1-9-17

Aim: SWBAT translate and use the algebraic process to solve word problems involving equations and inequalities.

Do Now:

HW: Finish packet pages 6 - 11
   Quiz Wednesday
13. Phoebe is 3 years less than half her brother's age. Phoebe is 13 years old. Her brother is $b$ years old. Write an equation that could be used to find her brother's age.

$$\frac{b}{2} - 3 = 13$$

14. Nigel went to an ice rink and paid $5 admission plus an additional $2.50 per hour to rent skates. The total cost was $15. Write an equation that represents $h$, the number of hours for which Nigel rented skates.

$$5 + 2.5h = 15$$

**TRANSLATING PHRASES INTO MATHEMATICAL INEQUALITIES**

- Some rules as translating expressions
- Inequalities will contain one or more operations and one of the four inequality symbols ($<, >, \leq, \geq$).

Write an algebraic inequality to represent each of the following.

15. Six times the difference of a number and 3 is more than 24.

Let $x = $ the number. 

$$6(x - 3) > 24$$

16. Nine more than 4 times a number is at least 30 plus 11 times the number.

Let $x = $ the number. 

$$4x + 9 \geq 30 + 11x$$

17. Three times a number divided by 4 is no more than 5 plus twice the number.

Let $n = $ the number. 

$$\frac{3n}{4} \leq 5 + 2n$$
18. On Saturday, Maya read at least 5 fewer than 3 times as many pages in her book as she did on Friday. On Saturday, she read 58 pages. Write an inequality that would determine how many books Maya read on Friday?

\[ 58 \leq 3x - 5 \]

19. A taxi driver charges a flat fee of $4 plus $6 per mile. The tip is included in the mileage rate. Orlando only has $22 to pay for his taxi ride. Write an inequality that would determine the greatest number of miles Orlando can ride in the taxi?

\[ 4 + 6x \leq 22 \]

20. Cicely has $30 to spend on art supplies. She wants to buy as many pastels as possible after buying a sketchbook that costs $6. The pastels cost at most $4 each. Write an inequality that would determine the greatest number of pastels that she can buy?

\[ 6 + 4x \leq 30 \]
**CLASSWORK:** Define a variable, write an equation, solve it, and write your answer in a sentence.

**Pg. 137 #21.** You and your friends decide to have a car wash as a fundraiser for the school chorus. You spend $15 on supplies and charge $6 per car. At the end of the day, your profit is $93. How many cars did you and your friends wash?

**ARITHMETIC**

\[ 93 + 15 = 108 \]

\[ 108 \div 6 = 18 \]

**ALGEBRAIC**

Let \( x \) = \# of cars

\[ 6x - 15 = 93 \]

\[ 15 \]

\[ 6x = 108 \]

\[ x = 18 \] cars.

**Pg. 137 #23.** You make candles and sell them for $15 each. The materials to make up to 20 candles cost $20. How many candles must you sell to have a profit of $85 after expenses?

**ARITHMETIC**

\[ 85 + 20 = 105 \]

\[ 105 \div 15 = 7 \]

**ALGEBRAIC**

Let \( x \) = \# of candles

\[ 15x - 20 = 85 \]

\[ + 20 \]

\[ + 20 \]

\[ 15x = 105 \]

\[ x = 7 \]

I must sell 7 candles.

**Pg. 137 #24:** A bicycle rental shop charges $5 per hour plus a fee of $10 each time you rent a bike. Which equation can you use to find the number of hours you can rent a bicycle for $45?

A) \[ 5h + 10 = 45 \]  
B) \[ 10h + 5 = 45 \]  
C) \[ 5h + 10 = 45 \]  
D) \[ 15h = 45 \]

**Pg. 137 #25:** You subscribe to a magazine that costs $26 yearly. You make an initial payment of $5 and then make three equal payments. How much is each payment?

**ARITHMETIC**

\[ 26 - 5 = 21 \]

\[ 21 \div 3 = 7 \]

**ALGEBRAIC**

Let \( x \) = amount of each payment

\[ 3x + 5 = 26 \]

\[ -5 \]

\[ -5 \]

\[ 3x = 21 \]

\[ \frac{3x}{3} \]

\[ x = 7 \]

Each payment is $7.
CLASSWORK: Define a variable, write an inequality, solve it, and write your answer in a sentence.

