

Arithmetic

Unit 8: Arithmetic

Addition & Subtraction

Basic Addition & Subtraction

Addition within 100

Subtraction within 100

Multi-Digit addition w/ regrouping

Multi-Digit subtraction w/ regrouping

• Adding with arrays ✓

• Addition - Subtraction within 20 ✓

• Addition within 100 ✓

• Subtraction within 100 ✓

• Strategies for Adding & Subtracting within 100 ✓

• Word problems within 100 ✓

$$\begin{array}{r} 149 \\ + 293 \\ \hline 442 \end{array}$$

$$\begin{array}{r} 373 \\ + 996 \\ \hline 1705 \end{array}$$

$$\begin{array}{r} 109 \\ + 996 \\ \hline 1095 \end{array}$$

$$\begin{array}{r} 109 \\ + 996 \\ \hline 1095 \end{array}$$

$$\begin{array}{r} 233930 \\ + 48079 \\ \hline 261959 \end{array}$$

$$\begin{array}{r} 297 \\ + 134 \\ \hline 411 \end{array}$$

$$\begin{array}{r} 621 \\ + 111 \\ \hline 732 \end{array}$$

$$\begin{array}{r} 233 \\ + 628 \\ \hline 861 \end{array}$$

$$\begin{array}{r} 959 \\ + 12 \\ \hline 971 \end{array}$$

$$\begin{array}{r} 439 \\ + 122 \\ \hline 561 \end{array}$$

$$\begin{array}{r} 380729 \\ + 62380 \\ \hline 442609 \end{array}$$

$$\begin{array}{r} 433207 \\ + 56557 \\ \hline 489764 \end{array}$$

$$\begin{array}{r} 76325 \\ + 58281 \\ \hline 134606 \end{array}$$

$$\begin{array}{r} 468224 \\ + 397166 \\ \hline 86390 \end{array}$$

• Multi-Digit Subtraction w/ Regrouping ✓

$$\begin{array}{r} 357 \\ -156 \\ \hline 201 \end{array}$$

$$\begin{array}{r} 1006 \\ -528 \\ \hline 472 \end{array}$$

$$\begin{array}{r} 981 \\ -659 \\ \hline 312 \end{array}$$

$\begin{array}{r} 280 \\ -164 \\ \hline 116 \end{array}$

(Regrouping from 0)

$\begin{array}{r} 137 \\ \text{We transfer from the hundreds to the tens, then tens to ones.} \end{array}$

$$\begin{array}{r} 301 \\ -189 \\ \hline 112 \end{array}$$

(Subtracting in your head - no regrouping)

$$\begin{array}{r} 43 \\ 613 \\ -286 \\ \hline 627 \end{array}$$

$$\begin{array}{r} 621 \\ -48 \\ \hline 633 \end{array} \quad \text{[not super intuitive as to why this works]}$$

$$\begin{array}{r} 389802 \\ -76151 \\ \hline 312451 \end{array}$$

$$495 = 621 - \underline{\quad}$$

$$\begin{array}{r} 5621 \\ -515 \\ \hline 126 \end{array}$$

$$-435 = 210$$

$$\begin{array}{r} 435 \\ +210 \\ \hline 645 \end{array}$$

$$\begin{array}{r} 567 \\ -179 \\ \hline 428 \end{array} \quad \begin{array}{r} 3485 \\ -186 \\ \hline 299 \end{array}$$

$$8968$$

$$\begin{array}{r} 8968 \\ -76 \\ \hline 8202 \end{array}$$

$$9500$$

$$\begin{array}{r} 9500 \\ -23 \\ \hline 9277 \end{array}$$

$$389802$$

$$\begin{array}{r} 389802 \\ -76151 \\ \hline 312851 \end{array}$$

$$7831216$$

$$\begin{array}{r} 7831216 \\ -771245 \\ \hline 11971 \end{array}$$

$$2673442$$

$$\begin{array}{r} 2673442 \\ -209650 \\ \hline 57792 \end{array}$$

$$1205381$$

$$\begin{array}{r} 1205381 \\ -37254 \\ \hline 168127 \end{array}$$

Enough practice.

You just memorize basic + - answers

$$\begin{array}{r} 843 \\ -672 \\ \hline 171 \end{array}$$

$$\begin{array}{r} 450 \\ -270 \\ \hline 180 \end{array}$$

$$\begin{array}{r} 340 \\ -52 \\ \hline 288 \end{array}$$

$$\begin{array}{r} 5035 \\ -50231 \\ \hline 134606 \end{array}$$

$$\begin{array}{r} 92 \\ -51 \\ \hline 41 \end{array}$$

$$\begin{array}{r} 147 \\ -562 \\ \hline 285 \end{array}$$

$$\begin{array}{r} 187 \\ -28 \\ \hline 9 \end{array}$$

$$\begin{array}{r} 341 \\ +293 \\ \hline \end{array}$$

✓ finish quiz tomorrow]

$$\begin{array}{r} 21 \\ +14 \\ +13 \\ \hline 48 \end{array}$$

$$\begin{array}{r} 218 \\ -154 \\ \hline 64 \end{array}$$

$$\begin{array}{r} 1214 \\ -150 \\ \hline 64 \end{array}$$

$$\begin{array}{r} 2488118 \\ -222427 \\ \hline 26991 \end{array}$$

$$\begin{array}{r} 21 \\ 21 \\ 37 \\ \hline 19 \end{array}$$

$$\begin{array}{r} 971 \\ -808 \\ \hline 103 \end{array}$$

$$\begin{array}{r} 125 \\ -5 \\ \hline 7 \end{array}$$

$$\begin{array}{r} 82 \\ -17 \\ \hline 15 \end{array}$$

$$\begin{array}{r} 98 \\ 24 \\ 16 \\ +16 \\ \hline 68 \end{array}$$

$$\begin{array}{r} 37 \\ 11 \\ 66 \\ +72 \\ \hline 139 \end{array}$$

$$\begin{array}{r} 68 \\ 68 \\ 70 \\ +70 \\ \hline 132 \end{array}$$

$$\begin{array}{r} 341 \\ +293 \\ \hline \end{array}$$

$$\begin{array}{r} 93 \\ 16 \\ 15 \\ +13 \\ \hline 97 \end{array}$$

$$\begin{array}{r} 389-115 \\ 980251 \\ -44103 \\ \hline 456148 \end{array}$$

$$\begin{array}{r} 96 \\ -32 \\ -31 \\ \hline 33 \end{array}$$

$$\begin{array}{r} 28 \\ +27 \\ +40 \\ \hline 95 \end{array}$$

$$\begin{array}{r} 684228 \\ +86671 \\ 770899 \\ \hline 266 \end{array}$$

$$\begin{array}{r} 48 \\ +21 \\ +12 \\ +33 \\ +22 \\ \hline 3 \end{array}$$

$$\begin{array}{r} 389-115 \\ 980251 \\ -44103 \\ \hline 456148 \end{array}$$

$$\begin{array}{r} 96 \\ -32 \\ -31 \\ \hline 33 \end{array}$$

$$\begin{array}{r} 28 \\ +27 \\ +40 \\ \hline 95 \end{array}$$

$$\begin{array}{r} 684228 \\ +86671 \\ 770899 \\ \hline 266 \end{array}$$

Multiplication & Division

- Multiplication Intro ✓

Multiplication = repeated addition. (equal)

Multiplication is 1 (or 1000), and 1000

$$(56 \times 8) = (50+6) \times 8$$

$$400 + 48 = 448$$

$$87 \times 63$$

$$87 \times (60+3)$$

$$(87 \times 60) + 87 \times 3$$

$$60 \cdot (80+7) + 3(80+7)$$

$$60 \cdot 80 + 60 \cdot 7 + 3 \cdot 80 + 3 \cdot 7$$

$$4800 + 420 + 240 + 21$$

$$= 5481$$

$$87 \times 3$$

$$261$$

$$5220$$

$$5481$$

• Multiplication: place value, area models

They modified it...

