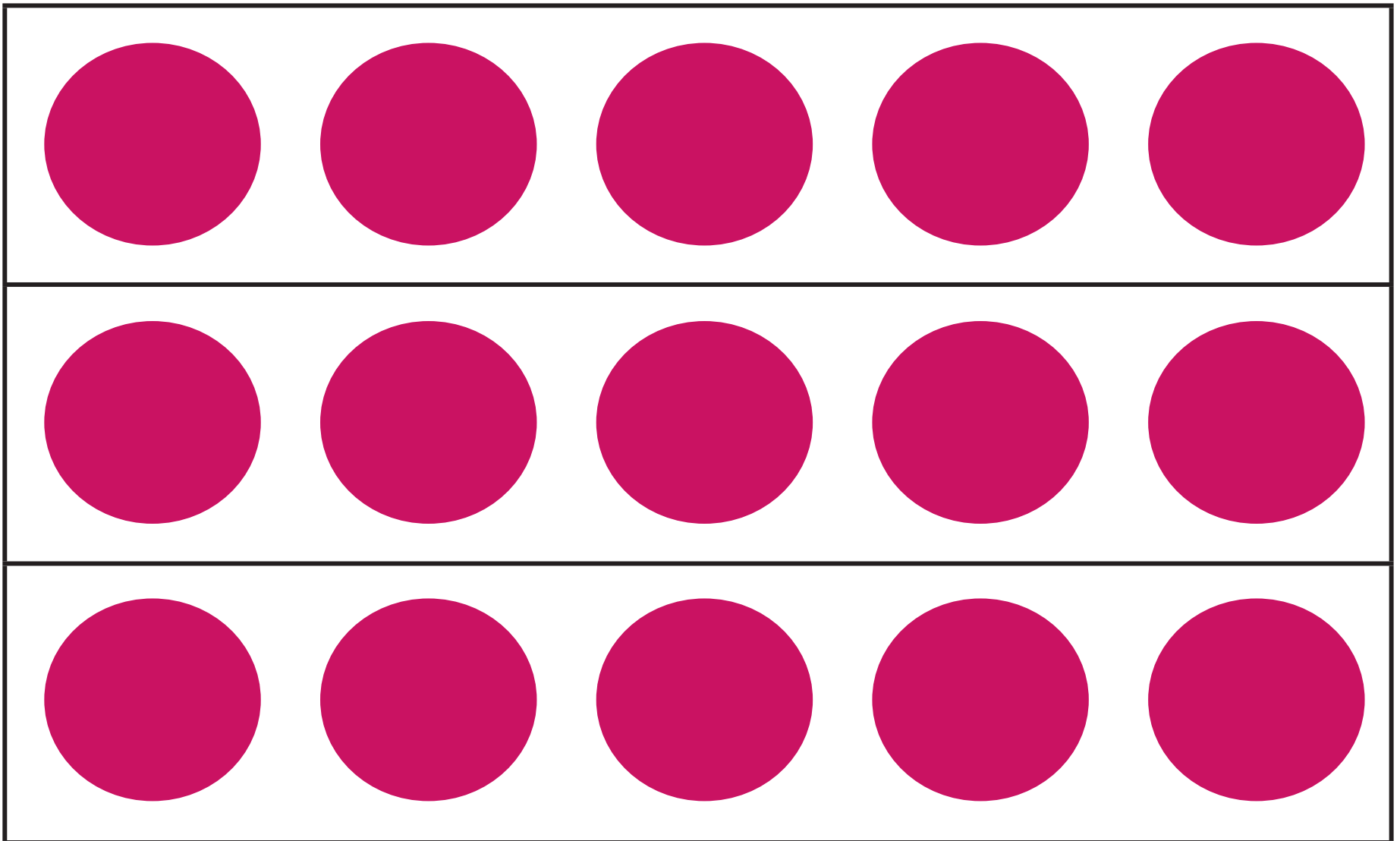


Multiplication Strategies

Array

Rows and columns with an equal amount in each.

