Place Value and Algebraic Thinking

Place Value to the Billions:

Write each number in standard form:

1) $800 + 90 + 5 = 895$
2) $6000 + 40 + 3 = 6043$
3) $5000 + 600 + 80 + 2 = 5682$
4) $7000 + 200 + 30 + 1 = 7231$

Write the place of the underlined digit and then write the value of the digit:

5) $54,870$
   Place: Hundreds
   Value: 800

6) $8,423,646,000$
   Place: Billions
   Value: 8,000,000,000

Write the given numbers using words:

7) $9,445,200$ Nine million, four hundred forty-five thousand, two hundred

8) $7,213,745,002$ Seven billion, two hundred thirteen million, seven hundred forty-five thousand, and two

Write each number in standard form:

9) Five million, six hundred thousand, forty-two $5,600,042$

10) Thirty million, eighteen thousand, four $30,018,004$

Place Value to the Thousandths:

Write the place of the underlined digit and then write the value of the digit:

11) $0.870$
    Place: Tenths
    Value: 0.8

12) $2.408$
    Place: Thousandths
    Value: 0.008

Write the given numbers using words:

13) $9.405$ Nine and four hundred fifty thousandths
14) 133.8 \textbf{one hundred thirty-three and eight tenths.}

For #15-18 compare the following decimals using $<$, $>$, or $=$

15) \[ 4.4 \ oxed{>} \ 0.44 \]

16) \[ 8.72 \ oxed{>} \ 0.872 \]

17) \[ 0.8 \ oxed{>} \ 0.75 \]

18) \[ 0.05 \ oxed{<} \ 0.505 \]

Put the numbers in order from least to greatest:

19) 0.9, 0.909, 0.09, 0.99, 0.009

\[ 0.009, 0.09, 0.9, 0.909, 0.99 \]

Rounding Decimals:

20) Round to the nearest tenth 0.356 \[ \underline{0.4} \]

21) Round to the nearest hundredth 164.006 \[ 164.01 \]

22) Round to the nearest tenth 22.805 \[ 22.80 \]

23) Round to the nearest whole number 18.099 \[ 18 \]

24) Round to the nearest hundredth 324.853 \[ 324.85 \]

25) Round to the nearest whole number 1,445.999 \[ 1,446 \]
Multiply and Divide Whole numbers

Powers of Ten:

26) Complete the table below:

<table>
<thead>
<tr>
<th>Power</th>
<th>Equation</th>
<th>Standard Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>$10^1$</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>$10^2$</td>
<td>$10 \times 10$</td>
<td>100</td>
</tr>
<tr>
<td>$10^3$</td>
<td>$10 \times 10 \times 10$</td>
<td>1000</td>
</tr>
<tr>
<td>$10^4$</td>
<td>$10 \times 10 \times 10 \times 10$</td>
<td>10,000</td>
</tr>
<tr>
<td>$10^5$</td>
<td>$10 \times 10 \times 10 \times 10 \times 10$</td>
<td>100,000</td>
</tr>
<tr>
<td>$10^6$</td>
<td>$10 \times 10 \times 10 \times 10 \times 10 \times 10$</td>
<td>1,000,000</td>
</tr>
</tbody>
</table>

27) To get from 6 to 600, you move ___ 2 ____ places right, or ___ 2 ____ powers of ten. Complete the number sentence: $6 \times \underline{100} = 600$.

28) To get from 60,000 to 60, you move ___ 3 ____ places left, or ___ 3 ____ powers of ten. Complete the number sentence: $60,000 \div \underline{1,000} = 60$.

29) Complete the table below:

<table>
<thead>
<tr>
<th>Multiply by powers of ten</th>
<th>Divide by powers of ten</th>
</tr>
</thead>
<tbody>
<tr>
<td>$5 \times 10^2 = 5 \times \underline{100} = 500$</td>
<td>$80 \div 10^2 = 80 \div \underline{100} = 0.80$</td>
</tr>
<tr>
<td>$9 \times 10^3 = 9 \times \underline{1,000} = 9,000$</td>
<td>$7,000 \div 10^3 = 7,000 \div \underline{1000} = 7$</td>
</tr>
<tr>
<td>$12 \times 10^1 = 12 \times \underline{10} = 120$</td>
<td>$1,200 \div 10^1 = 1,200 \div \underline{10} = 120$</td>
</tr>
<tr>
<td>$34 \times 10^4 = 34 \times \underline{10,000} = 340,000$</td>
<td>$460 \div 10^2 = 460 \div \underline{100} = 4.60$</td>
</tr>
<tr>
<td>$60 \times 10^2 = 60 \times \underline{100,000} = 60,000,000$</td>
<td>$9,800 \div 10^3 = 9,800 \div \underline{1000} = 9.8$</td>
</tr>
</tbody>
</table>
Multiplication with whole numbers

