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Multiplication Mania Year 4

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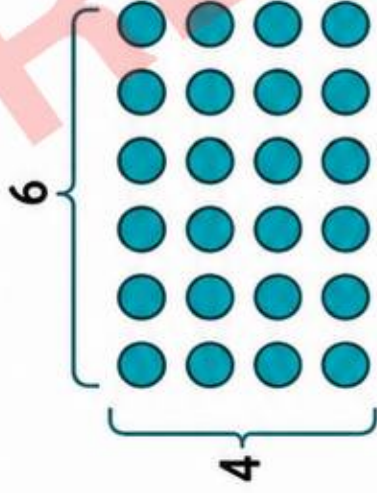
Presentation: Multiplication Mania Year 4
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Multiplication Strategy Toolkit

Arrays

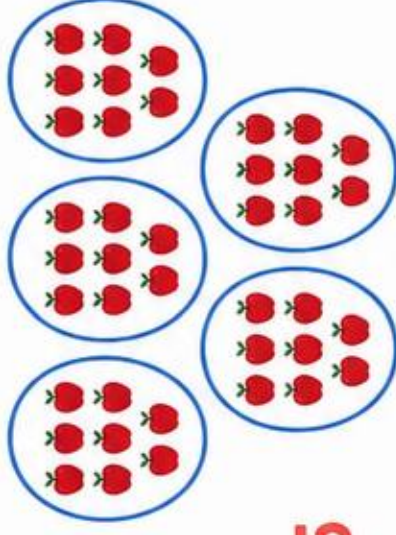
Rows and columns show equal groups.



$$4 \times 6 = 24$$

Draw a Diagram

Sketch equal groups to see the problem.



$$5 \text{ groups of } 7 = 35$$

Double and Halve

Double one factor and halve the other.

$$25 \times 8$$

Double
one factor

$$50 \times 4 =$$

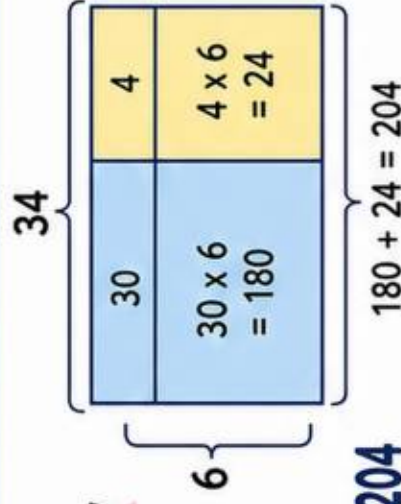
Halve
the other

$$= 200$$

$$25 \times 8 = 50 \times 4 = 200$$

Area Model

Partition numbers, multiply the parts, then add.



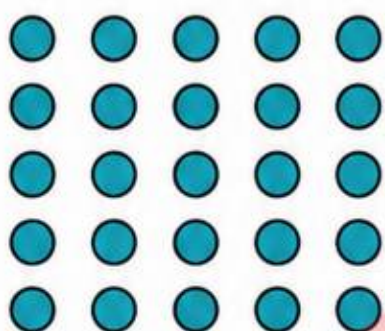
$$34 \times 6 = 30 \times 6 + 4 \times 6 = 204$$

Strategy Choice Mat

Choose a multiplication strategy that fits the numbers.

Array

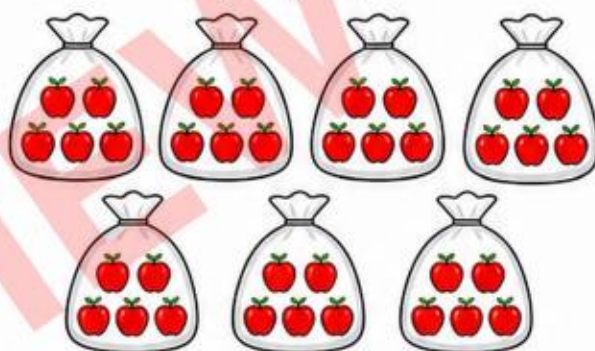
Best for equal groups you can arrange in rows and columns.



$$6 \text{ rows of } 4 = 6 \times 4 = 24$$

Diagram

Best for word problems with equal groups.



$$7 \text{ bags with } 5 \text{ apples} = 35 \text{ apples}$$

Double and Halve

Best when one factor is even.

$$18 \times 25$$

Double
one factor

Halve
the other

$$9 \times 50$$

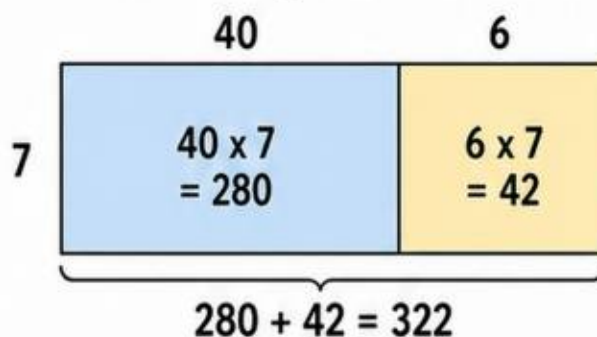
=

$$450$$

$$18 \times 25 = 9 \times 50 = 450$$

Area Model

Best for two-digit and three-digit factors.

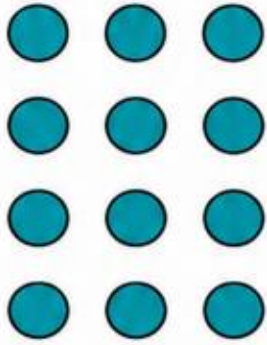


$$46 \times 7 = 40 \times 7 + 6 \times 7 = 322$$

Estimate. Choose. Solve. Check.

Array Match-Up Cards

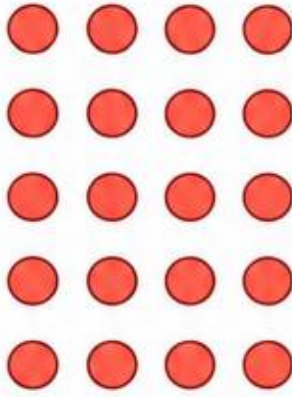
Directions: Cut, mix and match each array with its equation and product.



3 rows of 4

$$3 \times 4 = 12$$

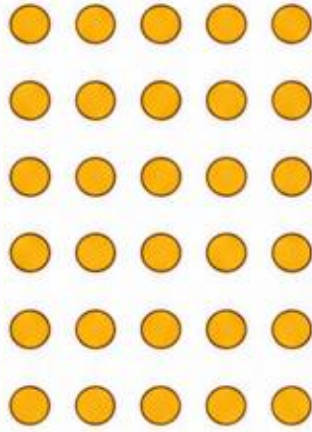
12 counters



4 rows of 5

$$4 \times 5 = 20$$

20 counters



5 rows of 6

$$5 \times 6 = 30$$

30 counters





Factor Trail Strategy Board



How to Play

1. Roll a die.
2. Move along the trail.
3. Solve the space using any strategy.
4. Explain your strategy before your next turn.

