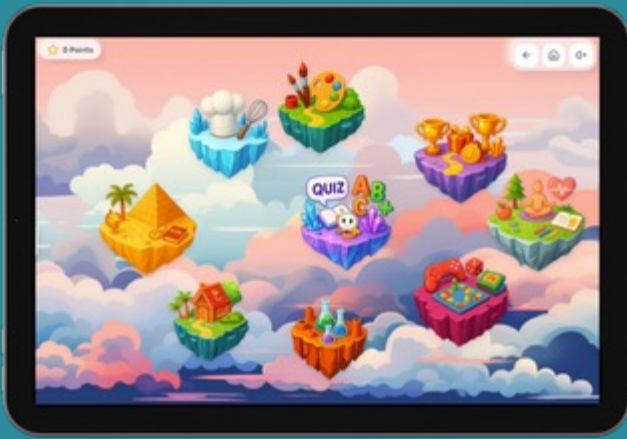


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Multiplication Problems - Year 3

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MULTIPLICATION

PROBLEM-SOLVING STEPS

1

READ

Read twice. Circle the question. Underline numbers and units.



2

CHOOSE

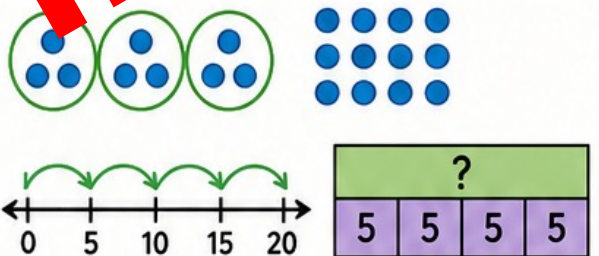
Are there equal groups?
What is unknown?



3

REPRESENT

Draw equal groups,
an array, a number line
or a bar model.



4

SOLVE

Use a known fact
or an efficient
strategy.



5

CHECK

Estimate, use the inverse
and answer with a unit.

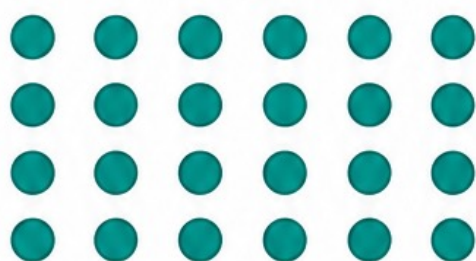


Number of groups $\times$ amount in each group = total

MULTIPLICATION STRATEGY TOOLBOX

ARRAYS & EQUAL GROUPS

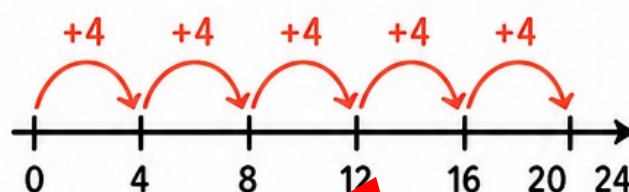
See the groups.



$$4 \times 6 = 24$$

SKIP COUNT & REPEATED ADDITION

Build the total.



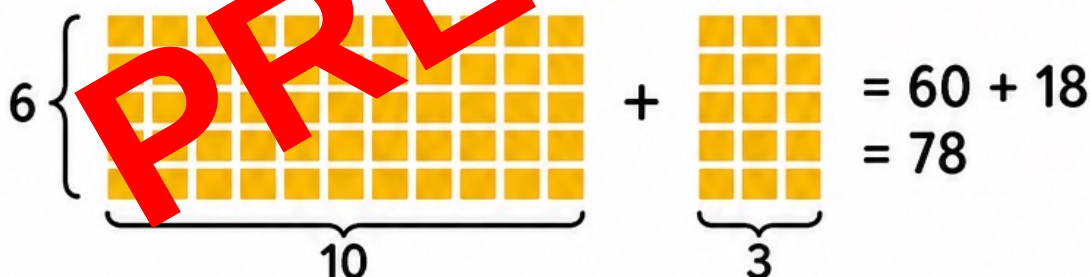
$$6 \times 4 = 24$$

$$4 + 4 + 4 + 4 + 4 + 4 = 24$$

SPLIT

Break apart a factor.

$$6 \times 13 = 6 \times 10 + 6 \times 3$$



DOUBLE & HALVE

Use a fact you know.

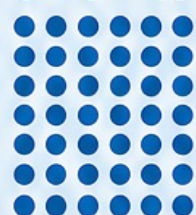
8×6 is double 4×6

$$4 \times 6 = 24$$



DOUBLE

$$8 \times 6 = 48$$

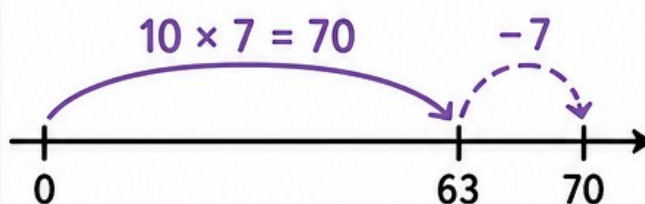


COMPENSATE

Use a friendly fact, then adjust.

$$9 \times 7 = 10 \times 7 - 7$$

$$10 \times 7 = 70$$



$$= 70 - 7 = 63$$

Choose a strategy that makes the numbers easier.



OPERATION DETECTIVE – PROBLEM CARDS



Cut out the cards. Decide whether each situation needs multiplication or division.



1

4 plates hold 6 sandwiches each.
How many sandwiches?



2

24 shells are shared equally among 6 children.
How many each?



3

7 nests hold 5 eggs each.
How many eggs?



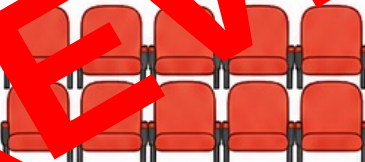
4

36 pencils are packed equally into 4 tubs.
How many per tub?



5

8 rows have 3 seats each.
How many seats?



6

4 stickers are shared among 7 students.
How many each?



7

5 packs hold 9 cards each.
How many cards?



8

32 players form 8 equal teams.
How many per team?



9

6 buses carry 4 students each.
How many students?



10

45 counters are split into 5 equal groups.
How many per group?



11

9 bags hold 6 marbles each.
How many marbles?



12

28 apples are shared among 4 baskets.
How many per basket?





