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Problem Solving

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Problem Solving Toolkit

1

READ

What is the question asking?



2

MEAN

What information matters?



3

MATHS

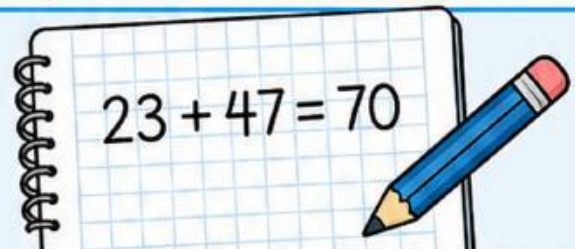
Which operation or strategy will help?



4

DO

Show your working.



5

ANSWER

Check that it makes sense.



Helpful strategies

Draw a diagram



Make a table



Work backwards



Make a list



Find a pattern



Guess and check

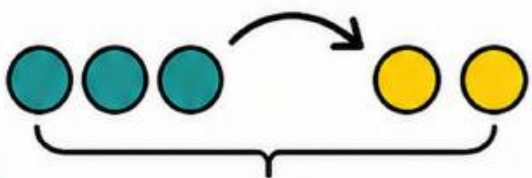


Strategy Solver Cards - Set 1



1 Draw a diagram

Use when position, groups or sharing matters.

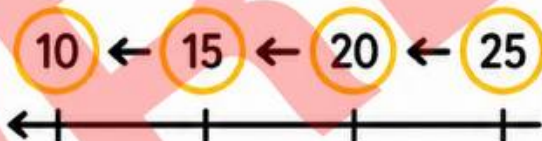


2 Make a table

Use when information repeats.

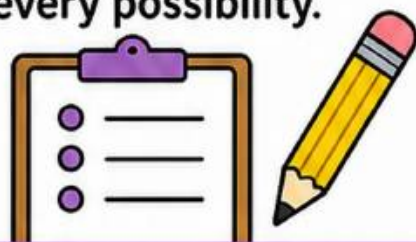
3 Work backwards

Use when you know the end point.



4 Make a list

Use when you need every possibility.



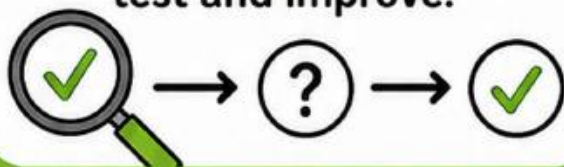
5 Find a pattern

Use when numbers follow a rule.



6 Guess and check

Use when you can test and improve.

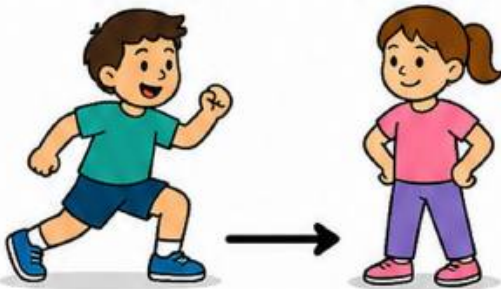


Strategy Solver Cards - Set 2



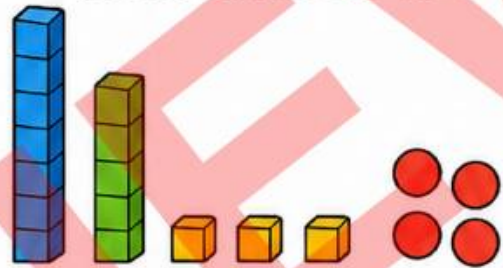
1 Act it out

Use when movement helps explain the problem.



2 Use materials

Use when counters or blocks can model it.



3 Simplify it

Use when smaller numbers reveal the idea.

$$48 + 36 \rightarrow 4 + 3$$

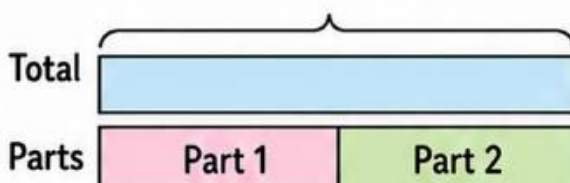
4 Solve a smaller part

Use when the problem has many steps.

Step 1 → Step 2 → Step 3 → ...

5 Bar model

Use when parts and totals need comparing.



6 Estimate and check

Use when your answer must make sense.

About 50?



Read Mean Maths

Do Answer = +

Task Cards - Set 1

Card 1: Same Spend

Mia spent \$28 on a book and \$17 on lunch. Leo spent the same total amount. His book cost \$31. How much was Leo's lunch?



Read - Mean - Maths - Do - Answer

Card 2: Mystery Number

I think of a number.
I double it and then
add 14. The result is 58.
What was my starting
number?