Strategy Key

A = array



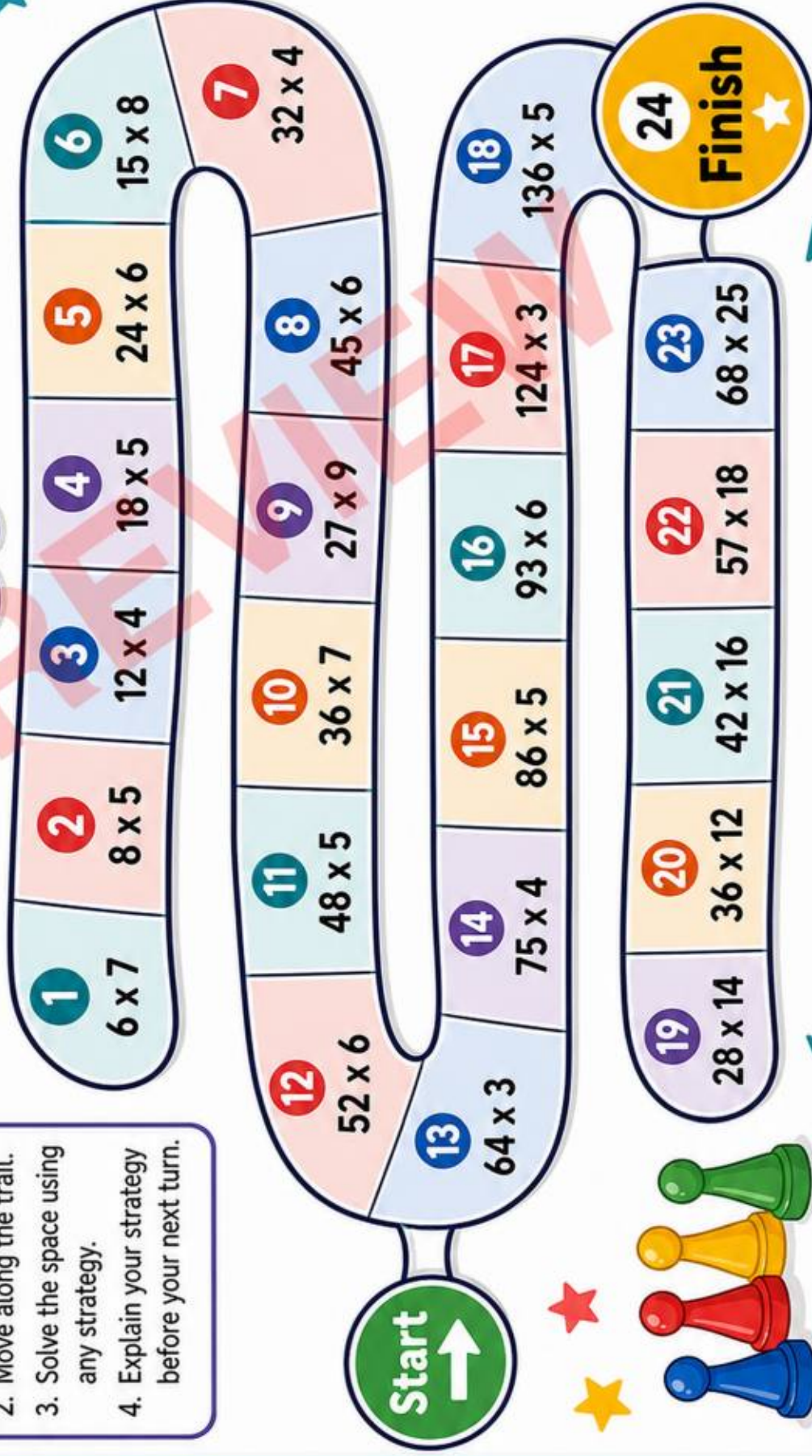
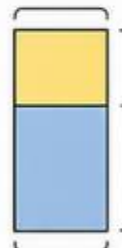
D = diagram



H = double and halve



M = area model



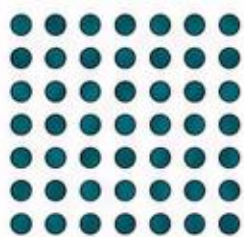
Multiplication Mission Cards



Choose a card. Solve it. Tell a partner which strategy helped you.

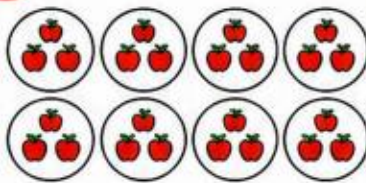


1



Draw an array
for 7×6 .

2



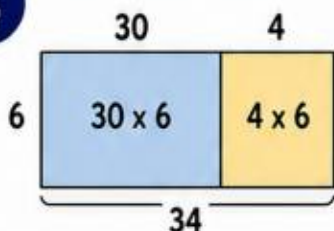
Use a diagram
for 8 groups of 5.

3



Double and
halve: 25×12 .

4



Use an area
model: 34×6 .

5



Which strategy
fits 46×7 ?
Explain.

6



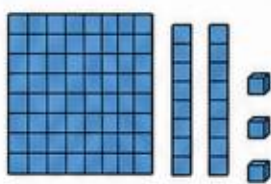
Write a word
problem for 9×8 .

7



Solve 18×5
two ways.

8



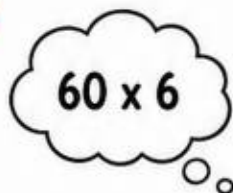
Partition
 73×4 .

9



Draw equal groups
for 6×11 .

10



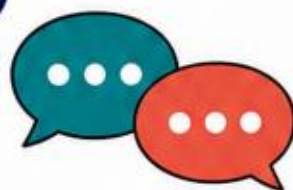
Estimate 57×6
before solving.

11



Use an area
model: 42×15 .

12



Check a partner's
strategy.

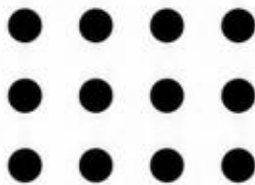
Array Architects



Name: _____

1. Circle the equation that matches each array.

a) 3 rows of 4



$3 \times 4 = 12$

$3 \times 5 = 15$

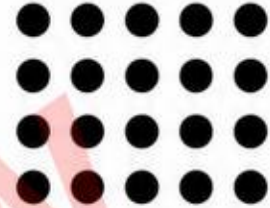
b) 2 rows of 6



$2 \times 6 = 12$

$6 \times 3 = 18$

c) 4 rows of 5



$4 \times 5 = 20$

$5 \times 5 = 25$

2. Draw each array. Then write the multiplication sentence.

d) 5 rows of 3 counters

___ x ___ = ___

e) 4 rows of 7 books

___ x ___ = ___

f) 6 rows of 4 flags

___ x ___ = ___

3. Solve the word problem with an array.

The art room has 6 trays. Each tray holds 7 markers.
How many markers are there altogether?