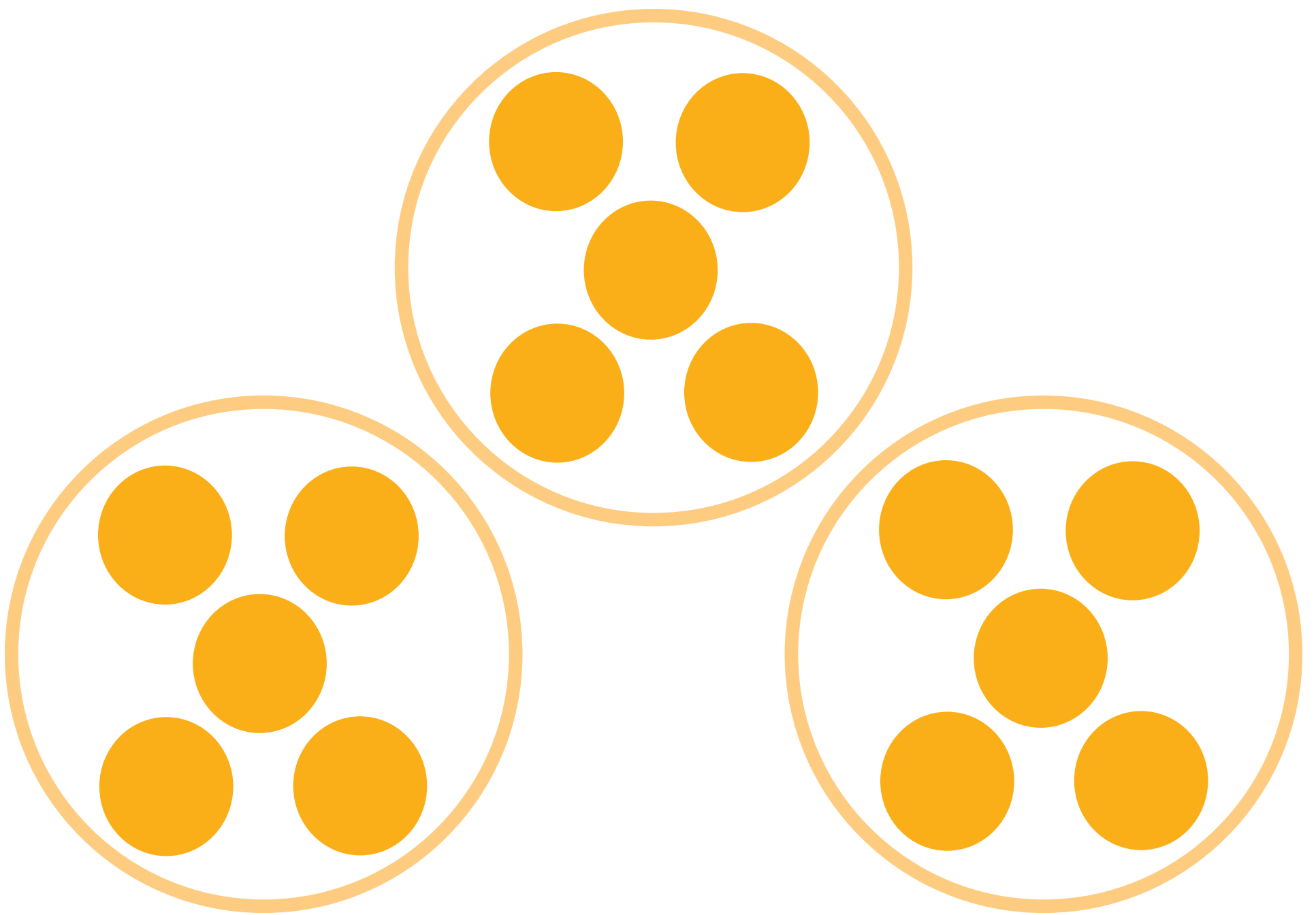


$$5 \times 3 = 15$$

Multiplication Strategies

Equal Groups

Use the same number of units in each group.