OPERATION DETECTIVE – + ×

SORT & EXPLAIN ÷



Place each problem card in the correct column. Then explain two choices.

MULTIPLY

Equal groups are known. Find the total.

1

2

3

4

5

6

DIVIDE

The total is known. Find a group or number of groups.

1

2

3

4

5

6

PREVIEW

★ I chose MULTIPLY for card ____ because...



★ I chose DIVIDE for card ____ because...



STORY BUILDER STUDIO – PROMPT CARDS

Choose one setting card, one groups card and one number card. Create a multiplication problem.

SETTINGS

BAKERY



AQUARIUM



SPORTS DAY



GROUPS

trays of cupcakes



tanks of fish

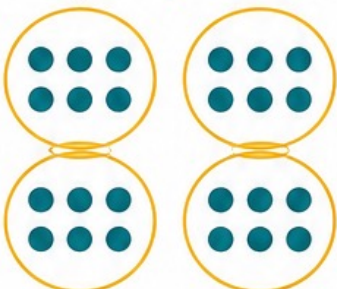


teams with cones

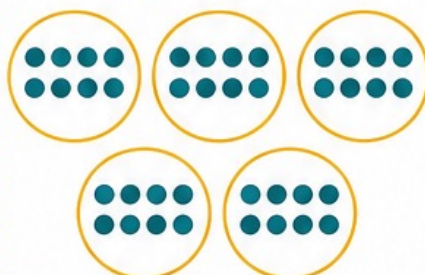


NUMBERS

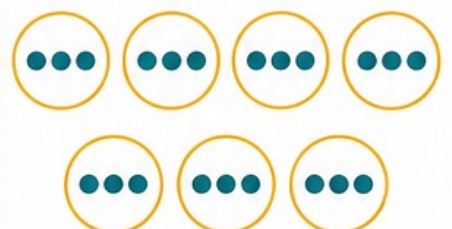
4 groups of 6



5 groups of 8



7 groups of 3





STORY BUILDER STUDIO – PLAN & SOLVE



Name _____

Date _____



1 Who and where is your story about?



2 What equal groups are in the story?



3 Write your multiplication question.



4 Draw an array or equal-groups picture.



5 Write the equation and solve.

$$\square \times \square = \square$$

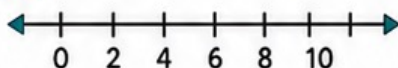
6 Check your answer. Write a complete answer sentence.



☐ My groups are equal.



☐ My numbers make sense.



☐ My answer includes a unit.



MULTIPLICATION MISSION

Solve a card correctly to move one space. First to FINISH wins.



12 EXPLAIN
A STRATEGY

19 MOVE
AHEAD 2

25 MOVE
BACK 1

FINISH





MULTIPLICATION MISSION – CARDS 1-8



1

4 trays hold
6 muffins each.
How many
muffins?



2

7 bags hold
5 marbles each.
How many
marbles?



3

8 rows have
4 seedlings each.
How many
seedlings?



4

3 boxes hold
9 pencils each.
How many
pencils?



5

6 teams need
7 cones each.
How many
cones?



6

Mia collects
8 cards each week
for 5 weeks.
How many
cards?



7

9 tables have
4 chairs each.
How many
chairs?



8

6 shelves hold
8 books each.
How many
books?





MULTIPLICATION MISSION – CARDS 9-16



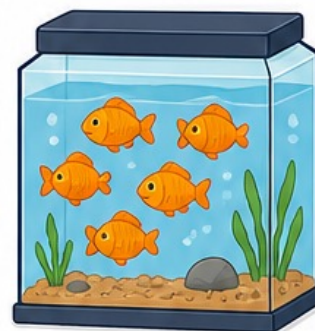
9

Leo reads 6 pages each day for 7 days. How many pages?



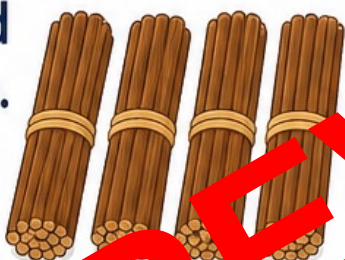
10

8 tanks hold 5 fish each. How many fish?



11

4 bundles hold 12 sticks each. How many sticks?



12

3 classes have 10 students each. How many students?



13

9 packs hold 7 cards each. How many cards?



14

5 rows have 11 plants each. How many plants?



15

There are 8 baskets with 9 apples each. How many apples?



16

6 boxes hold 13 counters each. How many counters?





MULTIPLICATION MISSION — ANSWER KEY

- | | | | |
|---|--------------|----|-------------|
| 1 | 24 muffins | 9 | 42 pages |
| 2 | 35 marbles | 10 | 40 fish |
| 3 | 32 seedlings | 11 | 48 sticks |
| 4 | 27 pencils | 12 | 54 students |
| 5 | 42 cones | 13 | 63 cards |
| 6 | 40 cards | 14 | 55 plants |
| 7 | 36 chairs | 15 | 72 apples |
| 8 | 48 books | 16 | 78 counters |



Accept equivalent working and complete answer sentences.

MULTIPLICATION MISSION – RECORDING SHEET

Name _____

Date _____

TURN	CARD	EQUATION	STRATEGY OR WORKING	ANSWER WITH UNIT
1				
2				
3				
4				
5				
6				

Which strategy helped you most today? Why?



WORKSHEET 1 – CHOOSE & PLAN

Name _____

Date _____

For each problem, identify the equal groups, write an equation, solve and answer with a unit.

1. Four trays hold 6 muffins each. How many muffins are there?



Groups	Equation	Working	Answer

2. Seven bags hold 5 marbles each. How many marbles are there?



Groups	Equation	Working	Answer

3. Eight rows have 4 seedlings each. How many seedlings are there?



Groups	Equation	Working	Answer

4. Three boxes hold 9 pencils each. How many pencils are there?



Groups	Equation	Working	Answer

WORKSHEET 1 – CHOOSE & PLAN

ANSWERS

Name _____

Date _____

For each problem, identify the equal groups, write an equation, solve and answer with a unit.