Find the product to the following problems:

30) $13 \times 9 = 117$

\[
\begin{array}{c}
213 \\
\times \ 9 \\
\hline
117
\end{array}
\]

31) $120 \times 5 = 600$

\[
\begin{array}{c}
120 \\
\times \ 5 \\
\hline
600
\end{array}
\]

32) $84 \times 8 = 512$

\[
\begin{array}{c}
364 \\
\times \ 8 \\
\hline
512
\end{array}
\]

33) $750 \times 3 = 2250$

\[
\begin{array}{c}
750 \\
\times \ 3 \\
\hline
2250
\end{array}
\]

34) $50 \times 8 = 400$

\[
\begin{array}{c}
50 \\
\times \ 8 \\
\hline
400
\end{array}
\]

35) $72 \times 6 = 432$

\[
\begin{array}{c}
72 \\
\times \ 6 \\
\hline
432
\end{array}
\]

36) $30 \times 9 = 270$

\[
\begin{array}{c}
30 \\
\times \ 9 \\
\hline
270
\end{array}
\]

37) $502 \times 5 = 2510$

\[
\begin{array}{c}
502 \\
\times \ 5 \\
\hline
2510
\end{array}
\]

38) $59 \times 11 = 649$

\[
\begin{array}{c}
59 \\
\times \ 11 \\
\hline
649
\end{array}
\]

39) $83 \times 29 = 2407$

\[
\begin{array}{c}
83 \\
\times \ 29 \\
\hline
1747 \\
+ \ 1660 \\
\hline
2407
\end{array}
\]

40) $452 \times 14 = 6328$

\[
\begin{array}{c}
2452 \\
\times \ 14 \\
\hline
1808 \\
+ \ 6328 \\
\hline
6328
\end{array}
\]

41) $588 \times 48 = 28,224$

\[
\begin{array}{c}
588 \\
\times \ 48 \\
\hline
4704 \\
+ \ 23520 \\
\hline
28224
\end{array}
\]

42) $312 \times 240 = 74,880$

\[
\begin{array}{c}
312 \\
\times \ 240 \\
\hline
12480 \\
+ \ 74880 \\
\hline
74880
\end{array}
\]

43) $675 \times 408 = 275,400$

\[
\begin{array}{c}
675 \\
\times \ 408 \\
\hline
270000 \\
+ \ 5560 \\
\hline
275400
\end{array}
\]

44) $139 \times 347 = 48,233$

\[
\begin{array}{c}
139 \\
\times \ 347 \\
\hline
5560 \\
+ \ 41780 \\
\hline
48233
\end{array}
\]
**Division with Whole Numbers**

Find the quotient to the following problems:

45) $1,800 \div 3 = \boxed{600}$  
46) $170 \div 5 = \boxed{34}$  
47) $708 \div 6 = \boxed{118}$

48) $280 \div 8 = \boxed{35}$  
49) $9 \div 9 = \boxed{1}$  
50) $0 \div 3 = \boxed{0}$

51) $143 \div 27 = \boxed{5.3}$  
52) $104 \div 8 = \boxed{13}$  
53) $660 \div 5 = \boxed{132}$

54) $720 \div 6 = \boxed{120}$  
55) $388 \div 5 = \boxed{77.6}$  
56) $296 \div 14 = \boxed{21.4}$

57) $3,984 \div 5 = \boxed{796.8}$  
58) $968 \div 6 = \boxed{161.3}$  
59) $693 \div 4 = \boxed{173.25}$

Solve the following word problems using multiplication or division:

60) Paloma has a dog walking business. If she earned $418 this week, about how many dogs did she walk if she charged $22 per dog? Round to solve. Show your Work.

\[ 418 \div 22 = 19 \text{ dogs} \]
61) The town library is moving so all of the books had to be packed. One box of books weighs 38 pounds. About how many pounds will 72 boxes of books weigh? Show your work.

\[
\begin{align*}
\frac{72}{38} + \frac{57}{60} &= \frac{216}{380} + \frac{570}{380} \\
&= \frac{786}{380} \\
&= \frac{219}{100} \\
&= 2.19 \text{ lbs}
\end{align*}
\]

62) One pitcher can hold 62 ounces of lemonade. Millie’s lemonade stand sold 21 pitchers of lemonade today. About how many ounces of lemonade did Millie sell? Show your work.