$$3 \times 5 = 15$$

Multiplication Strategies

Repeated Addition

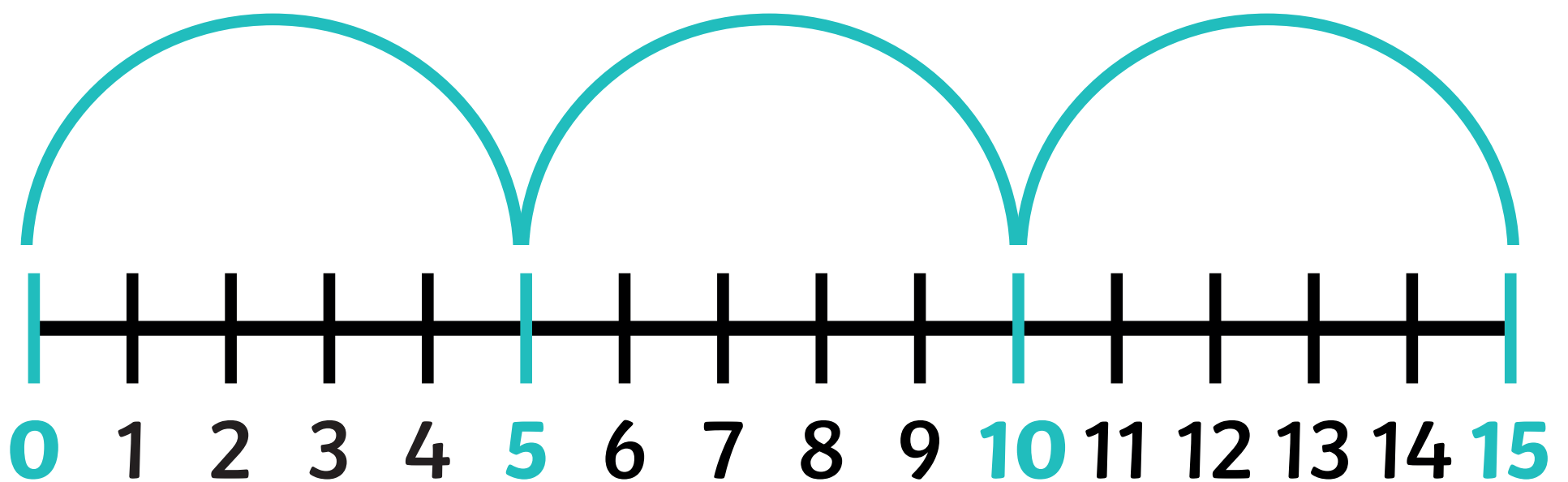
$$5 + 5 + 5 = 15$$

$$3 \times 5 = 15$$

Multiplication Strategies

Number Line

Jump 5cm at a time, where do you land?



1 jump of 5 = 5

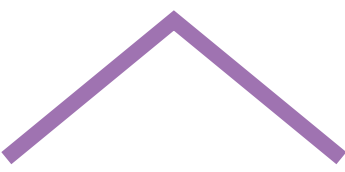
2 jumps of 5 = 10

3 jumps of 5 = 15

$$5 \times 3 = 15$$

Multiplication Strategies

Multiplication Magic


$$60 \times 4$$

Draw the wizard's hat to find the facts to calculate.

$$6 \times 4 = 24$$

Multiply the answer by 10/100/1000.

$$60 \times 4 = 240$$

Write your final answer.

$$60 \times 4 = 240$$

Remember

- Draw the wizard's hat.
- Use your multiplication facts to calculate.
- If we know: $6 \times 4 = 24$.
- Then we know $60 \times 4 = 240$.

$$6 \times 4 = 24$$

$$60 \times 4 = 240$$

$$60 \times 40 = 2,400$$

$$600 \times 40 = 24\ 000$$

Multiplication Strategies

Partial Product Method

$$50 + 2 \text{ a } 30 + 8$$

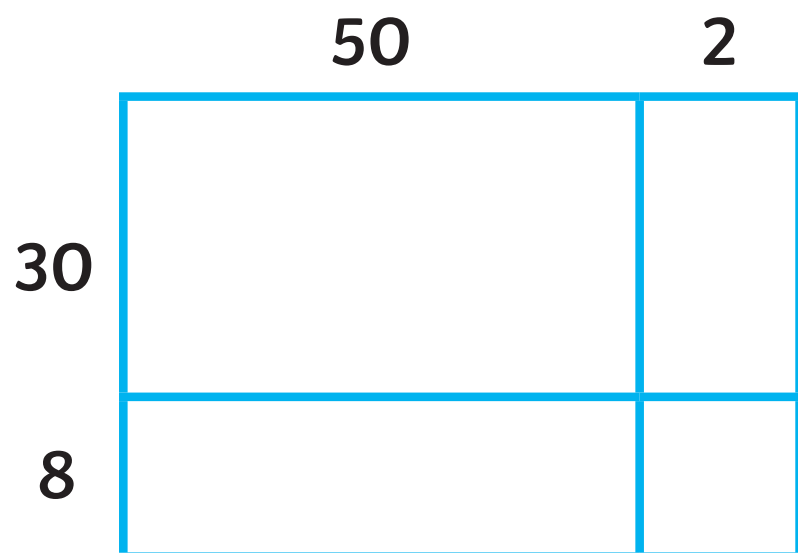
Multiply each decomposed number together and add the products.

$$\begin{array}{r} 50 \times \\ 30 = 1,500 \\ 2 \times 30 = 60 \\ 50 \times 08 = 400 \\ 2 \times 08 = 16 \\ \hline 1,976 \end{array}$$