___ x ___ = ___



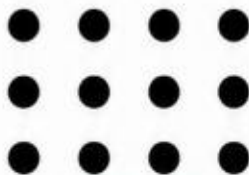
Array Architects



Name: ANSWERS

1. Circle the equation that matches each array.

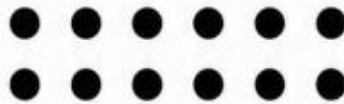
a) 3 rows of 4



$$3 \times 4 = 12$$

$$3 \times 5 = 15$$

b) 2 rows of 6



$$2 \times 6 = 12$$

$$6 \times 3 = 18$$

c) 4 rows of 5



$$4 \times 5 = 20$$

$$5 \times 5 = 25$$

2. Draw each array. Then write the multiplication sentence.

d) 5 rows of 3 counters



$$5 \times 3 = 15$$

e) 4 rows of 7 books



$$4 \times 7 = 28$$

f) 6 rows of 4 flags



$$6 \times 4 = 24$$

3. Solve the word problem with an array.

The art room has 6 trays. Each tray holds 7 markers.
How many markers are there altogether?

$$6 \times 7 = 42$$



Diagram Detectives



Name: _____

Read each problem. Draw equal groups. Write the multiplication sentence and answer.

- a) A library has 5 shelves. Each shelf has 6 books. How many books are there altogether?

Draw

___ X ___ = ___

- b) There are 7 teams. Each team has 4 players. How many players are there altogether?

Draw

___ X ___ = ___

- c) Ava has 8 packets. Each packet has 3 stickers. How many stickers does she have altogether?

Draw

___ X ___ = ___

- d) There are 6 tables. Each table seats 8 students. How many students can sit altogether?

Draw

___ X ___ = ___



Diagram Detectives



Name: ANSWERS

Read each problem. Draw equal groups. Write the multiplication sentence and answer.

- a) A library has 5 shelves. Each shelf has 6 books. How many books are there altogether?

Draw

$$\underline{5} \times \underline{6} = \underline{30}$$

- b) There are 7 teams. Each team has 4 players. How many players are there altogether?

Draw

$$\underline{7} \times \underline{4} = \underline{28}$$

- c) Ava has 8 packets. Each packet has 3 stickers. How many stickers does she have altogether?

Draw

$$\underline{8} \times \underline{3} = \underline{24}$$

- d) There are 6 tables. Each table seats 8 students. How many students can sit altogether?

Draw

$$\underline{6} \times \underline{8} = \underline{48}$$

Double and Halve Helpers



Name: _____

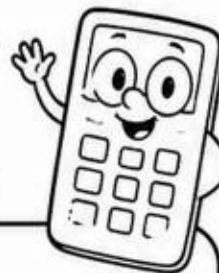


DOUBLE

Double one factor and halve the other to make an easier fact.



HALVE



1. Complete each double-and-halve strategy.

Problem	Double	Halve	New fact	Product
a) 14×25	$25 \rightarrow \underline{\hspace{2cm}}$	$14 \rightarrow \underline{\hspace{2cm}}$	$\underline{\hspace{2cm}} \times \underline{\hspace{2cm}}$	$\underline{\hspace{2cm}}$
b) 18×35	$35 \rightarrow \underline{\hspace{2cm}}$	$18 \rightarrow \underline{\hspace{2cm}}$	$\underline{\hspace{2cm}} \times \underline{\hspace{2cm}}$	$\underline{\hspace{2cm}}$
c) 24×15	$15 \rightarrow \underline{\hspace{2cm}}$	$24 \rightarrow \underline{\hspace{2cm}}$	$\underline{\hspace{2cm}} \times \underline{\hspace{2cm}}$	$\underline{\hspace{2cm}}$
d) 32×25	$25 \rightarrow \underline{\hspace{2cm}}$	$32 \rightarrow \underline{\hspace{2cm}}$	$\underline{\hspace{2cm}} \times \underline{\hspace{2cm}}$	$\underline{\hspace{2cm}}$

2. Solve each word problem. Show the easier fact.

- e) A store packs 25 boxes with 18 pencils in each box.
How many pencils are packed altogether?

Easier fact: _____ Answer: _____

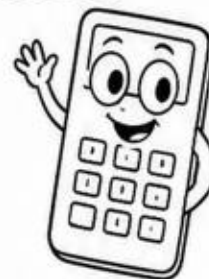
- f) A bakery makes 35 trays with 12 muffins on each tray.
How many muffins are made altogether?

Easier fact: _____ Answer: _____



Double and Halve Helpers

Name: ANSWERS



DOUBLE

Double one factor and halve the other to make an easier fact.



HALVE

1. Complete each double-and-halve strategy.

Problem	Double	Halve	New fact	Product
a) 14×25	$25 \rightarrow \underline{50}$	$14 \rightarrow \underline{7}$	$\underline{7 \times 50}$	$\underline{350}$
b) 18×35	$35 \rightarrow \underline{70}$	$18 \rightarrow \underline{9}$	$\underline{9 \times 70}$	$\underline{630}$
c) 24×15	$15 \rightarrow \underline{30}$	$24 \rightarrow \underline{12}$	$\underline{12 \times 30}$	$\underline{360}$
d) 32×25	$25 \rightarrow \underline{50}$	$32 \rightarrow \underline{16}$	$\underline{16 \times 50}$	$\underline{800}$

2. Solve each word problem. Show the easier fact.

- e) A store packs 25 boxes with 18 pencils in each box.
How many pencils are packed altogether?

Easier fact: $\underline{9 \times 50 = 450}$ Answer: $\underline{450 \text{ pencils}}$

- f) A bakery makes 35 trays with 12 muffins on each tray.
How many muffins are made altogether?

Easier fact: $\underline{70 \times 6 = 420}$ Answer: $\underline{420 \text{ muffins}}$



Area Model Builders

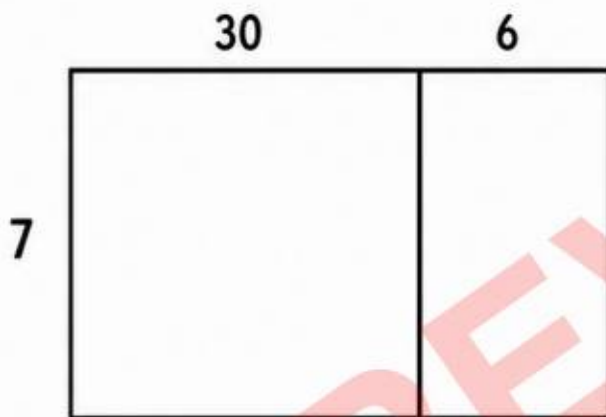
Name: _____



Reminder: Partition the larger factor, multiply each part, then add.

