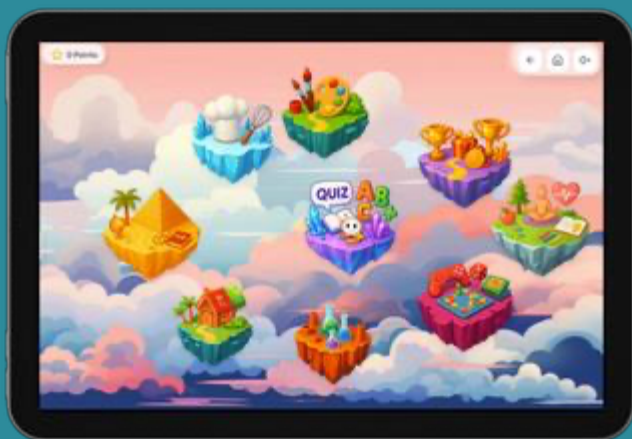




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Multiplying and Dividing Decimals - Year 6

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Powers of 10 and Place Value

MULTIPLY

Multiplying by 10, 100 or 1000 shifts each digit 1, 2 or 3 places to a greater place value.

$$4.72 \times 100 = 472$$

DIVIDE

Dividing by 10, 100 or 1000 shifts each digit 1, 2 or 3 places to a smaller place value.

$$7.25 \div 100 = 0.0725$$



Predict whether the answer should be larger or smaller.

Decimal Shift Reference Cards

Multiply by 10

Each digit shifts 1 place to a greater place value.

Th	H	T	O	.	t	h	th
----	---	---	---	---	---	---	----

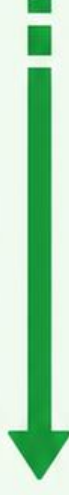


$$3.48 \times 10 = 34.8$$

Multiply by 100 or 1000

Each digit shifts 2 or 3 places to a greater place value.

Th	H	T	O	.	t	h	th
----	---	---	---	---	---	---	----



$$0.625 \times 1000 = 625$$

Divide by 10

Each digit shifts 1 place to a smaller place value.

Th	H	T	O	.	t	h	th
----	---	---	---	---	---	---	----



$$56.2 \div 10 = 5.62$$

Divide by 100 or 1000

Each digit shifts 2 or 3 places to a smaller place value.

Th	H	T	O	.	t	h	th
----	---	---	---	---	---	---	----



$$8.4 \div 100 = 0.084$$

Powers of 10 Equation Builder

- 1 Choose a number card.
- 2 Choose an operation card.
- 3 Predict whether the result will be larger or smaller.
- 4 Build and solve the equation.
- 5 Check with inverse reasoning.

$\times 10$

$\times 100$

$\times 1000$

$\div 10$

$\div 100$

$\div 1000$

BUILD

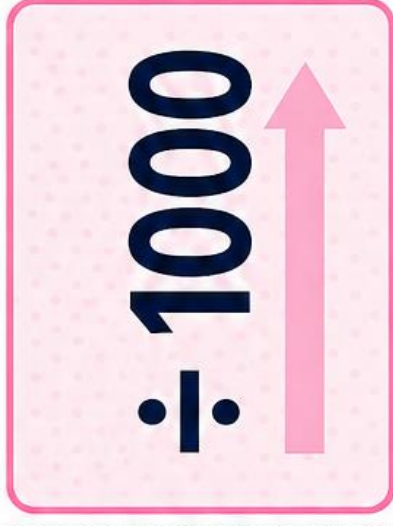
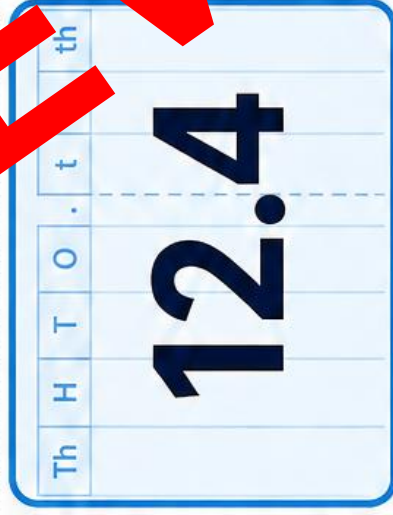
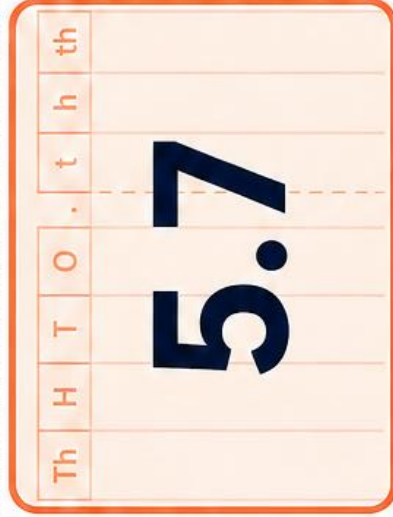
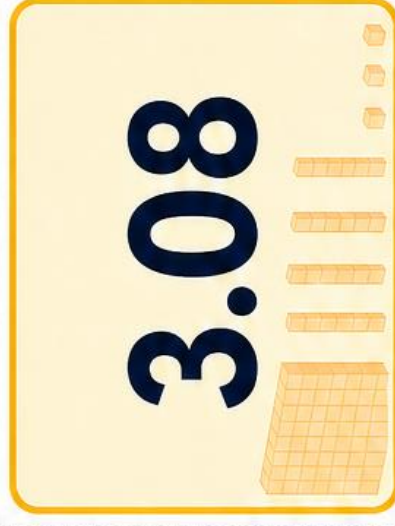
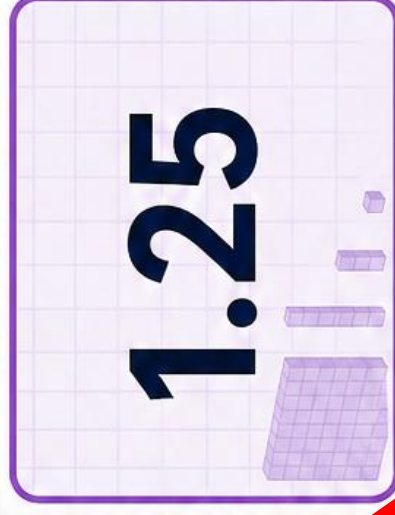
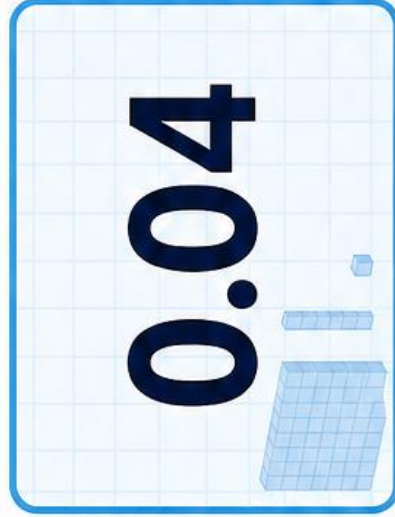
SOLVE