Read - Mean - Maths - Do - Answer

Card 3: Class Tables

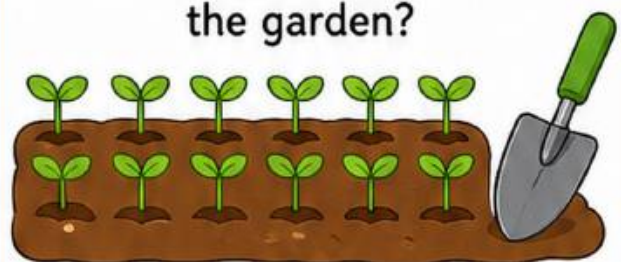
There are 32 students
sitting equally at 8 tables.
Four more students join
and the students are
shared equally again. How
many students sit at each
table now?



Read - Mean - Maths - Do - Answer

Card 4: Garden Rows

A garden has 6 rows
with 7 seedlings in each
row. After 9 seedlings
are moved, how many
seedlings remain in
the garden?



Read - Mean - Maths - Do - Answer

Read Mean Maths

+ Do Answer

÷ Task Cards - Set 2 =

Card 5: Ticket Total

An adult ticket costs \$18. A child ticket costs half as much. What is the total cost for two adults and three children?



Read - Mean - Maths - Do - Answer

Card 6: Book Pages

Ava reads 18 pages each day. Her book has 126 pages. How many full days will it take her to finish the book?



126
pages

Read - Mean - Maths - Do - Answer

Card 7: Sports Points

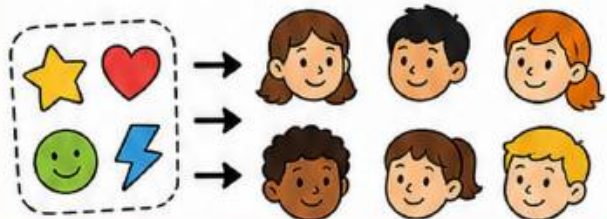
A team scores 24 points in the first half and 19 points in the second half. The other team scores 38 points. How many points did the first team win by?



Read - Mean - Maths - Do - Answer

Card 8: Shared Stickers

Rafi has 72 stickers. He keeps 18 and shares the rest equally between 6 friends. How many stickers does each friend get?

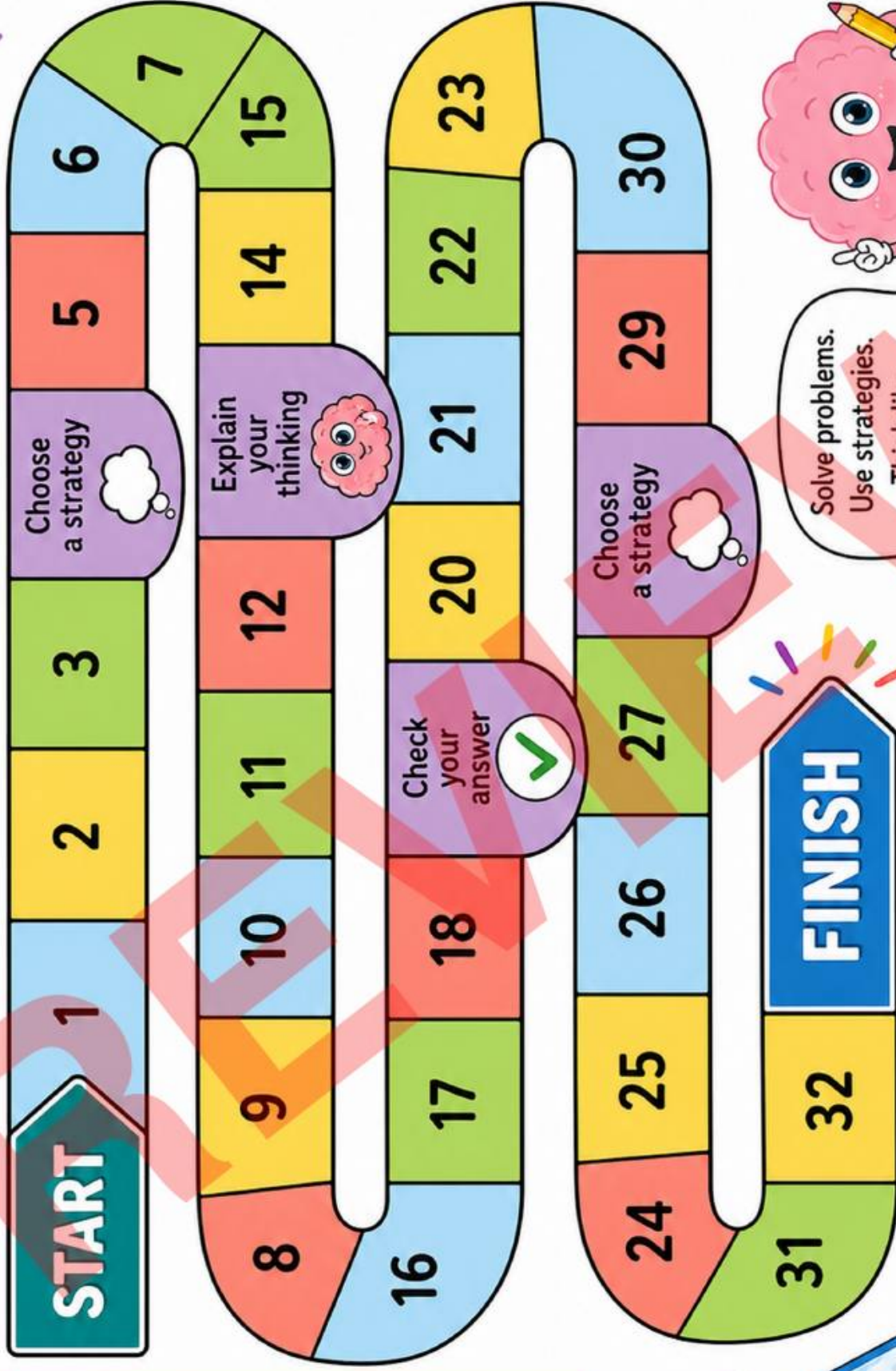
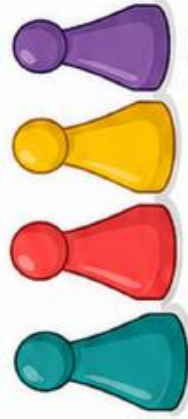