Intro to Multiplication ✓

- Multiplication as equal groups ✓
- Multiplication on the number line ✓
- Multiply using groups of objects ✓
- Multiplication with arrays ✓
- Commutative property of multiplication ✓

1-digit multiplication ✓

- Multiply by 0 or 1 ✓

- Multiply by 2 or 4 ✓

- Multiply by 5 or 10 ✓

- Multiply by 3 or 6 ✓

- Distributive Property ✓

- Multiply by 7, 8, or 9 ✓

1-digit Multiplication ✓

Associative property of multiplication

$$5 \times 18 = 5 \times (6 \times 3) = 30 \times 3 = 90$$

$$3 \times 21 = 3 \times (7 \times 3) = 9 \times 7 = 63$$

Mental math!

Comparing with multiplication ✓

Relating Multiplication & Division ✓

- Divide by 1, 2, or 4 ✓

- Divide by 5 or 10 ✓

- Divide by 3 or 6 ✓

- Divide by 7, 8, or 9 ✓

1-digit division ✓

- Multiplication & Division Word Problems ✓

Understand Fractions ✓

- Fractions Intro ✓

- What fractions mean ✓

- Fractions on the number line ✓

- Fractions & Whole Numbers ✓

- Equivalent Fractions ✓

Place Value through 1,000,000 ✓

- Intro to Place Value through 1,000 ✓

- Numbers in expanded form ✓

- Regroup whole numbers ✓

- Greater Place Values ✓

- How 10 relates to place values ✓

$$300 + 40 + 16 = 356$$

$$200$$

Add & Subtract through 1,000,000 ✓

- Visually adding within 1,000 ✓

- Strategies for adding within 1,000 ✓

- Strategies for subtracting within 1,000 ✓

- Adding within 1,000,000 ✓

- Subtracting within 1,000,000 ✓

Multiplying 1- and 2-digit #s

- Multiplication by 10, 100s, etc. ✓

- Multi-digit multiplication place value & area models ✓

$$48.92 = (4 \times 10) + (4 \times 2) = 360 + 8 = 368$$

Scalene!

$$19.26 = 6 \times (10 + 2) = 6(10 + 6 \times 2)$$

$$\begin{array}{r} 27000 \\ 2100 \\ 60 \\ + 3 \\ \hline 29163 \end{array}$$

- Multiplying with partial products ✓

$$150 \times 42 = 720$$

$$7 \times 253$$

$$1400 + 350 + 21$$

$$1771$$

* Multiply by 10s ✓

* Multiply 2-digit numbers with area models ✓

BRUANT Multiplying w/area model: 16×27

$$\begin{array}{r} 2000 & 1200 & 1600 \\ 120 & 210 & 100 \\ 350 & 450 & 560 \\ + 21 & + 35 & + 35 \\ \hline 2491 & 3395 & 2295 \end{array}$$

* Multiplying 2-digit #s w/ partial products

$$\begin{array}{r} 70 \\ \times 3 \\ \hline 210 \end{array}$$

this one sucks

$$\begin{array}{r} 200 \\ 260 \\ 260 \\ + 35 \\ \hline 2695 \end{array}$$

$$\begin{array}{r} 78 \\ \times 5 \\ \hline 390 \\ + 390 \\ \hline 3900 \end{array}$$

$$\begin{array}{r} 1600 \\ 100 \\ 100 \\ + 35 \\ \hline 1935 \end{array}$$

$$\begin{array}{r} 1600 \\ 100 \\ 100 \\ + 35 \\ \hline 1935 \end{array}$$

$$\begin{array}{r} 78 \\ \times 5 \\ \hline 390 \\ + 390 \\ \hline 3900 \end{array}$$

$$\begin{array}{r} 1600 \\ 100 \\ 100 \\ + 35 \\ \hline 1935 \end{array}$$

$$\begin{array}{r} 1600 \\ 100 \\ 100 \\ + 35 \\ \hline 1935 \end{array}$$

[unit test]

$$\begin{array}{r} 78 \\ \times 5 \\ \hline 390 \\ + 390 \\ \hline 3900 \end{array}$$

3534

One area wasn't covered on the unit test so I only have 50% on my

Divide with remainders ✓

- Remainders ✓

- Divide multiples of 10, 100, and 1000 by 1-digit numbers ✓

$$963 \div 9 = (100 + 63) \div 9 = 100 \div 9 = 10 \text{ R } 3$$

think!

- Division with place value ✓

- Division with area models ✓

- Multi-digit division w/ partial quotients ✓

$$\begin{array}{r} 119 \\ 7 \overline{) 53} \\ - 49 \\ \hline 4 \\ - 4 \\ \hline 0 \end{array}$$

(64 r0)

$$\begin{array}{r} 206 \\ 2 \overline{) 413} \\ - 40 \\ \hline 13 \\ - 12 \\ \hline 1 \end{array}$$

(206 r1)

$$\begin{array}{r} 4 \\ 3 \overline{) 117} \\ - 30 \\ \hline 17 \\ - 15 \\ \hline 2 \end{array}$$

(139 r0)

$$\begin{array}{r} 4 \\ 5 \overline{) 200} \\ - 20 \\ \hline 0 \end{array}$$

$$\begin{array}{r} 8 \\ 3 \overline{) 1416} \\ - 12 \\ \hline 21 \\ - 21 \\ \hline 0 \end{array}$$

$$\begin{array}{r}
 2\overline{)15} \\
 -400 \\
 \hline
 30 \\
 -30 \\
 \hline
 0
 \end{array}
 \quad
 \begin{array}{r}
 2\overline{)15} \\
 -300 \\
 \hline
 240 \\
 -240 \\
 \hline
 0
 \end{array}
 \quad
 \begin{array}{r}
 2\overline{)15} \\
 -300 \\
 \hline
 240 \\
 -240 \\
 \hline
 0
 \end{array}
 \quad
 \begin{array}{r}
 2\overline{)452} \\
 -400 \\
 \hline
 52 \\
 -40 \\
 \hline
 12
 \end{array}$$

$$\begin{array}{r}
 6\overline{)106} \\
 -600 \\
 \hline
 46 \\
 -36 \\
 \hline
 10 \\
 -6 \\
 \hline
 4
 \end{array}
 \quad
 151 \times 0
 \end{array}$$

$$\begin{array}{r}
 6\overline{)106} \\
 -600 \\
 \hline
 46 \\
 -36 \\
 \hline
 10 \\
 -6 \\
 \hline
 4
 \end{array}
 \quad
 151 \times 0
 \end{array}$$

$$\begin{array}{r}
 6\overline{)106} \\
 -600 \\
 \hline
 46 \\
 -36 \\
 \hline
 10 \\
 -6 \\
 \hline
 4
 \end{array}
 \quad
 151 \times 0
 \end{array}$$