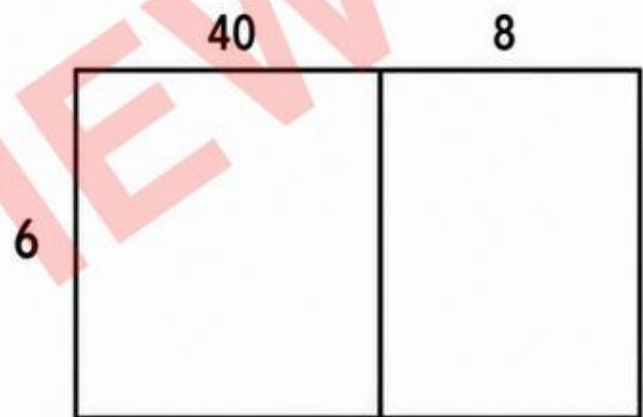
Complete each area model.

a) $36 \times 7 = \underline{\quad}$



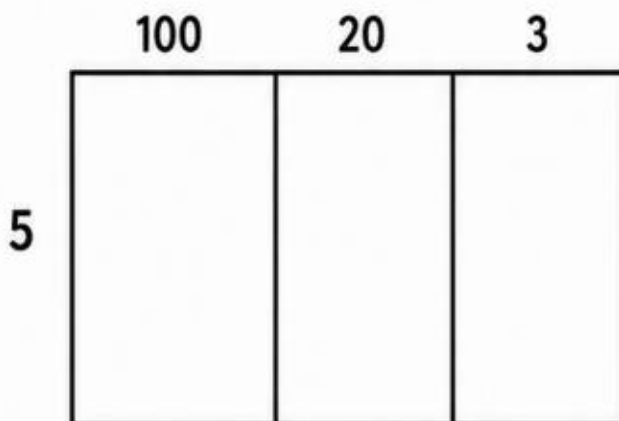
Partial products: $\underline{\quad} + \underline{\quad} = \underline{\quad}$

b) $48 \times 6 = \underline{\quad}$



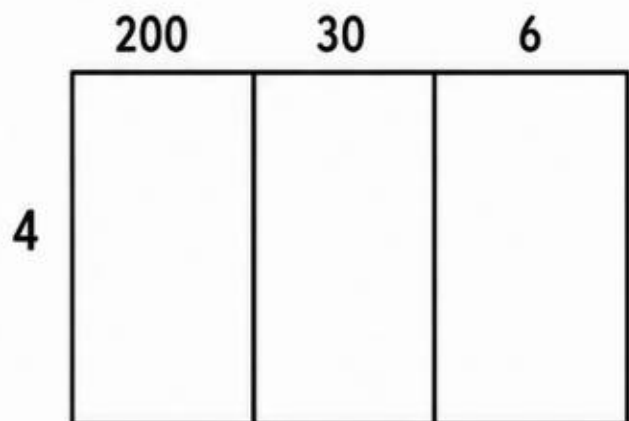
Partial products: $\underline{\quad} + \underline{\quad} = \underline{\quad}$

c) $123 \times 5 = \underline{\quad}$



Partial products: $\underline{\quad} + \underline{\quad} + \underline{\quad} = \underline{\quad}$

d) $236 \times 4 = \underline{\quad}$



Partial products: $\underline{\quad} + \underline{\quad} + \underline{\quad} = \underline{\quad}$



Area Model Builders

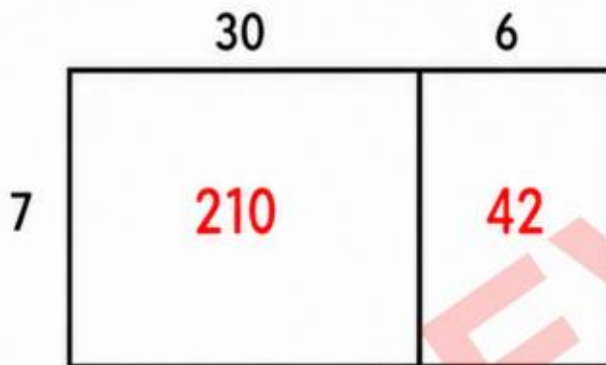
Name: ANSWERS



Reminder: Partition the larger factor, multiply each part, then add.

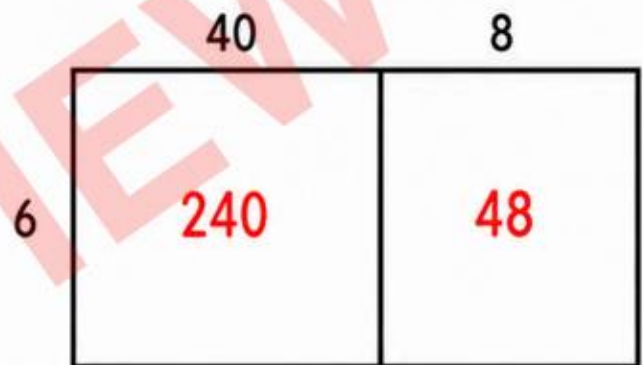
Complete each area model.

a) $36 \times 7 = \underline{252}$



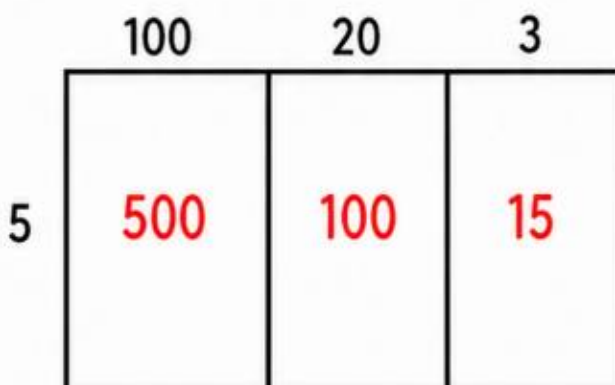
Partial products: $\underline{210} + \underline{42} = \underline{252}$

b) $48 \times 6 = \underline{288}$



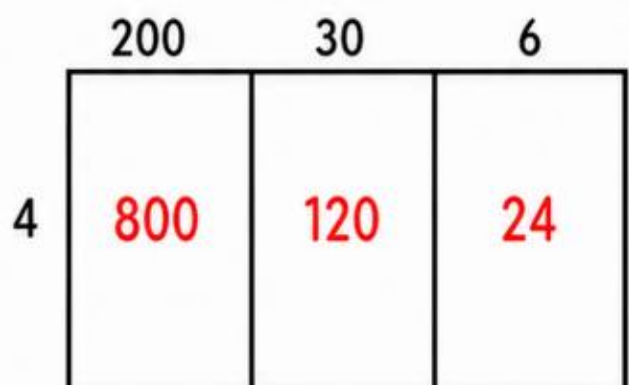
Partial products: $\underline{240} + \underline{48} = \underline{288}$

c) $123 \times 5 = \underline{615}$



Partial products: $\underline{500} + \underline{100} + \underline{15} = \underline{615}$

d) $236 \times 4 = \underline{944}$



Partial products: $\underline{800} + \underline{120} + \underline{24} = \underline{944}$



Two-Digit Area Model Challenge



Name: _____



Reminder: Partition both factors. Multiply all four parts.
Add the partial products.