Read - Mean - Maths - Do - Answer

Problem Path Board Game

How to play

- 1 Roll the die and move.
- 2 Pick a task card.
- 3 Solve it on your recording mat.
- 4 Explain your strategy.
- 5 First to FINISH wins.



Solve problems.
Use strategies.
Think like
a mathematician!



Problem Path Recording Mat



Name: _____

1	Task card: _____	Strategy I chose: _____
	Working out:	Answer: _____
		Check: Does it make sense? Yes / Not yet

2	Task card: _____	Strategy I chose: _____
	Working out:	Answer: _____
		Check: Does it make sense? Yes / Not yet

3	Task card: _____	Strategy I chose: _____
	Working out:	Answer: _____
		Check: Does it make sense? Yes / Not yet

4	Task card: _____	Strategy I chose: _____
	Working out:	Answer: _____
		Check: Does it make sense? Yes / Not yet



Use **READ** - **MEAN** - **MATHS** - **DO** - **ANSWER**.



Read It, Mean It, Solve It Mat

Name: _____



1 READ

What is the question asking? Circle key information.

2 MEAN

Write the gist in your own words.

**READ - MEAN -
MATHS - DO - ANSWER**

3 MATHS

Which operation or strategy will help?

4 DO

Show your working out.

5 ANSWER

Write your answer and check it makes sense.



Choose a Strategy Warm-Up

Name: _____

Choose a helpful strategy. Show your working and check your answer.



1. Sam had 47 stickers. He gave 18 stickers to Ava and then bought 25 more stickers. How many stickers does Sam have now?



Strategy: _____

Working out:

Answer: _____

2. A number is 63. It is 27 more than Kai's number. What is Kai's number?



Strategy: _____

Working out:

Answer: _____

3. Four trays hold 6 muffins each. Nine muffins are eaten. How many muffins are left?



Strategy: _____

Working out:

Answer: _____

4. A toy costs \$39. Noah has \$18. He earns \$7 each week. How many more weeks does he need to save?



Strategy: _____

Working out:

Answer: _____



Choose a Strategy Warm-Up

Name: ANSWERS

Choose a helpful strategy. Show your working and check your answer.



1. Sam had 47 stickers. He gave 18 stickers to Ava and then bought 25 more stickers. How many stickers does Sam have now?



Strategy: Add and subtract

Working out:

$$47 - 18 = 29$$

$$29 + 25 = 54$$

Answer: 54 stickers

2. A number is 63. It is 27 more than Kai's number. What is Kai's number?



Strategy: Work backwards

Working out:

$$63 - 27 = 36$$

Answer: 36

3. Four trays hold 6 muffins each. Nine muffins are eaten. How many muffins are left?



Strategy: Multiply then subtract

Working out:

$$4 \times 6 = 24$$

$$24 - 9 = 15$$

Answer: 15 muffins

4. A toy costs \$39. Noah has \$18. He earns \$7 each week. How many more weeks does he need to save?



Strategy: Repeated addition

Working out:

$$\$39 - \$18 = \$21$$

$$\$7 + \$7 + \$7 = \$21$$

Answer: 3 weeks



Multi-Step Word Problems

Name: _____

Read each problem. Underline key information, choose a strategy and show your working.



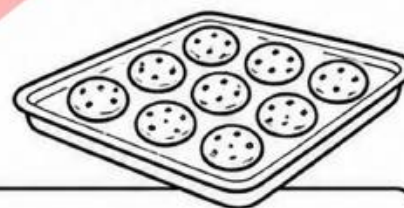
1. Emma wants to read 150 pages by Friday. She reads 36 pages on Monday, 48 pages on Tuesday and 27 pages on Wednesday. How many pages does she still need to read?