Mult & Div word probs

$$\begin{array}{r}
 3\overline{)144} \\
 -120 \\
 \hline
 24 \\
 -24 \\
 \hline
 0
 \end{array}
 = 48
 \quad
 \begin{array}{r}
 16\overline{)16} \\
 -16 \\
 \hline
 0
 \end{array}
 = 16$$

$$\begin{array}{r}
 81 \text{ pizza slices} \\
 216 \\
 \times 4 \\
 \hline
 64
 \end{array}
 \quad
 \begin{array}{r}
 5\overline{)40} \\
 -40 \\
 \hline
 0
 \end{array}
 = 8
 \quad
 \begin{array}{r}
 4\overline{)164} \\
 -16 \\
 \hline
 4
 \end{array}
 = 41
 \quad
 \begin{array}{r}
 6\overline{)180} \\
 -180 \\
 \hline
 0
 \end{array}
 = 30$$

$$\begin{array}{r}
 5\overline{)3525} \\
 -35 \\
 \hline
 25 \\
 -25 \\
 \hline
 0
 \end{array}
 \quad
 \begin{array}{r}
 3\overline{)177} \\
 -150 \\
 \hline
 27
 \end{array}
 \quad
 \begin{array}{r}
 937 \\
 \times 6 \\
 \hline
 222
 \end{array}
 \quad
 \begin{array}{r}
 2231 \\
 \times 7 \\
 \hline
 1617
 \end{array}$$

$$\begin{array}{l}
 \text{Season 1: } 15-6 \\
 \text{Season 2: } 15 \\
 \text{Perry total: } 9+15=24 \\
 \text{Team: } 24 \times 4=96
 \end{array}$$

$$\begin{array}{r}
 109 \\
 +26 \\
 \hline
 45
 \end{array}
 \quad
 \begin{array}{r}
 6\overline{)45} \\
 -42 \\
 \hline
 3
 \end{array}
 \quad
 \begin{array}{r}
 235 \\
 -18 \\
 \hline
 17
 \end{array}
 \quad
 \begin{array}{r}
 4\overline{)19} \\
 -16 \\
 \hline
 3
 \end{array}$$

$$\begin{array}{l}
 [\text{unit test}] \\
 2471 \quad \text{Sum: } 15+16=31 \\
 \times 3 \\
 \hline
 1413 \quad \text{Equation: } 55-7+48=8=10
 \end{array}
 \quad
 \begin{array}{r}
 4\overline{)19} \\
 -16 \\
 \hline
 3
 \end{array}
 \quad
 \begin{array}{l}
 50 \text{ groups of } 3 \\
 1 \text{ group of } 3
 \end{array}$$

$$\begin{array}{r}
 4\overline{)3814} \\
 -36 \\
 \hline
 24 \\
 -24 \\
 \hline
 0
 \end{array}
 \quad
 \begin{array}{r}
 8\overline{)200} \\
 -160 \\
 \hline
 40
 \end{array}
 \quad
 \begin{array}{r}
 25 \mid 50 \quad 3 \\
 \hline
 50 \quad 25
 \end{array}
 \quad
 \begin{array}{r}
 4\overline{)100} \\
 -80 \\
 \hline
 20
 \end{array}
 \quad
 \begin{array}{r}
 125 \mid 3 \\
 \hline
 1
 \end{array}$$

$$\begin{array}{r}
 4\overline{)14} \\
 -12 \\
 \hline
 2
 \end{array}
 \quad
 \begin{array}{r}
 4\overline{)14} \\
 -12 \\
 \hline
 2
 \end{array}
 \quad
 \begin{array}{r}
 400 \\
 -400 \\
 \hline
 0
 \end{array}
 \quad
 \begin{array}{r}
 207 \\
 -200 \\
 \hline
 7
 \end{array}
 \quad
 \begin{array}{r}
 200 \\
 -200 \\
 \hline
 0
 \end{array}$$

$$\begin{array}{r}
 400 \\
 -400 \\
 \hline
 0
 \end{array}
 \quad
 \begin{array}{r}
 207 \\
 -200 \\
 \hline
 7
 \end{array}
 \quad
 \begin{array}{r}
 200 \\
 -200 \\
 \hline
 0
 \end{array}$$

at 6%... close enough

Add & Subtract fractions (like denominators) ✓

Equivalent fractions ✓

Common Denominators ✓

$$\frac{2}{8}, \frac{5}{6} \quad \text{LCM} = \text{LCM}(8, 6) = 24$$

G: 6, 12, 18, 24

B: 8, 16, 24

[Don't reduce here]

$$\frac{1}{3} + \frac{1}{2} = \frac{2}{6} + \frac{3}{6} = \frac{5}{6} \quad \text{Must be multiples of 3+2}$$

- Decomposing Fractions ✓

- Adding & Subtracting Fractions with Like Denominators ✓

- Adding & Subtracting Fractions - Word Problems ✓

- Mixed Numbers ✓

$$\frac{7}{4} \quad 4\frac{1}{7} \quad 1\frac{3}{4} \quad \left[\begin{array}{|c|c|} \hline \frac{1}{4} & \frac{1}{4} \\ \hline \end{array} \right] \quad \left[\begin{array}{|c|c|} \hline \frac{1}{4} & \frac{1}{4} \\ \hline \end{array} \right]$$

Note: $\frac{5}{3}$ is an improper fraction by definition.

$$\frac{1}{3} : so \frac{5}{3} = 1\frac{2}{3}$$

$$5\frac{1}{2}$$

$$(3\frac{1}{2}) (3\frac{1}{2}) (1\frac{1}{2}) (3\frac{1}{2}) (1\frac{1}{2}) (1\frac{1}{2})$$

$\frac{15}{2} + \frac{1}{2} = \frac{11}{2}$ patterns we observe.

$$\frac{5}{4}$$

$$\frac{25}{16}$$

$$5\frac{1}{4} \quad 5\frac{1}{5} \quad \frac{6\frac{1}{16}}{2\frac{1}{16}} \quad 6\frac{5}{6} \quad 2\frac{3}{7} \quad 8\frac{7}{8}$$

$$4\frac{4}{3}$$

$$4\frac{3}{4}$$

$$7\frac{1}{12} - 1\frac{1}{12} = \frac{15}{12} = 1\frac{3}{4}$$

$$7\frac{1}{12} - 1 = 6\frac{1}{12}$$

$$6\frac{1}{12} - 1 = 5\frac{1}{12}$$

$$2\frac{5}{6} = \frac{16}{6} \sim c +$$

$$= 0\frac{5}{6}$$

$$4\frac{1}{4} - 2\frac{1}{4} = 2\frac{1}{4} - \frac{1}{4} = 2\frac{3}{4}$$

$$1\frac{3}{4}$$

$$\boxed{\text{Practice}} \quad 4\frac{5}{12} + 3\frac{1}{12} = 7\frac{6}{12} = 7\frac{1}{2}$$

$$\left\{ \begin{array}{l} 5\frac{2}{3} - 1\frac{1}{5} = 4\frac{2}{3} \\ - 1\frac{1}{5} \end{array} \right. \quad \left\{ \begin{array}{l} 4\frac{1}{3} + 1\frac{1}{3} = 4\frac{1}{3} \\ + 1\frac{1}{3} \end{array} \right. \quad \left\{ \begin{array}{l} 5\frac{1}{6} \\ - 5\frac{1}{6} \end{array} \right.$$

$$\frac{11}{6} - \frac{11}{6} = 0$$

$$\left\{ \begin{array}{l} 7\frac{11}{12} - 1\frac{1}{12} = 6\frac{10}{12} = 6\frac{5}{6} \\ + 1\frac{1}{12} = 7\frac{9}{10} \end{array} \right. \quad \left\{ \begin{array}{l} 8\frac{3}{6} - 2\frac{2}{6} = 6\frac{1}{6} \\ + 4\frac{1}{6} = 8\frac{4}{6} \end{array} \right. \quad \left\{ \begin{array}{l} 5\frac{2}{3} + 3\frac{4}{6} = 8\frac{6}{6} = 9\frac{1}{3} \\ 8\frac{6}{6} \end{array} \right. \quad \left\{ \begin{array}{l} 5\frac{1}{6} \\ - 1\frac{1}{6} \end{array} \right. \quad \left\{ \begin{array}{l} 1\frac{1}{5} - 3\frac{2}{6} = 1\frac{5}{6} \\ 1\frac{5}{6} \end{array} \right.$$

$$\left\{ \begin{array}{l} 8\frac{3}{4} - 5\frac{2}{4} = 3\frac{1}{4} \\ 4\frac{5}{4} - 1\frac{1}{4} = 3\frac{4}{4} \end{array} \right. \quad \left\{ \begin{array}{l} 7\frac{2}{8} + 8\frac{10}{8} = 15\frac{2}{8} = 15\frac{1}{4} \\ 7\frac{2}{8} \end{array} \right. \quad \left\{ \begin{array}{l} 12\frac{4}{3} \\ - 12\frac{4}{3} \end{array} \right. \quad \left\{ \begin{array}{l} 13\frac{1}{3} \\ - 13\frac{1}{3} \end{array} \right.$$

$$13\frac{1}{4} - 14\frac{1}{4} = 14\frac{1}{4} - 14\frac{1}{4} = 0$$

$$\boxed{13\frac{1}{3}}$$

$$\frac{4}{3} \times \frac{2}{5} = \frac{8}{15}$$

Multiply fractions ✓

- Multiplying fractions & whole numbers ✓
- Multiplying mixed numbers & fractions ✓
- Multiplying whole numbers & mixed numbers ✓

$$1\frac{7}{10} \times 5 = \frac{17}{10} \times 5 = \frac{85}{10} \rightarrow \text{or } 1\frac{7}{10} + 1\frac{7}{10} + 1\frac{7}{10} + 1\frac{7}{10}$$

$$\frac{85}{10}$$

$$5 + \left(\frac{35}{10}\right) = 5\frac{35}{10} = 5\frac{3}{2} = \frac{17}{2}$$