\[
\begin{align*}
62 \times 21 &= 1302 \\
1302 \div 8 &= 162.75 \\
&= 1302 \text{ oz}
\end{align*}
\]

63) Morgan completed a 39 mile charity walk. She spent a total of 8 hours walking. About how many miles did she walk each hour?

\[
\frac{39}{8} = 4.875 \text{ mi/hr}
\]

64) Antonio is stocking shelves at the grocery store. He has 450 boxes of cereal to place on 25 shelves. How many boxes will go on each shelf?

\[
\frac{450}{25} = 18 \text{ boxes}
\]

Order of operations

PEMDAS (Parenthesis, exponents, multiplication, division, addition, subtraction)

Solve the following problems using the order of operations:

65) \(12 \times 6 + 2 \) \[36\]

66) \(30 - 15 ÷ 3 + 8 \) \[33\]

67) \(45 + 5 \times 3 + 2 \) \[29\]

68) \(6 + 4 \times 6 - 3 \) \[27\]

69) \(8 + 2 \times 4 - 3 \) \[13\]

70) \(35 - 9 ÷ 3 + 2 \times 4 \) \[40\]
71) \((28 + 4) \times 2 + 3 \times 4 = 26\)
72) \(3 + 4 \times 6 + 2 + 15 = 30\)
73) \((30 + 3) - 4 + (2 \times 7) = 20\)
74) \(15 - 2 + 2 + (10 - 8) + 5 = 21\)

**Decimal Operations**

**Adding and Subtracting Decimals:**

Add and subtract the following decimals:

75) \(18.49 + 33.07 = 51.56\)
76) \(9.9 + 13.08 = 22.98\)
77) \(15.35 - 1.2 = 14.15\)
78) \(47.62 - 1.07 = 46.55\)
79) \(32.5 + 0.9 = 33.4\)
80) \(15.8 - 1.9 = 13.9\)
81) \(184.2 - 0.6 = 183.6\)
82) \(13.4 + 39.7 = 53.1\)
83) Edwin walks 1.24 miles to school each day. Carson walks 1.8 miles. Who has to walk the greatest distance? How much longer is his walk?

```
1.24
-1.810
---
-0.56
```

Carson, 0.56 mi longer
84) Patrick ran 4.7 miles today and 5.65 miles yesterday. How many miles did he run over the last two days?

\[
\begin{array}{c}
\frac{5.65}{+ 4.70} \\
\hline
10.35 \text{ mi}
\end{array}
\]

85) Meghan bought $1.99 worth of strawberries and paid with $10 bill. How much change will she receive?

\[
\begin{array}{c}
\frac{10.00}{- 1.99} \\
\hline
8.01 \text{ $}
\end{array}
\]

86) Jasmine bought 4.95 pounds of strawberries and 1.6 pounds of grapes. How much fruit did she buy altogether?

\[
\begin{array}{c}
4.95 \\
+ 1.60 \\
\hline
6.55 \text{ lbs}
\end{array}
\]

Multiplying and Dividing Decimals:

Multiply the following decimals:

87) \(2.8 \times 7 = 19.6\)

\[
\begin{array}{c}
\frac{2.8}{\times 7} \\
\hline
19.6
\end{array}
\]

88) \(21.5 \times 1.2 = 25.80\)

\[
\begin{array}{c}
21.5 \\
\times 1.2 \\
\hline
25.80
\end{array}
\]

89) \(50.3 \times 0.5 = 25.15\)

\[
\begin{array}{c}
\frac{50.3}{\times 0.5} \\
\hline
25.15
\end{array}
\]

90) \(1.2 \times 4.5 = 5.40\)

\[
\begin{array}{c}
1.2 \\
\times 4.5 \\
\hline
5.40
\end{array}
\]

91) \(0.6 \times 8 = 12.8\)

\[
\begin{array}{c}
0.6 \\
\times 8 \\
\hline
12.8
\end{array}
\]

92) \(16.2 \times 1.5 = 24.30\)

\[
\begin{array}{c}
\frac{16.2}{\times 1.5} \\
+ 16.2 \\
\hline
24.30
\end{array}
\]

93) \(5.14 \times 0.14 = 0.7196\)

\[
\begin{array}{c}
\frac{5.14}{\times 0.14} \\
\hline
0.7196
\end{array}
\]

94) \(22.8 \times 4.3 = 98.04\)

\[
\begin{array}{c}
22.8 \\
\times 4.3 \\
\hline
98.04
\end{array}
\]
Divide the following decimals:

