

**Properties of Addition****Commutative Property of Addition**

If the order of addends changes, the sum stays the same.

$$12 + 7 = 7 + 12$$

**Associative Property of Addition**

If the grouping of addends changes, the sum stays the same.

$$5 + (8 + 14) = (5 + 8) + 14$$

**Identity Property of Addition**

The sum of any number and 0 is that number.

$$13 + 0 = 13$$

**Properties of Multiplication****Commutative Property of Multiplication**

If the order of factors changes, the product stays the same.

$$4 \times 9 = 9 \times 4$$

**Associative Property of Multiplication**

If the grouping of factors changes, the product stays the same.

$$11 \times (3 \times 6) = (11 \times 3) \times 6$$

**Identity Property of Multiplication**

The product of any number and 1 is that number.

$$4 \times 1 = 4$$

**Algebra • Properties**

Properties of operations are characteristics of the operations that are always true.

| Property                                                  | Examples                                                                                                 |
|-----------------------------------------------------------|----------------------------------------------------------------------------------------------------------|
| <b>Commutative Property of Addition or Multiplication</b> | Addition: $3 + 4 = 4 + 3$<br>Multiplication: $8 \times 2 = 2 \times 8$                                   |
| <b>Associative Property of Addition or Multiplication</b> | Addition: $(1 + 2) + 3 = 1 + (2 + 3)$<br>Multiplication: $6 \times (7 \times 2) = (6 \times 7) \times 2$ |
| <b>Distributive Property</b>                              | $8 \times (2 + 3) = (8 \times 2) + (8 \times 3)$                                                         |
| <b>Identity Property of Addition</b>                      | $9 + 0 = 9$ $0 + 3 = 3$                                                                                  |
| <b>Identity Property of Multiplication</b>                | $54 \times 1 = 54$ $1 \times 16 = 16$                                                                    |

### Distributive Property

Multiplying a sum by a number is the same as multiplying each addend by the number and then adding the products.

$$5 \times (7 + 9) = (5 \times 7) + (5 \times 9)$$

The Distributive Property can also be used with multiplication and subtraction. For example,  $2 \times (10 - 8) = (2 \times 10) - (2 \times 8)$ .

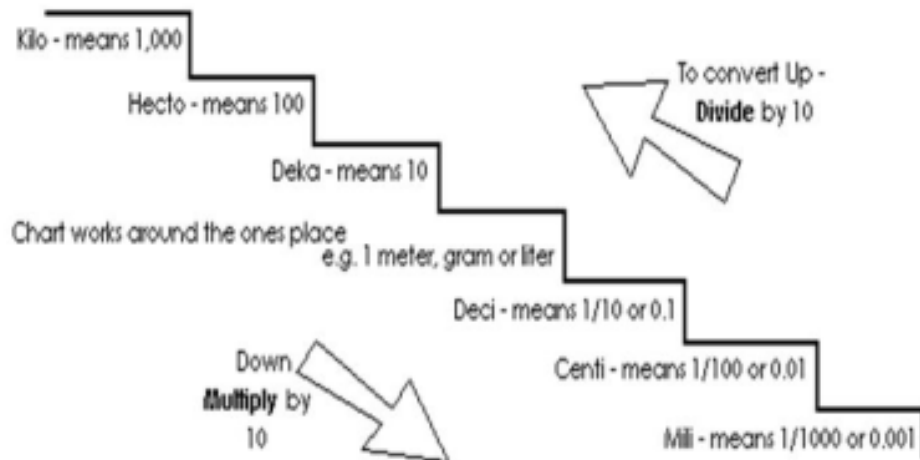
Metric Conversions:

King Henry's Dad (Mark, Larry or Gary) Drinks Chocolate Milk

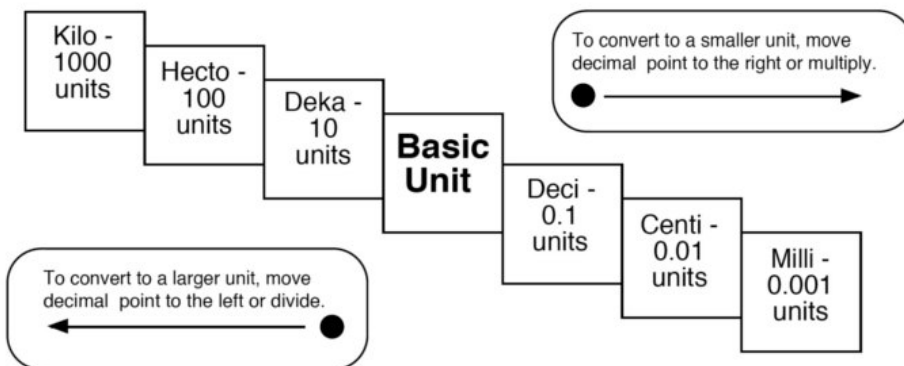
|           |          |      |        |        |            |             |
|-----------|----------|------|--------|--------|------------|-------------|
| 1,000     | 100      | 10   | 1      | 0.1    | 0.01       | 0.001       |
| thousands | hundreds | tens | ones   | tenths | hundredths | thousandths |
| kilo      | hecto    | deka | meters | deci   | centi      | milli       |