Complete each 2 by 2 area model.

a) $42 \times 16 = \underline{\hspace{2cm}}$

40

2

10

6

Partial products: $\underline{\hspace{1cm}} + \underline{\hspace{1cm}} + \underline{\hspace{1cm}} + \underline{\hspace{1cm}} = \underline{\hspace{2cm}}$

b) $68 \times 25 = \underline{\hspace{2cm}}$

60

8

20

5

Partial products: $\underline{\hspace{1cm}} + \underline{\hspace{1cm}} + \underline{\hspace{1cm}} + \underline{\hspace{1cm}} = \underline{\hspace{2cm}}$

c) $73 \times 14 = \underline{\hspace{2cm}}$

70

3

10

4

Partial products: $\underline{\hspace{1cm}} + \underline{\hspace{1cm}} + \underline{\hspace{1cm}} + \underline{\hspace{1cm}} = \underline{\hspace{2cm}}$

d) $56 \times 32 = \underline{\hspace{2cm}}$

50

6

30

2

Partial products: $\underline{\hspace{1cm}} + \underline{\hspace{1cm}} + \underline{\hspace{1cm}} + \underline{\hspace{1cm}} = \underline{\hspace{2cm}}$



Two-Digit Area Model Challenge



Name: ANSWERS



Reminder: Partition both factors. Multiply all four parts.
Add the partial products.

Complete each 2 by 2 area model.

a) $42 \times 16 = \underline{672}$

	40	2
10	400	20
6	240	12

Partial products:

400 + 20 + 240 + 12 = 672

b) $68 \times 25 = \underline{1700}$

	60	8
20	1200	160
5	300	40

Partial products:

1200 + 160 + 300 + 40 = 1700

c) $73 \times 14 = \underline{1022}$

	70	3
10	700	30
4	280	12

Partial products:

700 + 30 + 280 + 12 = 1022

d) $56 \times 32 = \underline{1792}$

	50	6
30	1500	180
2	100	12

Partial products:

1500 + 180 + 100 + 12 = 1792



Strategy Choice Word Problems

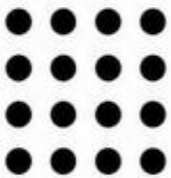


Name: _____

Choose a strategy for each problem. Show your working and write the answer.

Strategies

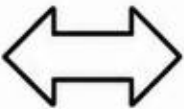
Array



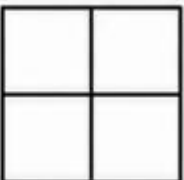
Draw a Diagram



Double and Halve



Area Model



- 1** The hall has 9 rows of chairs with 8 chairs in each row.
How many chairs are there altogether?

Strategy: _____

Answer: _____

- 2** A class orders 25 boxes of crayons.
Each box has 16 crayons.
How many crayons are ordered altogether?

Strategy: _____

Answer: _____

- 3** A sports club buys 34 packs of bibs.
Each pack has 7 bibs.
How many bibs are bought altogether?

Strategy: _____

Answer: _____

- 4** A theatre has 42 sections with 12 seats in each section.
How many seats are there altogether?

Strategy: _____

Answer: _____

- 5** A school garden has 73 rows with 4 seedlings in each row.
How many seedlings are planted altogether?

Strategy: _____

Answer: _____



Strategy Choice Word Problems

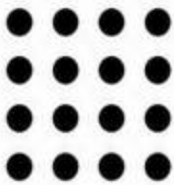


Name: ANSWERS

Choose a strategy for each problem. Show your working and write the answer.

Strategies

Array



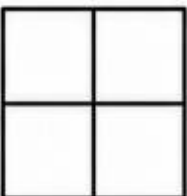
Draw a Diagram



Double and Halve



Area Model



- 1** The hall has 9 rows of chairs with 8 chairs in each row.
How many chairs are there altogether?

Strategy: array

Answer: 72 chairs

- 2** A class orders 25 boxes of crayons.
Each box has 16 crayons.
How many crayons are ordered altogether?

Strategy: double and halve

Answer: 400 crayons

- 3** A sports club buys 34 packs of bibs.
Each pack has 7 bibs.
How many bibs are bought altogether?

Strategy: area model

Answer: 238 bibs

- 4** A theatre has 42 sections with 12 seats in each section.
How many seats are there altogether?

Strategy: area model

Answer: 504 seats

- 5** A school garden has 73 rows with 4 seedlings in each row.
How many seedlings are planted altogether?

Strategy: partition

Answer: 292 seedlings

Multiplication Strategy Checkpoint

Name: _____

Show your strategy and record your answer.

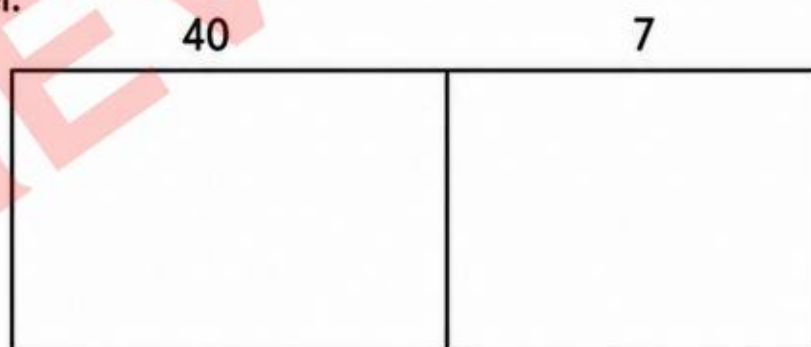
1. Draw an array.

At camp, 8 cabins each have 6 bunks.
How many bunks are there altogether?

$$\underline{\quad} \times \underline{\quad} = \underline{\quad}$$

2. Use an area model.

$$47 \times 6 = \underline{\quad}$$

Partial products: $\underline{\quad} + \underline{\quad} = \underline{\quad}$

3. Draw a diagram.

There are 5 boxes. Each box holds 9 tennis balls.
How many tennis balls are there altogether?

$$\underline{\quad} \times \underline{\quad} = \underline{\quad}$$

Multiplication Strategy Checkpoint

Name: ANSWERS

Show your strategy and record your answer.

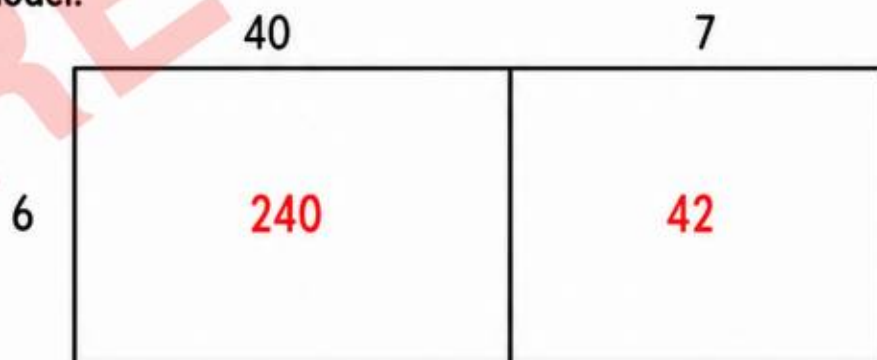
1. Draw an array.