Working out:

Answer: _____

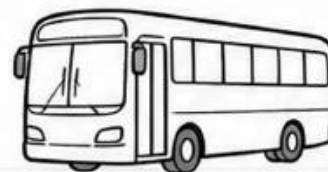
2. A class sold 24 cookies before lunch and 3 trays of 12 cookies after lunch. Each cookie cost \$2. How much money did the class collect altogether?



Working out:

Answer: _____

3. A bus had 68 people on it. At the museum, 17 adults got off and 24 students got on. How many people were on the bus then?



Working out:

Answer: _____



Multi-Step Word Problems

Name: ANSWERS

Read each problem. Underline key information, choose a strategy and show your working.



1. Emma wants to read 150 pages by Friday. She reads 36 pages on Monday, 48 pages on Tuesday and 27 pages on Wednesday. How many pages does she still need to read?



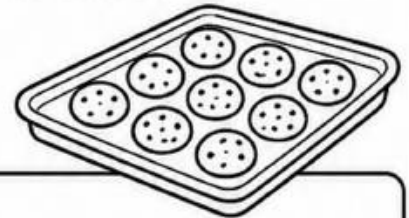
Working out:

$$36 + 48 + 27 = 111$$

$$150 - 111 = 39$$

Answer: 39 pages

2. A class sold 24 cookies before lunch and 3 trays of 12 cookies after lunch. Each cookie cost \$2. How much money did the class collect altogether?



Working out:

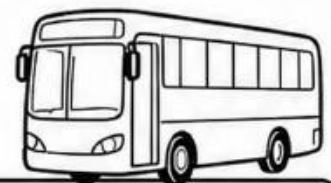
$$3 \times 12 = 36$$

$$24 + 36 = 60$$

$$60 \times \$2 = \$120$$

Answer: \$120

3. A bus had 68 people on it. At the museum, 17 adults got off and 24 students got on. How many people were on the bus then?



Working out:

$$68 - 17 = 51$$

$$51 + 24 = 75$$

Answer: 75 people



Work Backwards and Balance Problems

Name: _____



Use inverse operations, diagrams or trial and check to solve each problem.

1. Zara thinks of a number. She adds 15, then doubles the result. Her final answer is 86. What was Zara's starting number?

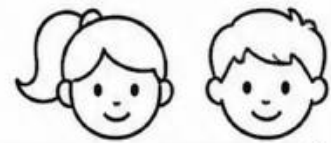
Hint: Work backwards.

Working out:

Answer: _____

2. There are 74 students in the hall. There are 8 more girls than boys. How many girls and boys are there?

Hint: Balance the two groups.

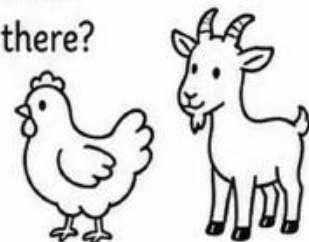


Working out:

Answer: _____

3. A small farm has 16 chickens and goats altogether. The animals have 48 legs altogether. How many chickens and goats are there?

Hint: Test and adjust.



Working out:

Answer: _____



Work Backwards and Balance Problems

Name: ANSWERS



Use inverse operations, diagrams or trial and check to solve each problem.

1. Zara thinks of a number. She adds 15, then doubles the result. Her final answer is 86. What was Zara's starting number?

Hint: Work backwards.

Working out:

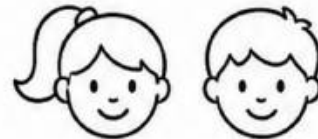
$$86 \div 2 = 43$$

$$43 - 15 = 28$$

Answer: 28

2. There are 74 students in the hall. There are 8 more girls than boys. How many girls and boys are there?

Hint: Balance the two groups.



Working out:

$$74 - 8 = 66$$

$$66 \div 2 = 33$$

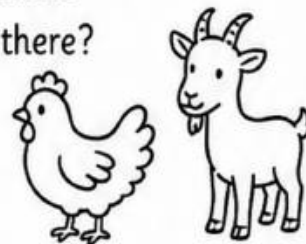
$$\text{Boys} = 33$$

$$\text{Girls} = 33 + 8 = 41$$

Answer: 41 girls and 33 boys

3. A small farm has 16 chickens and goats altogether. The animals have 48 legs altogether. How many chickens and goats are there?

Hint: Test and adjust.



Working out:

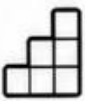
Try 8 goats and 8 chickens.

$$8 \text{ goats} = 32 \text{ legs}$$

$$8 \text{ chickens} = 16 \text{ legs}$$

$$32 + 16 = 48$$

Answer: 8 goats and 8 chickens



Patterns, Tables and Diagrams

Name: _____

Choose a pattern, table or diagram to help solve each problem.



1. Continue the pattern and write the rule: 12, 18, 24, 30, __, __

Working out:



Answer: _____

2. Each art table seats 6 students. Complete the table for 1, 2, 3, 4 and 5 tables. How many students can sit at 5 tables?