1. Four trays hold 6 muffins each. How many muffins are there?



Groups	Equation	Working	Answer
4 groups of 6	$4 \times 6 = 24$	$6 + 6 + 6 + 6 = 24$	24 muffins

2. Seven bags hold 5 marbles each. How many marbles are there?



Groups	Equation	Working	Answer
7 groups of 5	$7 \times 5 = 35$	$5 + 5 + 5 + 5 + 5 + 5 + 5 = 35$	35 marbles

3. Eight rows have 4 seedlings each. How many seedlings are there?



Groups	Equation	Working	Answer
8 groups of 4	$8 \times 4 = 32$	$4 + 4 + 4 + 4 + 4 + 4 + 4 + 4 = 32$	32 seedlings

4. Three boxes hold 9 pencils each. How many pencils are there?



Groups	Equation	Working	Answer
3 groups of 9	$3 \times 9 = 27$	$9 + 9 + 9 = 27$	27 pencils

WORKSHEET 2 — DRAW & MULTIPLY

Name _____

Date _____

Draw an array or equal-groups picture. Then write the equation and answer.

1 5 teams have 7 players each.

[illegible]

Equation _____

Answer _____

2 6 shelves hold 4 books each.

A large, bold red 'X' is drawn across the bottom-left corner of a light gray grid. The 'X' is composed of two thick, slightly irregular lines that intersect in the center. The grid consists of small squares, and the 'X' spans across several of them.

Equation: _____

Answer _____

3 8 spiders have 8 legs each

A blank sheet of graph paper with a grid of squares. A red arrow points from the top edge towards the center of the page.

Equation _____

Answer _____

4 3 packs hold 12 cards each.



Equation _____

Answer _____

WORKSHEET 2 — DRAW & MULTIPLY

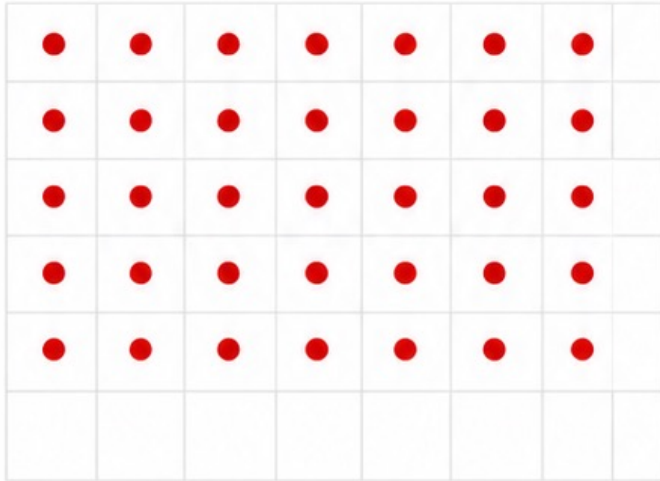
ANSWERS

Name _____

Date _____

Draw an array or equal-groups picture. Then write the equation and answer.

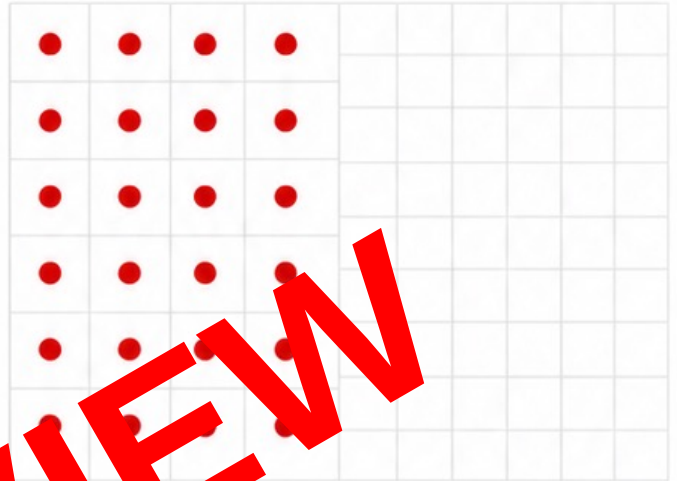
1 5 teams have 7 players each.



Equation $5 \times 7 = 35$

Answer 35 players

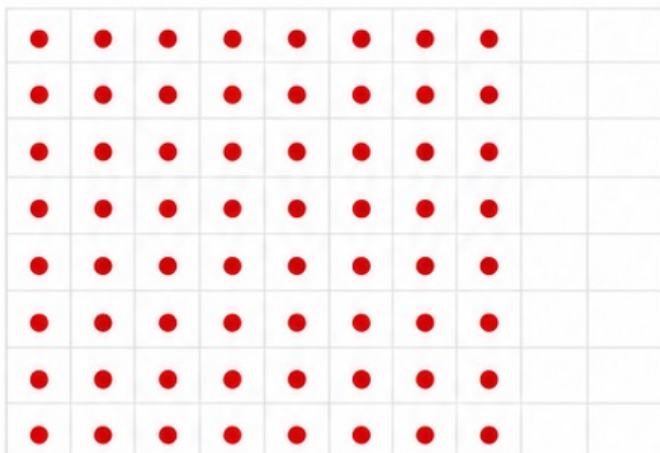
2 6 shelves hold 4 books each.



Equation $6 \times 4 = 24$

Answer 24 books

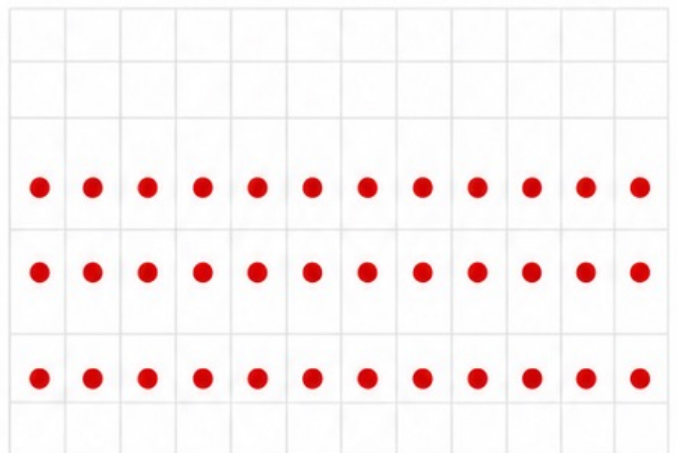
3 8 spiders have 8 legs each.



Equation $8 \times 8 = 64$

Answer 64 legs

4 3 packs hold 12 cards each.



Equation $3 \times 12 = 36$

Answer 36 cards

WORKSHEET 3 – STRATEGY SWITCH

Name _____

Date _____

Use the named strategy. Show each step.