- Multiplying fractions & whole no's word problems ✓

$$\frac{4}{5} \cdot 6 = \frac{24}{5} = 5\frac{4}{5} \rightarrow \text{so close to 5 between 4 \& 5}$$

$$(1\frac{3}{4}) \times 3 = \frac{7}{4} \times 3 = \frac{21}{4} = 5\frac{1}{4} \rightarrow \text{5 hours}$$

$$R: \frac{3}{2} \times 2 = \frac{6}{4} = \frac{3}{2}$$

$$1C: \frac{4}{5} \times 6 = \frac{24}{5} = \text{Equal}$$

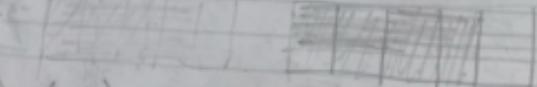
- Multiplication as scaling ✓
- ~~the fraction smaller or larger~~
- Multiplying fractions & whole nos ✓

$$\frac{15}{100}$$

$$\frac{15}{70}$$

- Multiplying fractions ✓

$$\frac{2}{3} \cdot \frac{4}{5}$$



$$(1 \cdot \frac{2}{3}) + (\frac{1}{3} \cdot \frac{2}{5}) = \frac{2}{3} + \frac{2}{15} = \frac{8}{15}$$

$$= \frac{6}{15} + \frac{2}{15} = \frac{8}{15}$$

Multiplying mixed numbers ✓

$$1\frac{2}{3} \times 1\frac{1}{5} = \frac{5}{3} \times \frac{6}{5} = \frac{30}{15} = 2\frac{2}{3}$$

$$1\frac{2}{3} \times 1\frac{1}{5} = \left(1 + \frac{2}{3}\right) \left(1 + \frac{1}{5}\right)$$

$$1 + \frac{2}{3} = \frac{5}{3}, \quad 1 + \frac{1}{5} = \frac{6}{5}$$

$$3\frac{3}{7} \times 2 = \frac{24}{7} \times 2 = \frac{48}{7}$$

$$3\frac{3}{11} \times 3\frac{1}{11} = \frac{36}{11} \times \frac{34}{11} = \frac{1224}{121} = \frac{1224}{121}$$

- Area of rectangles with fractional side lengths ✓

$$\frac{5}{9} \times \frac{2}{8} = \frac{10}{72} \text{ m}^2$$

$$27 \text{ m}^2$$

$$\frac{9}{10} \times \frac{8}{7} = \frac{72}{70} \text{ m}^2 \text{ oh that works too!}$$

$$\frac{1}{3} \cdot \frac{5}{6} = \frac{5}{18}$$

$$\frac{3}{5} \cdot \frac{7}{10} = \frac{21}{50}$$

$$\frac{5}{4} \cdot \frac{3}{4} = \frac{9}{16}$$

$$\frac{1}{2} \cdot 1\frac{3}{4} = \frac{1}{2} \cdot \frac{7}{4} = \frac{7}{8}$$

$$3 \cdot \frac{3}{5} = \frac{9}{5}$$

$$\frac{2}{7} \cdot \frac{2}{7} = \frac{4}{49}$$

Multiplying fractions word problems

like 4/5 miles what is 6, 0.5 times? multiply!

$$\frac{1}{5} \times \frac{10}{3} = \frac{10}{15} = \frac{2}{3}$$

$$\frac{3}{4} \times \frac{1}{5} = \frac{3}{4} \times \frac{1}{5} = \frac{9}{20} = \frac{9}{20} \times \frac{1}{10} = \frac{9}{200}$$

$$3\frac{1}{5} \times 2\frac{2}{5} = \frac{16}{5} \times \frac{12}{5} = \frac{192}{25} = \frac{192}{25} \times \frac{1}{10} = \frac{192}{250}$$

UNIT TEST

$$\begin{array}{r} 125 \\ \times 13 \\ \hline 785 \end{array}$$

$$\begin{array}{r} 125 \\ \times 13 \\ \hline 375 \end{array}$$

$$\frac{3}{5} \times 1\frac{4}{5} = \frac{3}{5} \times \frac{9}{5} = \frac{27}{25}$$

$$\frac{1}{4} \times 2\frac{2}{3} = \frac{1}{4} \times \frac{8}{3} = \frac{8}{12}$$

$$2\frac{2}{3} \times 2\frac{2}{3} = \frac{8}{3} \times \frac{8}{3} = \frac{64}{9}$$

- Decimals and Place values ✓

- Decimal Fractions ✓

- Decimal fractions greater than 1 ✓

$$1\frac{2}{10} \text{ or } 1.2 \quad 2\frac{7}{100} \text{ or } 2.71 \quad 4.2 \text{ or } 4\frac{2}{5}$$

- Writing Fractions as decimals ✓

$$\begin{array}{r} 100/256 \\ 200 \\ 500 \\ 1000 \\ - 500 \\ \hline 0 \end{array}$$

all my long, big numbers

the greatest in my denominator

- Decimal place value intro ✓

- Decimals on the number line ✓

- Decimals in expanded form ✓

- Regroup decimals ✓

$$\begin{array}{r} 11.65 \\ 4.5) 5) \\ \hline 46 \\ 45) 5 \\ \hline 10 \\ 10) 5 \\ \hline 5 \end{array}$$

Addition Decimals

Adding Decimals (tenths and hundredths)

$\begin{array}{r} 33.40 \\ + 263.55 \\ \hline 296.95 \end{array}$	$\begin{array}{r} 0.13 \\ + 0.10 \\ \hline 0.23 \end{array}$
-------------------------------------------------------------------	--------------------------------------------------------------

• Adding decimals (tenths and hundredths) ✓

$\begin{array}{r} 4.27 \\ + 16.37 \\ \hline 65.59 \end{array}$	$\begin{array}{r} 3.53 \\ + 4.72 \\ \hline 8.25 \end{array}$	$\begin{array}{r} 0.53 \\ + 0.42 \\ \hline .95 \end{array}$	$\begin{array}{r} 0.68 \\ + 0.33 \\ \hline 1.01 \end{array}$
$\begin{array}{r} 55.3 \\ + 4.4 \\ \hline 59.7 \end{array}$	$\begin{array}{r} 13.8 \\ + 15.7 \\ \hline 29.5 \end{array}$	$\begin{array}{r} 8.6 \\ + 13.2 \\ \hline 21.8 \end{array}$	$\begin{array}{r} 24.7 \\ + 13.9 \\ \hline 38.6 \end{array}$
$\begin{array}{r} 46.28 \\ + 27.0 \\ \hline 73.28 \end{array}$	$\begin{array}{r} 27.24 \\ + 48.85 \\ \hline 76.09 \end{array}$		