Tables	1	2	3	4	5
Students					



Working out:

Answer: _____

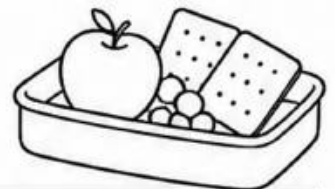
3. A hall has 5 rows of 8 chairs. Six chairs are broken.
Draw a diagram or number sentence. How many chairs can be used?

Working out:



Answer: _____

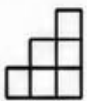
4. A snack box has 2 fruit pieces and 3 crackers.
Complete the table for 1 to 6 snack boxes.
How many items are in 6 snack boxes?



Boxes	1	2	3	4	5	6
Items						

Working out:

Answer: _____



Patterns, Tables and Diagrams

Name: ANSWERS

Choose a pattern, table or diagram to help solve each problem.



1. Continue the pattern and write the rule: 12, 18, 24, 30, __, __

Working out:

Add 6 each time.

Answer: 36, 42; rule: add 6



2. Each art table seats 6 students. Complete the table for 1, 2, 3, 4 and 5 tables. How many students can sit at 5 tables?

Tables	1	2	3	4	5
Students	6	12	18	24	30



Working out:

$$5 \times 6 = 30$$

Answer: 30 students

3. A hall has 5 rows of 8 chairs. Six chairs are broken.

Draw a diagram or number sentence. How many chairs can be used?

Working out:

$$5 \times 8 = 40$$

$$40 - 6 = 34$$

Answer: 34 chairs

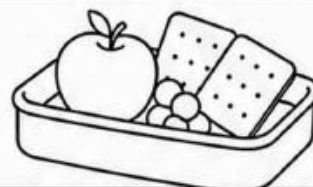


4. A snack box has 2 fruit pieces and 3 crackers.

Complete the table for 1 to 6 snack boxes.

How many items are in 6 snack boxes?

Boxes	1	2	3	4	5	6
Items	5	10	15	20	25	30



Working out:

$$2 + 3 = 5 \text{ items in each box}$$

$$6 \times 5 = 30$$

Answer: 30 items



Problem Possibilities

Name: _____

These problems can have more than one correct answer.
Explain your thinking.



- 1.** Use the digits 2, 4, 6 and 8 once each to make four-digit numbers. Write the smallest number, the largest number and the difference between them.

Working out:

Response: _____

- 2.** Show three different **WAYS** to make \$18.50 using Australian notes and coins.

Working out:

Response: _____

- 3.** A class **has** 28 students. Teams must have at least 4 students and no more than 7 students. List three possible team arrangements.

Working out:

Response:

1. _____
2. _____
3. _____



Problem Possibilities

Name: ANSWERS

These problems can have more than one correct answer.
Explain your thinking.



1. Use the digits 2, 4, 6 and 8 once each to make four-digit numbers. Write the smallest number, the largest number and the difference between them.



Working out:

Smallest: 2468

Largest: 8642

$$8642 - 2468 = 6174$$

Response: 6174

2. Show three different WAYS to make \$18.50 using Australian notes and coins.



Working out:

Example ways:

$$\$10 + \$5 + \$2 + \$1 + 50c$$

$$\$5 + \$5 + \$5 + \$2 + \$1 + 50c$$

$$\$10 + \$2 + \$2 + \$2 + \$2 + 50c$$

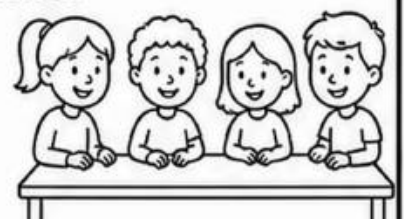
Response: Answers may vary.

3. A class has 28 students. Teams must have at least 4 students and no more than 7 students. List three possible team arrangements.

Working out:

Each arrangement must total 28.

Teams must have 4, 5, 6 or 7 students.



Response:

1. 4 teams of 7

2. 7 teams of 4

3. 5 teams: 4, 6, 6, 6, 6



Problem Solving Challenge - Page 1

Name: _____

Read carefully. Show your strategy, working and answer for each problem.



- 1.** At the school fair, game tickets cost \$4 each. A class buys 9 tickets and pays with \$50. They are given \$7 change. Is the change correct? Explain.

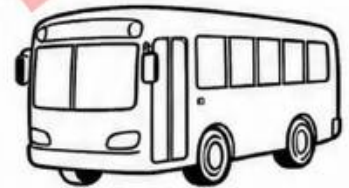


Strategy: _____

Working out:

Answer: _____

- 2.** There are 96 students going on an excursion. They are shared equally across 4 buses. How many students are on each bus?

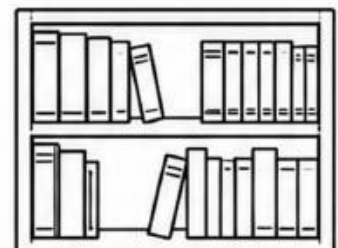


Strategy: _____

Working out:

Answer: _____

- 3.** A library shelf had 136 books. During the week, 48 books were borrowed and 37 books were returned. How many books are on the shelf now?



