Key

Unit 2 Learning Goals Check List:

section	Learning Goal	✓
2.1	**a) I can translate sentences into equations.**	

Ex. 5 less than twice a number is 12

$2x - 5 = 12$

ex. 4 times the quantity of 2 less than m is 9

$4(m-2) = 9$

b) I can translate equations into sentences.

Ex. $3(g+8) = 4g-10$

three times the sum of g & 8 is the same as 4 times g reduced by 10.

ex. $7m - 3 = 25$

The product of 7 and m reduced by 3 is equal to 25

2.2 I can solve one step equations using multiplication, division, addition & subtraction.

Ex. $\frac{2}{3} = \frac{1}{8}y$

$\frac{8}{1}\left(\frac{2}{3} = \frac{1}{8}y\right)\frac{8}{1}$

$y = \frac{16}{3}$

ex. $\frac{2}{3} + r = -\frac{4}{9}$

$-\frac{4}{9}$

$-\frac{2}{3} \cdot \frac{3}{2} = -\frac{6}{9}$

$r = -\frac{10}{9}$

Ex. $7 + x = 12$

$-7 \quad -7$

$x = 5$

ex. $-5x = -90$

$\frac{-5}{-5} = \frac{-90}{-5}$

$x = 18$

2.3 a) I can solve multi-step equations using more than one operation.

Ex. $9 - 2x = 11$

$-9 \quad -9$

$\frac{-2x}{-2} = \frac{2}{-2}$

$x = -1$

ex. $\frac{x-4}{x} = 3$

$x\left(\frac{x-4}{x} = 3\right)x$

$x - 4 = 3x$

$-x \quad -x$

$\frac{-4}{2} = \frac{2x}{2}$

$x = -2$

ex. $\frac{2}{3}p - 25 = 115$

$+25 \quad +25$

$\frac{3}{2}\left(\frac{2}{3}p\right) = (140)\frac{3}{2}$

$p = 210$

ex. $-11 = \frac{a-5}{6}$

$6(-11) = \frac{a-5}{6}\cdot 6$

$-66 = a - 5$

$+5 \quad +5$

$-61 = a$

2.3 b) I can solve equations involving fractions and decimals.

LCD = 20

Ex. $-\frac{1}{5}-\frac{3}{4}x=\frac{2}{5}$

$20\left(\frac{-1}{5}\right)-20\left(\frac{3}{4}x\right)=20\left(\frac{2}{5}\right)$

$-4-15x=8$

$-15x=12$

$x=\frac{-12}{15}$

ex. $-5x-4.8=-6.7$

$+4.8 \quad +4.8$

$\frac{-5x}{-5}=\frac{-1.9}{-5}$

$x=0.38$

c) I can solve equations involving consecutive integers.

Ex. Find three consecutive integers whose sum is 78

x = 1st

$x+1$ = 2nd

$x+2$ = 3rd

$x+(x+1)+(x+2)=78$

$3x+3=78$

$3x=75$

$x=25$

Ex. Find the sum of three consecutive even integers, given that three times the smallest integer is equal to four times the middle integer.

x = 1st

$x+2$ = 2nd

$x+4$ = 4th

$3x=4(x+2)$

$3x=4x+8$

$-4x \quad -4x$

$-x=8$

$x=8$

$x+2=10$

$x+4=12$

2. 4 a) I can solve equations with variables on both sides, including grouping symbols.

Ex. $6(3a+1)-30=3(2a-4)$

$18a+6-30=6a-12$

$18a-24=6a-12$

$-6a \quad -6a$

$12a-24=-12$

$+24 \quad +24$

$\frac{12a}{12}=\frac{12}{12}$

$a=1$

ex. $\frac{1}{8}(3d-2)=\frac{1}{4}(d+5)$

LCD = 8

$3d-2=2(d+5)$

$3d-2=2d+10$

$-2d \quad -2d$

$d-2=10$

$+2 \quad +2$

$d=12$

b) I can find special solutions (no solutions and infinitely many solutions)

ex. $2x=2(x-3)$

$2x=2x-6$

$-2x \quad -2x$

$0=-6$

false!

no solution

ex. $-5(3-q)+4=5q-11$

$-15+5q+4=5q-11$

$5q-11=5q-11$

$-5q \quad -5q$

$-11=-11$

true!

all real numbers work!

2.5 **a) I can evaluate absolute value expressions.**

Ex. Evaluate: $|m+6|-14 \quad if\ m=-4.1$

$|-4.1+6|-14$

$=|1.9|-14$

$=1.9-14$

$=-12.1$

ex. Evaluate: $23-|3-4x| \quad if\ x=-2$

$23-|3-4(-2)|$

$=23-|3+8|$

$=23-11$

$=12$

b) I can solve absolute value equations.

