**

1.  $20 \times 5 = 100$
2.  $20 - 19 = 1$
3.  $1 \times 5 = 5$
4.  $100 - 5 = 95$

**Method 2: Split 19 into 10 and 9**

1.  $10 \times 5 = 50$
2.  $9 \times 5 = 45$
3.  $50 + 45 = 95$

**Fractions:  $1/2 + 3/4 \cdot 1/2 + 3/4 = 5/4 = 1 \frac{1}{4}$**

**Method 1: Use common quarters**

1.  $1/2 = 2/4$
2.  $2/4 + 3/4 = 5/4$
3.  $5/4 = 1 + 1/4 = 1 \frac{1}{4}$

**Method 2: Regroup to make one whole**

1.  $3/4 = 1/2 + 1/4$
2.  $1/2 + 3/4 = 1/2 + 1/2 + 1/4$
3.  $1/2 + 1/2 = 1$
4.  $1 + 1/4 = 1 \frac{1}{4} = 5/4$

Procedure: Heinemann (2022), Create Confident Problem Solvers with Number Talks; Inside Mathematics, Number Talks (n.d.). Original checked problems, teacher prompts, corrections and layout. Classroom research has separate population/design/duration limits.