$$52 \times 38 = 1,976$$

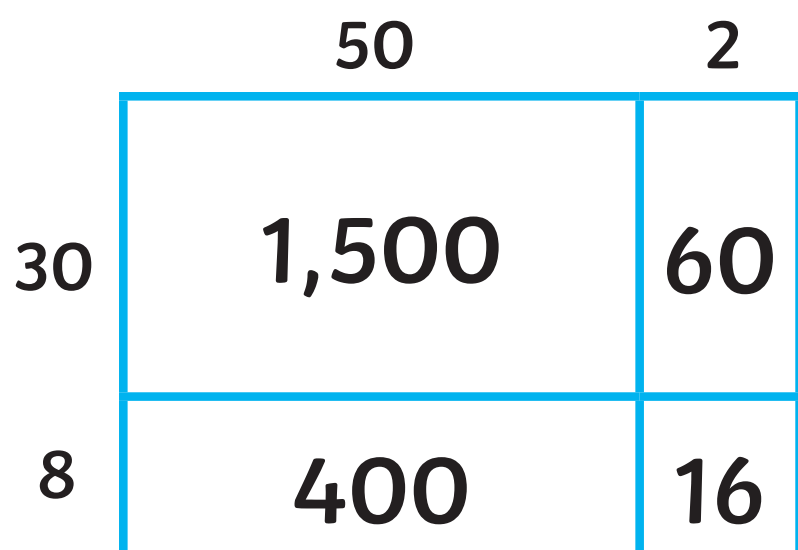
Multiplication Strategies

Area Model



Draw a rectangle.

Write the decomposed numbers at the top and left of the rectangle.



Multiply the decomposed numbers.

$$\begin{array}{r} 1,500 \\ 400 \\ 60 \\ 16 \\ \hline 1,976 \end{array}$$

Add the products.

$$52 \times 38 = 1,976$$

Multiplication Strategies

Column Method

$$\begin{array}{r} 52 \\ \times 38 \\ \hline \end{array}$$

Write the numbers above each other in columns.

$$\begin{array}{r} 52 \\ \times 38 \\ \hline 416 \end{array}$$

Multiply 52×8 .

$$\begin{array}{r} 52 \\ \times 38 \\ \hline 416 \\ 1,560 \\ \hline \end{array}$$

Multiply 52×30 .

$$\begin{array}{r} 416 \\ + 1,560 \\ \hline 1,976 \end{array}$$

Add the products.

$$52 \times 38 = 1,976$$

Multiplication Strategies

Expanded Column Method

- Line up the ones and the tens.
- Multiply the ones.
- Multiply the tens.
- Add the totals together.

$$\begin{array}{r} 42 \\ \times 6 \\ \hline 12 \\ 240 \\ \hline 252 \end{array} \quad \begin{array}{l} (2 \times 6) \\ (40 \times 6) \end{array}$$

$$42 \times 6 = 252$$

Multiplication Strategies

Column Method

3-digit × 2-digit regrouping not shown

$$\begin{array}{r} 368 \\ \times 24 \\ \hline \end{array}$$

Write the numbers above each other in columns.

$$\begin{array}{r} 368 \\ \times 24 \\ \hline 1,472 \end{array}$$

Multiply 368×4 .

$$\begin{array}{r} 368 \\ \times 24 \\ \hline 1,472 \\ 7,360 \\ \hline \end{array}$$

Multiply 368×20 .

$$\begin{array}{r} 1,472 \\ + 7,360 \\ \hline 8,832 \end{array}$$

Add the products.

$$368 \times 24 = 8,832$$

Multiplication Strategies

Column Method

4-digit $\times$ 2-digit regrouping not shown

$$\begin{array}{r} 5,368 \\ \times 24 \\ \hline \end{array}$$

Write the numbers above each other in columns.

$$\begin{array}{r} 5,368 \\ \times 24 \\ \hline 21\ 472 \end{array}$$

Multiply $5,368 \times 4$.

$$\begin{array}{r} 5,368 \\ \times 24 \\ \hline 21\ 472 \\ 107\ 360 \\ \hline \end{array}$$

Multiply $5,368 \times 20$.

$$\begin{array}{r} 21\ 472 \\ + 107\ 360 \\ \hline 128\ 832 \end{array}$$

Add the products.

$$5,368 \times 24 = 128\ 832$$

Multiplication Strategies

Column Method

5-digit $\times$ 2-digit regrouping not shown

$$\begin{array}{r} 25\ 368 \\ \times\ 24 \\ \hline \end{array}$$

Write the numbers above each other in columns.

$$\begin{array}{r} 25\ 368 \\ \times\ 24 \\ \hline 101\ 472 \end{array}$$

Multiply $25,368 \times 4$.

$$\begin{array}{r} 25\ 368 \\ \times\ 24 \\ \hline 101\ 472 \\ 507\ 360 \\ \hline \end{array}$$

Multiply $25,368 \times 20$.

$$\begin{array}{r} 101\ 472 \\ +\ 507\ 360 \\ \hline 608\ 832 \end{array}$$

Add the products.

$$25\ 368 \times 24 = 608\ 832$$

Multiplication Strategies

Column Method

6-digit $\times$ 2-digit regrouping not shown

$$\begin{array}{r} 125\,368 \\ \times \quad 24 \\ \hline \end{array}$$

Write the numbers above each other in columns.