At camp, 8 cabins each have 6 bunks.
How many bunks are there altogether?

$$\underline{8} \times \underline{6} = \underline{48}$$

2. Use an area model.

$$47 \times 6 = \underline{282}$$



Partial products: $\underline{240} + \underline{42} = \underline{282}$

3. Draw a diagram.

There are 5 boxes. Each box holds 9 tennis balls.
How many tennis balls are there altogether?

$$\underline{5} \times \underline{9} = \underline{45}$$



Multiplication Strategy Checkpoint

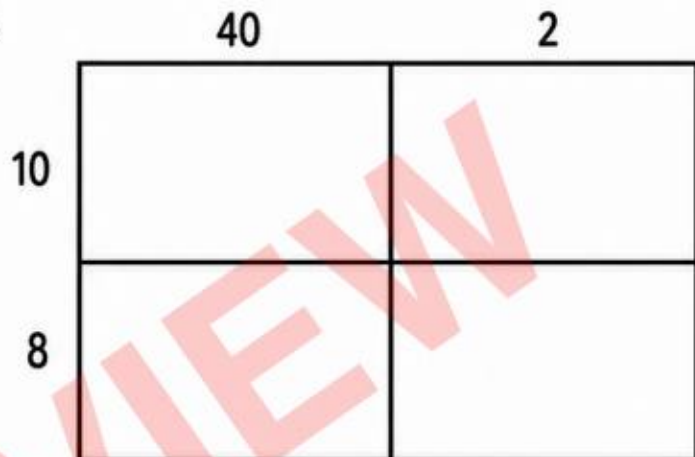


Name: _____

Show your strategy and record your answer.

4. Use a 2 by 2 area model.

$42 \times 18 = \underline{\hspace{2cm}}$



Partial products: $\underline{\hspace{1cm}} + \underline{\hspace{1cm}} + \underline{\hspace{1cm}} + \underline{\hspace{1cm}} = \underline{\hspace{2cm}}$

5. Use double and halve.

$35 \times 24 = \underline{\hspace{2cm}}$

Double $\underline{\hspace{1cm}} = \underline{\hspace{1cm}}$ Halve $\underline{\hspace{1cm}} = \underline{\hspace{1cm}}$ Easier fact: $\underline{\hspace{2cm}}$

6. Choose a strategy.

A fundraiser packs 28 bags. Each bag has 15 stickers.
How many stickers are packed altogether?

Strategy: $\underline{\hspace{3cm}}$ Answer: $\underline{\hspace{3cm}}$

Multiplication Strategy Checkpoint

Name: ANSWERS

Show your strategy and record your answer.

4. Use a 2 by 2 area model.

$$42 \times 18 = \underline{756}$$

	40	2
10	400	20
8	320	16

Partial products: $\underline{400} + \underline{20} + \underline{320} + \underline{16} = \underline{756}$

5. Use double and halve.

$$35 \times 24 = \underline{840}$$

Double $35 = 70$

Halve $24 = 12$

Easier fact: $70 \times 12 = 840$

Double $\underline{35} = \underline{70}$ Halve $\underline{24} = \underline{12}$ Easier fact: $\underline{70} \times \underline{12} = \underline{840}$

6. Choose a strategy.

A fundraiser packs 28 bags. Each bag has 15 stickers.
How many stickers are packed altogether?

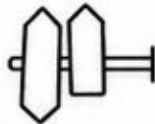
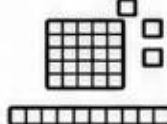
Strategy: double and halve

Answer: 420 stickers

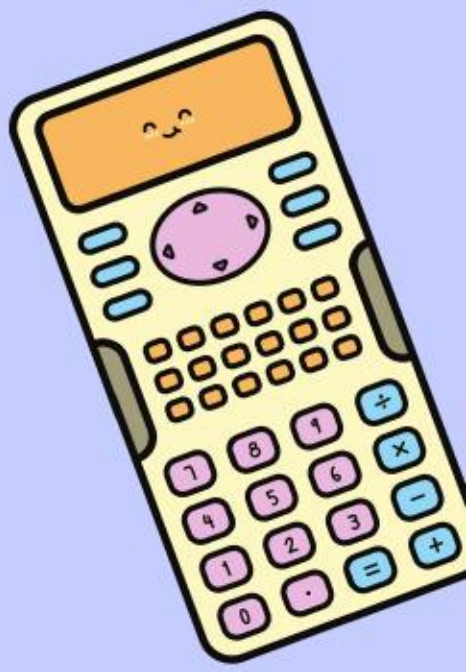
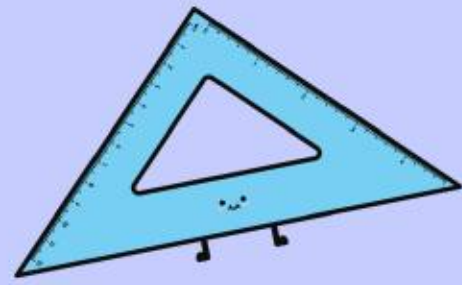


Multiplication Mania Year 4 Rubric



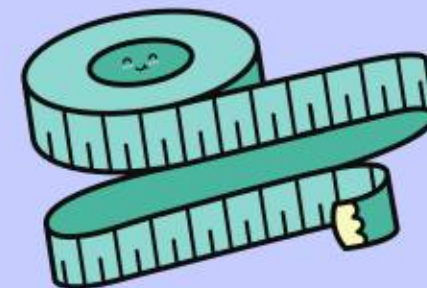
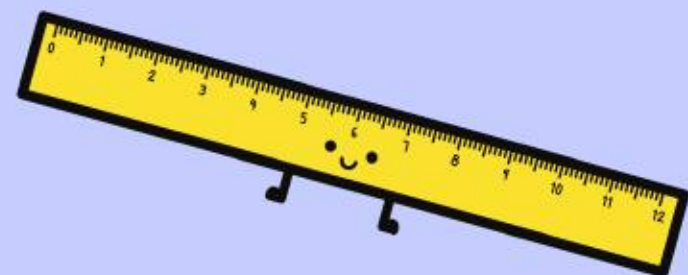
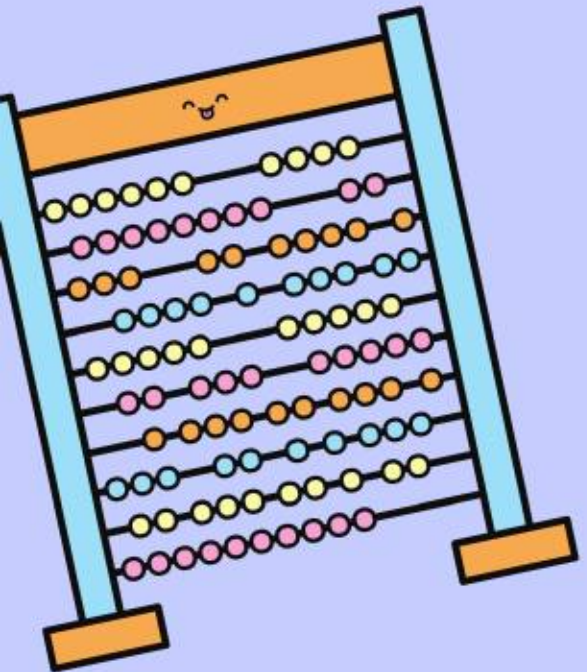
Criteria	BEGINNING	DEVELOPING	ACHIEVING	CONFIDENT	EXCEEDING
 Strategy selection	Needs support to choose a strategy.	Chooses a strategy with prompts.	Chooses a suitable strategy.	Chooses efficient strategies.	Explains why a strategy is efficient.
 Representing multiplication	Drawings or models are incomplete.	Uses arrays, diagrams or models with some accuracy.	Represents problems clearly.	Connects models to number sentences.	Uses representations flexibly and precisely.
 Calculating products	Products are often incorrect.	Solves simple products with support.	Solves most products accurately.	Solves multi-digit products accurately.	Checks and corrects calculations independently.
 Reasoning and explanation	Gives little explanation.	Explains steps with prompting.	Explains working clearly.	Justifies steps using mathematical language.	Compares strategies and gives strong reasoning.