1 DOUBLE: Solve 8×6 by doubling 4×6 .



Working

Answer

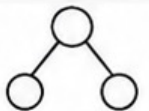
2 COMPENSATE: Solve 9×7 using 10×7 .



Working

Answer

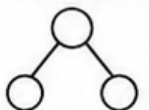
3 SPLIT: Solve 4×13 by splitting 13 into 10 and 3.



Working

Answer

4 SPLIT: Solve 4×18 by splitting 18 into 10 and 8.



Working

Answer

WORKSHEET 3 – STRATEGY SWITCH

ANSWERS

Name _____

Date _____

Use the named strategy. Show each step.

1 DOUBLE: Solve 8×6 by doubling 4×6 .



Working

$$4 \times 6 = 24; \text{ double } 24 = 48$$

Answer

$$8 \times 6 = 48$$

2 COMPENSATE: Solve 9×7 using 10×7 .



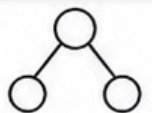
Working

$$10 \times 7 = 70; 70 - 7 = 63$$

Answer

$$9 \times 7 = 63$$

3 SPLIT: Solve 6×13 by splitting 13 into 10 and 3.



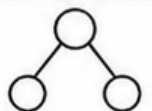
Working

$$6 \times 10 + 6 \times 3 = 60 + 18 = 78$$

Answer

$$6 \times 13 = 78$$

4 SPLIT: Solve 4×18 by splitting 18 into 10 and 8.



Working

$$4 \times 10 + 4 \times 8 = 40 + 32 = 72$$

Answer

$$4 \times 18 = 72$$

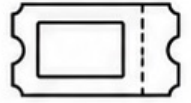
WORKSHEET 4 — MONEY & TIME

Name _____

Date _____

Represent, solve and answer each real-life multiplication problem.

- 1** Four tickets cost \$7 each. What is the total cost?



Equation

Working

Answer

- 2** Kai practises for 25 minutes each day for 5 days.
How many minutes altogether?

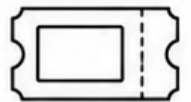


Equation

Working

Answer

- 3** Three museum tickets cost \$12 each.
What is the total cost?



Equation

Working

Answer

- 4** A runner completes 6 laps.
Each lap takes 8 minutes. How many minutes altogether?



Equation

Working

Answer

WORKSHEET 4 — MONEY & TIME

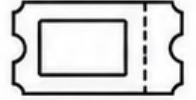
ANSWERS

Name _____

Date _____

Represent, solve and answer each real-life multiplication problem.

- 1** Four tickets cost \$7 each. What is the total cost?



Equation

Working

Answer

$$4 \times 7 = 28$$

$$7 + 7 + 7 + 7 = 28$$

\$28

- 2** Kai practises for 25 minutes each day for 5 days.
How many minutes altogether?



Equation

Working

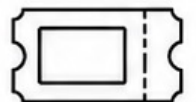
Answer

$$5 \times 25 = 125$$

$$5 \times 20 + 5 \times 5 = 100 + 25 = 125$$

125 minutes

- 3** Three museum tickets cost \$12 each.
What is the total cost?



Equation

Working

Answer

$$3 \times 12 = 36$$

$$3 \times 10 + 3 \times 2 = 30 + 6 = 36$$

\$36

- 4** A runner completes 6 laps.
Each lap takes 8 minutes. How many minutes altogether?



Equation

Working

Answer

$$6 \times 8 = 48$$

$$8 + 8 + 8 + 8 + 8 + 8 = 48$$

48 minutes

WORKSHEET 5 — EXPLAIN & CREATE

Name _____

Date _____



Show clear mathematical reasoning.

- 1** Compare 7×8 and 5×11 . Which product is greater? By how much? Prove it.



Working

Explanation

FN

- ② Create a word problem for 6×9 . Draw a representation, solve it and write an answer sentence.



PREVIEW

Equation _____

Answer sentence _____

- 3 Ava says $8 \times 7 = 54$ because $8 \times 5 = 40$ and $8 \times 2 = 14$. Find and correct the error.



The error _____

The correction _____

WORKSHEET 5 — EXPLAIN & CREATE

ANSWERS

Name _____

Date _____



Show clear mathematical reasoning.

- ① Compare 7×8 and 5×11 . Which product is greater? By how much? Prove it.



Working

$$7 \times 8 = 56; 5 \times 11 = 55; 56 - 55 = 1.$$

Explanation

7×8 is greater by 1.

- ② Create a word problem for 6×9 . Draw a representation, solve it and write an answer sentence.



Six trays had muffins each. How many muffins?



Equation $6 \times 9 = 54$

Answer sentence There are 54 muffins.

- ③ Ava says $8 \times 7 = 54$ because $8 \times 5 = 40$ and $8 \times 2 = 14$. Find and correct the error.



The error 8×2 is 16, not 14.

The correction $40 + 16 = 56$, so $8 \times 7 = 56$.



Answer: _____

ASSESSMENT – MULTIPLICATION PROBLEMS – PART 1

ANSWERS



Name _____

Date _____



≧ Show your thinking. ≦

1. Six buses carry 8 children each. How many children?

A 14



B 36



C 48



D 56



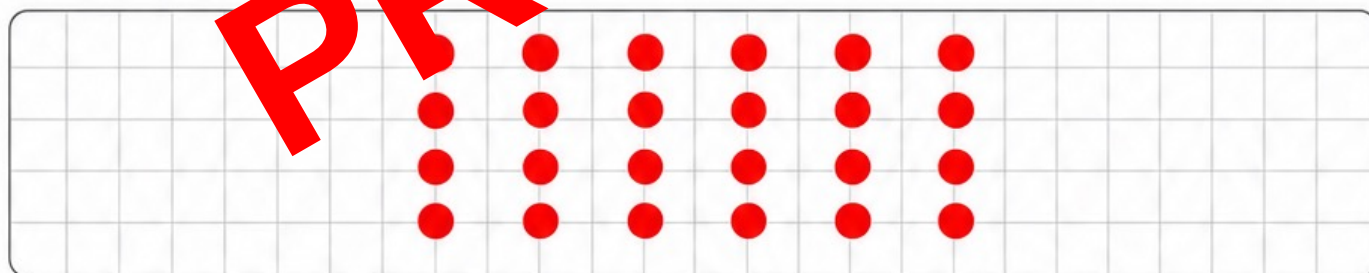
$6 \times 8 = 48$ children

2. Seven packets hold 9 stickers each. Write an equation and solve.

Equation: $7 \times 9 = 63$ stickers

Solve: 63 stickers

3. Draw equal groups of eggs to show 4 nests with 6 eggs in each nest. Find the total.



Total: $4 \times 6 = 24$ eggs

4. Choose an efficient strategy and solve 9×8 . Explain why your strategy works.

$10 \times 8 = 80$; $80 - 8 = 72$, so $9 \times 8 = 72$.