$$\begin{array}{r} 125\,368 \\ \times \quad 24 \\ \hline 501\,472 \end{array}$$

Multiply $125,368 \times 4$.

$$\begin{array}{r} 125\,368 \\ \times \quad 24 \\ \hline 501\,472 \\ 2\,507\,360 \\ \hline \end{array}$$

Multiply $125,368 \times 20$.

$$\begin{array}{r} 501\,472 \\ + 2\,507\,360 \\ \hline 3\,008\,832 \end{array}$$

Add the products.

$$125\,368 \times 24 = 3\,008\,832$$

Multiplication Strategies

Multiplying by 10

Use place value to work out how to multiply by 10.

$$674 \times 10 = ?$$

If you multiply a number by 10, the digits move one place value to the left.

Thousands	Hundreds	Tens	Ones
	6	7	4

Thousands	Hundreds	Tens	Ones
6	7	4	0

Use place value to work out how to multiply by 100.

Ten Thousands	Thousands	Hundreds	Tens	Ones
		6	7	4

Ten Thousands	Thousands	Hundreds	Tens	Ones
6	7	4	0	0

Use place value to work out how to multiply by 100.

$$674 \times 100 = 67\,400$$

Multiplication Strategies

Multiplying Decimals by 10

If you multiply a number by 10, the digits move one place value to the left.

$$6.74 \times 10 = ?$$

If you multiply a number by 10, the digits move one place value to the left.

Hundreds	Tens	Ones	Tenths	Hundredths
		6	7	4

Hundreds	Tens	Ones	Tenths	Hundredths
	6	7	4	

$$6.74 \times 10 = 67.4$$

Use place value to work out how to multiply by 100.

Hundreds	Tens	Ones	Tenths	Hundredths
		6	7	4

Hundreds	Tens	Ones	Tenths	Hundredths
6	7	4		

If you multiply a number by 100, the digits move two places to the left.

$$67.4 \times 100 = 674$$

Division Strategies

Dividing by 10

Use place value to work out how to divide by 10

$$674 \div 10 = ?$$

If you divide a number by 10, the digits move one place to the right.

Hundreds	Tens	Ones	Tenths	Hundredths
6	7	4		

Hundreds	Tens	Ones	Tenths	Hundredths
	6	7	4	

$$674 \div 10 = 67.4$$

If you divide a number by 100, the digits move two places to the right.

Hundreds	Tens	Ones	Tenths	Hundredths
6	7	4		

Hundreds	Tens	Ones	Tenths	Hundredths
		6	7	4

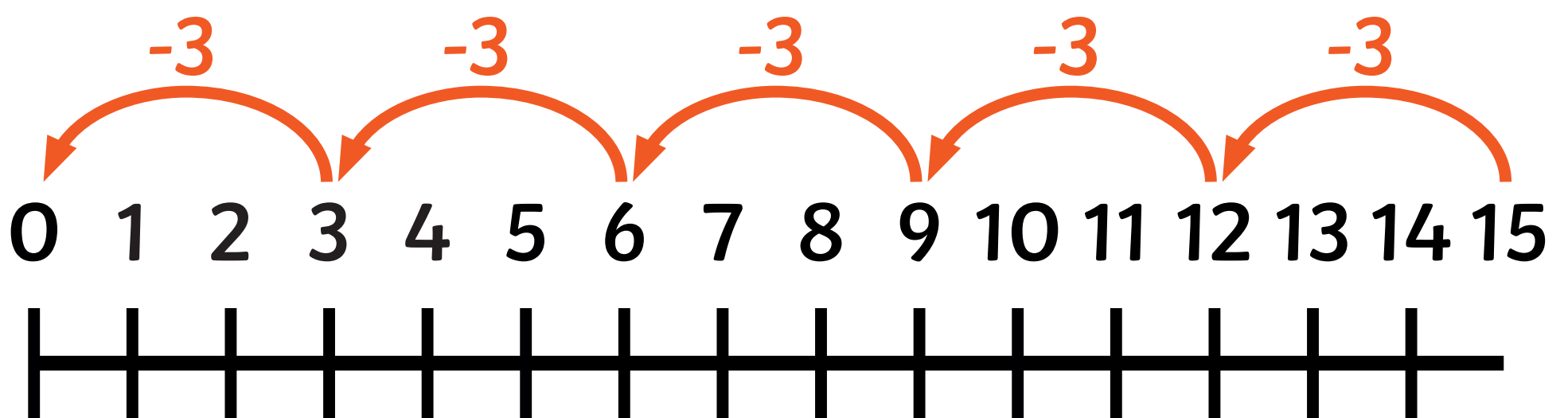
$$674 \div 100 = 6.74$$

Division Strategies

Repeated Subtraction

You can use repeated subtraction to see how many times a smaller number goes into a bigger one.