Strategy: _____

Working out:

Answer: _____

Score: ____ / 10



Problem Solving Challenge - Page 2

Name: _____

Use diagrams, tables or number sentences to communicate your thinking.



4. Continue the pattern: 14, 21, 28, 35, __, __.

What is the 8th number in the pattern?



Working out:

Response: _____

5. The sports shed has \$60 to spend on balls.

Soccer balls cost \$8 each and tennis balls cost \$4 each.

Choose one combination that spends exactly \$60.



Working out:

Response: _____

6. Choose one problem from this assessment.

Explain how you checked that your answer made sense.



Working out:

Response: _____

Score: ____ / 10



Problem Solving Challenge - Page 1

Name: ANSWERS

Read carefully. Show your strategy, working and answer for each problem.



1. At the school fair, game tickets cost \$4 each. A class buys 9 tickets and pays with \$50. They are given \$7 change. Is the change correct? Explain.



Strategy: Multiply, then subtract

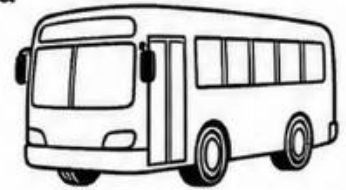
Working out:

$$9 \times \$4 = \$36$$

$$\$50 - \$36 = \$14$$

Answer: No. The change should be \$14, not \$7.

2. There are 96 students going on an excursion. They are shared equally across 4 buses. How many students are on each bus?



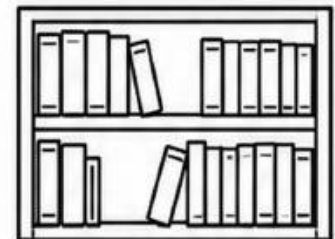
Strategy: Divide equally

Working out:

$$96 \div 4 = 24$$

Answer: 24 students

3. A library shelf had 136 books. During the week, 48 books were borrowed and 37 books were returned. How many books are on the shelf now?



Strategy: Subtract, then add

Working out:

$$136 - 48 = 88$$

$$88 + 37 = 125$$

Answer: 125 books

Score: / 10



Problem Solving Challenge - Page 2

Name: ANSWERS

Use diagrams, tables or number sentences to communicate your thinking.



4. Continue the pattern: 14, 21, 28, 35, __, __.

What is the 8th number in the pattern?



Working out:

Rule: add 7

14, 21, 28, 35, 42, 49, 56, 63

Response: 42, 49; 8th number = 63

5. The sports shed has \$60 to spend on balls.

Soccer balls cost \$8 each and tennis balls cost \$4 each.

Choose one combination that spends exactly \$60.



Working out:

One possible combination:

5 soccer balls = $5 \times \$8 = \40

5 tennis balls = $5 \times \$4 = \20

$\$40 + \$20 = \$60$

Response: 5 soccer balls and 5 tennis balls

6. Choose one problem from this assessment.

Explain how you checked that your answer made sense.



Working out:

Example: I checked the ticket problem by estimating first and then subtracting my answer from \$50.

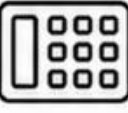
Response: Answers may vary if the check is sensible.

Score: / 10



Year 3 Problem Solving Rubric



Criteria	BEGINNING	DEVELOPING	ACHIEVING	CONFIDENT	EXCEEDING
Understands the problem 	Needs help to identify key information.	Finds some key information.	Identifies what the problem asks.	Explains the problem in own words.	Interprets complex or hidden information.
Chooses a strategy 	Needs help choosing a strategy.	Chooses a strategy with prompting.	Chooses a suitable strategy.	Explains why the strategy fits.	Uses more than one strategy flexibly.
Calculates accurately 	Calculations are mostly incomplete.	Uses some correct calculations.	Calculates accurately for familiar problems.	Calculates accurately in multi-step problems.	Checks and corrects calculations independently.
Communicates and checks 	Working is unclear or missing.	Shows some working.	Shows working and records an answer.	Explains and checks reasonableness.	Communicates clear reasoning and justifies the solution.

Aligned to AC9M3A02 and AC9M3N06

Problem Solving



Why Use Problem Solving Steps?

Some maths problems have more than one step.

A clear routine helps us understand the situation, choose useful mathematics and check that our answer makes sense.



The Five-Step Routine

READ the question.

MEAN: say what it is asking.

MATHS: choose the operation or strategy.

DO the working.

ANSWER and check.



Step 1: Read

Read the whole problem first.

Circle or underline the important information.

Look for what the question is really asking.



Step 2: Mean

Put the problem in your own words.

Ask: What do I know?

Ask: What do I need to find out?



Step 3: Maths

Choose the mathematics that fits.

You might add, subtract, multiply, divide, compare, make a table or draw a diagram.



Step 4: Do

Show your working clearly.

Use number sentences, diagrams, tables or lists so another person can follow your thinking.



Step 5: Answer

Write the answer in the context of the problem.

Check whether the answer is reasonable.

If it does not make sense, try another strategy.



