

Equations in Our Everyday Lives...

Task Overview:

- This task will allow students to extend their skills to solving equations containing integers, decimals, and fractions and identify the relationship between additive inverse in terms of change.
- Then, the one-step equations involving integers, decimals, and fractions will gradually transition to a deeper understanding of solving equations by exploring two-step equations involving two operations.
- Then, students will solve equations that contain multiple operations, including combining like terms and the distributive property.
- Finally, variables on both sides will be added to the equations skills and the concept of equality will be developed as equations are balanced.

Students were given a task of choosing 6 of the 10 real life word problems. In groups of two they were required to:

- Read and discuss the real life situation
- Identify the missing variable
- Set up the equation
- Follow the steps to solving equation using the prescribed steps
- Solve for the missing variable
- Check for meaning using the check method

ESSENTIAL QUESTIONS

1. How is the distributive property applied when rewriting and evaluating algebraic expressions?
2. How do you solve equations containing integers?
3. How do you solve equations containing decimals?
4. How do you solve equations containing fractions?
5. How do you solve equations with two operations?
6. How do you solve multi-step equations?
7. How do you solve equations with variables on both sides?
8. How are verbal expressions translated to algebraic expression?

Task #1: **Solving Two-Step Equations**

You can use inverse operations to solve equations with more than one operation.

Part A.

A dog sled driver added more gear to the sled, doubling its weight. This felt too heavy, so the driver removed 20 pounds to reach the final weight of 180 pounds. Write and solve an equation to find the sled's original weight.

Show your work!

Part B.

Analyze Relationships Describe how you could find the original weight of the sled using only arithmetic. Compare this method with the method shown in Example 2.

Task #2 Two-Step Equations with fractions and Negative Numbers

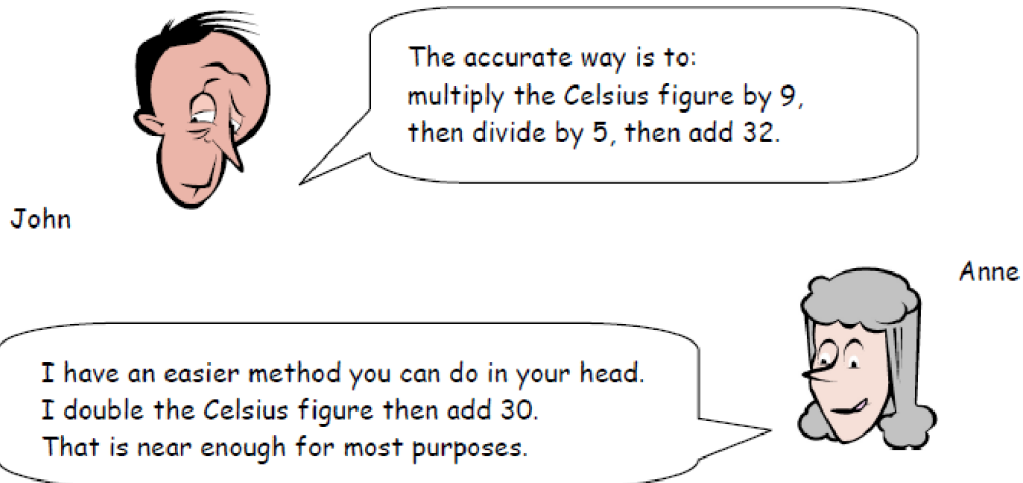
Many real-world quantities such as altitude or temperature involve negative numbers. You solve equations with negative numbers just as you did equations with positive numbers.

Task A.

To convert a temperature from degrees Fahrenheit to degrees Celsius, first subtract 32. Then multiply the result by $\frac{5}{9}$. An outdoor thermometer showed a temperature of -10°C . What was the temperature in degrees Fahrenheit?

Show Your Work!

John and Anne are discussing how they change temperatures in degrees Celsius into degrees Fahrenheit.



- If the temperature is 20°C , what is this in Fahrenheit?
- Will Anne's method is too high or too low, and by how much?
- For what temperatures does Anne's method give a temperature that is too high?

Task 3.

An airplane flies at an altitude of 38,000 feet. As it nears the airport, the plane begins to descend at a rate of 600 feet per minute. At this rate, how many minutes will the plane take to descend to 18,800 feet?

Show Your Work!

Task 4: **Error Analysis**

Mr. Grant solved an equation incorrectly, as shown below.

$$\begin{aligned} 3x + 6 &= 24 \\ \frac{3x}{3} + 6 &= \frac{24}{3} \\ x + 6 &= 8 \\ x &= 2 \end{aligned}$$

Part A

On the lines below, explain in words the mistake Mr. Grant made.

Part B

Solve the equation $3x + 6 = 24$ correctly.

Show your work.

Answer _____

Task 5: Write and solve equations from real life situations

At Muscle Gym, membership is \$35 per month, and personal training sessions are \$25 each. At Bigger Muscle Gym, membership is \$75 per month, and personal training sessions are \$15 each. In one month, how many personal training sessions would Sarah have to buy to make the total cost at the two gyms equal?

Show all steps!

Sarah would have to buy _____ personal training sessions to make the total cost at the two gyms equal.

Task 6:

Jack went to the movies on Saturday. He spent \$8.25 on the movie ticket plus an additional amount at the snack bar. If Tanner spent a total of \$21.20 on his ticket and snacks at the movies, how much did he spend at the snack bar?

Show all steps!

Task 7:

Belinda withdrew \$150 from her savings account. This brought the balance of her savings account to \$685. How much did Belinda have in savings before her withdrawal?

Show all steps!

Task 8: Ann has the 5 newest music CD's which is 3 less than twice the amount that Bob has.

Show all steps!

Task 9: Kate's 85 on her English test was 37 points less than twice the grade on her Science test.

Show all steps!

Task 10: At the Middle School Graduation Dance, the DJ played 12 slow songs, which was equal to the quotient of the number of fast songs and 2.

Show all steps!

Task 11: The 347 students who listed soccer as their favorite sport were 13 less than three times the number of students who listed basketball as their favorite sport.

Show all steps!

Task 12: Marvin made some candles that each weight 34pound. He shipped them in a box weighed 3 pounds. The total weight of the box filled with candles was 12 pounds. How many candles did Marvin ship in the box?

Show all steps!