$$15 \div 3 = ?$$



The number of times you can take 3 from 15 is 5

$$15 - 3 - 3 - 3 - 3 - 3 = 0$$

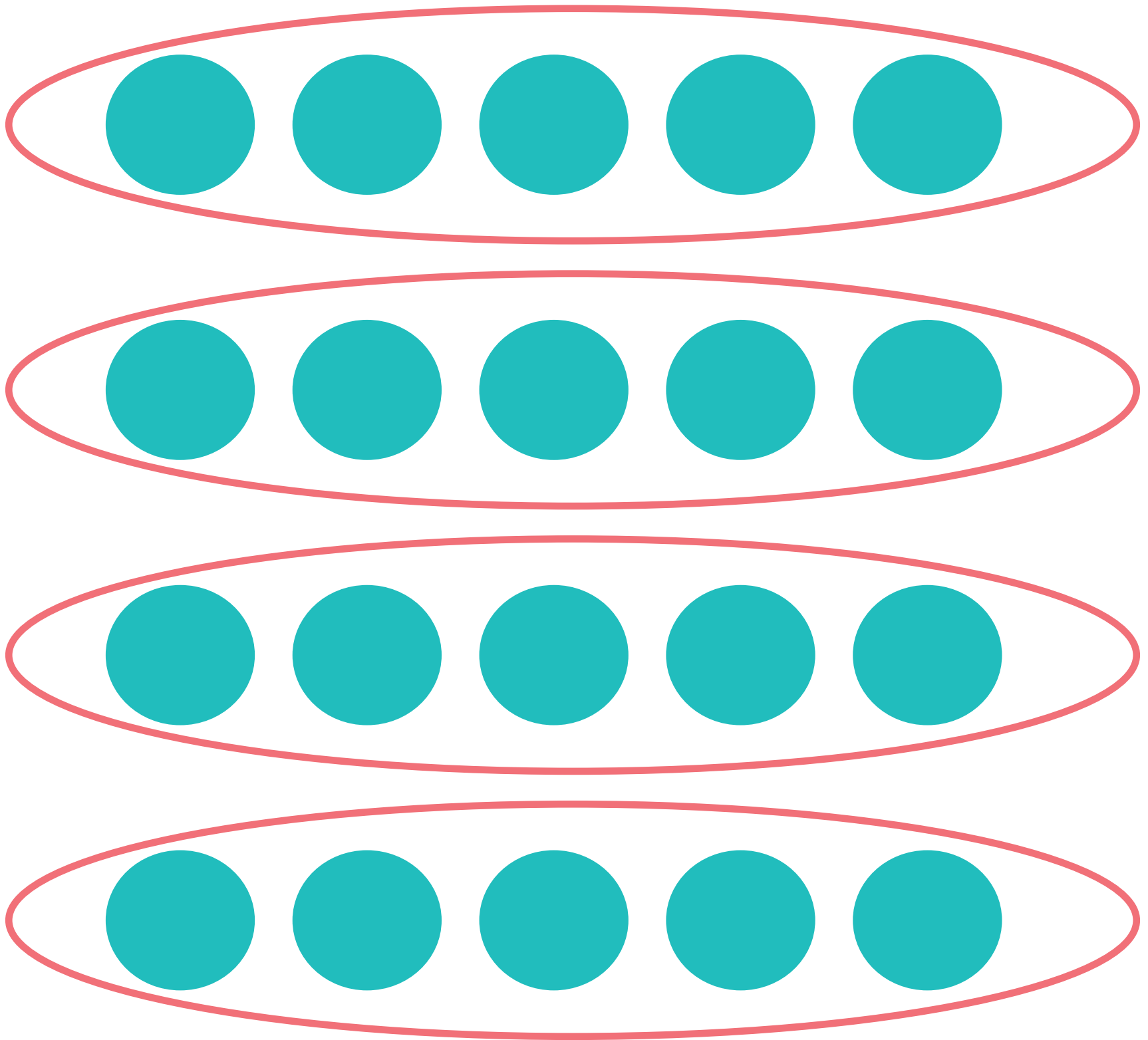
$$15 \div 3 = 5$$

Division Strategies

Grouping

$$20 \div 5 = 4$$

20 divided by 5 gives 4 groups.



Grouping using arrays.

