

## Place Value

Arranging numbers in place value charts can help with estimation.

The place value chart below shows 1247.63.

Thousands	Hundreds	Tens	Ones	Decimal Point	Tenths	Hundredths
1	2	4	7	•	6	3

The number 1248.63 is one more than 1247.63.

Look at the ones place.  $7 + 1 = 8$

The number 1147.63 is one hundred less than 1247.63.

Look at the hundreds place.  $2 - 1 = 1$

The number 1247.83 is two tenths more than 1247.63.

Look at the tenths place.  $6 + 2 = 8$

- Arrange the following numbers in a place value chart.
  - 1349.52
  - 45.069
  - 100.05
  - 0.455
- Show how to use place value to determine each number.
  - one hundred less than 699.41
  - one tenth less than 94.72
  - one hundredth more than 94.87
  - ten more than 999.9

## Compare and Order Numbers

You can use a place value chart to compare and order numbers.

The numbers 270, 2.7, and 27 are shown in the following place value chart.

	Hundreds	Tens	Ones	Decimal Point	Tenths
270	2	7	0	•	0
2.7	0	0	2	•	7
27	0	2	7	•	0

The numbers arranged from greatest to least are 270, 27, and 2.7.

You can write this as  $270 > 27 > 2.7$ .

The symbol  $>$  means "is greater than."

- Arrange each set of numbers from greatest to least.
  - 1.8, 2.8, 1.9
  - 365.7, 358, 365.9
- Use the symbol  $>$  to show the numbers arranged from greatest to least.
  - 1.9, 2.4, 2
  - 5, 4.3, 0.7

## Use Mental Mathematics

Mental mathematics includes estimating and calculating answers mentally. When asked to estimate, give an approximate but carefully thought-out answer. To mentally calculate, look for numbers that are easy to work with.



To estimate  $2530 \div 7$ , work with numbers that are easy to calculate mentally.

$$2100 \div 7 = 300 \quad \text{Low estimate.}$$

$$2800 \div 7 = 400 \quad \text{High estimate.}$$

The answer to  $2530 \div 7$  is between 300 and 400.



7 divides evenly into both 2100 and 2800.

To mentally calculate  $98 + 59$ , look for numbers that are easy to work with.

$$\begin{aligned} 98 + 59 &= 100 + 57 \\ &= 157 \end{aligned}$$



Add 2 to 98 to make 100.  
Subtract that 2 from 59.  
 $59 - 2 = 57$ .

5. Estimate. Is your estimate high or low?

Explain your thinking.

- a)  $468 + 227 + 351$     b)  $7428 - 3915$   
c)  $49 \times 7$                 d)  $312 \div 6$

6. Calculate each answer mentally.

Show your thinking.

- a)  $97 + 49$                                 b)  $102 + 57$   
c)  $99 \times 5$                                 d)  $38 + 67 + 35$

## Order of Operations With Whole Numbers

Mathematicians use a set order of operations when calculating number expressions.

Step 1: Do operations in brackets.	( )
Step 2: Multiply and divide in order from left to right.	$\times, \div$
Step 3: Add and subtract in order from left to right.	$+, -$

$$\begin{aligned} &5 \times 5 + 20 \div (5 - 3) - 3 \times 2 \\ &= 5 \times 5 + 20 \div 2 - 3 \times 2 \\ &= 25 + 10 - 6 \\ &= 35 - 6 \\ &= 29 \end{aligned}$$

Brackets.

Multiply and divide in order.

Add and subtract in order.

7. Calculate  $83 \times 7 + 234 \div 6$ . Show your steps.

8. Evaluate without using a calculator.

- a)  $16 - 4 \times 2$   
b)  $14 + 3 \times 8 + 5 \times 6$   
c)  $10 - 8 \div 4 + 14 \div 7$   
d)  $3 \times 5 + 16 \div 4 - 12 \div 3$



9. Calculate the value of each expression.

- a)  $(21 - 12) \times 9 + 8$   
b)  $(12 + 5) \times 5 - (26 - 13) \times 6$   
c)  $(34 - 6) \div 7 \times 3$   
d)  $180 \div (35 - 25)$   
e)  $28 \div (4 + 3) + 4 \times (8 - 5)$