CHECK

1 point: correct solution

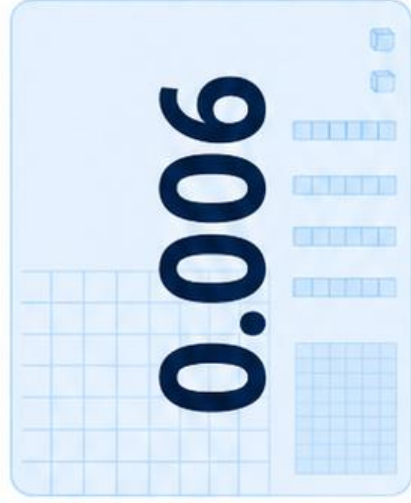
1 bonus point: clear check

Equation Builder Cards A



PREVIEW

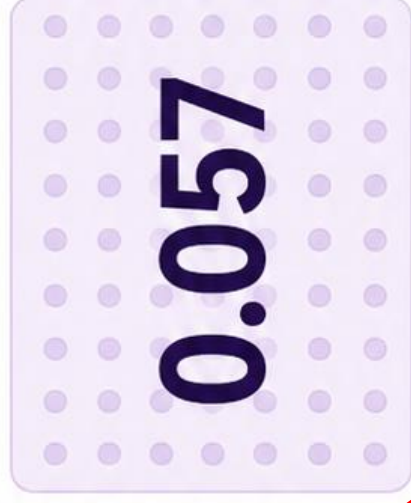
Equation Builder Cards B



0.006



0.01



0.057



0.124



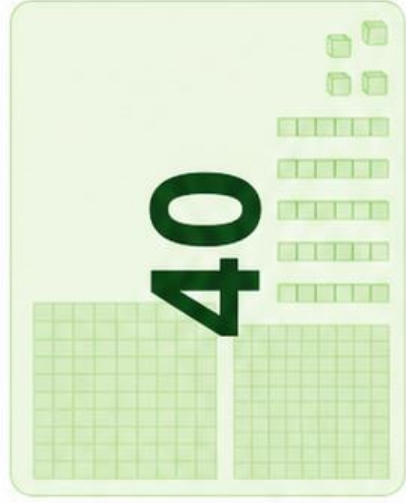
0.57



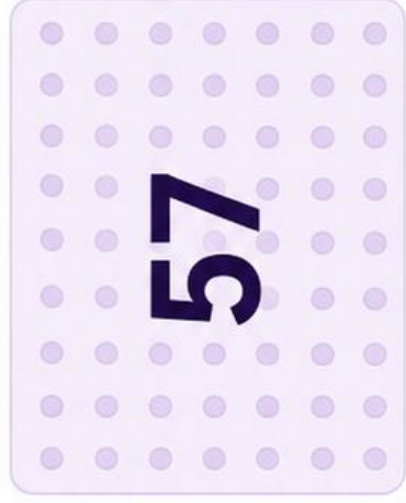
0.08



12.4



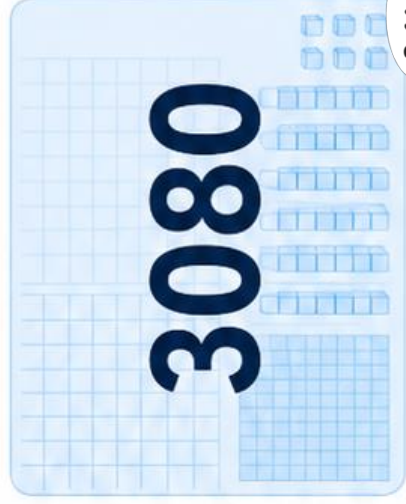
40



57



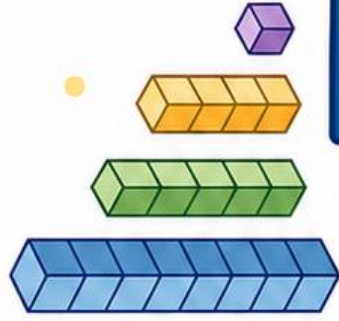
125



3080

PREVIEW

Decimal Trail



START

M: draw a Multiply card

D: draw a Divide card

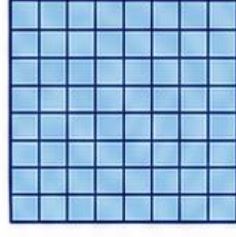
E: draw an Estimate card

CHECK: explain how you know

0.1

0.01

0.001



FINISH



Roll and move. Answer the card.

Correct: stay. Incorrect: move back 1.

First to FINISH wins.

Decimal Trail - Multiply Cards

$$0.47 \times 10$$

$$3.26 \times 100$$

$$0.805 \times 1000$$

$$12.04 \times 10$$

$$6.7 \times 100$$

$$0.009 \times 1000$$

$$\underline{\hspace{1cm}} \times 100 = 54$$

$$7.2 \times \underline{\hspace{1cm}} = 720$$

PREVIEW

Decimal Trail - Divide and Estimate Cards

$$48.6 \div 10$$

$$725 \div 100$$

$$9.4 \div 1000$$

$$0.63 \div 10$$

$$\text{Estimate } 6.18 \times 100$$

$$\text{Estimate } 843 \div 100$$

$$\frac{\quad}{\quad} \div 100 = 0.45$$

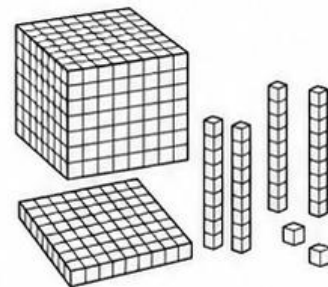
$$37 \div \quad = 0.037$$

PREVIEW

Name: _____

Place Value Shift Lab - Page 1

Use place value to predict, calculate and explain.