Subtracting Decimals intro ✓

$\begin{array}{r} 0.34 \\ - 0.2 \\ \hline 0.14 \end{array}$	$\begin{array}{r} 13.7 \\ - 2.6 \\ \hline 11.1 \end{array}$	$\begin{array}{r} 78.5 \\ - 61.4 \\ \hline 17.1 \end{array}$	$\begin{array}{r} 0.94 \\ - 0.14 \\ \hline 0.40 \end{array}$	$\begin{array}{r} 10.0 \\ - 0.25 \\ \hline 0.75 \end{array}$
-------------------------------------------------------------	-------------------------------------------------------------	--------------------------------------------------------------	--------------------------------------------------------------	--------------------------------------------------------------

• Subtracting Decimals (tenths and hundredths) ✓

$\begin{array}{r} 0.31 \\ - 0.10 \\ \hline 0.21 \end{array}$	$\begin{array}{r} 0.84 \\ - 0.22 \\ \hline 0.62 \end{array}$
--------------------------------------------------------------	--------------------------------------------------------------

$\begin{array}{r} 0.15 \\ - 0.75 \\ \hline 0.10 \end{array}$	$\begin{array}{r} 34.15 \\ - 21.8 \\ \hline 12.35 \end{array}$	$\begin{array}{r} 4 + 0.5 - (2 + 0.8) \\ - 1.7 \\ \hline 1.7 \end{array}$	$\begin{array}{r} 0.69 \\ - 0.34 \\ \hline 0.35 \end{array}$
--------------------------------------------------------------	----------------------------------------------------------------	---------------------------------------------------------------------------	--------------------------------------------------------------

Subtracting Decimals (tenths and hundredths) ✓

$\begin{array}{r} 65.79 \\ - 42.58 \\ \hline 23.21 \end{array}$	$\begin{array}{r} 78.38 \\ - 4.54 \\ \hline 3.84 \end{array}$	$\begin{array}{r} 340.8 \\ - 32.3 \\ \hline 8.5 \end{array}$	$\begin{array}{r} 78.4 \\ - 6.0 \\ \hline 72.4 \end{array}$	$\begin{array}{r} 133.16 \\ - 16.8 \\ \hline 116.36 \end{array}$
-----------------------------------------------------------------	---------------------------------------------------------------	--------------------------------------------------------------	-------------------------------------------------------------	------------------------------------------------------------------

$\begin{array}{r} 78.92 \\ - 69.41 \\ \hline 17.9 \end{array}$

$$\begin{array}{r}
 1.66 - 28.69 = -27.03 \\
 -1.61 - 6.47 = -8.08 \\
 \hline
 0.29 72.22 = 72.12
 \end{array}$$

$$\begin{array}{r}
 22.1 11.42 = 33.54 \\
 +3.7 +6.63 = -33.90 \\
 \hline
 25.8 18.25 = 32.58
 \end{array}$$

$$\begin{array}{r}
 71.18 - 7.00 = 64.18 \\
 \hline
 72.12 - 36.30 = 35.82 \\
 \end{array}$$

$$\begin{array}{r}
 0.266 - 0.02 = 0.246 \\
 -0.037 - 0.02 = -0.057 \\
 \hline
 0.000 - 0.000 = 0.000
 \end{array}$$

- 52.6
- 41.6
10.48
- Add & Subtract Fractions (different denominators) ✓
 - Fractions with denominators of 10 & 100 ✓
 - Visually adding & subtracting fractions ✓
- $$\frac{1}{2} + \frac{1}{7} = \frac{7}{14} + \frac{2}{14} = \frac{9}{14}$$
- $$\frac{1}{2} - \frac{1}{7} = \frac{7}{14} - \frac{2}{14} = \frac{5}{14}$$
- $$\frac{1}{4} + \frac{1}{8} = \frac{6}{24} + \frac{3}{24} = \frac{9}{24}$$

- Common Denominators ✓
- Adding & Subtracting Fractions w/ unlike Denominators

$$\frac{5}{20} + \frac{12}{20} - \frac{6}{20} = \frac{11}{20}$$

$$\frac{8}{16} - \frac{3}{16} + \frac{6}{16} = \frac{11}{16}$$

$$a = 50$$

$$guess = 5$$

$$sum = 10, sum < a$$

count is incremented

it will iterate $\times 10$

so yeah, a/b

Also note that it's doing division [a/b]
Count is the solution, a/b, and it will iterate that many times.

$$\begin{array}{r}
 2 + \frac{1}{14} = \frac{10}{12} + \frac{3}{12} = \frac{13}{12} \\
 \frac{5}{8} + \frac{5}{21} = \frac{5}{8} + \frac{10}{16} = \frac{15}{16} \\
 \frac{2}{3} + \frac{9}{12} = \frac{8}{12} + \frac{9}{12} = \frac{17}{12} \\
 \frac{5}{10} + \frac{1}{3} = \frac{15}{30} + \frac{10}{30} = \frac{25}{30}
 \end{array}$$

$$\begin{array}{r}
 \frac{7}{8} + \frac{7}{12} = \frac{6}{24} + \frac{10}{24} = \frac{16}{24} \\
 \frac{1}{6} + \frac{7}{14} = \frac{2}{12} + \frac{21}{12} = \frac{23}{12} \\
 \frac{1}{11} + \frac{5}{12} = \frac{3}{12} + \frac{20}{12} = \frac{23}{12} \\
 \frac{8}{30} - \frac{1}{30} = \frac{49}{30} - \frac{5}{30} = \frac{43}{30}
 \end{array}$$

(VI.5, stepping through)

1) start(100)

$$n = 100$$

$$min = 1$$

max = 100 (makes sense; start can't be larger than the # itself)

$$100 \div 1$$

$$guess = (1+100)/2 \approx 50.5 \approx 51$$

51 * 51 > 100, too high

try it again with

$$n = 100$$

$$min = 1$$

$$max = 50$$

it will go down by 1 until we hit 10

so, it will run approx. 40x

$$\frac{n}{2} = \sqrt{n}$$

Not quite... It's doing a binary search I guess? let's review that. It does kind of look like one.

$$\begin{aligned}
 \frac{5}{4} &= \frac{1}{2} + \frac{\frac{3}{2}}{24} - \frac{\frac{3}{2}}{24} = \frac{29}{24} & \frac{3}{4} &= \frac{6}{8} = \frac{1}{2} \\
 \frac{14}{3} &= \frac{42}{9} = \frac{42}{60} - \frac{36}{60} = \frac{6}{60} = \frac{3}{30} = \frac{3}{40} = \frac{15}{40} = \frac{3}{8} \\
 \frac{8}{5} &= \frac{1}{2} + \frac{\frac{10}{2}}{15} - \frac{\frac{10}{2}}{15} = \frac{7}{15} & \frac{6}{5} &= \frac{1}{2} + \frac{\frac{6}{2}}{6} - \frac{\frac{6}{2}}{6} = \frac{16}{6} = \frac{8}{3} \\
 \frac{5}{6} &+ \frac{3}{4} + \frac{2}{3} = \frac{10}{12} + \frac{9}{12} + \frac{8}{12} = \frac{27}{12} & \frac{1}{4} + \frac{\frac{3}{2}}{5} - \frac{\frac{3}{2}}{10} = \frac{5}{20} + \frac{12}{20} - \frac{6}{20} = \frac{11}{20}
 \end{aligned}$$