95) 2.35 ÷ 5 = 0.47
96) 44.24 ÷ 7 = 6.32
97) 73.58 ÷ 2 = 36.79
98) 87.8 ÷ 5 = 17.56
99) 0.65 ÷ 5 = 0.13
100) 25.38 ÷ 6 = 4.23
101) 4.66 ÷ 2 = 2.33
102) 18.36 ÷ 3 = 6.12

Decimal Operations Applications:

103) Norma purchased 4.88 pounds of strawberries, 1.36 pounds of bananas and 7.4 pounds of apples. How much fruit did she buy altogether?

\[ 13.62 \text{ lbs} \]

104) Marcus deposited $42.50 into his bank account each week for 15 weeks. How much money did he deposit altogether?

\[ \frac{42.50 \times 15}{212.50 + 425.00} = \$637.50 \]
105) Six people split the cost of a meal. If the meal was $113.04, how much did each person pay?

\[ \frac{18.84}{6} = 18.84 \text{ each} \]

Fraction Concepts and Operations:

**Fraction Concepts:**

Write an equivalent fraction to the given fraction: Answers will vary.

106) \( \frac{\frac{3}{7} \times 2}{14} \)

107) \( \frac{\frac{12}{15} \times 10}{120} \)

108) \( \frac{\frac{2}{3} \times 3}{6} \)

109) \( \frac{\frac{14}{16} \times 2}{7} \)

Rewrite each mixed number as an improper fraction:

110) \( 12\frac{1}{2} = \frac{25}{2} \)

111) \( 4\frac{2}{3} = \frac{14}{3} \)

112) \( 2\frac{4}{5} = \frac{14}{6} \)

113) \( 3\frac{1}{7} = \frac{22}{7} \)

Write each improper fraction as a mixed number:

114) \( \frac{49}{8} = 6\frac{1}{8} \)

115) \( \frac{14}{5} = 2\frac{4}{5} \)

116) \( \frac{11}{2} = 5\frac{1}{2} \)

117) \( \frac{90}{3} = 30 \frac{1}{3} \)

**Fraction Operations:**

Add and subtract the following fractions:

118) \( \frac{5}{12} + \frac{\frac{1}{2}}{12} = \frac{8}{12} = \frac{4}{6} = \frac{2}{3} \)

119) \( \frac{4}{14} - \frac{1}{14} = \frac{4}{14} = \frac{2}{7} \)

120) \( \frac{\frac{10}{12} - \frac{1}{4} = \frac{7}{12} }{10 - \frac{1}{4} = \frac{10}{12} - \frac{3}{12} = \frac{7}{12} } \)

121) \( \frac{4 \frac{1}{5} + \frac{1}{5}}{5} = \frac{\frac{11}{20} = 1 \frac{1}{20}} \)

122) \( \frac{\frac{3}{11} - \frac{1}{2} \times 11}{12} = \frac{\frac{18}{11} - \frac{11}{22} = \frac{7}{22}} \)

123) \( \frac{\frac{3}{10} + \frac{2}{10}}{3 \times 10} = \frac{\frac{7}{30} + \frac{20}{30} = \frac{29}{30}} \)
124) \( \frac{\frac{5}{18}}{\frac{9}{2}} = \frac{1}{3} \) 
\( \frac{\frac{8}{18}}{\frac{3}{3}} = \frac{2}{9} \) 
\( \frac{\frac{5}{18}}{\frac{2}{9}} = \frac{5}{18} \) 

125) \( \frac{\frac{8}{9}}{\frac{3}{3}} = \frac{2}{9} \) 
\( \frac{\frac{8}{9}}{\frac{1}{9}} = \frac{8}{9} \) 

126) \( \frac{\frac{60}{56}}{\frac{12}{4}} = \frac{60}{56} \) 
\( \frac{\frac{1}{12} + \frac{6}{4}}{\frac{3}{3}} = \frac{1}{12} + \frac{9}{12} \) 
\( = \frac{10}{12} = \frac{5}{6} \) 

127) \( \frac{\frac{23}{30}}{\frac{1}{10} + \frac{1}{3}} = \frac{23}{30} \) 
\( \frac{\frac{1}{10} + \frac{12}{10}}{\frac{3}{3} + \frac{10}{3}} = \frac{3}{3} + \frac{20}{30} \) 
\( = \frac{23}{30} \) 

128) \( \frac{\frac{10}{6} - \frac{4}{2}}{\frac{4}{4} - \frac{4}{4}} = \frac{10}{6} - \frac{4}{2} \) 
\( = \frac{10}{6} - \frac{4}{2} \) 