Strategy: Draw a Diagram

A diagram can show groups, positions, distances or missing parts.

It helps when the words feel crowded.



Strategy: Make a Table

A table helps when information repeats.
It can organise patterns, totals, costs or groups.



Strategy: Work Backwards

Use work backwards when you know the ending but not the start.

Undo the operations in the reverse order.



Strategy: Make a List

A list helps you find all possibilities.

Keep your list systematic so you do not miss or repeat answers.



Strategy: Guess and Check

Choose a sensible first answer.

Test it.

Use what you learn to improve your next try.



Model Problem

A class buys 9 fair tickets.

Each ticket costs \$4.

They pay with \$50.

They receive \$7 change.

Is the change correct?



Model Thinking

READ: The question asks if the change is correct.

MATHS: Multiply, then subtract.

DO: $9 \times \$4 = \36 . $\$50 - \$36 = \$14$.

ANSWER: No. The change should be \$14.



Open-Ended Problems

Some problems can have more than one correct answer.

Explain your choices and show how you know your answer fits the rules.



Communicate Your Thinking

Good problem solvers show their method.

Use labels, number sentences and a final answer sentence.



Check Reasonableness

Estimate first.

Use the inverse operation.

Compare with the question.

Ask: Does this answer make sense?



This Week

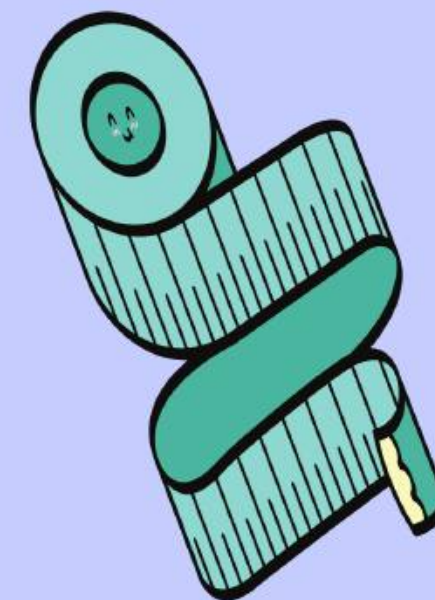
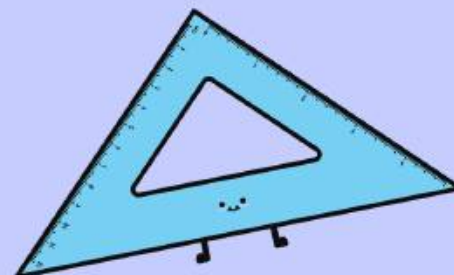
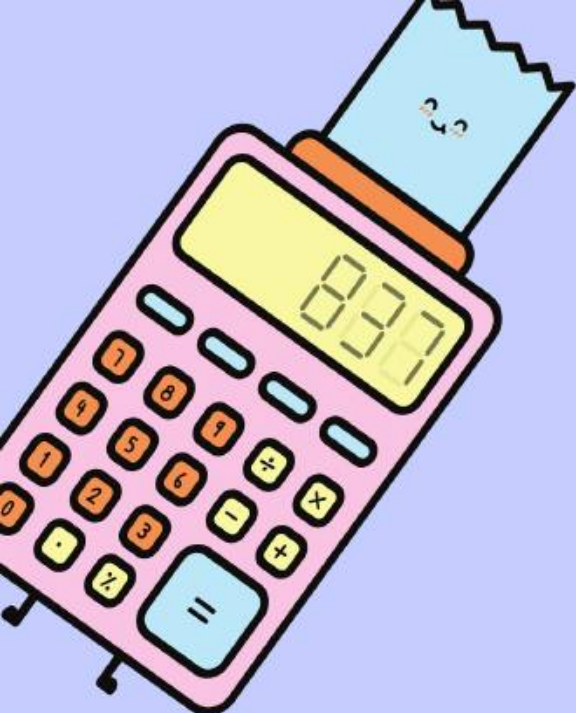
Use the five-step routine.

Try different strategies.

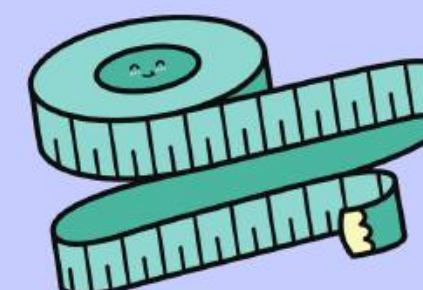
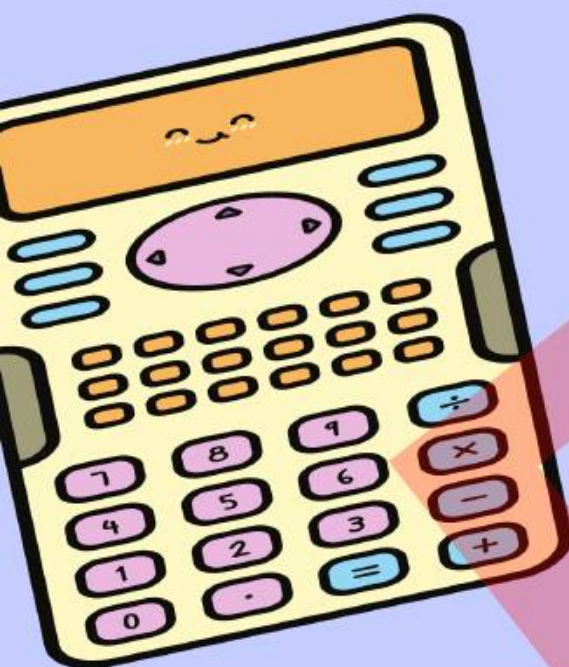
Solve additive and multiplicative problems.