- Adding and subtracting mixed numbers with unlike denominators

$$2\frac{2}{3} + 8\frac{3}{4} = 10 + \frac{8}{12} + \frac{9}{12} = 10\frac{17}{12} = 12\frac{1}{12}$$

$$\begin{aligned} &= 10 + 1\frac{1}{12} = 11\frac{1}{12} \\ 17\frac{4}{9} - 12\frac{2}{3} &= 5 + \left(\frac{4}{9} - \frac{2}{3}\right) = 5 + \left(\frac{4}{9} - \frac{6}{9}\right) = 5 - \frac{2}{9} \\ &= \frac{45}{9} - \frac{2}{9} = \frac{43}{9} \quad 9 \cancel{\mid} \frac{43}{236} \quad \boxed{4\frac{7}{9}} \end{aligned}$$

$$2\frac{2}{7} + 4\frac{1}{2} = 6 + \left(\frac{2}{7} + \frac{1}{2}\right) = 6 + \left(\frac{4}{14} + \frac{7}{14}\right) = \left[6\frac{11}{14}\right]$$

$$2\frac{3}{4} - 1\frac{5}{16} = 1 + \left(\frac{3}{4} - \frac{5}{16}\right) = 1 + \left(\frac{12}{16} - \frac{5}{16}\right) = 1 + \left(\frac{7}{16}\right) = 1\frac{7}{16}$$

$$2\frac{3}{4} - 1\frac{5}{16} = 2\frac{3}{4} - 1\frac{5}{16} = \frac{3}{4} + \frac{5}{16} = \frac{12}{16} - \frac{5}{16} = \frac{7}{16}$$

In a mixed fraction is NOT IMP.

$$\frac{1}{2} + 4\frac{5}{6} = 4 + \left(\frac{1}{2} + \frac{5}{6}\right) = 4 + \left(\frac{4}{6} + \frac{5}{6}\right) = 4\frac{9}{6} = 4 + 1\frac{1}{2}$$

$$= \left\lceil \frac{5t_2}{2} \right\rceil = 2 + \left(\frac{\frac{5}{2}t_2 - 2}{3} \right) = 2 + \left(\frac{6t_2 - 10}{15} \right) = 2 + \left(\frac{t_2}{15} \right)$$

$$7\frac{2}{3} - 5\frac{5}{8} = 7 + \left(\frac{2}{3} - \frac{5}{8}\right) = 7 + \left(\frac{16}{24} - \frac{15}{24}\right) = 7 + \frac{1}{24} = 7\frac{1}{24}$$

$$4\frac{3}{5} + 7\frac{1}{2} = 11 + \left(\frac{3}{5} + \frac{1}{2}\right) = 11 + \left(\frac{6}{10} + \frac{5}{10}\right) = 11\frac{11}{10} = 11 + 1\frac{1}{10} = 12\frac{1}{10}$$

$$1\frac{1}{3} - 1\frac{1}{4} = \frac{4}{3} - \frac{5}{4} = \frac{16}{12} - \frac{15}{12} = \frac{1}{12}$$

$$3\frac{1}{4} - 2\frac{7}{8} = 1 + \left(4 - \frac{7}{8}\right) = 1 + \left(\frac{32}{8} - \frac{7}{8}\right) = 1 + \frac{25}{8} = \frac{33}{8}$$

$$x = 2\frac{1}{2} = \frac{1}{3}$$

$$x - \frac{1}{3} + 2\frac{1}{2} = 2 + \left(\frac{1}{3} + \frac{1}{2}\right) = 2 + \left(\frac{2}{6} + \frac{3}{6}\right) = 2\frac{5}{6}$$

$$\frac{1}{6} + \frac{2}{5} = \frac{5}{30} + \frac{12}{30} = \frac{17}{30}$$

Need \$1700

Deposit \$1100

What is minimum annual interest rate?

Has 2 years

$$\text{Simple Interest} = [\text{Principal} \times \text{Rate} \times \text{Time}] / 100$$

$$600 = [1100 \cdot R \cdot 2] / 100$$

$$600 = \frac{2200R}{100}$$

$$600 = 22R$$

$$R = 27.27$$

$$(\text{Simple Interest} = 1700 - 1100 = 600)$$

$$\frac{1}{2} + \frac{3}{8} = \frac{10}{24} + \frac{9}{24}$$

$$\frac{7}{10} = \frac{4}{100} \quad 10y = 700$$

$$3 - 1\frac{3}{4} = \frac{3}{1} - \frac{3}{4} = \frac{12}{4} - \frac{3}{4} = \frac{9}{4} = 1\frac{1}{4}$$

$$\sqrt[4]{5} \\ \approx 2.5 \\ \frac{25}{10} \\ \frac{25}{10} \\ \frac{25}{10}$$

$$\frac{3}{5} + \frac{7}{10} - \frac{1}{2} = \frac{6}{10} + \frac{7}{10} - \frac{5}{10} = \frac{13}{10} - \frac{5}{10} = \frac{8}{10} = \frac{4}{5}$$

$$6\frac{1}{4} - 3\frac{5}{8} = 3 + \left(\frac{1}{4} - \frac{5}{8}\right) = 3 + \left(\frac{2}{8} - \frac{5}{8}\right) = 3 - \frac{3}{8}$$

$$= \frac{24}{8} - \frac{5}{8} = \frac{21}{8}$$

$$\frac{29}{21} \times \frac{29}{8} = \frac{80}{21} \times \frac{29}{8} = \frac{21}{8}$$

$$\frac{1}{2} + \frac{2}{5} = \frac{5}{10} + \frac{4}{10} = \frac{9}{10}$$

$$\frac{5}{6} - x = \frac{1}{2} \quad x = \frac{5}{6} - \frac{1}{2} = \frac{5}{6} - \frac{3}{6} = \frac{2}{6} = \frac{1}{3}$$

$$\frac{5}{6} = \frac{1}{2} + x$$

$$\frac{5}{8} - \frac{3}{10} = \frac{25}{40} - \frac{12}{40} = \frac{13}{40}$$

$$\frac{147}{112}$$

$$\frac{3}{8} + 7\frac{5}{6} = \frac{3}{8} + \frac{47}{6} = \frac{9}{24} + \frac{188}{24} = \frac{197}{24}$$

WAT

- Multiplying with multiples of 10
 - Multi-digit multiplication

	MULTIPLIER	MULTIPLICAND	PRODUCT
26242	74334	21982	1871
X 25	X 59	X 13	X 27
20220			X 20
18640	36106	13346	18840
159066	171700	123520	00000
	247806	26166	2359
			16588
			16680

- Divide with multiples of 10, 100, and 1000 ✓

$\frac{1}{3} \overline{) 1476}$	$\frac{1}{3} \overline{) 1476}$	$\frac{1}{3} \overline{) 1476}$
$\underline{-3}$	$\underline{-3}$	$\underline{-3}$
$\frac{1}{3} \overline{) 11}$	$\frac{1}{3} \overline{) 11}$	$\frac{1}{3} \overline{) 11}$
$\underline{-9}$	$\underline{-9}$	$\underline{-9}$
$\frac{1}{3} \overline{) 26}$	$\frac{1}{3} \overline{) 26}$	$\frac{1}{3} \overline{) 26}$
$\underline{-21}$	$\underline{-21}$	$\underline{-21}$
$\frac{1}{3} \overline{) 56}$	$\frac{1}{3} \overline{) 56}$	$\frac{1}{3} \overline{) 56}$
$\underline{-51}$	$\underline{-51}$	$\underline{-51}$
$\frac{1}{3} \overline{) 13}$	$\frac{1}{3} \overline{) 13}$	$\frac{1}{3} \overline{) 13}$
$\underline{-12}$	$\underline{-12}$	$\underline{-12}$
$\frac{1}{3} \overline{) 1}$	$\frac{1}{3} \overline{) 1}$	$\frac{1}{3} \overline{) 1}$
$32 \overline{) 4176}$	$32 \overline{) 16}$	$32 \overline{) 16}$
$\underline{-32}$	$\underline{-96}$	$\underline{-96}$
$\frac{1}{3} \overline{) 15}$	$\frac{1}{3} \overline{) 15}$	$\frac{1}{3} \overline{) 15}$
$\underline{-12}$	$\underline{-12}$	$\underline{-12}$
$\frac{1}{3} \overline{) 3}$	$\frac{1}{3} \overline{) 3}$	$\frac{1}{3} \overline{) 3}$
$32 \overline{) 235}$	$32 \overline{) 11}$	$32 \overline{) 11}$
$\underline{-24}$	$\underline{-96}$	$\underline{-96}$
$\frac{1}{3} \overline{) 11}$	$\frac{1}{3} \overline{) 11}$	$\frac{1}{3} \overline{) 11}$
$32 \overline{) 11}$	$32 \overline{) 11}$	$32 \overline{) 11}$
$\underline{-96}$	$\underline{-96}$	$\underline{-96}$
$\frac{1}{3} \overline{) 15}$	$\frac{1}{3} \overline{) 15}$	$\frac{1}{3} \overline{) 15}$
$\underline{-12}$	$\underline{-12}$	$\underline{-12}$
$\frac{1}{3} \overline{) 3}$	$\frac{1}{3} \overline{) 3}$	$\frac{1}{3} \overline{) 3}$
$98 \div 13 =$	13	13
$13 \overline{) 98}$	$\times 4$	$\times 7$
$\underline{-84}$	10	11
$13 \overline{) 14}$	$\underline{10}$	$\underline{11}$
$\underline{-13}$	1	1
$13 \overline{) 11}$	$\underline{1}$	$\underline{1}$
$13 \overline{) 11}$	0	0