129) \( \frac{\frac{5}{3} - \frac{1}{3}}{\frac{1}{3}} = \frac{4}{12} \) 
\( \frac{\frac{5}{3} - \frac{1}{3}}{\frac{3}{3} - \frac{1}{3}} = \frac{5}{3} - \frac{8}{12} \) 
\( = \frac{4}{12} \) 

130) Bryan has \( 15 \frac{3}{4} \) yards of fencing. He needs a total of \( 22 \frac{1}{2} \) yards. How much more fencing does he need?
\( 22 \frac{3}{4} - 15 \frac{3}{4} = 22 \frac{3}{4} - 15 \frac{3}{4} = 21 \frac{15}{12} - 15 \frac{5}{12} \) 
\( = 6 \frac{3}{12} \) yards 

131) Emma mixed \( \frac{1}{2} \) cups of flour, \( \frac{9}{10} \) cups of white sugar and \( 1 \frac{1}{3} \) cups of brown sugar for a recipe. How many cups of flour and sugar did she use altogether?
\( \frac{\frac{1}{2} + \frac{9}{10} + \frac{1}{3}}{\frac{2}{3} + \frac{1}{10} + \frac{2}{10}} = \frac{5}{10} + \frac{9}{10} + \frac{2}{10} = \frac{16}{10} = 2 \frac{3}{10} \) cups 

132) Tevin ate \( 2 \frac{1}{2} \) slices of pizza for lunch and \( 1 \frac{5}{6} \) slices for snack that same day. How much pizza did he eat altogether?
\( 2 \frac{1}{2} + 1 \frac{5}{6} = 2 \frac{2}{6} + 1 \frac{5}{6} \) 
\( = 3 \frac{7}{6} = 4 \frac{1}{6} \) slices 

133) Gina has \( 1 \frac{1}{3} \) cups of fruit. She eats \( \frac{3}{4} \) cups for lunch. How much does she have left?
\( \frac{1}{3} - \frac{3}{4} = \frac{8}{20} - \frac{15}{20} = \frac{28}{20} - \frac{15}{20} \) 
\( = \frac{13}{20} \) cups
Multiply the following fractions:

134) \( \frac{2}{3} \times \frac{2}{3} = \frac{4}{9} \)

135) \( \frac{10}{12} \times \frac{2}{3} = \frac{20}{36} = \frac{5}{9} \)

136) \( \frac{1}{4} \times \frac{1}{4} = \frac{2}{24} = \frac{1}{12} \)

137) \( \frac{5}{3} \times \frac{2}{10} = \frac{165}{30} = \frac{1}{5} \)

138) \( \frac{4}{10} \times \frac{3}{5} = \frac{29}{50} \)

139) \( \frac{10}{12} \times \frac{7}{4} = \frac{88}{8} = \frac{11}{12} \)

140) After his baseball game, Marcus had one-half of his sports drink left. Before walking off the field, he drank three-fifths of what was left. How much of the original bottle did he drink before walking off the field?

\[ \frac{3}{5} \times \frac{1}{2} = \frac{3}{10} \text{ of his drink} \]

141) Carra’s track coach met with \( \frac{1}{3} \) of the team after school. They were told that \( \frac{1}{4} \) of those in the meeting would be selected for an All Star Track Team. What fraction of the entire team would be picked for the All Star Team?

\[ \frac{1}{4} \times \frac{1}{3} = \frac{1}{12} \text{ of the team} \]

Divide the following fractions:

142) \( \frac{3}{2} \div \frac{1}{4} = 6 \)

143) \( \frac{1}{3} \div \frac{3}{5} = \frac{5}{15} = \frac{1}{3} \)

144) \( \frac{12}{1} \div \frac{4}{3} = \frac{36}{4} = 9 \)

145) \( \frac{2}{3} \div \frac{1}{3} = \frac{18}{35} \)

146) \( \frac{6}{11} \div \frac{3}{8} = \frac{48}{33} = \frac{15}{11} \)

147) \( \frac{12}{15} \div \frac{7}{5} = \frac{8}{4} = 2 \)

148) Caroline used \( \frac{1}{2} \) of a bag of chocolate chips to make three dozen cookies. How much of the bag went into each batch?

\[ \frac{11}{12} \div 36 = \frac{11}{12} \times \frac{1}{36} = \frac{11}{432} \text{ bag} \]

149) Aaron needs six cups of flour for a recipe. He only has \( \frac{1}{8} \) cup scoops. How many scoops will he need?

\[ 6 \div \frac{3}{8} = 6 \times \frac{8}{3} = \frac{48}{3} = 16 \text{ scoops} \]