**M**  
**L**  
**G**

**K**   **H**   **Da**   **\***   **D**   **C**   **M**  
•   •   •   •   •   •   •



## Metric Conversion Chart



Metric ton- a unit of weight equal to 1,000 kilograms

[illegible]

**PLACE VALUE CHART**

|          |                   |               |           |          |      |      |               |        |            |             |                 |                     |            |
|----------|-------------------|---------------|-----------|----------|------|------|---------------|--------|------------|-------------|-----------------|---------------------|------------|
| Millions | Hundred Thousands | Ten Thousands | Thousands | Hundreds | Tens | Ones | Decimal Point | Tenths | Hundredths | Thousandths | Ten-Thousandths | Hundred-Thousandths | Millionths |
|----------|-------------------|---------------|-----------|----------|------|------|---------------|--------|------------|-------------|-----------------|---------------------|------------|

**MULTIPLICATION TABLE 1 – 20**

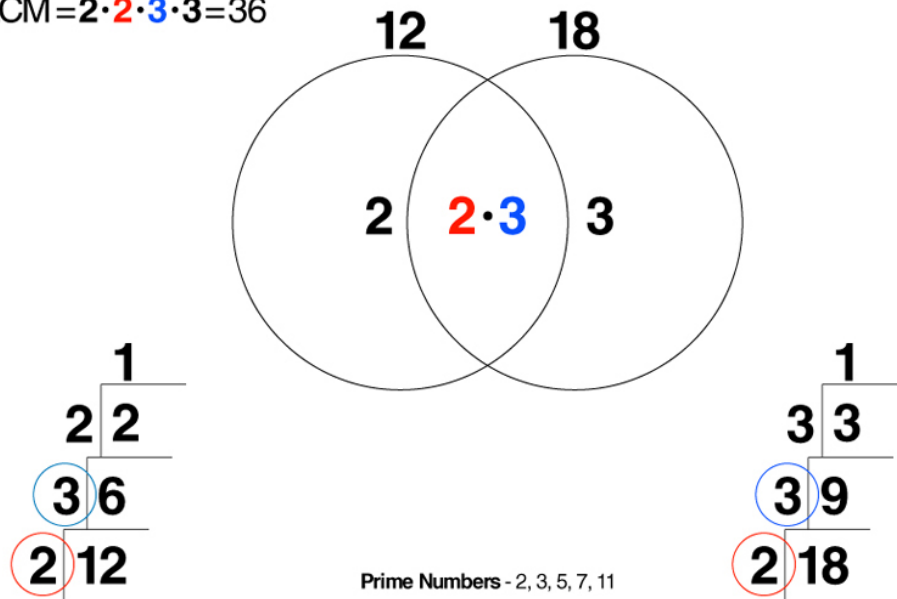
|    | 1  | 2  | 3  | 4  | 5   | 6   | 7   | 8   | 9   | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  |
|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1  | 1  | 2  | 3  | 4  | 5   | 6   | 7   | 8   | 9   | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  |
| 2  | 2  | 4  | 6  | 8  | 10  | 12  | 14  | 16  | 18  | 20  | 22  | 24  | 26  | 28  | 30  | 32  | 34  | 36  | 38  | 40  |
| 3  | 3  | 6  | 9  | 12 | 15  | 18  | 21  | 24  | 27  | 30  | 33  | 36  | 39  | 42  | 45  | 48  | 51  | 54  | 57  | 60  |
| 4  | 4  | 8  | 12 | 16 | 20  | 24  | 28  | 32  | 36  | 40  | 44  | 48  | 52  | 56  | 60  | 64  | 68  | 72  | 76  | 80  |
| 5  | 5  | 10 | 15 | 20 | 25  | 30  | 35  | 40  | 45  | 50  | 55  | 60  | 65  | 70  | 75  | 80  | 85  | 90  | 95  | 100 |
| 6  | 6  | 12 | 18 | 24 | 30  | 36  | 42  | 48  | 54  | 60  | 66  | 72  | 78  | 84  | 90  | 96  | 102 | 108 | 114 | 120 |
| 7  | 7  | 14 | 21 | 28 | 35  | 42  | 49  | 56  | 63  | 70  | 77  | 84  | 91  | 98  | 105 | 112 | 119 | 126 | 133 | 140 |
| 8  | 8  | 16 | 24 | 32 | 40  | 48  | 56  | 64  | 72  | 80  | 88  | 96  | 104 | 112 | 120 | 128 | 136 | 144 | 152 | 160 |
| 9  | 9  | 18 | 27 | 36 | 45  | 54  | 63  | 72  | 81  | 90  | 99  | 108 | 117 | 126 | 135 | 144 | 153 | 162 | 171 | 180 |
| 10 | 10 | 20 | 30 | 40 | 50  | 60  | 70  | 80  | 90  | 100 | 110 | 120 | 130 | 140 | 150 | 160 | 170 | 180 | 190 | 200 |
| 11 | 11 | 22 | 33 | 44 | 55  | 66  | 77  | 88  | 99  | 110 | 121 | 132 | 143 | 154 | 165 | 176 | 187 | 198 | 209 | 220 |
| 12 | 12 | 24 | 36 | 48 | 60  | 72  | 84  | 96  | 108 | 120 | 132 | 144 | 156 | 168 | 180 | 192 | 204 | 216 | 228 | 240 |
| 13 | 13 | 26 | 39 | 52 | 65  | 78  | 91  | 104 | 117 | 130 | 143 | 156 | 169 | 182 | 195 | 208 | 221 | 234 | 247 | 260 |
| 14 | 14 | 28 | 42 | 56 | 70  | 84  | 98  | 112 | 126 | 140 | 154 | 168 | 182 | 196 | 210 | 224 | 238 | 252 | 266 | 280 |
| 15 | 15 | 30 | 45 | 60 | 75  | 90  | 105 | 120 | 135 | 150 | 165 | 180 | 195 | 210 | 225 | 240 | 255 | 270 | 285 | 300 |
| 16 | 16 | 32 | 48 | 64 | 80  | 96  | 112 | 128 | 144 | 160 | 176 | 192 | 208 | 224 | 240 | 256 | 272 | 288 | 304 | 320 |
| 17 | 17 | 34 | 51 | 68 | 85  | 102 | 119 | 136 | 153 | 170 | 187 | 204 | 221 | 238 | 255 | 272 | 289 | 306 | 323 | 340 |
| 18 | 18 | 36 | 54 | 72 | 90  | 108 | 126 | 144 | 162 | 180 | 198 | 216 | 234 | 252 | 270 | 288 | 306 | 324 | 342 | 360 |
| 19 | 19 | 38 | 57 | 76 | 95  | 114 | 133 | 152 | 171 | 190 | 209 | 228 | 247 | 266 | 285 | 304 | 323 | 342 | 361 | 380 |
| 20 | 20 | 40 | 60 | 80 | 100 | 120 | 140 | 160 | 180 | 200 | 220 | 240 | 260 | 280 | 300 | 320 | 340 | 360 | 380 | 400 |