Aligned to AC9M4N06



Multiplication Mania

Year 4



Multiplication Strategies

This unit explores efficient multiplication strategies.
You will represent equal groups, choose a useful strategy,
calculate products and explain your thinking.



Arrays Show Equal Groups

An array organises equal groups into rows and columns.

Rows x columns gives the total.

Arrays also show that 4×6 and 6×4 have the same product.



Array Example

There are 6 rows with 7 counters in each row.

$$6 \times 7 = 42$$

The total is 42 counters.



Draw a Diagram

A quick diagram helps you understand a word problem.
Draw equal groups, label the groups, then write a multiplication sentence.



Diagram Example

Five boxes each hold 9 tennis balls.

Draw 5 boxes with 9 in each box.

$$5 \times 9 = 45 \text{ tennis balls.}$$



Double and Halve

When one factor is even, double one factor and halve the other.

The product stays the same, but the new fact can be easier.



Double and Halve Example

25 x 18 can become 50 x 9.

$$50 \times 9 = 450$$

So $25 \times 18 = 450$.



Partition for Area Models

Area models partition a factor into place-value parts.

Multiply each part, then add the partial products.



One-Digit Area Model

$$47 \times 6 = 40 \times 6 + 7 \times 6$$

$$240 + 42 = 282$$

The product is 282.



Two-Digit Area Model

42 x 18 partitions both factors.

$$40 \times 10 = 400, 2 \times 10 = 20$$

$$40 \times 8 = 320, 2 \times 8 = 16$$

$$400 + 20 + 320 + 16 = 756.$$



Choose the Strategy

Arrays and diagrams help with equal groups.

Double and halve helps when a factor is even.

Area models help with larger factors.



Estimate Before Solving

Estimation helps you check if an answer is reasonable.

For 57×6 , think $60 \times 6 = 360$, so the exact answer should be a little less.



Check Your Product

Check by using a second strategy, adding partial products again,
or comparing with an estimate.

A good mathematician checks for reasonableness.



Maths Talk

Explain:

Which strategy did you choose?

Why did it fit the numbers?

How did you check your answer?



This Week

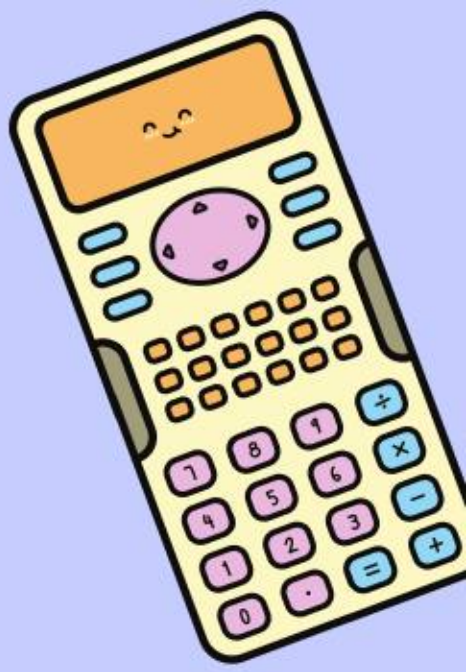
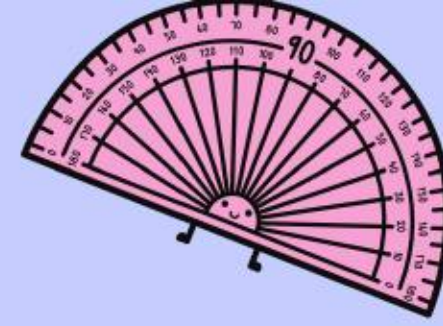
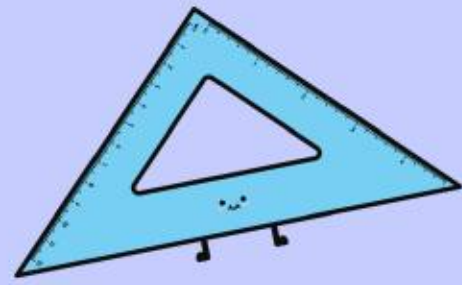
Use arrays, diagrams, doubling and halving, and area models.

Solve multiplication word problems.

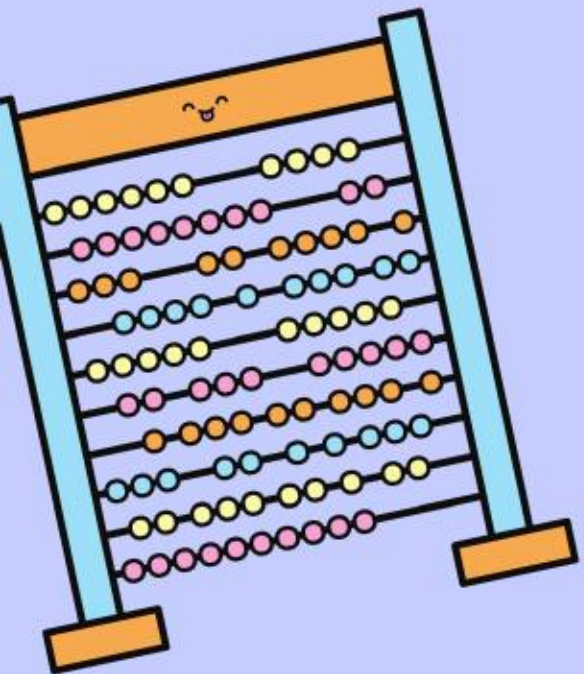
Show your working clearly.