$$12 \overline{)15.5} \quad \text{with } 2.3 = 70.8$$

(Practice Quiz)
 2) $20 \overline{)7.8}$ 3) $5 \overline{)2.4}$ 4) $5 \overline{)12.0}$

* Divide decimals by whole numbers ✓

Video 1
 $0.4 \div 5 = \frac{4}{10} \div \frac{5}{1} = \frac{4}{10} \cdot \frac{1}{5} = \frac{4}{50}$
 $\frac{40}{50} = \boxed{0.08}$

Video 2
 $0.6 \div 2 = \frac{6}{10} \div \frac{2}{1} = \frac{6}{10} \cdot \frac{1}{2} = \frac{3}{10} = 0.3$

Video 3
 $1.86 \div 2 = \frac{186}{100} \div \frac{2}{1} = \frac{186}{100} \cdot \frac{1}{2} = \frac{186}{200} = \frac{93}{100} = 0.93$

[Practice Quiz]
 1) $0.96 \div 6 = \frac{96}{100} \div \frac{6}{1} = \frac{96}{100} \cdot \frac{1}{6} = \frac{16}{100} = \boxed{0.16}$

2) Suspecting 0.12 based on diagram $\Rightarrow \boxed{0.12}$

3) $0.42 \div 3 = \frac{42}{100} \div \frac{3}{1} = \frac{42}{100} \cdot \frac{1}{3} = \frac{14}{100} = \boxed{0.14}$

4) $0.9 \div 3 = \boxed{0.3}$

[Practice Quiz]

D) $1.53 \div 3 = \frac{153}{100} \div \frac{3}{1} = \frac{153}{100} \div \frac{3}{1} = \frac{153}{100} \cdot \frac{1}{3} = \frac{51}{100} = 0.51$

In adult life ~ OR it wanted 153 tenth's. I'm going inside a decimal score / A score here.

2) $2 \overline{)15.5} : 0.5$

3) $2 \overline{)15.5} : 15.5 \text{ so } 1.5 \text{ so } 2 = 0.43$

4) $3 \overline{)1.56} : \boxed{0.53}$

* Dividing whole numbers by decimals ✓

Video 1

$$3 \div 0.75 = 3 \div \frac{75}{100} = 3 \div \frac{3}{4} = \boxed{4}$$

Video 2

$$2 \div 0.4 = 2 \div \frac{4}{10} = 2 \div \frac{2}{5} = \frac{2}{1} \cdot \frac{5}{2} = \boxed{5}$$

Video 3

$$3 \div 2 = \boxed{1.5}$$

$$10 \overline{)7.0}$$

Video 4

$$8 \div 0.4 = 8 \div \frac{4}{10} = 8 \div \frac{2}{5} = \frac{8}{1} \cdot \frac{5}{2} = \frac{40}{2} = 20$$

$$48 \div 0.14 = 48 \div \frac{14}{100} = 48 \div \frac{14}{100} = \boxed{400}$$

$$48 \div \frac{14}{100} = \frac{48}{1} \cdot \frac{100}{14} = \frac{4800}{14} = \boxed{200}$$

$$1) \frac{3}{4} \cdot 0.75 = 4$$

$$3 \cdot 0.75 = 3 \cdot \frac{75}{100} = 3 \cdot \frac{3}{4} = \frac{3}{4} \cdot \frac{15}{4} = [4.5]$$

Quiz 2

$$2) 0.4 = \frac{4}{10} = \frac{2}{5} = \frac{8}{20} = \frac{8}{100} = [0.08]$$

$$3) 720 \div 0.72 = 720 \div \frac{72}{100} = 720 \cdot \frac{100}{72} = 1000$$

$$4) 575 \div 0.5 = 575 \div \frac{5}{10} = 575 \cdot \frac{10}{5} = 575 \cdot 2 = [1150]$$

$$4) 720 \div 0.08 = 720 \div \frac{8}{100} = 720 \cdot \frac{100}{8} = [9000]$$

*Unit Test (Multiplication & Divide Decimals) (After math block: outside break)

$$1) 0.3 \times 3 = \frac{3}{10} = [0.9]$$

$$2) (0.8)(0.6) = \frac{0.8}{10} \cdot \frac{0.6}{10} = [0.48]$$

$$3) 6 - 0.3 = 6 - \frac{3}{10} = 6 - \frac{10}{3} = [2]$$

$$4) 39.1 \times 0.7 = [27.37]$$

$$5) 18 \times 0.4 = \frac{18}{10} \cdot \frac{4}{10} = \frac{36}{5} \cdot \frac{1}{10} = [7.2]$$

$$6) \frac{0.3}{0.6} = [0.5]$$

$$7) \frac{0.92}{0.30} = [0.246]$$

$$8) 6 \div 0.4 = [15]$$

$$9) 6 \pi \cdot 5.0 = 2.5 \quad 10) 8 \cdot 8 \div 4$$

How many tenths is 8.8? I think 88
 $88 \div 10 = \frac{88}{10} = 22.60 = [2.2]$

$$11) 0.88 \div 2 = \frac{88}{100} \div 2 = \frac{44}{50} \div 2 = \frac{44}{50} \cdot \frac{1}{2} = \frac{22}{50} = [0.44]$$

$\frac{44}{50} = [0.44]$ (in retrospect could've done that mentally)

*Multiplying & dividing by 10, 100, and 1000

$$1) 77000 \div x = 770$$

$$\frac{77000}{x} = 770$$

$$77000 = 770 \cdot x$$

$$x = \frac{77000}{770} = [100] \text{ so the other should be 100}$$

$$2) \frac{42000}{10} = [4200]$$

$$\frac{4200}{100}$$

$$[42]$$

$$3) \frac{5720 \times 10}{572} = [5720]$$

$$5720 \div 10 = [572]$$

$$4) 250x = 25000$$

$$x = \frac{25000}{100}$$

$$= [250]$$

*Multiplying and dividing by 10, 100, and 1000 ✓

$$\underline{\text{Video 1}} \quad 3.015 \times 10 = [30.15]$$

$$67.5 \times \frac{1}{10} = [6.75]$$

$$\underline{\text{Video 2}} \quad 2.05 \times 10 = [20.5]$$

$$7.05 \div 10 = [0.705]$$

$$57 \div 1000 = [0.057]$$

$$1.032 \times 100 = [103.2]$$

$$0.015 \times 100 = [1.5]$$

Quiz 1 done

*Powers of 10 ✓

Video 1 ok Quiz 1

*Multiplying & Dividing by powers of 10 ✓

Video 1 ok

Video 2 ok

Video 3.