Explain and check your thinking.





Well Done!



Problem Solving Quiz



Question 1

Which step asks, "What is the question asking?"

A. READ

B. DO

C. ANSWER

D. CHECK



Answer !

A. READ



Question 2

True or false?

It is helpful to underline key information before solving a word problem.



Answer 2

True.



Question 3

A number is 58. It is 19 more than Mia's number.

What is Mia's number?



Answer 3

39



Question 4

Which strategy is best when you know the final answer but not the starting number?

- A. Work backwards
- B. Guess randomly
- C. Skip the problem
- D. Write only the answer



Answer 4

A. Work backwards



Question 5

True or false?

A problem can sometimes have more than one correct answer.



Answer 5

True.



Question 6

Four teams have 6 players each. Three more players join.

How many players are there altogether?



Answer 6

$$4 \times 6 = 24$$

$$24 + 3 = 27 \text{ players}$$



Question 7

Which tool can help organise repeated information?

- A. a table
- B. a lunchbox
- C. a ruler only
- D. a title page



Answer 7

A. a table



Question 8

Luca has \$50. He buys 5 tickets that cost \$8 each.

How much money is left?

A. \$5

B. \$8

C. \$10

D. \$18



Answer 8

C. \$10



Question 9

True or false?

Checking an answer can help you find a mistake.



Answer d

True.



Question 10

Name one way to check whether a problem-solving answer makes sense.



Answer 10

Any sensible answer, such as:

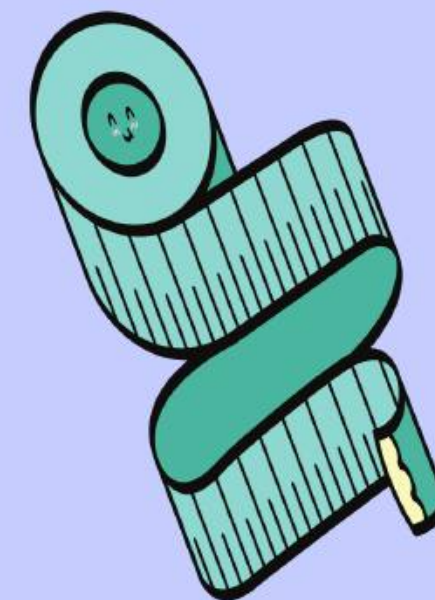
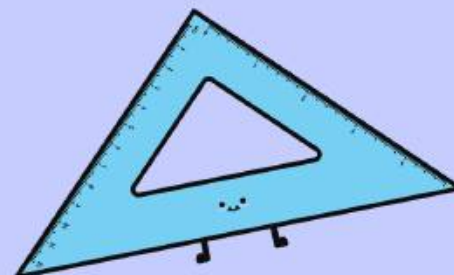
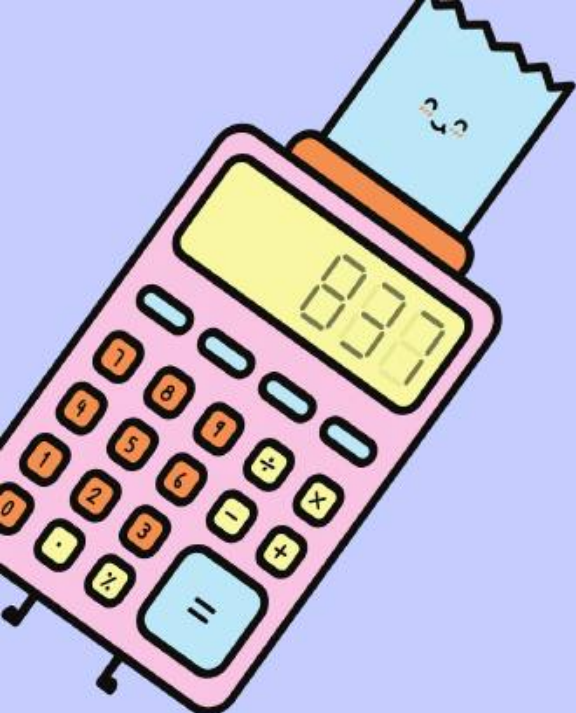
Estimate first.

Use the inverse operation.

Read the question again.

Compare with the situation.





Great Work!