|     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|     | 2   | 3   | 5   | 7   | 11  | 13  | 17  | 19  | 23  |
| 29  | 31  | 37  | 41  | 43  | 47  | 53  | 59  | 61  | 67  |
| 71  | 73  | 79  | 83  | 89  | 97  | 101 | 103 | 107 | 109 |
| 113 | 127 | 131 | 137 | 139 | 149 | 151 | 157 | 163 | 167 |
| 173 | 179 | 181 | 191 | 193 | 197 | 199 | 211 | 223 | 227 |
| 229 | 233 | 239 | 241 | 251 | 257 | 263 | 269 | 271 | 277 |
| 281 | 283 | 293 | 307 | 311 | 313 | 317 | 331 | 337 | 347 |
| 349 | 353 | 359 | 367 | 373 | 379 | 383 | 389 | 397 | 401 |
| 409 | 419 | 421 | 431 | 433 | 439 | 443 | 449 | 457 | 461 |
| 463 | 467 | 479 | 487 | 491 | 499 | 503 | 509 | 521 | 523 |
| 541 | 547 | 557 | 563 | 569 | 571 | 577 | 587 | 593 | 599 |
| 601 | 607 | 613 | 617 | 619 | 631 | 641 | 643 | 647 | 653 |
| 659 | 661 | 673 | 677 | 683 | 691 | 701 | 709 | 719 | 727 |
| 733 | 739 | 743 | 751 | 757 | 761 | 769 | 773 | 787 | 797 |
| 809 | 811 | 821 | 823 | 827 | 829 | 839 | 853 | 857 | 859 |
| 863 | 877 | 881 | 883 | 887 | 907 | 911 | 919 | 929 | 937 |
| 941 | 947 | 953 | 967 | 971 | 977 | 983 | 991 | 997 |     |