1. Place 4.305 in the chart.

thousands	hundreds	tens	ones		tenths	hundredths	thousandths
				•			

2. Write the value of the digit 3.

3. Predict: will 4.305×100 be larger or smaller?

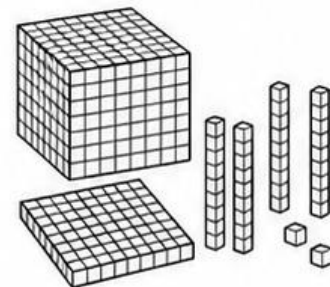
4. Calculate 4.305×100 .

5. Predict: will $4.305 \div 1000$ be larger or smaller?

6. Calculate $4.305 \div 1000$.

ANSWERS**Place Value Shift Lab - Page 1**

Use place value to predict, calculate and explain.



1. Place 4.305 in the chart.

thousands	hundreds	tens	ones		tenths	hundredths	thousandths
			4	•	3	0	5

2. Write the value of the digit 3.

0.3

3. Predict: will 4.305×100 be larger or smaller?

larger

4. Calculate 4.305×100 .

430.5

5. Predict: will $4.305 \div 1000$ be larger or smaller?

smaller

6. Calculate $4.305 \div 1000$.

0.004305

Name: _____

Place Value Shift Lab - Page 2

Complete each relationship. Show or explain your reasoning.

Hundreds	Tens	Ones	.	Tenths	Hundredths	Thousandths
			.			

1. $0.72 \times \underline{\hspace{1cm}} = 72$

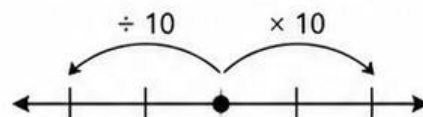
2. $53 \div \underline{\hspace{1cm}} = 0.053$

3. $\underline{\hspace{1cm}} \times 1000 = 6.4$

4. $\underline{\hspace{1cm}} \div 100 = 0.32$

5. Explain why 6.05×100 is not 6.500.

6. Correct the error: $7.3 \div 100 = 0.73$.



ANSWERS _____

Place Value Shift Lab - Page 2

Complete each relationship. Show or explain your reasoning.

Hundreds	Tens	Ones	.	Tenths	Hundredths	Thousandths
			.			

1. $0.72 \times \underline{100} = 72$

2. $53 \div \underline{1000} = 0.053$

3. $\underline{0.0064} \times 1000 = 6.4$

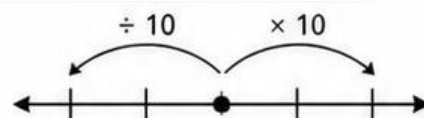
4. $\underline{8.2} \div 100 = 0.082$

5. Explain why 6.05×100 is not 6.500.

605, not 6500: each digit shifts two places to a greater place value.

6. Correct the error: $7.3 \div 100 = 0.73$.

0.073



Name: _____

Multiply by Powers of 10 - Core Practice

Predict the size first. Then calculate.

Tens	Ones	.	Tenths	Hundredths	Thousandths
2	8	.	0	5	6

← $\times 10$

Digits move one place to the left.

← $\times 100$

Digits move two places to the left.

← $\times 1000$

Digits move three places to the left.

1. $0.46 \times 10 =$ _____

2. $3.07 \times 100 =$ _____

3. $0.825 \times 1000 =$ _____

4. $14.2 \times 10 =$ _____

5. $6.39 \times 100 =$ _____

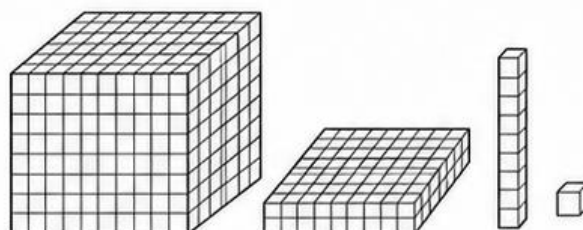
6. $0.004 \times 1000 =$ _____

7. $28.05 \times 100 =$ _____

8. $0.73 \times 10 =$ _____

9. $5.006 \times 1000 =$ _____

10. $91.4 \times 100 =$ _____



ANSWERS

Multiply by Powers of 10 - Core Practice

Predict the size first. Then calculate.

Tens	Ones	.	Tenths	Hundredths	Thousandths
2	8	.	0	5	6

$\times 10$

Digits move one place to the left.

$\times 100$

Digits move two places to the left.

$\times 1000$

Digits move three places to the left.

1. $0.46 \times 10 =$ 4.6

2. $3.07 \times 100 =$ 307

3. $0.825 \times 1000 =$ 825

4. $14.2 \times 10 =$ 142

5. $6.39 \times 100 =$ 639

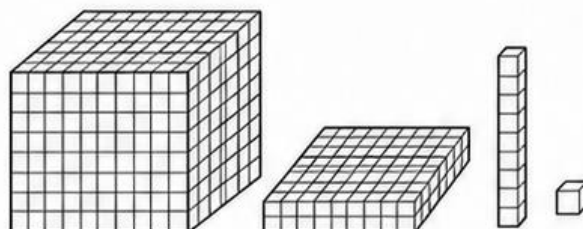
6. $0.004 \times 1000 =$ 4

7. $28.05 \times 100 =$ 2805

8. $0.73 \times 10 =$ 7.3

9. $5.006 \times 1000 =$ 5006

10. $91.4 \times 100 =$ 9140



Name: _____

Multiply by Powers of 10 - Extend and Reason

Solve each problem. Explain your thinking where asked.

Thousands	Hundreds	Tens	Ones	Tenths	Hundredths	Thousandths
1	2	3	4	5	6	7

← $\times 10$ moves digits left. $\div 10$ moves digits right. →

H	T	O	.	t	h	th
		○		○	○	○
		○			○	○
		○	.			○
		○				○

1. $0.0096 \times 1000 =$

2. $42.08 \times 100 =$

3. $0.0705 \times 1000 =$

4. $6.4 \times \underline{\quad} = 640$

5. $\underline{\quad} \times 1 = 3$

6. $0.52 \times \underline{\quad} = 520$

7. Which is greater: 8.09×10 or 0.809×1000 ? Explain.

8. Write a number that becomes 72 when multiplied by 1000.

ANSWERS**Multiply by Powers of 10 - Extend and Reason**

Solve each problem. Explain your thinking where asked.

