5th Grade Math Notes

**Basic Fraction**

- **numerator** - (the # of pieces shaded or unshaded)
- **denominator** - (the total number of pieces)

Example:

![Fraction Diagram]

5

12

**Mixed Numbers and Improper Fractions**

When converting a mixed number into an improper fraction you multiply the denominator by the whole number, then add the numerator.

Example:

$$3 \frac{5}{12} \rightarrow 12 \times 3 + 5 = 41 \rightarrow \frac{41}{12}$$

**Hint: The improper does NOT change.**

When converting an improper fraction into a mixed number you divide the numerator by the denominator.

$$\frac{41}{12} \rightarrow 12 \left[\frac{41}{36}\right] \rightarrow 3 \frac{5}{12}$$

**Hint: The dividend becomes the whole number and the remainder becomes the numerator and your denominator does NOT change.**

**Equivalent Fraction**

![Fraction Diagram]

$$\frac{12}{24} = \frac{2}{4}$$

The rule when converting fractions is that whatever you do to the top you must also do to the bottom.

$$\frac{12}{24} = \frac{4}{4}$$

~ If your denominator is 24 and it changes to 4 you have to determine which operation was used.

~ You divided 24 by 6 which equals 4.

~ Since you divided 24 by 6, you also have to divide 12 by 6.

~ 12 divided by 6 equals 2

$$\frac{12}{24} = \frac{2}{4}$$

**Adding Fractions**

~ For the numerators add straight across.

~ The denominator does not change.

Ex.

$$\frac{2}{6} + \frac{3}{6} = \frac{5}{6}$$

Ex.

$$\frac{3}{4} + \frac{2}{4} = \frac{5}{4}$$

**Hint: Make sure you have a common denominator before you add.**
### Adding & Subtracting with UNLIKE Denominators

\[ \frac{1}{2} + \frac{2}{3} \]

1. Find the least common multiple (LCM) by listing the multiples of each denominator in the problem. Circle the least common multiple and use it as your common denominator. (Ex: the LCM of 2 and 3 is 6. Use 6 as your common denominator.)

   2: 2, 4, 6,
   3: 3, 6

2. Rename the fractions using the new common denominator.

\[ \frac{1}{2} = \frac{3}{6}, \quad \frac{2}{3} = \frac{4}{6} \]

3. Perform the operation & keep the new denominator.

\[ \frac{3}{6} + \frac{4}{6} = \frac{7}{6} \]

4. Write the answer in simplest form.

\[ \frac{7}{6} = \frac{1}{6} \]

### Dividing Fractions

**~ Invert the fraction**

**~ multiply the fractions**

\[ \frac{1}{2} \div \frac{3}{4} = \frac{1}{2} \times \frac{4}{3} = \frac{4}{6} \]

### Multiplying Fractions

**~ Multiply the numerator by the numerator.**

**~ Multiply the denominator by the denominator.**

Ex. \[ \frac{3}{4} \times \frac{2}{6} = \frac{6}{24} \]

### Sled Method

**~ The method will help you find the simplest form of a fraction AND the GCF and LCM for the numerator and denominator.**

\[ \frac{12}{18} = \frac{2}{3} \]

**~ Draw a sled and write the fraction in it.**

**~ Divide by the lowest prime number.**

**~ Continue dividing by the lowest prime number until the numbers under the sled cannot be divided by any number other than 1.**

**~ The two numbers under the last sled shows the fraction in simplest form.**

**~ To find the GCF multiply the numbers to the left of the sled. (ex. 2 x 3 = 6) GCF = 6**

**~ To find the LCM multiply the numbers to the left of the sled and below the sled (ex. 2 x 3 x 2 x 3 = 36) LCM = 36**

**~ Draw a picture to represent the first fraction and draw a picture beneath that to represent the second fraction.**

**~ Draw a line where the second fraction ends and that fraction has a new denominator.**

**~ See how many squares on the bottom picture match the top picture and that is the new fraction.**
## Operations With Decimals

**Adding Decimals:**
1. Line up the decimal points and add as usual.
2. Drag the decimal straight down.

**Subtracting Decimals:**
1. Line up the decimal points and subtract as usual.
2. Drag the decimal point straight down.

**Multiplying Decimals:**
1. Multiply as usual.
2. Count the digits behind the decimals.
3. Place your decimal point in the product (answer).

   Make sure the product and the original problem have the same number of digits behind the decimal.

**Dividing Decimals:**
1. Move the decimal in the divisor so it is a whole number. Move the decimal in the dividend the same number of spaces.
2. Divide as usual.
3. In your answer, place the decimal directly above the decimal in the dividend.

## Measurement Conversions

<table>
<thead>
<tr>
<th>Unit</th>
<th>Conversion</th>
</tr>
</thead>
<tbody>
<tr>
<td>inches</td>
<td>1 foot</td>
</tr>
<tr>
<td>feet</td>
<td>1 yard</td>
</tr>
<tr>
<td>yard</td>
<td>1 mile</td>
</tr>
<tr>
<td>yard</td>
<td>1,760 feet</td>
</tr>
<tr>
<td>mile</td>
<td>5,280 feet</td>
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<td>1 gallon</td>
</tr>
<tr>
<td>pint</td>
<td>1 quart</td>
</tr>
<tr>
<td>cup</td>
<td>1 pint</td>
</tr>
<tr>
<td>ounce</td>
<td>1 cup</td>
</tr>
<tr>
<td>ounce</td>
<td>8 ounces</td>
</tr>
<tr>
<td>ounce</td>
<td>8 oz.</td>
</tr>
<tr>
<td>pound</td>
<td>16 oz.</td>
</tr>
<tr>
<td>pound</td>
<td>1 lb.</td>
</tr>
</tbody>
</table>

## Fraction, Decimal and Percent

\[ \frac{3}{4} = 0.75 = 75\% \]

~ To find the decimal divide the numerator by the denominator.

\[ \frac{3}{4} \rightarrow 4 \overline{) 3.00} \]

~ The percentage is the first two numbers behind the decimal point. (decimal 0.75 = 75%)

~ To determine a fraction from a decimal put the decimal in fraction form and simplify.