| <b>Divisibility Rules</b>                                     |                  |                      |
|---------------------------------------------------------------|------------------|----------------------|
| <b>A number is divisible by. . .</b>                          | <b>Divisible</b> | <b>Not Divisible</b> |
| <b>2</b> if the last digit is even (0, 2, 4, 6, or 8).        | 3,978            | 4,975                |
| <b>3</b> if the sum of the digits is divisible by 3.          | 315              | 139                  |
| <b>4</b> if the last two digits form a number divisible by 4. | 8,512            | 7,518                |
| <b>5</b> if the last digit is 0 or 5.                         | 14,975           | 10,978               |
| <b>6</b> if the number is divisible by both 2 and 3           | 48               | 20                   |
| <b>9</b> if the sum of the digits is divisible by 9.          | 711              | 93                   |
| <b>10</b> if the last digit is 0.                             | 15,990           | 10,536               |

$$\text{GCF} = 2 \cdot 3 = 6$$

$$\text{LCM} = 2 \cdot 2 \cdot 3 \cdot 3 = 36$$

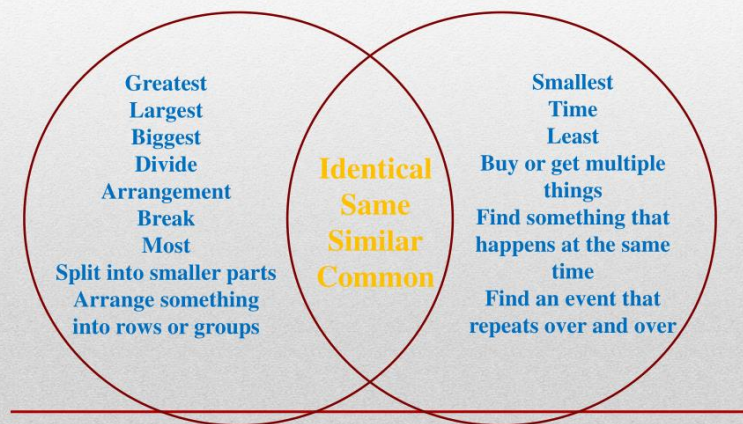


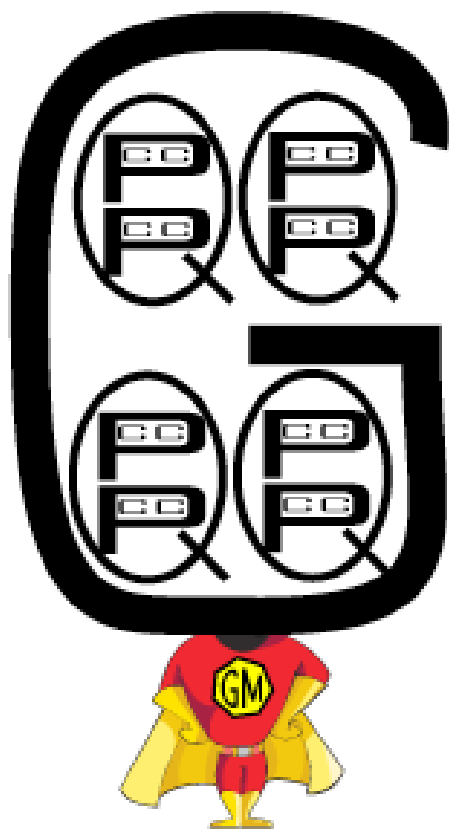
## GCF & LCM Word Problem Key Words

**Greatest**

**Common**

**Least**





| Common Customary Measurements |                      |                        |                        |
|-------------------------------|----------------------|------------------------|------------------------|
| Length                        | Weight               | Time                   | Capacity               |
| 1 foot = 12 inches            | 1 pound = 16 ounces  | 1 minute = 60 seconds  | 1 cup = 8 fluid ounces |
| 1 yard = 36 inches            | 1 ton = 2,000 pounds | 1 hour = 60 minutes    | 1 pint = 2 cups        |
| 1 yard = 3 feet               |                      | 1 day = 24 hours       | 1 quart = 2 pints      |
| 1 mile = 5,280 feet           |                      | 1 week = 7 days        | 1 quart = 4 cups       |
| 1 mile = 1,760 yards          |                      | 1 year = 12 months     | 1 gallon = 4 quarts    |
|                               |                      | 1 year = 365 days      | 1 gallon = 16 cups     |
|                               |                      | 1 leap year = 366 days |                        |