Division Strategies

Repeated Addition

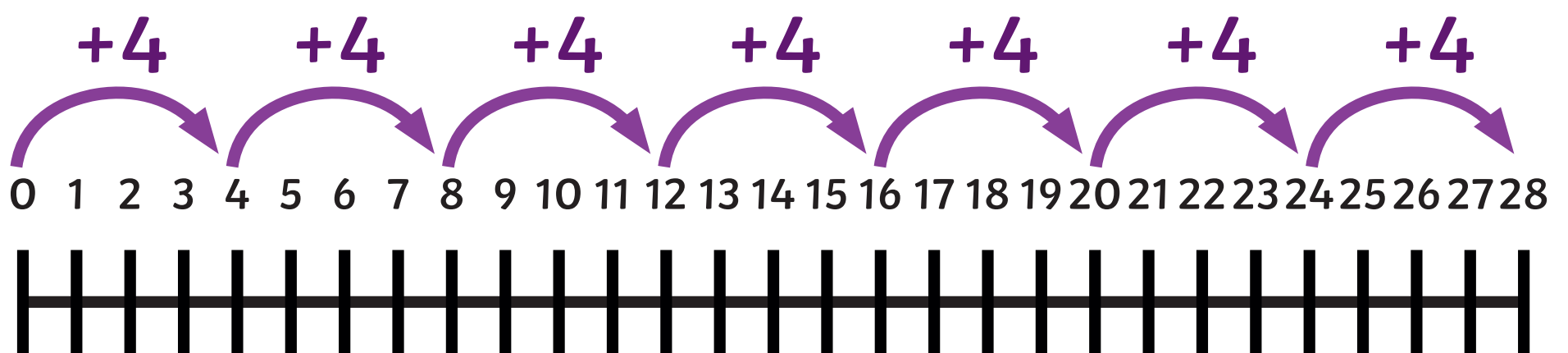
$$28 \div 4 = 7$$

Draw a number line starting at 0.

Count by 4s until you reach 28.

Count how many jumps it took.

28 divided by 4 is 7.

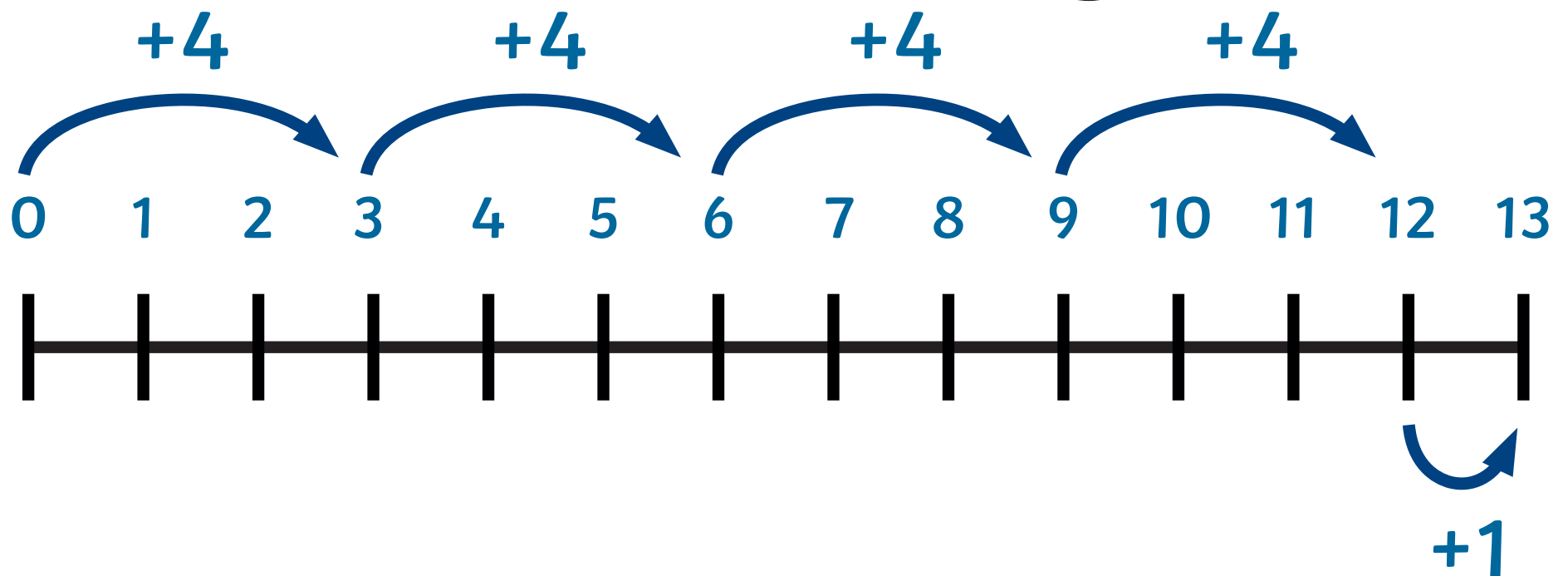


Division Strategies

Repeated Addition

(with remainders)

$$13 \div 3 = 4 \text{ g}1$$



Draw a number line starting at 0.

Count by 3s getting as close as you can but not going past it.

Count your jumps to get the answer.

Any left over is the remainder.

