

Multiplying and Dividing by Powers of 10

Use mental math to explore multiplying and dividing by powers of 10. Verify your thinking with a calculator.

1. Complete each chart. In part a), the first row is done for you.

a)

Number	Operation	Answer
34.912	$\times 10$	349.12
34.912	$\times 100$	
34.912	$\div 10$	
34.912	$\div 100$	
34.912	$\div 1000$	

What do you notice?

b)

Number	Operation	Answer
0.8531	$\times 10$	
0.8531	$\times 100$	
0.8531	$\div 10$	
0.8531	$\div 100$	
0.8531	$\div 1000$	

What do you notice?

Multiplying and Dividing by Powers of 10 (cont'd)

c)

Number	Operation	Answer
90.47	$\times 10$	
90.47	$\times 100$	
90.47	$\div 10$	
90.47	$\div 100$	
90.47	$\div 1000$	

What do you notice?

2. Pat wants to convert 453 m to kilometres.

Sam says to divide by 1000 while Chris says to multiply by $\frac{1}{1000}$.

a) Explain why they are both correct.

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Multiplying and Dividing by Powers of 10 (cont'd)

b) How many kilometres is 453 m?

c) To convert a distance measured in kilometres to metres,
would you multiply or divide?

By what number? Explain your thinking.

Multiplying and Dividing by Powers of 10 (cont'd)

3. Complete the following charts.

a)

Number Sentence	Expanded Form	Value
89×10^3	89×1000	
89×10^2	89×100	
89×10^1	89×10	
89×10^0		
89×10^{-1}		
89×10^{-2}		
89×10^{-3}		

What do you notice?

Multiplying and Dividing by Powers of 10 (cont'd)

b)

Number Sentence	Expanded Form	Value
$89 \div 10^3$	$89 \div 1000$	
$89 \div 10^2$		
$89 \div 10^1$		
$89 \div 10^0$		
$89 \div 10^{-1}$		
$89 \div 10^{-2}$		
$89 \div 10^{-3}$		

What do you notice?