$$34 \div 10 = 3.4$$

$$2 \div 100 = 0.02$$

$$63 \div 100 = 0.53$$

$$7 \div 10 = 0.7$$

$$1098 \div 100 = 10.98$$

$$9967 \div 1000 = 9$$

• Add/Subtract Integers ✓
 • Video 1
 -15 + (-16) + (-29)
 -61 = 29
 [-90]
 • Intro to subtracting negative w/ [-2]

• Adding/Subtracting Integers ✓
 Video 1) $1 = 7 - x$ $-10 + x = -5$ $4 = -2 + x$
 $x - 1 = 7$ $|x = 5|$ $x = 6$
 $x = 8$ $x = 6$

Video 2) $(x + 8) = -8$ $x - (-2) = -7$ $-11 = x - 7$
 $x = -14$ $x + 2 = -7$ $\cancel{x} = \cancel{7}$
 $4 = -8 - x$ $|x = -9|$ $x = 5$
 $x + 4 = -8$
 $x = -12$

Quiz 1) $2) 2 + x = -13$ $3) x + 6 = -3$ $4) -5 = -10 + x$
 $x = -15$ $|x = -9|$ $\cancel{x} = \cancel{10}$
 $x = 5$

• Adding/Subtracting negative fractions ✓

Video 1) $3\frac{1}{8} + \frac{3}{11} + (-2\frac{1}{6})$

$$\begin{aligned} & \frac{25}{8} + \frac{3}{11} - \frac{13}{6} = \frac{25}{8} - \frac{13}{6} \\ & \frac{25}{8} + \frac{6}{8} - \frac{13}{6} = \frac{31}{8} - \frac{13}{6} = \frac{93}{24} - \frac{52}{24} = \frac{41}{24} \end{aligned}$$

$$\begin{aligned} 1) & -\frac{2}{5} - \frac{3}{10} = -\frac{9}{10} & 2) & -\frac{1}{12} - \left(-\frac{1}{3}\right) = -\frac{1}{12} \\ & -\frac{2}{5} - \frac{3}{10} - \frac{9}{10} = -\frac{9}{10} & & -\frac{1}{12} - \left(-\frac{4}{12}\right) = -\frac{1}{12} \\ 3) & \frac{2}{3} + \left(-\frac{7}{6}\right) = -\frac{2}{3} - \frac{7}{6} = \frac{10}{6} - \frac{7}{6} = -\frac{1}{2} & & -\frac{1}{12} + \frac{4}{12} = \frac{1}{12} \end{aligned}$$

$$\begin{aligned} 4) & -\frac{3}{7} - \frac{3}{14} = -\frac{12}{28} - \frac{21}{28} = \left[-\frac{33}{28}\right] \\ 5) & \frac{9}{10} - \left(-\frac{6}{10}\right) = \frac{9}{10} + \frac{6}{10} = \frac{15}{10} = \frac{24}{10} = \frac{12}{5} \\ 6) & -\frac{3}{4} - \left(-\frac{1}{6}\right) = -\frac{3}{4} + \frac{1}{6} = \frac{-9}{12} + \frac{2}{12} = -\frac{7}{12} \\ 7) & -\frac{3}{5} + \frac{1}{3} = -\frac{9}{15} + \frac{5}{15} = \left[-\frac{4}{15}\right] \end{aligned}$$

Unit Test ✓

$$5) \frac{9}{6} + \left(-\frac{3}{3}\right) = -\frac{9}{6} - \frac{3}{3} = -\frac{15}{30} - \frac{15}{30} = \left[-\frac{30}{30}\right] = \left[-\frac{21}{10}\right]$$

1) 8.5 3) B
 2) B 4) 0 6) $-4 - 7 = -11$
 7) A 8) A, C 9) If $D = -\frac{1}{2}$, then $-(D) = -\left(-\frac{1}{2}\right) = \frac{1}{2}$.
 10) -12 11) $-7 = x - (-2)$
 $-7 = x + 2$
 $x = -7 - 2 = -9$

Multiply and Divide Negative Numbers

- Multiply And Divide Integers ✓
- Video 1 / Long video. Video 2 ✓ WS 1 ✓ Quiz 1 ✓
- Video 2 ✓ Video 1 ✓ WS 2 ✓
- Multiplication + Division Word Problems w/ Negatives ✓
- Video 1: $-\frac{1}{2} \cdot 3 \cdot -12$ # total limbs lost. -300: # viewers lost each mo.
- Quiz 1
- 1) -300 over 5 years. $-300 \div 5 = -60$

2) $-1\frac{1}{2}$ / week over 11 weeks
-6 total kg lost.

$$3) -60 \cdot 3 = -180$$

4) B Solving 5-step equations with negative rational numbers ✓

$$1) t - \frac{5}{12} = -\frac{3}{10}$$
$$\frac{5}{12}t = \frac{-3}{10}$$
$$\frac{5}{12}t = -\frac{15}{120}$$
$$t = -\frac{15}{120} = -\frac{3}{24} = -\frac{1}{8}$$

$$2) -\frac{5}{6}x = -\frac{10}{3}$$
$$-\frac{5}{6}x = -\frac{10}{3}$$
$$x = 4$$

$$3) 40 = \frac{x}{(-\frac{7}{4})}$$
$$40 = \frac{x}{-\frac{7}{4}} \div -\frac{4}{7}$$

$$40 = \frac{x}{-\frac{7}{4}}$$

$$40 = -7x$$

$$x = -\frac{160}{7}$$

$$4) \frac{34}{-2} = -2x$$
$$x = -17$$

$$5) -4.75 = \frac{z}{2}$$

$$z = \frac{-4.75}{2}$$

$$z = -9.5$$

$$6) \frac{16}{-3} = -3t$$
$$t = 6$$

$$7) -\frac{7}{1} =$$

$$112 = ?$$

Understanding multiplying & dividing negative fractions ✓

Multiplying & dividing negative fractions ✓

Video 1: $-\frac{7}{3} \cdot \frac{3}{-2} = -\frac{21}{-6} = \frac{7}{2}$

$$\frac{15}{-5} \cdot \frac{3}{-15} = \frac{15}{15} = \frac{1}{1} \quad (\text{helps to reduce before mult.})$$

$$\text{Video 2: } \frac{5}{-6} \cdot \frac{3}{4} = \frac{5}{6} \cdot \frac{4}{3} = \frac{20}{18} = \frac{10}{9}$$

$$-\frac{4}{1} = -\frac{1}{2} \cdot -\frac{4}{1} = \frac{1}{2} \cdot \frac{4}{1} = 6$$

$$\text{Quiz 1: } 2) -\frac{63}{72} = -\frac{7}{8} \checkmark$$

Quiz 2:

$$1) \frac{5}{3} \div -\frac{6}{7} = \frac{5}{3} \cdot -\frac{7}{6} = -\frac{35}{18}$$

$$2) -\frac{2}{7} \div -\frac{4}{9} = -\frac{2}{7} \cdot -\frac{9}{4} = \frac{2}{7} \cdot \frac{9}{4} = \frac{9}{14}$$

$$3) -\frac{7}{8} \div -\frac{7}{5} = -\frac{7}{8} \cdot -\frac{5}{7} = \frac{5}{8}$$

$$4) -\frac{8}{3} \div \frac{1}{4} = -\frac{8}{3} \cdot \frac{4}{1} = -\frac{32}{3}$$

Unit Test

$$1) \frac{1}{7} \div \frac{2}{5} = \frac{1}{7} \cdot \frac{5}{2} = \frac{5}{14}$$

$$2) 2.4 \text{ cm over 4 years, evenly}$$

$$2.4 \div 4 = 0.6 \text{ cm}$$

$$3) -7$$

$$4) \frac{7}{14} \times \frac{2}{3} = \frac{49}{12} \quad 7) -24$$

$$5) 3x = 8.16 \quad 8) -6$$

$$t = -2.72 \quad 9) A$$

6) none

No course change needed (add 9°)