Answer: 72

ASSESSMENT – MULTIPLICATION PROBLEMS – PART 2

Name _____

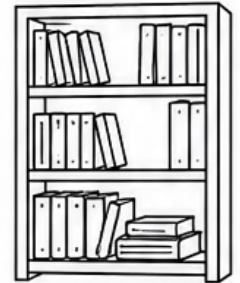
Date _____



Show your thinking and answer in context.

5. Four shelves hold 8 books each. Seven books are checked out. How many books remain?

Equation / working:



Answer: _____

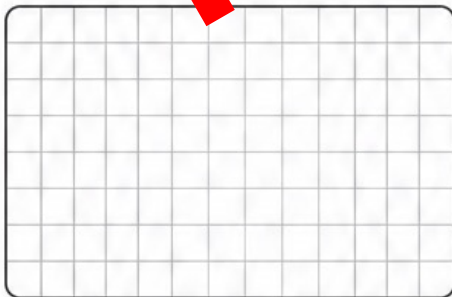
6. Five notebooks cost \$6 each. What is the total cost?

Equation / working:



Answer: _____

7. Explain why 3×12 and 12×3 have the same product. You may use an array.



Explanation:

8. Create and solve a multiplication story that matches $8 \times 4 = 32$.

Story: _____

Equation: _____



Answer sentence: _____

ASSESSMENT – MULTIPLICATION PROBLEMS – PART 2

ANSWERS

Name _____

Date _____

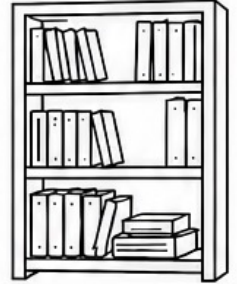


Show your thinking and answer in context.

5. Four shelves hold 8 books each. Seven books are checked out. How many books remain?

Equation / working:

$$4 \times 8 = 32; 32 - 7 = 25$$



Answer: 25 books remain.

6. Five notebooks cost \$6 each. What is the total cost?

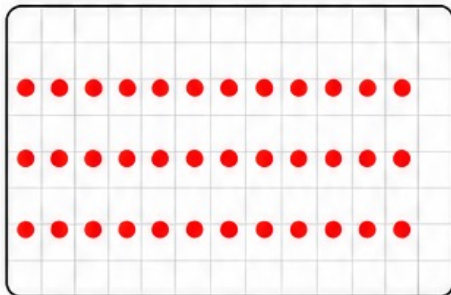
Equation / working:

$$5 \times 6 = 30$$



Answer: \$30

7. Explain why 3×12 and 12×3 have the same product. You may use an array.



Explanation:

A 3-by-12 array can be turned to
make a 12-by-3 array. Both contain
36 squares, so both products are 36.

8. Create and solve a multiplication story that matches $8 \times 4 = 32$.

Story: Eight baskets hold 4 apples each. How many apples are there?

Equation: $8 \times 4 = 32$



Answer sentence: There are 32 apples.

MULTIPLICATION PROBLEM-SOLVING RUBRIC

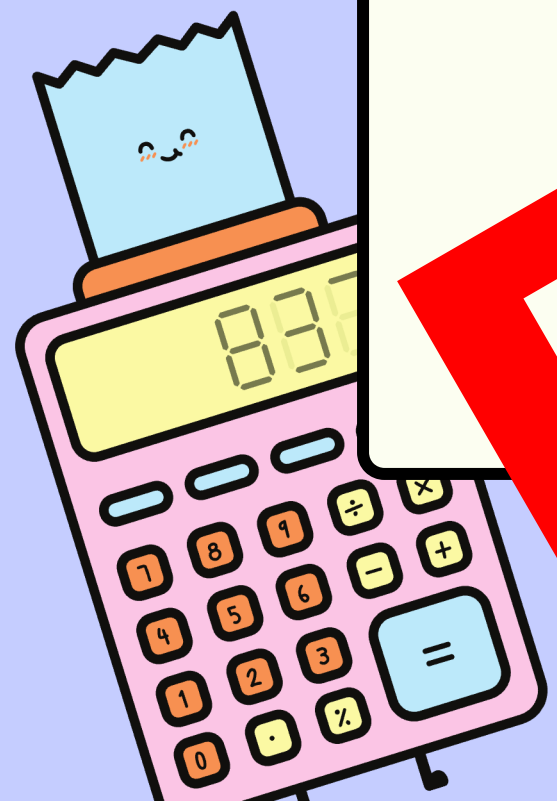
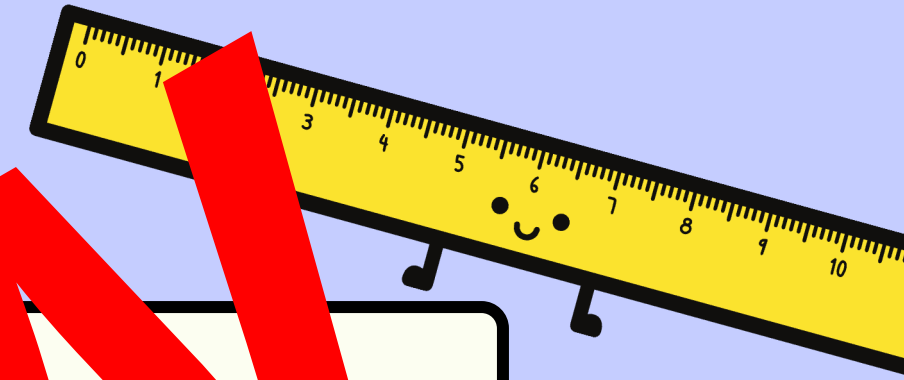
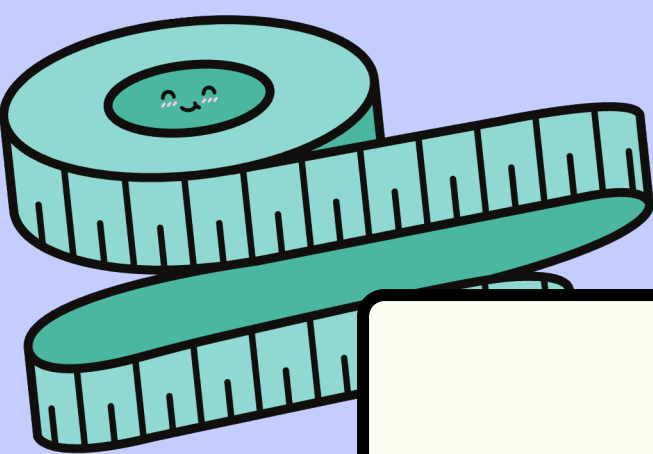
Year 3