## Grade 6 Mathematics Reference Sheet

### CONVERSIONS

1 inch = 2.54 centimeters

1 meter = 39.37 inches

1 mile = 5,280 feet

1 mile = 1,760 yards

1 mile = 1.609 kilometers

1 kilometer = 0.62 mile

1 pound = 16 ounces

1 pound = 0.454 kilogram

1 kilogram = 2.2 pounds

1 ton = 2,000 pounds

1 cup = 8 fluid ounces

1 pint = 2 cups

1 quart = 2 pints

1 gallon = 4 quarts

1 gallon = 3.785 liters

1 liter = 0.264 gallon

1 liter = 1,000 cubic centimeters

---

### FORMULAS

Triangle

$$A = \frac{1}{2}bh$$

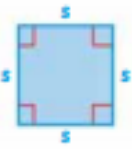
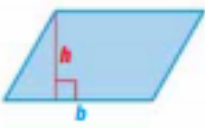
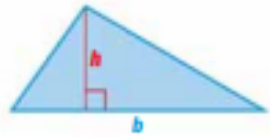
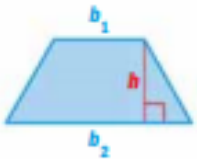
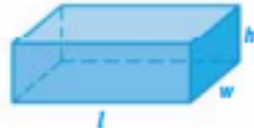
---

Right Rectangular Prism

$$V = Bh \text{ or } V = lwh$$

---

## Table of Formulas

| Geometric Formulas                                                                                                             |                                              |                                                                                                                        |                                                        |
|--------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|
| <b>Rectangle</b> (p. 32)<br>                  |                                              | <b>Square</b> (p. 32)<br>             |                                                        |
| <b>Area</b><br>$A = lw$                                                                                                        | <b>Perimeter</b><br>$P = 2l + 2w$            | <b>Area</b><br>$A = s^2$                                                                                               | <b>Perimeter</b><br>$P = 4s$                           |
| <b>Parallelogram</b> (p. 552)<br>           |                                              | <b>Area</b><br>$A = bh$                                                                                                |                                                        |
| <b>Triangle</b> (p. 558)<br>                  |                                              | <b>Trapezoid</b> (p. 559)<br>         |                                                        |
| <b>Area</b><br>$A = \frac{1}{2}bh$                                                                                             | <b>Area</b><br>$A = \frac{1}{2}(b_1 + b_2)h$ | <b>Area</b><br>$A = \pi r^2$                                                                                           | <b>Circumference</b><br>$A = \pi d$ or<br>$C = 2\pi r$ |
| <b>Rectangular Prism</b> (pp. 594, 607)<br> |                                              | <b>Cylinder</b> (pp. 602, 611)<br> |                                                        |
| <b>Surface Area</b><br>$S = 2lw + 2lh + 2wh$                                                                                   | <b>Volume</b><br>$V = lwh$                   | <b>Surface Area</b><br>$S = 2\pi r^2 + 2\pi rh$                                                                        | <b>Volume</b><br>$V = \pi r^2 h$                       |

### Other Formulas

|                                     |                                                                                                                                  |
|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| <b>Distance traveled</b> (p. 27)    | $d = rt$ where $d$ = distance, $r$ = rate, and $t$ = time                                                                        |
| <b>Temperature</b> (p. 279)         | $F = \frac{9}{5}C + 32$ and $C = \frac{5}{9}(F - 32)$ where<br>$F$ = degrees Fahrenheit and $C$ = degrees Celsius                |
| <b>Simple Interest</b> (p. 454)     | $I = Prt$ where $I$ = simple interest, $P$ = principal,<br>$r$ = annual interest rate, and $t$ = time in years                   |
| <b>Pythagorean theorem</b> (p. 546) | In a right triangle, $a^2 + b^2 = c^2$ where $a$ and $b$ are the length<br>of the legs, and $c$ is the length of the hypotenuse. |

List of Prime Numbers through 499:

2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59, 61, 67, 71, 73, 79, 83, 89, 97, 101,  
103, 107, 109, 113, 127, 131, 137, 139, 149, 151, 157, 163, 167, 173, 179, 181, 191, 193,  
197, 199, 211, 223, 227, 229, 233, 239, 241, 251, 257, 263, 269, 271, 277, 281, 283, 293,  
307, 311, 313, 317, 331, 337, 347, 349, 353, 359, 367, 373, 379, 383, 389, 397, 401, 409,  
419, 421, 431, 433, 439, 443, 449, 457, 461, 463, 467, 479, 487, 491, 499