Thousands	Hundreds	Tens	Ones	Tenths	Hundredths	Thousandths
1	2	3	4	5	6	7

← $\times 10$ moves digits left. $\div 10$ moves digits right. →

H	T	O	.	t	h	th
		○		○	○	○
		○			○	○
		○	•			○
		○				○

1. $0.0096 \times 1000 =$

9.6

2. $42.08 \times 100 =$

4208

3. $0.0705 \times 1000 =$

70.5

4. $6.4 \times \underline{100} = 640$

5. $\underline{0.037} \times 100 = 3.7$

6. $0.52 \times \underline{1000} = 520$

7. Which is greater: 8.09×10 or 0.809×1000 ? Explain.

 0.809×1000 is greater because $809 > 80.9$.

8. Write a number that becomes 72 when multiplied by 1000.

Sample answer: 0.072

Name: _____

Divide by Powers of 10 - Core Practice

Predict the size first.

Dividing by Powers of 10 Moves Digits to the Right

- $\div 10 \rightarrow$ move 1 place right
 $\div 100 \rightarrow$ move 2 places right
 $\div 1000 \rightarrow$ move 3 places right

Thousands	Hundreds	Tens	Ones	Tenths	Hundredths	Thousandths
1000	100	10	1	0.1	0.01	0.001

- $48.6 \div 10$ _____
- $725 \div 100$ _____
- $9.4 \div 1000$ _____
- $63 \div 10$ _____
- $8.25 \div 100$ _____
- $5400 \div 1000$ _____
- $0.72 \div 10$ _____
- $301 \div 100$ _____
- $6.008 \div 1000$ _____
- $92.5 \div 100$ _____

ANSWERS

Divide by Powers of 10 - Core Practice

Predict the size first.

Dividing by Powers of 10 Moves Digits to the Right

- $\div 10 \rightarrow$ move 1 place right
 $\div 100 \rightarrow$ move 2 places right
 $\div 1000 \rightarrow$ move 3 places right

Thousands	Hundreds	Tens	Ones	Tenths	Hundredths	Thousandths
1000	100	10	1	0.1	0.01	0.001

1. $48.6 \div 10$

4.86

2. $725 \div 100$

7.25

3. $9.4 \div 1000$

0.0094

4. $63 \div 10$

6.3

5. $8.25 \div 100$

0.0825

6. $5400 \div 1000$

5.4

7. $0.72 \div 10$

0.072

8. $301 \div 100$

3.01

9. $6.008 \div 1000$

0.006008

10. $92.5 \div 100$

0.925

Divide by Powers of 10 - Extend and Reason

Name: _____

Place-Value Reminder

Dividing by powers of 10 moves the digits to the right to smaller place values.

Hundreds	Tens	Ones		Tenths	Hundredths	Thousandths
100	10	1	.	0.1	0.01	0.001



Divide by 10: move right 1 place | Divide by 100: move right 2 places | Divide by 1000: move right 3 places

1. $0.63 \div 100$

2. $7.02 \div 1000$

3. $450 \div \underline{\hspace{1cm}} = 4.5$

4. $\underline{\hspace{1cm}} \div \underline{\hspace{1cm}} = 0.071$

5. $38 \div \underline{\hspace{1cm}} = 0.038$

6. $\underline{\hspace{1cm}} \div 1000 = 0.0062$

7. Which is smaller: $5.4 \div 100$ or $0.54 \div 10$? Explain.

8. Correct the error: $82 \div 1000 = 0.82$.

Divide by Powers of 10 - Extend and Reason

ANSWERS

Place-Value Reminder

Dividing by powers of 10 moves the digits to the right to smaller place values.

Hundreds	Tens	Ones		Tenths	Hundredths	Thousandths
100	10	1	.	0.1	0.01	0.001

Divide by 10: move right 1 place | Divide by 100: move right 2 places | Divide by 1000: move right 3 places

1. $0.63 \div 100$

0.0063

2. $7.02 \div 1000$

0.00702

3. $450 \div \underline{\quad} = 4.5$

100

4. $\underline{\quad} \div \underline{\quad} = 0.071$

7.1

5. $38 \div \underline{\quad} = 0.038$

1000

6. $\underline{\quad} \div 1000 = 0.0062$

6.2

7. Which is smaller: $5.4 \div 100$ or $0.54 \div 10$? Explain.

Equal - both are 0.054.

8. Correct the error: $82 \div 1000 = 0.82$.

0.082

Estimate, Calculate and Check - Page 1

Name: _____

Round the starting number to one significant place for the estimate.

	Estimate	Exact answer	Reasonable?
6.27×100			
0.804×1000			
$348 \div 100$			
$7.19 \div 10$			
$92.6 \div 10$			
$64.2 \div 1000$			
4.005×100			
$8050 \div 100$			

Estimate, Calculate and Check - Page 1

ANSWERS

Round the starting number to one significant place for the estimate.

	Estimate	Exact answer	Reasonable?
6.27×100	600	627	yes
0.804×1000	800	804	yes
$348 \div 100$	3	3.48	yes
$7.19 \div 10$	7	0.719	yes
$92.6 \div 10$	900	926	yes
$64.2 \div 1000$	0.06	0.0642	yes
4.005×100	400	400.5	yes
$8050 \div 100$	80	80.5	yes

Estimate, Calculate and Check - Page 2

Name: _____

1. Mia says $3.8 \times 100 = 38$. Is her answer reasonable? Correct it.

Ones	Tenths	Hundredths
3.	8	0

$\times 100$ →

.		
---	--	--

2. Noah says $49 \div 100 = 4.9$. Is his answer reasonable? Correct it.

Ones	Tenths	Hundredths
4	9	0

$\div 100$ →

	.	
--	---	--

3. Circle the reasonable answer for 0.72×1000 :

0.72

72

720

4. Circle the reasonable answer for $620 \div 100$:

0.62

6.2

62

5. Create one multiplication estimate and exact answer.

Estimate: _____

Exact answer: _____

6. Create one division estimate and exact answer.

Estimate: _____

Exact answer: _____

Estimate, Calculate and Check - Page 2

ANSWERS

1. Mia says $3.8 \times 100 = 38$. Is her answer reasonable? Correct it.

No. 380.

Ones	Tenths	Hundredths
3.	8	0

$\times 100$

3	8	0
---	---	---

2. Noah says $49 \div 100 = 4.9$. Is his answer reasonable? Correct it.

No. 0.49.