CRITERIA	BEGINNING — 1	DEVELOPING — 2	SOUND — 3	STRONG — 4	EXCEPTIONAL — 5
1. Interprets the problem	Needs help to identify what is asked.	Identifies some key information.	Identifies the question and key information.	Explains what is known and what must be found.	Interprets all details and notices hidden steps.
2. Selects an equation	Does not yet select a matching equation.	Selects an equation with support.	Selects a suitable multiplication equation.	Selects and justifies a suitable equation.	Selects, justifies and connects equations.
3. Uses a strategy or representation	Needs help to begin a strategy.	Uses a partial strategy or model.	Uses a suitable strategy or representation.	Uses an efficient strategy and clear model.	Uses and compares efficient strategies.
4. Calculates accurately	Calculations are mostly incomplete.	Some calculations are accurate.	Calculates the product accurately.	Calculates accurately and checks the result.	Calculates, checks and explains accuracy.
5. Explains and checks the answer	Gives little explanation or checking.	Gives a brief answer with support.	Answers in context and shows checking.	Explains reasoning and checks in context.	Communicates convincing reasoning and checks.

Total: ____ / 25

Feedback: _____

Next step: _____



Multiplication Problems Year 3

PREVIEW



Learning Intention

We are learning to solve multiplication problems by finding equal groups, choosing our representation and explaining our thinking.



Success Criteria

I can:

- identify equal groups
- write a multiplication equation
- represent the problem
- choose an efficient strategy
- check and answer in context



The Big Picture

Multiplication helps us find a total when equal sized groups are repeated.

Number of groups $\times$ amount in each group = total



What Is a Multiplication Problem?

Multiplication situations have equal-sized groups.

Equal groups: 4 trays with 6 muffins on each tray.

Not equal groups: trays holding different numbers of muffins.



Multiplication Language

Listen for: groups of, each, even, row, packs, set and times as many.

Clue words can help with thinking, but the situation must make mathematical sense.



Five-Step Routine

READ • CHOOSE • REPRESENT • SOLVE • CHECK



Step 1: Read

Read the problem twice.

Circle the question.

Underline the quantities and their units.



Step 2: Choose

Ask: Are there equal groups?

What is unknown?

- the number of groups
- the amount in each group
- the total



Step 3: Represent

Show the situation with an equal groups sketch, an array, a number line, or a bar model.



Step 4: Solve

Use a strategy that makes the numbers easier to solve

- known facts
- repeated addition
- split
- double or halve
- compensation



Step 5: Check

Estimate first.

Use the inverse when helpful.

Reread the question.

Answer with the correct unit.



Strategy Toolbox

Arrays & equal groups • skip counting & repeated addition

Split • Double & halve • compensate



Worked Example: Equal Groups

Four trays hold muffins each.

4 groups of 6

$$4 \times 6 = 24$$

There are 24 muffins.



Worked Example: Repeated Addition

Five bags hold 7 marbles each.

$$7 + 7 + 7 + 7 + 7 = 35$$

$$5 \times 7 = 35$$

There are 35 marbles.



Worked Example: Split

Six boxes hold 10 pencils each.

$$6 \times 13$$

$$= 6 \times 10 + 6 \times 3$$

$$= 60 + 18$$

$$= 78 \text{ pencils}$$



Worked Example: Compensation

Nine rows have 7 chairs each row

$$10 \times 7$$

$$70 - 7$$

$$= 63 \text{ chairs}$$



Worked Example: Double

Eight teams need cones each.

$$4 \times 6 = 24$$

$$\text{Double } 24 = 48$$

$$8 \times 6 = 48 \text{ cones}$$



Money Problem

Four tickets cost \$7 each.

$$4 \times 7 =$$

The total cost is \$28.



Time Problem

Kai practises for 25 minutes each day for 5 days.

$$25 \times 20 + 5$$

$$= 500 + 25$$

$$= 125 \text{ minutes}$$



Same Problem, Different Representations

3×8 can be shown as:

- 3 equal groups of 8
- a 3-by-8 array
- $8 + 8 + 8$
- three jumps of 8 on a number line



Guided Practice

Seven packets hold 9 stickers each. How many stickers?

READ • CHOOSE • REPRESENT • SOLVE • CHECK



Guided Practice 2

Four shelves hold 8 books each. How many books?

Use a mental strategy. Show each part and justify your choice.



Common Mix-Ups

Avoid:

- adding only the two numbers
- swapping a quantity and its unit
- forgetting that group sizes must be equal
- giving a number without answering in context