Ex.: \[ 0.75 = \frac{75}{100} = \frac{3}{4} \]

## Rounding Rap

Yo, find that place value
Circle that digit
Move to the right, underline get it.
0-4 circle stays the same
      5-9 add one is the game
Now flex your muscles like a hero
Digits to the right change to zero
All the other digits stay the same
Yo! You're the winner of the rounding game!
### Place Value

<table>
<thead>
<tr>
<th>Hundred Millions</th>
<th>Ten Millions</th>
<th>Millions</th>
<th>Hundred Thousands</th>
<th>Ten Thousands</th>
<th>Thousands</th>
<th>Hundreds</th>
<th>Tens</th>
<th>Ones</th>
</tr>
</thead>
</table>

### Whole Numbers

<table>
<thead>
<tr>
<th>Hundred Thousands</th>
<th>Ten Thousands</th>
<th>Thousands</th>
<th>Hundreds</th>
<th>Tens</th>
<th>Ones</th>
<th>Tenths</th>
<th>Hundredths</th>
<th>Thousandths</th>
</tr>
</thead>
</table>

### Divisibility Rules 2-5

- **Divide** 1 by 6 which equals 6 and **subtract** from 7 which equals 1.
- **Multiply** 1 by 6 which equals 6 and **subtract** from 7 which equals 1.
- **Bring down** the 4 and the process begins again until every number has been divided.
- The final answer is 1,237 remainder 1.

**Hint:** If you have to bring a number down then you start back over with divide.

**Divisibility Rules 6-10**

- If the number is divisible by two and three then the number is divisible by 6.
- If the last digit is a five or a zero then the number is divisible by 5.
- If the last two digits are divisible by four then the original number is divisible by 4.
- If the sum of the digits is divisible by nine then the original number is divisible by 9.

### Example: 4,368

(Since 8 is divisible by two then 4,368 is divisible by 2.)

### Example: 495

4+9+5 = 18

(Since 18 is divisible by 3 then 495 is divisible by 3.)

### Example: 4,328

(Since 28 is divisible by four then 4,328 is divisible by 4.)

### Example: 3,695

(Since the last digit is a 5 then 3,695 is divisible by 5.)

### Example: 534

Is it divisible by 2? – yes because 4 is divisible by 2
Is it divisible by 3? – yes because 5+3+4=12 and 12 is divisible by 3
... so 534 is divisible by 6

### Example: 7,328

(Since 328 is divisible by eight then 7,328 is divisible by 8.)

### Example: 495

4+9+5 = 18

(Since 18 is divisible by 9 then 495 is divisible by 9.)

### Example: 4,560

(Since the last digit is a 0 then 4,560 is divisible by 10.)
**5th Grade Math Notes**

### Geometry Formulas

- **P = perimeter** (The distance around a figure.)
- **A = area** (The measure, in square units, of the inside of a plane figure.)
- **V = volume** (The number of cubic units a space of a solid figure takes up.)

**triangle:**

- \[
  P = s + s + s = 6\text{"} + 6\text{"} + 6\text{"} = 18\text{"
  \]
- \[
  A = \frac{1}{2}bh = \frac{1}{2} \times 6\text{"} \times 5\text{"
  \]
- \[
  A = \frac{1}{2} \times 5\text{"} \times 6\text{"} = 15\text{in.}^2
  \]

**quadrilateral:**

- \[
  P = s + s + s + s = 5\text{"} + 6\text{"} + 7\text{"} + 6\text{"
  \]
- \[
  A = bh = 5\text{"} \times 6\text{"}
  \]
- \[
  P = 7\text{"} + 7\text{"} = 5\text{"} + 5\text{"} = 24\text{"
  \]
- \[
  A = 6 \times 7 = 42\text{in.}^2
  \]

**circle:**

- \[
  C = 2\pi r = 2 \times 3.14 \times 3\text{"
  \]
- \[
  A = \pi r^2 = \pi \times (3\text{"
  \]
- \[
  C = 2\pi r = 2 \times 3.14 \times 3\text{"
  \]
- \[
  A = \pi r^2 = \pi \times (3\text{"
  \]
- \[
  C = 6\pi = 6 	imes 3.14 = 18.84\text{"
  \]
- \[
  A = 9\pi = 9 \times 3.14 = 28.26\text{in.}^2
  \]

### Data Analysis

**Line Graph**

- Shows changes over time

**Circle Graph**

- Shows data that is part of a whole

**Double-Bar Graph**

- Compares similar Data

**Line Plot**

- Shows frequency of data along a number

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**Mean, Median, Mode and Range**

**Data:** 23, 27, 25, 22, 29, 23, 26

**Mean (average):**

\[
\text{~ Add the numbers together}
\]

\[
\text{~ Count up how many numbers you added together and divide the sum by that number.}
\]

**Ex.** 23 + 27 + 25 + 22 + 29 + 23 + 26 = 175

\[
175 \div 7 = 25
\]

Mean = 25

**Median:**

\[
\text{~ Put the numbers in numerical order and the number in the middle is the median.}
\]

22, 23, 23, 25, 26, 27, 29

Median = 25

**Mode:**

\[
\text{~ The number that occurs most often.}
\]

Mode = 23

**Range:**

\[
\text{~ The largest number subtract the lowest number.}
\]

**Ex.** 29 - 22 = 7

Range = 7