Division Strategies

Partial Quotient Method

$$84 \div 4$$

$$80 \div 4 = 20$$

$$4 \div 4 = 1$$

21

Separate the number into tens and ones.

Divide the tens and ones.

Combine your totals.

$$84 \div 4 = 21$$

Division Strategies

Inverse

Use multiplication tables to work out a division question.

$$63 \div 9 = ?$$

You can work this out by knowing...

$$7 \times 9 = 63$$

So using inverse, we know that...

$$63 \div 9 = 7$$

Division Strategies

Halving

Sometimes you can use halving
to divide into 2s, 4s, and 8s

$$120 \div 2 = 60$$

We can use this to divide
by 4 by halving twice.

$$120 \div 2 = 60$$

then

$$60 \div 2 = 30$$

so

$$120 \div 4 = 30$$

We can use this to divide
by 8 by halving 3 times.

$$120 \div 2 = 60$$

then

$$60 \div 2 = 30$$

then

$$30 \div 2 = 15$$

so

$$120 \div 8 = 15$$

Division Strategies

Short Division

2-Digit Numbers

$$84 \div 6 = ?$$

Separate 84 into tens and ones.

Work out how many 6s divide into 80 so that the answer is a multiple of 10.

In this case, the highest multiple of 10 divisible by 6 is 60.

Separate 84 into 60 and 24 then divide each number by 6.

Combine your totals.

$$10 + 4 = 14$$

$$6 \overline{) 60 + 24}$$

This method can be shortened to:

$$\begin{array}{r} 14 \\ 6 \overline{) 84} \end{array}$$

Division Strategies

Short Division

3-Digit Numbers

$$434 \div 7 = ?$$

Work out how many 7s go into 430.
(The answer must be a multiple of 10).

In this case, 7 goes into 430 sixty times leaving a remainder of 10.

Add this 10 to the remaining 4 from the original 434 to make 14.

Divide 14 by 7 to get 2.

Combine 60 and 2 to get the answer.

$$7 \overline{) 430 + 4} = 7 \overline{) 430 + 14} \begin{array}{r} 60 + 2 \end{array}$$

This method can be shortened to:

$$\begin{array}{r} 62 \\ 7 \overline{) 43^1 4} \end{array}$$

Division Strategies

Area Model for Division

$$26 \div 8 = ?$$



Draw a rectangle.

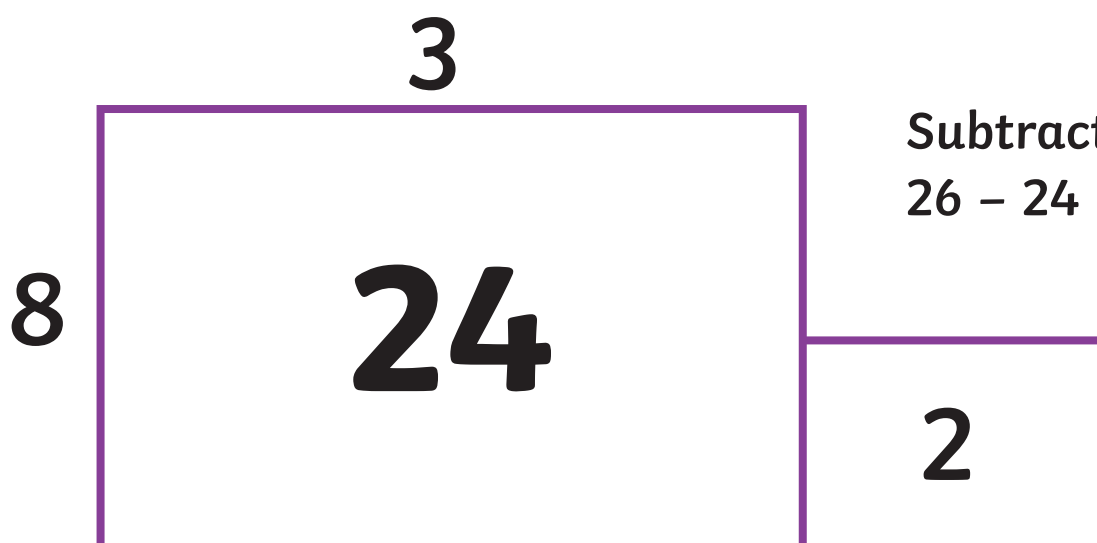
Place the divisor on the left side to represent the width of the rectangle.



Find the closest multiple of the divisor to the dividend, but do not go over. In this problem, it is 3 ($3 \times 8 = 24$).

Write the multiple as the length of the rectangle.

Find the area.



Subtract the area from the dividend.
 $26 - 24 = 2$

Draw a small square next to the rectangle. The square is the remainder.

$$26 \div 8 = 3 \text{ g } 2$$