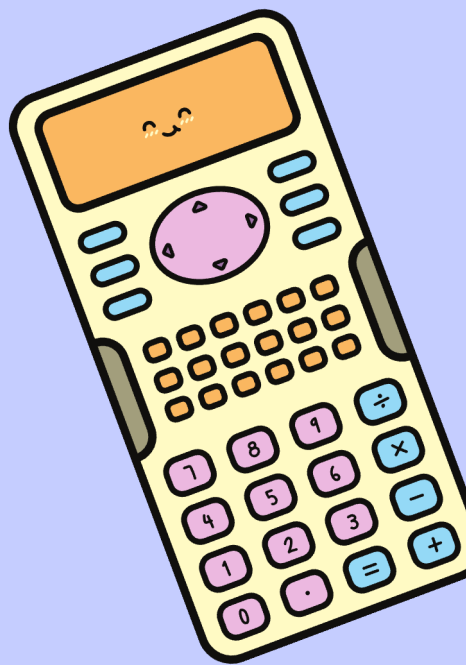
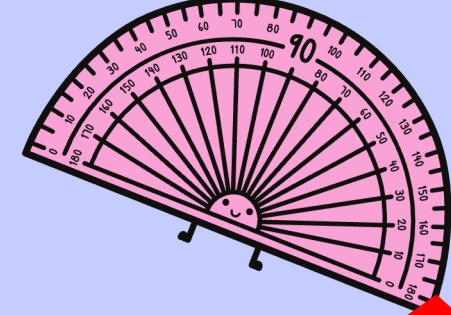
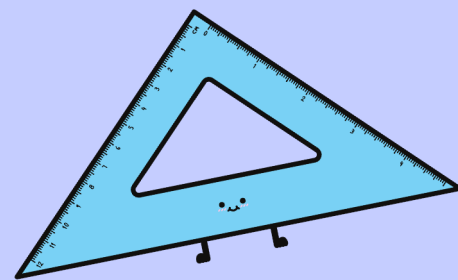
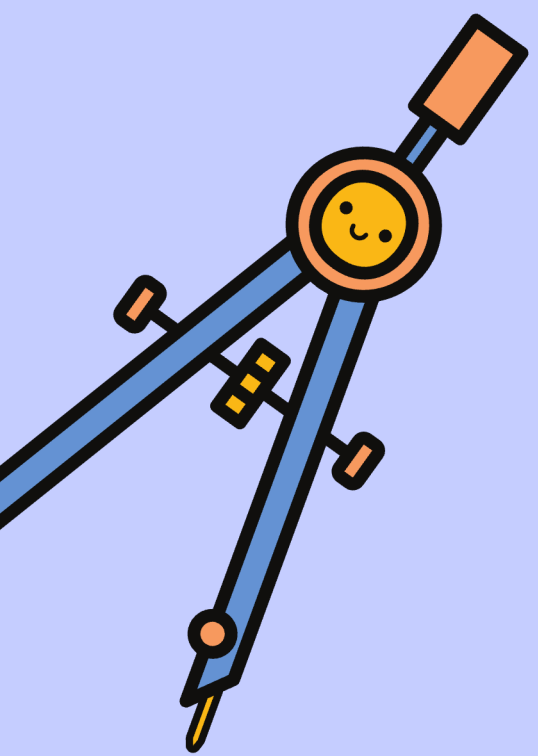


Exit Ticket

Six buses carry 8 children each. How many children?

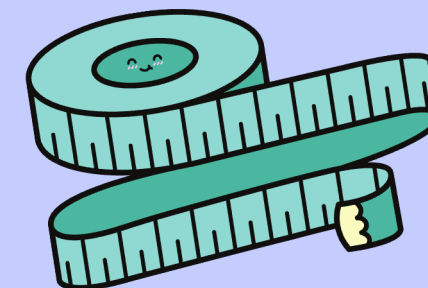
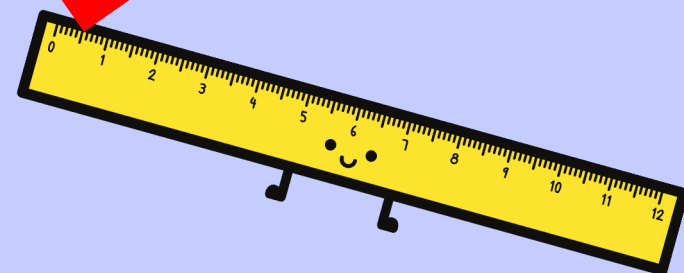
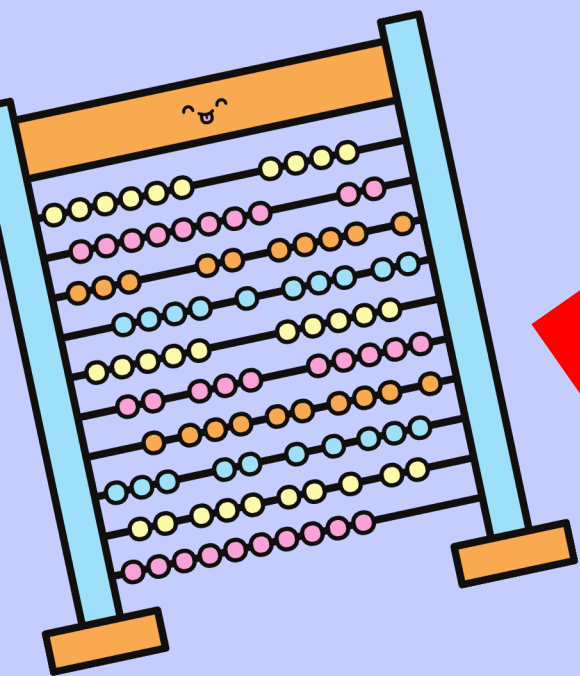
Include an equation, a visual representation, your strategy and a complete answer sentence.





Well Done!

You can solve multiplication problems with a plan.



Multiplication Problems Quiz

Year 3

PREVIEW



Q1 – True or False

4 groups of 6 has a total of 24.



AI - Answer

1. 2.
 $4 \times 6 = 24.$



Q2 – Multiple Choice

Seven bags hold 5 marbles each. How many marbles?

A 2 B 3 C 35 D 40



A2 – Answer

C – 35 apples.

$$7 \times 5 = 35.$$



Q3 – Short Answer

Write a multiplication equation for 8 rows of 4 seedlings.



A3 – Answer

PREVIEW

$$8 \times 4 =$$



Q4 – Multiple Choice

Which representation best shows 3×9 ?

A 3 groups of 9

B $3 + 9$

C $9 - 3$

D 9 shared among 3



A4 – Answer

A 3 groups of 9.



Q5 – True or False

To solve 9×7 , you can calculate 10×7 and subtract 7.



A5 - Answer

1. 2.
 $70 - 7 = 63.$



Q6 – Short Answer

Use a split strategy to solve 6×13 .

PREVIEW



A6 – Answer

$$6 \times 10 + 6 \times 3$$

$$= 60 + 18$$

$$= 78.$$



Q7 – Multiple Choice

Four tickets cost \$7 each. What is the total?

A \$28 B \$47 C \$28 D \$47



A7 - Answer

$$C = \$2$$

$$4 \times 7 = 28.$$



Q8 – Short Answer

Five days of 5 minutes each how many minutes?