Ones	Tenths	Hundredths
4	9	0

$\div$

0	.	4	9
---	---	---	---

3. Circle the reasonable answer for 0.72×1000 :

0.72

72

720

4. Circle the reasonable answer for $620 \div 100$:

0.62

6.2

62

5. Create one multiplication estimate and exact answer.

Estimate: _____ **Sample: 4.6×100 ; estimate 500; exact 460.** _____

Exact answer: _____

6. Create one division estimate and exact answer.

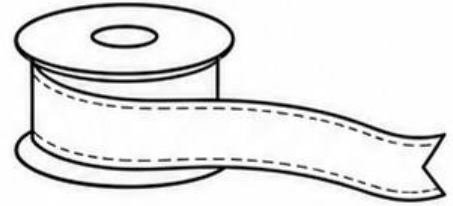
Estimate: _____ **Sample: $735 \div 100$; estimate 7; exact 7.35.** _____

Exact answer: _____

Decimal Problems in Context - Page 1

Name: _____

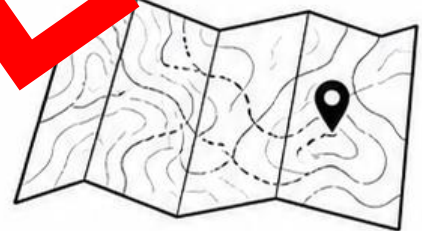
1. A 3.45 m ribbon is cut into 10 equal lengths.
Find each length.



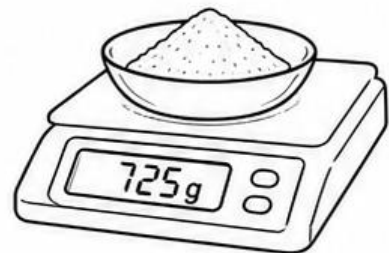
2. A lab uses 0.028 L in each of 100 trials.
Find total litres.



3. A map scale makes a 6.2 cm line 100 times longer.
Find the new length.



4. A 725 g sample is divided into 100 equal portions.
Find mass per portion.



5. Ten tickets cost \$4.80 each.
Find total cost.



6. A 9.6 km route is split into 1000 equal stages.
Find kilometres per stage.

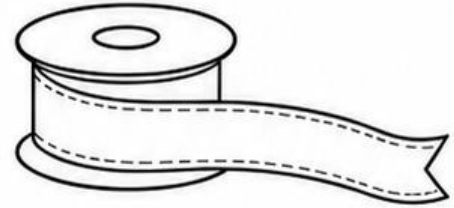


Decimal Problems in Context - Page 1

ANSWERS

1. A 3.45 m ribbon is cut into 10 equal lengths.
Find each length.

0.345 m



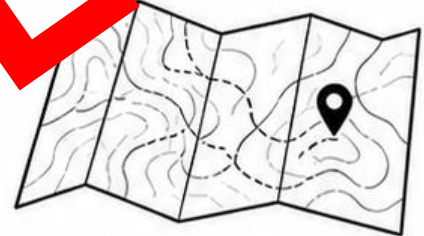
2. A lab uses 0.028 L in each of 100 trials.
Find total litres.

2.8 L



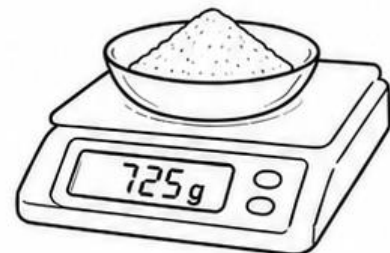
3. A map scale makes a 6.2 cm line 100 times longer.
Find the new length.

620 cm



4. A 725 g sample is divided into 100 equal portions.
Find grams per portion.

7.25 g



5. Ten tickets cost \$4.80 each.
Find total cost.

\$48.00



6. A 9.6 km route is split into 1000 equal stages.
Find kilometres per stage.

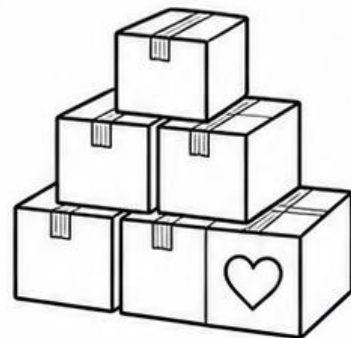
0.0096 km



Name: _____

Decimal Problems in Context - Page 2

1. A charity packs 100 boxes with 2.35 kg in each. It then shares the total equally among 10 centres. How many kilograms per centre?



2. A runner completes 10 laps of 0.625 km, then divides the distance equally across 100 training intervals. Find kilometres per interval.



3. A shop orders 100 beads at \$0.05 each. Find the total cost.



4. Write and solve your own powers-of-10 word problem.

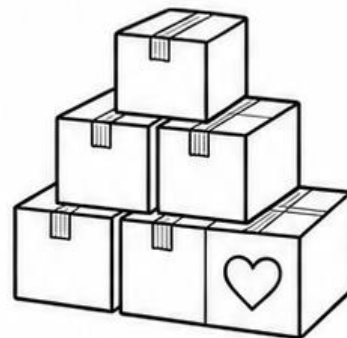


ANSWERS

Decimal Problems in Context - Page 2

1. A charity packs 100 boxes with 2.35 kg in each. It then shares the total equally among 10 centres. How many kilograms per centre?

23.5 kg



2. A runner completes 10 laps of 0.625 km, then divides the distance equally across 100 training intervals. Find kilometres per interval.

0.0625 km



3. A shop orders 100 beads at \$0.06 each. Find the total cost.

\$6.00



4. Write and solve your own powers-of-10 word problem.

Sample: Ten 3.4 m ropes total 34 m.