Pg. 321 # 33. You agree to raise at least $2500 for charity to enter a marathon. You raised $925 by asking people to pledge $25 each. How many more $25 pledges do you need?

\[ 925 + 25x \geq 2500 \]

\[ 25x \geq 1575 \]

\[ x \geq 63 \]

I need at least 63 more pledges.

Pg. 321 # 34. While at camp, you call your parents from a pay phone. The first minute costs you $0.25 and each additional minute costs $0.10. You have $1.65 in change. Solve the inequality

\[ 0.25 + 0.10m \leq 1.65 \]

to find the number of additional minutes \( m \) you can talk.

A) less than 14  B) no more than 14  C) at most 19  D) fewer than 19

Pg. 321 # 35. You are approaching the high score of 18,550 on a video game in which you have to catch discs for 150 points each. Your current score is 16,000. How many more discs do you need to catch to have a new high score? Interpret your solution.
HOMEWORK: Define a variable, write an equation, solve it, and write your answer in a sentence.

Pg. 138 # 30. You need 124 plastic forks for a party. At one store you buy the last 5 boxes, and each box contains 8 forks. At another store you find boxes that contain 12 forks. How many of these boxes do you need to buy?

ARITHMETIC | ALGEBRAIC

Pg. 138 # 31. The senior class at your school made a $300 profit at the school fair by having a dunk tank. The dunk tank cost $135 to rent, and the senior class charged $5 for each person to play. If one third of people who participated were adults, how many adults participated?

ARITHMETIC | ALGEBRAIC

Pg. 138 # 33. A taxi cab costs $2 plus an additional $1.50 for every mile. You ride costs $17 before the tip. How many miles did you go? Will it cost twice as much to go twice as far?

Explain.

ARITHMETIC | ALGEBRAIC
Pg. 138 # 35. You have a job in which you make $6 an hour plus tips. You made a total of $34 yesterday. How much did you make in tips?

**ARITHMETIC**

**ALGEBRAIC**

Pg. 138 # 38. Amanda takes her car to the repair shop. The mechanic starts working on the car at 10:30 A.M., takes a 45 minute lunch break, and then continues working into the afternoon. The parts to fix the car cost $350 and the labor costs $80 per hour. Amanda pays $730 in all. At what time does the mechanic finish the work?

**ARITHMETIC**

**ALGEBRAIC**
HOMEWORK: Define a variable, write an inequality, solve it, and write your answer in a sentence.

Pg. 152 # 43. You run a race in 2.5 hours. The record winning time is 1.9 hours. How many minutes can you improve by to break the record?

Pg. 152 # 44. The frequency \( f \) of the human singing voice is between 81 hertz and about 1100 hertz. Which statement is not true about \( f \)?

A) \( f \geq 81 \)  
B) \( f \leq 1100 \)  
C) 81 \( \leq f \)  
D) \( f \geq 1100 \)

Pg. 157 # 47. An elevator can hold a maximum of 2000 pounds. The average weight of a person is 150 pounds. Let \( p \) be the number of people the elevator can hold.

a. Write a multiplication inequality that models the situation.

b. Solve the inequality.

c. What does the answer tell you about the number of people who can ride in the elevator?

Pg. 158 # 52. John has test scores of 75, 84, 88, and 77 on four of his five science tests. He wants to get at least an average of 80 on his five tests. What is the lowest score that John can get on his last test to achieve his goal?

A) 76  
B) 79  
C) 80  
D) 81
Pg. 327 # 18. You have at most $200 to spend on a health club membership. The initial fee to join is $50. There is a monthly fee of $32. How many months can you be a member without spending more than $200?

Pg. 327 # 19. You are making craft items to sell for $2 each. The materials cost you $55. You want to make a profit of at least $100. Which inequality can you use to find the number of items you will need to sell?

A) $2x - 55 \leq 100$  
B) $2x - 55 \geq 100$  
C) $2x + 55 \geq 100$  
D) $2x + 55 \leq 100$

Pg. 328 # 21. A teen club has weekly dances. You can become a member of the club for $30 a year and pay only $4 to attend each dance. Otherwise, each dance costs $6. How many dances do you have to attend so that becoming a member will cost less than paying the nonmember rate?