Ex. $|6-2m|=9$

$6-2m=9$ or $6-2m=-9$

$-6 \quad -6 \qquad -6 \quad -6$

$-2m=3 \qquad -2m=-15$

$\frac{-2m}{-2}=\frac{3}{-2} \qquad \frac{-2m}{-2}=\frac{-15}{-2}$

$m=-3/2$ or $15/2$

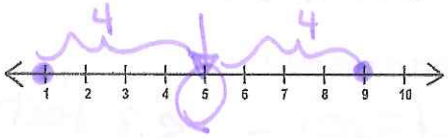
ex. $|x+5|=-7$ ...

no solution

↑ Absolute value is ALWAYS POSITIVE!!

c) I can write absolute value equations from a number line.

Ex. Write the absolute value equation with given solutions of 1 and 9.



$|x-5|=4$

d) I can write and solve absolute value equations from a word problem.

Ex. The temperature for a reptile aquarium needs to be kept at about 80 degrees Fahrenheit, plus or minus 5 degrees. Write an absolute value equation and find the max/min temperatures.

x = actual temp.

$|x-80|=5$

↑ actual ↑ desired

$x-80=5$

$x=85$

$x-80=-5$

$x=75$

2.6 **I can determine if a pair of ratios are equivalent and I can solve problems involving ratios.**

Ex. Determine if $\frac{2}{3.5}$ & $\frac{8}{14}$ form a proportion.

$\frac{2}{3.5}=\frac{8}{14}$

$2(14)=8(3.5)$

$28=28$ ✓ yes!

ex. Solve: $\frac{x+1}{x}=\frac{3}{4}$

$4(x+1)=3(x)$

$4x+4=3x$

$-4x \quad -4x$

$4=-x$

$x=-4$

ex. Solve: $\frac{x-2}{14}=\frac{2}{7}$

$7(x-2)=2(14)$

$7x-14=28$

$+14 \quad +14$

$\frac{7x}{7}=\frac{42}{7}$

$x=6$

2.7 I can solve for percent of change

ex. Mrs. Hyink's homeowner's insurance recently increased from \$1600 to \$2000 per year. What percent was the increase?

$\%\ change = \frac{amt\ change}{original\ amt}$ $\frac{400}{1600} = \frac{1}{4}$ or 25% increase

2.8 a) I can solve equations for a specific variable.

Ex. Solve for w: $2(l+w) = P$ $\frac{2}{2}$ $\frac{P}{2}$

$l + w = \frac{P}{2} - l$ $-l$

$w = \frac{P}{2} - l$

ex. Solve for a: $\frac{2(a-3)}{b} = c$ b b

$2(a-3) = bc$

$\frac{2}{2}$ $\frac{bc}{2}$

$a - 3 = \frac{bc}{2} + 3$ $+3$

$a = \frac{bc}{2} + 3$

b) I can use dimensional analysis to change units within a word problem

ex. Mrs. Hyink used to jog at a rate of 6 miles per hour. Translate her speed into feet per second. (5,280 feet in one mile)

$\frac{6\ mi}{1\ hr} \cdot \frac{1\ hr}{3600\ sec} \cdot \frac{5280\ feet}{1\ mile} = \frac{6(5280)}{3600} = \frac{8.8\ feet}{second}$

Pre-AP Extension

2.9 I can write and solve word problems using weighted averages.

Ex. Welch's advertises 10% real juice in their 2 quart bottle of grape juice. How much 100% juice should be added to 2 quarts to make a mixture that has 50% real juice?

$10\% = \frac{10}{100} = 0.1$ $50\% = 0.5$ $100\% = 1$

$0.1(2\ quarts) + 1(q) = 0.5(2+q)$

$0.2 + 1q = 0.5q + 1.0$

$-0.5q \quad -0.5q$

$0.2 + 0.5q = 1$

$\frac{0.5q}{0.5} = \frac{0.8}{0.5}$ $q = \frac{8}{5}$ or 1.6 quarts

Ex. Two planes are 1600 miles apart and headed toward one another at different altitudes. The first plane is travelling north at 620 mph. The second is travelling south at 780 mph. When will the two planes be 200 miles apart? When will the planes pass each other?

distance = 1400 miles

$d = rt$

1st plane = $620t$

2nd plane = $780t$

$780t + 620t = 1400$ miles

$\frac{1400t}{1400} = \frac{1400\ miles}{1400}$ $t = 1$ hour

Ex. Rose is setting up a 20 gallon salt water aquarium that requires 3.5% salt content. She has water with 3.7% salt content and water that has 2.5 % salt content. How many gallons of the 3.7% salt content water should she use?

$3.5\% = 0.035$ $3.7\% = 0.037$ $2.5\% = 0.025$

$0.035(20) = 0.037g + 0.025(20 - g)$

$0.7 = 0.037g + 0.5 - 0.025g$

$-0.5 \quad -0.5$

$0.2 = 0.012g$

$\frac{0.2}{0.012} = \frac{0.012g}{0.012}$ $g = 16.67$

3.7% strength gallons = 16.67