Multiplying and Dividing Decimals Assessment - Page 1

Student name: _____

Date: _____

Section A Calculate

1. 0.84×10 _____

2. 3.062×100 _____

3. 0.009×1000 _____

4. $72.5 \div 10$ _____

5. $640 \div 100$ _____

6. $8.4 \div 1000$ _____



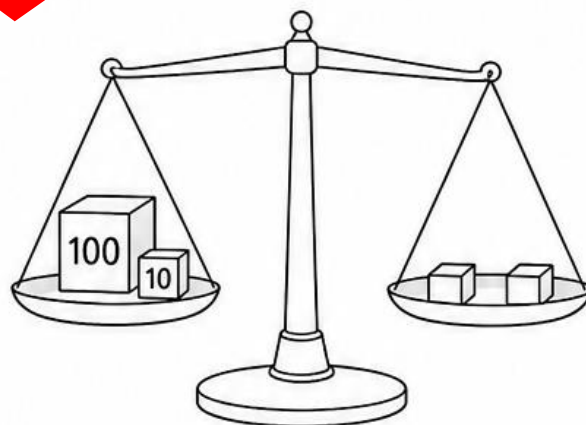
Section B Complete

7. _____ $\times 10 = 4$

8. $6.2 \div$ _____ $= 200$

9. _____ $\times 100 = 0.078$

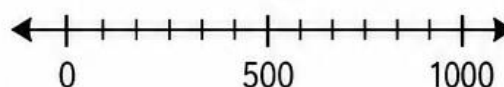
10. $39 \div$ _____ $= 0.039$



Section C Estimate

11. 6.18×100 _____

12. $843 \div 100$ _____



Multiplying and Dividing Decimals Assessment - Page 1

ANSWERS

Section A Calculate

1. 0.84×10 8.4

2. 3.062×100 306.2

3. 0.009×1000 9

4. $72.5 \div 10$ 7.25

5. $640 \div 100$ 6.4

6. $8.4 \div 1000$ 0.008



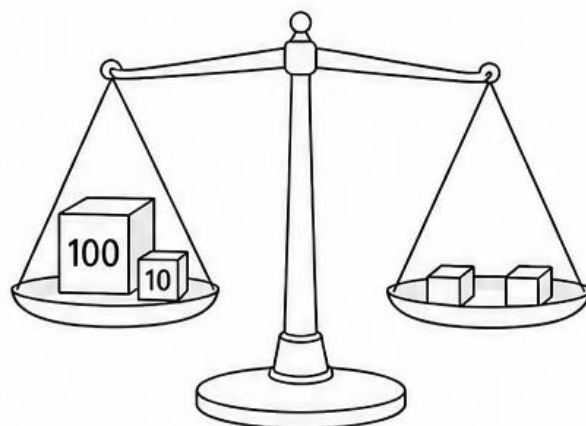
Section B Complete

7. 0.45 $\times 10 = 4.5$

8. $6.2 \times$ 1000 $= 6200$

9. 7.8 $\div 100 = 0.078$

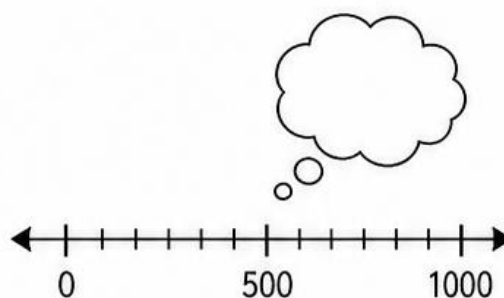
10. $39 \div$ 1000 $= 0.039$



Section C Estimate

11. 6.18×100 about 600

12. $843 \div 100$ about 8

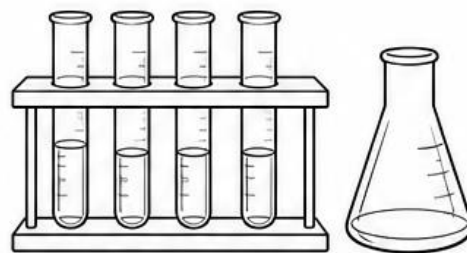


Multiplying and Dividing Decimals Assessment - Page 2

Student name: _____

Date: _____

1. A science team uses 0.036 L in each of 100 tests. Find total litres.



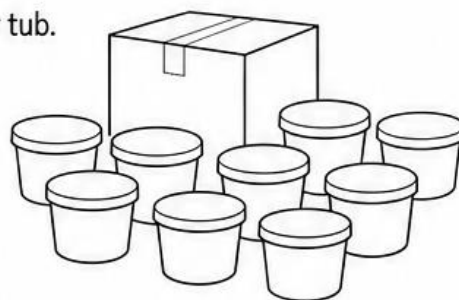
2. A 48.5 m track section is divided into 1000 equal markers. Find metres per interval.



3. A canteen sells 100 snacks at \$2.75 each. Find total sales.



4. A 6.4 kg parcel is divided equally among 10 tubs. Find kilograms per tub.



5. Correct and explain: $7.05 \times 100 = 70.5$.



6. Explain how inverse reasoning checks $8.2 \div 100 = 0.082$.

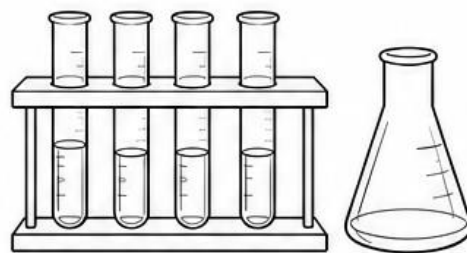


Multiplying and Dividing Decimals Assessment - Page 2

ANSWERS

1. A science team uses 0.036 L in each of 100 tests. Find total litres.

3.6 L



2. A 48.5 m track section is divided into 1000 equal markers. Find metres per interval.

0.0485 m



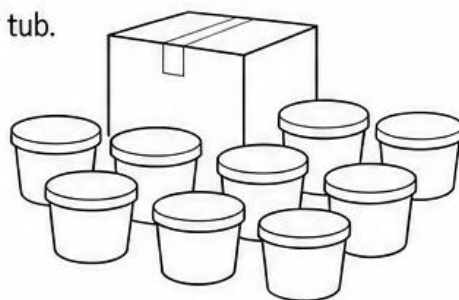
3. A canteen sells 100 snacks at \$2.75 each. Find total sales.

\$275.00



4. A 6.4 kg parcel is divided equally among 10 tubs. Find kilograms per tub.

0.64 kg



5. Correct and explain: $7.05 \times 100 = 70.5$.

705, because each digit shifts two places to greater place values.



6. Explain how inverse reasoning checks $8.2 \div 100 = 0.082$.

$0.082 \times 100 = 8.2$, so the division is correct.