A8 – Answer

125 hundreds.

$$20 + 5 \times 5 = 100 + 25.$$



Q9 – True or False

The best way to check a word problem answer is to ignore the units and keep only the number.



A9 – Answer

False
Reread the question, check the calculation and include the correct unit.



Q10 – Multiple Choice

Six buses carry 8 children each. How many children?

A 4 B 3 C 48 D 68

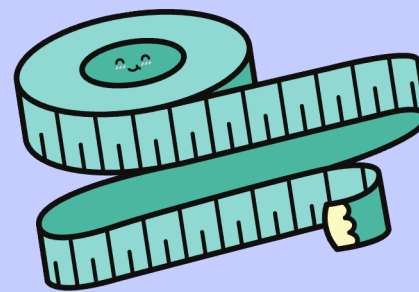
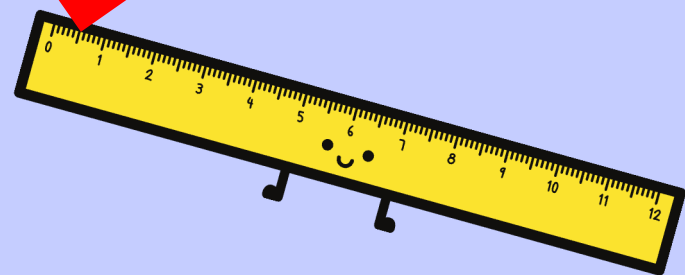
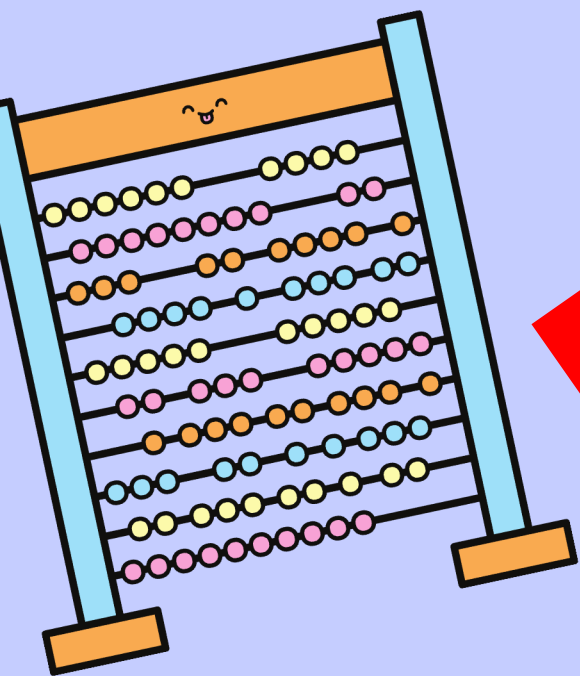
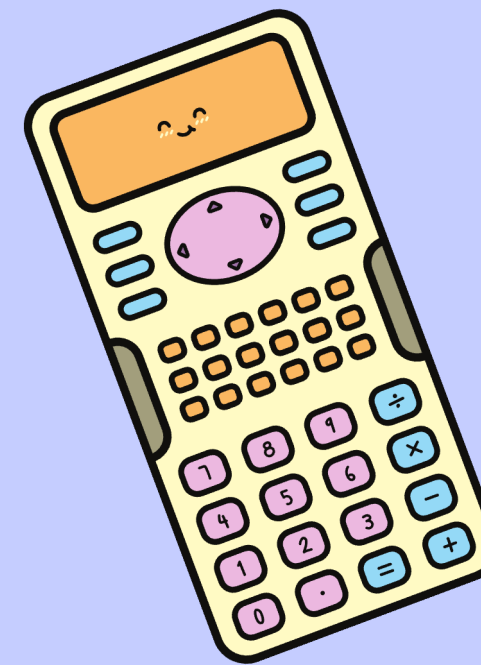
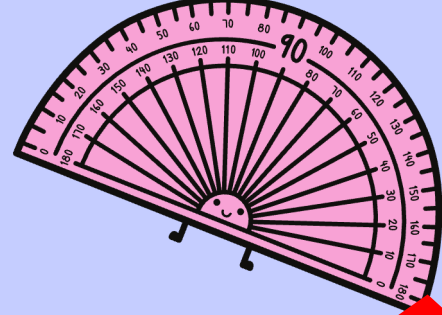
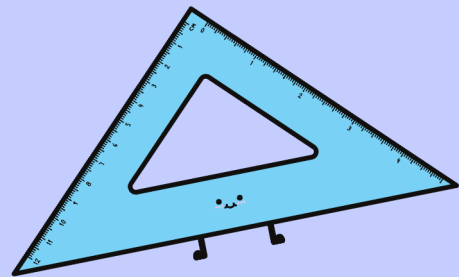
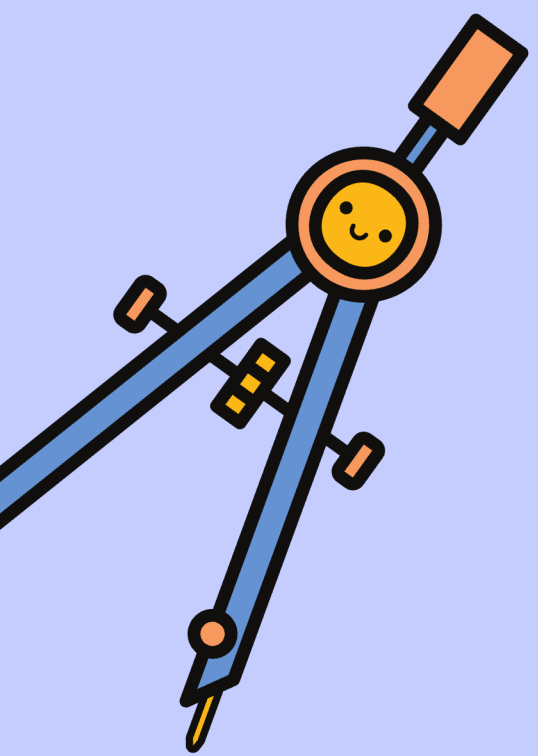


A10 – Answer

C – 48 children.

$$6 \times 8 = 48.$$





Well Done!
You completed the multiplication problems quiz.

PREVIEW