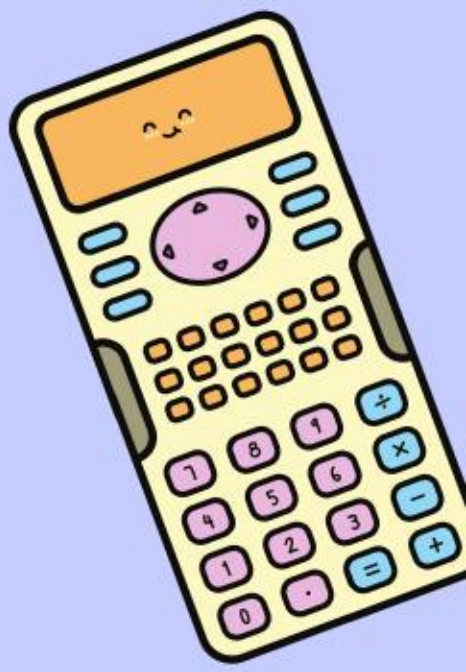
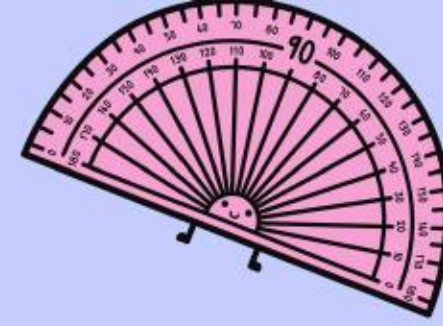
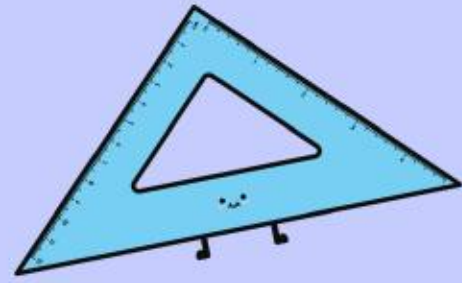
Explain your strategy choices.



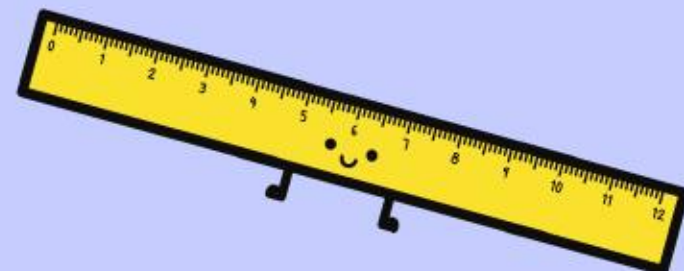
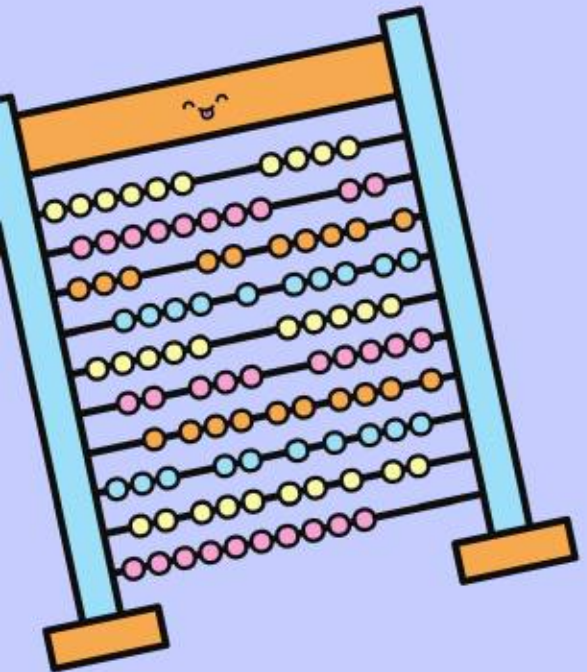


Well Done!





Multiplication Mania Year 4 Quiz



Question 1

Which answer matches 6×7 ?

A. 36

B. 42

C. 48

D. 56



Answer 1

B. 42



Question 2

True or false?

25×8 has the same product as 50×4 .



Answer 2

True. One factor was doubled and the other was halved, so the product stayed the same.



Question 3

Use an area model or partitioning to solve:

$$47 \times 6 = ?$$



Answer 3

$$47 \times 6 = 282$$

$$40 \times 6 = 240 \text{ and } 7 \times 6 = 42.$$

$$240 + 42 = 282.$$



Question 4

There are 7 teams with 4 players on each team. How many players are there altogether?

A. 11

B. 24

C. 28

D. 32



Answer 4

C. 28 players



Question 5

Use a 2 by 2 area model to solve:

$$42 \times 16 = ?$$



Answer 5

$$42 \times 16 = 672$$

$$40 \times 10 = 400, 2 \times 10 = 20,$$

$$40 \times 6 = 240, 2 \times 6 = 12.$$

$$400 + 20 + 240 + 12 = 672.$$



Question 6

True or false?

$$14 \times 5 = 80$$



Answer 6

False. $14 \times 5 = 70$.



Question 7

Which strategy is especially useful for 35×12 ?

- A. Alphabetical order
- B. Double and halve
- C. Measuring length
- D. Subtracting 1



Answer 7

B. Double and halve

$$35 \times 12 = 70 \times 6 = 420.$$



Question 8

A hall has 9 rows of chairs with 8 chairs in each row. How many chairs are there altogether?



Answer 8

$9 \times 8 = 72$ chairs.



Question 9

Which product is correct?

$$68 \times 25 = ?$$

A. 930

B. 1 360

C. 1 700

D. 2 040



Answer 9

C. 1 700



Question 10

A fundraiser packs 28 bags with 15 stickers in each bag. How many stickers are packed altogether?

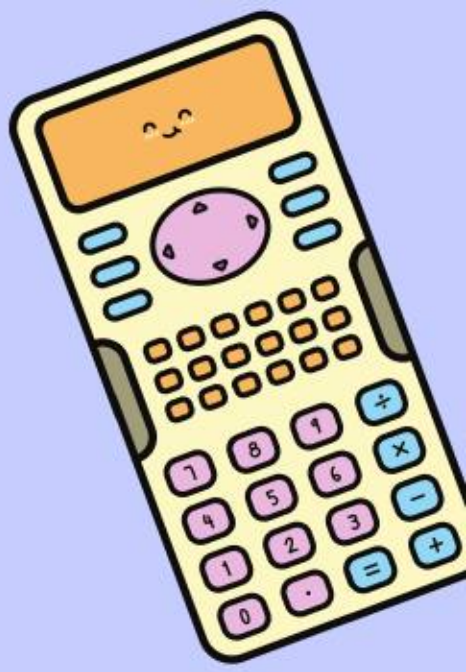
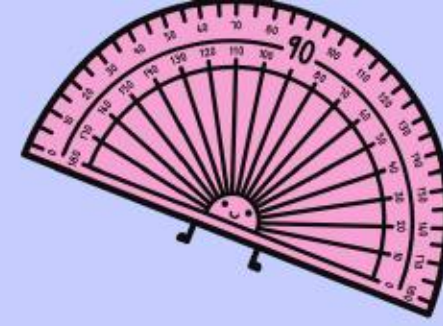
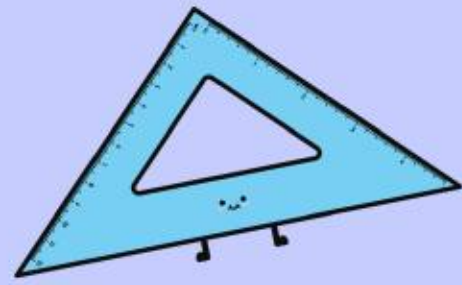


Answer 10

$28 \times 15 = 420$ stickers.

Possible strategy: double and halve, $14 \times 30 = 420$.





Great Work!