Multiplying and Dividing Decimals Rubric

Student name: _____

Class: _____

Date: _____

Criteria	BEGINNING	DEVELOPING	ACHIEVING	CONFIDENT	EXCEEDING
1. Place-value understanding	Needs substantial support to recognise tenths, hundredths and thousandths and their placement. Struggles to identify the decimal point and place value when solving problems.	Sometimes identifies place value with decimal support. Sometimes counting place value up number calculations.	Accurately identifies tenths, hundredths and thousandths and the decimal point. Correctly aligns numbers by place value before multiplying or dividing.	Securely works with decimals to thousandths and beyond. Flexibly explains how place value affects the position of the decimal point in answers.	Generalises place-value patterns for decimal operations and justifies how digits shift through place-value columns. Explains connections to powers of ten.
	Requires substantial support to complete calculations. Makes frequent errors with algorithms, place value or the decimal point.	Completes some calculations correctly but errors are common. May misplace the decimal point or make calculation mistakes.	Accurately multiplies and divides decimals using appropriate strategies and algorithms. Places the decimal point correctly in the answer.	Consistently accurate and efficient with a variety of decimal multiplication and division problems, including larger and multi-step calculations.	Solves complex decimal problems accurately using flexible strategies. Checks and explains answers using inverse operations or other methods.
3. Estimation and reasonableness	Needs substantial support to estimate or judge answers. Estimates are often far from the reasonable range.	Makes estimates with support. Sometimes recognises when an answer is not reasonable but needs help adjusting strategies.	Makes reasonable estimates using bounding or compatible numbers. Checks answers and identifies when answers are reasonable.	Uses efficient estimation strategies to check answers. Explains why answers are reasonable and adjusts if needed.	Uses sophisticated estimation and mental strategies to predict results and detect errors. Justifies reasonableness with clear numerical support.
4. Application and explanation	Needs substantial support to apply decimal operations in word problems. Explanations are unclear or missing.	Solves some word problems with support. Explanations are brief and may not clearly show the thinking or steps.	Applies multiplication and division of decimals to solve word problems. Shows clear working and explains the solution.	Selects appropriate strategies for a range of real-world problems. Communicates clear explanations using words, numbers and representations.	Models situations in multiple ways and explains solutions with insight. Justifies choices and generalises learning to new contexts.

Learning Intention & Success Criteria

Explain how digits shift through place-value positions when multiplying and dividing by 10, 100 and 1000.

Predict whether an answer will be larger or smaller, then calculate accurately.

Estimate and use inverse reasoning to decide whether an answer is reasonable.



Place Value Refresh

Thousands | hundreds | tens | ones | tenths | hundredths | thousandths

In 4.305, the 4 is in ones, the 3 is in tenths, the 0 is in hundredths and the 5 is in thousandths.

One place to the left is 10 times greater; one place to the right is 10 times smaller.



Powers of 10

Multiplying by 10, 100 or 1000 shifts each digit 1, 2 or 3 places to a greater place value.

Dividing by 10, 100 or 1000 shifts each digit 1, 2 or 3 places to a smaller place value.

The decimal point stays fixed in place-value charts. Digits change positions.



Multiply by 10

Predict: the answer should be larger than 4.72.

Shift every digit one place to a greater place value

$$4.72 \times 10 = 47.2$$

Inverse check: $47.2 \div 10 = 4.72$



Multiply by 100

Predict: the answer should be larger than 0.638.

Shift every digit two places to greater place values

$$0.638 \times 100 = 63.8$$

$$\text{Inverse check: } 63.8 \div 100 = 0.638$$



Multiply by 1000

Shift every digit three places to greater place value.

$$2.056 \times 1000 = 2056$$

Use placeholder zeros only when a place-value position is empty.

Check: $2056 \div 1000 = 2.056$.



Guided Multiplication Practice

Predict first: larger or smaller?

$$0.46 \times 10 = 4.6$$

$$3.07 \times 100 = 307$$

$$0.825 \times 1000 = 825$$

Explain which digits changed place value positions in one example.



Divide by 10

Predict: the answer should be smaller than 83.4.

Shift every digit one place to a smaller place value.

$$83.4 \div 10 = 8.34$$

Inverse check: $8.34 \times 10 = 83.4$



Divide by 100

Predict: the answer should be smaller than 7.25.

Shift every digit two places to smaller place values

$$7.25 \div 100 = 0.0725$$

$$\text{Inverse check: } 0.0725 \times 100 = 7.25$$



Divide by 1000

Shift every digit three places to smaller place value.

$$46.8 \div 1000 = 0.0468$$

Use placeholder zeros to keep each digit in its new position.

$$\text{Check: } 0.0468 \times 1000 = 46.8.$$



Guided Division Practice

Predict first: larger or smaller?

$$48.6 \div 10 = 4.86$$

$$725 \div 100 = 7.25$$

$$9.4 \div 1000 = 0.0094$$

Explain how an inverse operation checks one answer.



Multiply or Divide?

Multiplying by 10, 100 or 1000 shifts digits to greater place values. On a positive decimal becomes larger.

Dividing by 10, 100 or 1000 shifts digits to smaller place values. On a positive decimal becomes smaller.

Name the operation, predict the size, then decide the shift direction.



Estimate Before Calculating

Round the starting number to one significant place.

$6.27 \approx 6$, so 6.27×100 should be about 600.

Exact answer: 627. It is close to 600, so it is reasonable.

$843 \approx 800$, so $843 \div 100$ should be about 8; the exact answer is 8.43.



Inverse Relationship

Multiplication and division undo each other.

$$0.36 \times 100 = 36 \text{ and } 36 \div 100 = 0.36$$

Missing number: $__ \times 100 = 36$

Use the inverse: $36 \div 100 = 0.36$ so the missing number is 0.36.



Decimals in Real Life

Money: ten tickets at \$4.80 each cost \$48.00.

Mass: 725 g shared into 100 equal portions gives 7.25 g per portion.

Length: 9.6 km split into 1000 equal stages gives 0.0096 km per stage.

Always include the correct unit in the answer.



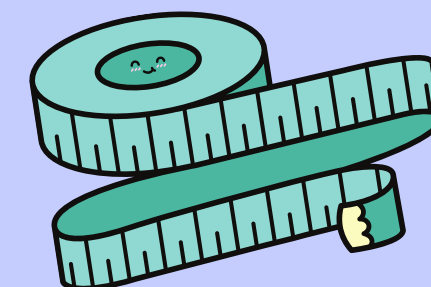
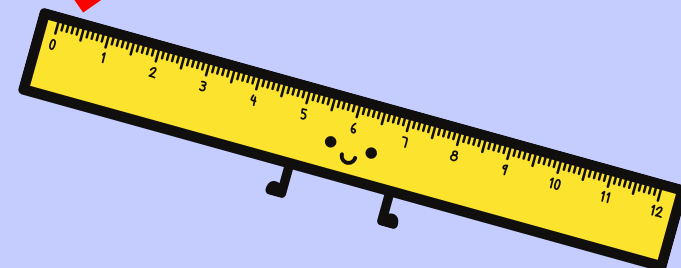
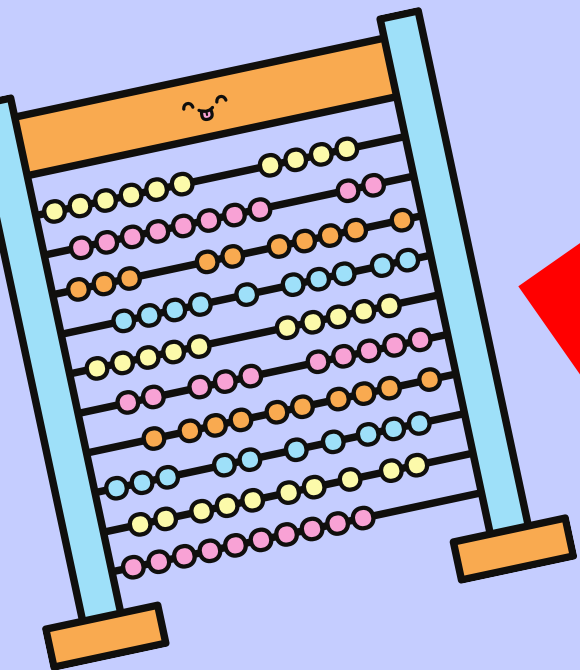
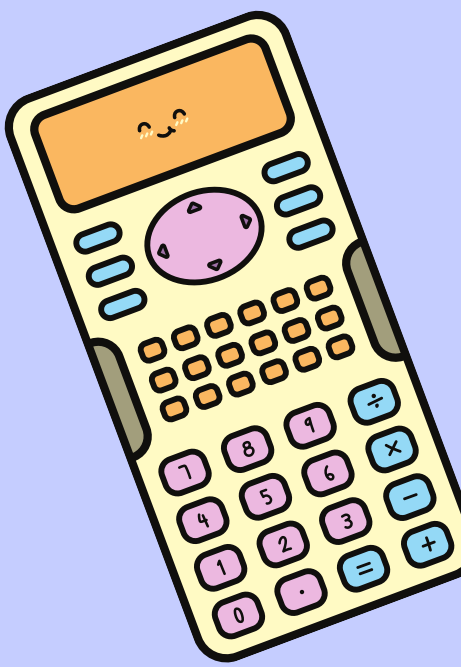
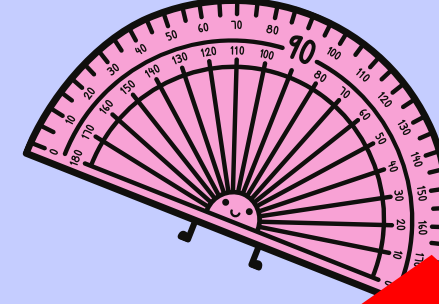
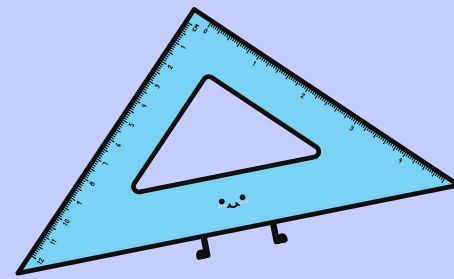
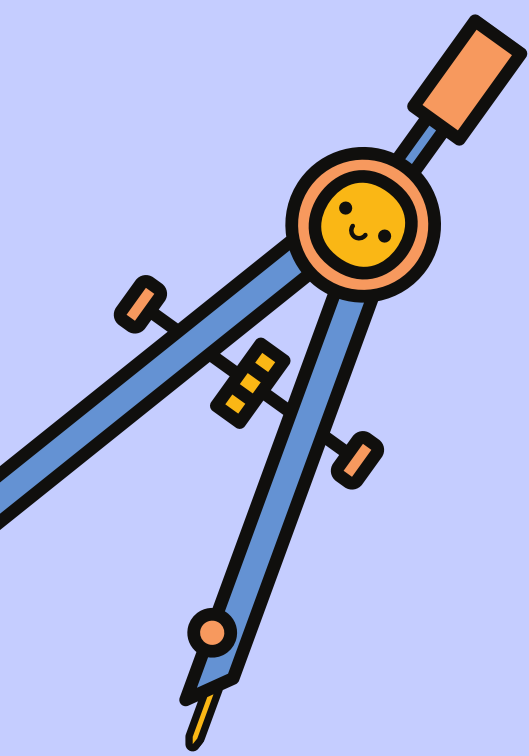
Common Errors & Self Check

Do not add or remove zeros without tracking each digit's place value.

Describe digits shifting; do not say the decimal point moves.

1 Predict: larger or smaller. 2 Calculate using place value. 3 Check with an estimate or inverse.





Question 1

True or false?

$$4.72 \times 100 = 472$$



Answer 1

True.

Each digit shifts two places to a greater place value: $4.72 \times 100 = 472$.



Question 2

Which expression equals 0.063?

A $6.3 \div 10$

B $6.3 \div 100$

C 6.3×100

D 0.63×100



Answer 2

B $6.3 \div 100$

Dividing by 100 shifts each digit two places to the small place value: $6.3 \div 100 = 0.063$.



Question 3

Short answer

$$0.508 \times 1000 = ?$$



Answer 3

508

Each digit shifts three places to a greater place value.



Question 4

True or false?

$$730 \div 100 = 7.3$$



Answer 4

True.

Each digit shifts two places to a smaller place value: $730 \div 100 = 7.3$.



Question 5

What is the best estimate for 6.27×100 ?

- A 0.6
- B 60
- C 600
- D 6000



Answer 5

C 600

6.27 rounds to 6; $6 \times 100 = 600$. The correct answer is 600.



Question 6

Short answer

$$84.5 \div 1000 = ?$$



Answer 6

0.0845

Each digit shifts three places to a smaller place value.



Question 7

Choose the missing number.

$$\underline{\hspace{1cm}} \times 100 = 36$$

A 0.036

B 0.36

C 3.6

D 3600



Answer 7

B 0.36

Inverse check: $36 \div 100 = 0.36$.



Question 8

Ten identical ribbons each measure 2.4 m.
What is their total length?



Answer 8

24 m

$2.4 \times 10 = 24$, so the ten ribbons measure 24 m altogether.



Question 9

True or false?

Dividing a positive number by 100 makes it one hundred times smaller.



Answer 9

True.

Each digit shifts two places to a smaller place value.



Question 10

Error analysis

Kai says $5.09 \div 10 = 5.9$.

Correct Kai's answer and explain the error.



Answer 10

0.509

Dividing by 10 shifts each digit one place to a smaller place value. Kai shifted in the wrong direction



