

Understanding English through Mathematics

An ELL Approach to teaching
students

The Norm

- Traditionally, math has been a curriculum taught independently of any other core area.
- Math is looked at as being universal, a language unto itself, that is understood and taught in all countries in almost the same style.
- Most elementary school kids understand what $3 + 4 =$ represents.

The New Approach

- By using Math and the concepts that the ELL student already understands, we can enhance the English language recognition and retention.
- This will benefit not only the English teacher, but also better the student's understanding of the language and improve the TAKS scores.

Approaches

- Use of cognates
- Practice of translating Mathematical expressions and equations into English phrases.
- Practice of translating English phrases into Mathematical expressions and equations.
- Breaking down Mathematical word problems and solving them.

Cognates: Cognatos

Sum : sumar

divide : dividir

Minus : menos

equal : igual

Multiply : multiplicar

total : total

Perimeter : perimetro

area : area

Diameter : diametro

cube : cubo

Horizontal : horizontal

vertical : vertical (la)

Velocity : velocidad

distance : distancia

Circumference : circunferencia

TRANSLATIONS

+

-

x

÷

=

add

subtract

multiply

divide

equals

sum

minus

times

into

same as

total

difference

product

quotient

is

greater than

less than

by

half ($\div 2$)

results in

increase

decrease

double ($\times 2$)

share

as good as

deposit

withdrawal

square

split

comparable with

increment

diminish

half ($\times \frac{1}{2}$)

partition

equivalent to

more than

narrow

triple ($\times 3$)

segregate

grow

fewer

quadruple

take apart

SPECIAL WORDS

accumulation

smaller

dual

divided by

from

plus

shorter

binary

break up

than

larger

take away

twice

separate

into

Translating English to Math

- Find the sum of two and five.

$$2 + 5$$

- Five less than an unknown number.

$$n - 5$$

- Ten more than twice x .

$$2x + 10$$

Translating Math to English

$$x - 3$$

A number x minus three.

Three less than an unknown number.

An unknown number decreased by three.

$$4x + 7$$

Four times a number plus seven.

Seven more than four times an unknown number.

Seven added to an unknown number quadrupled.

- The sum of a number and four is twenty. Find the number. ▲
- If five times a number is decreased by twelve, the difference is eighteen. Find the number.
- The length of a rectangle is four times the width. If the length is 15 feet, what is the width?
- The length of a rectangle is two times the width. If the perimeter is 18 feet, what is the width? ■

- The sum of a number and four is twenty.

A diagram illustrating the subtraction of 4 from both sides of the equation $x + 4 = 20$. The variable x is in red, the plus sign $+$ is in orange, the number 4 is in yellow, the equals sign $=$ is in green, and the number 20 is in blue. An orange arrow points from the 4 to the x , and a red arrow points from the 4 to the 20. A yellow arrow points from the 4 to the 4, a green arrow points from the $=$ to the $=$, and a blue arrow points from the 20 to the 20.

$$x + 4 = 20$$

Subtract 4 from
both sides.

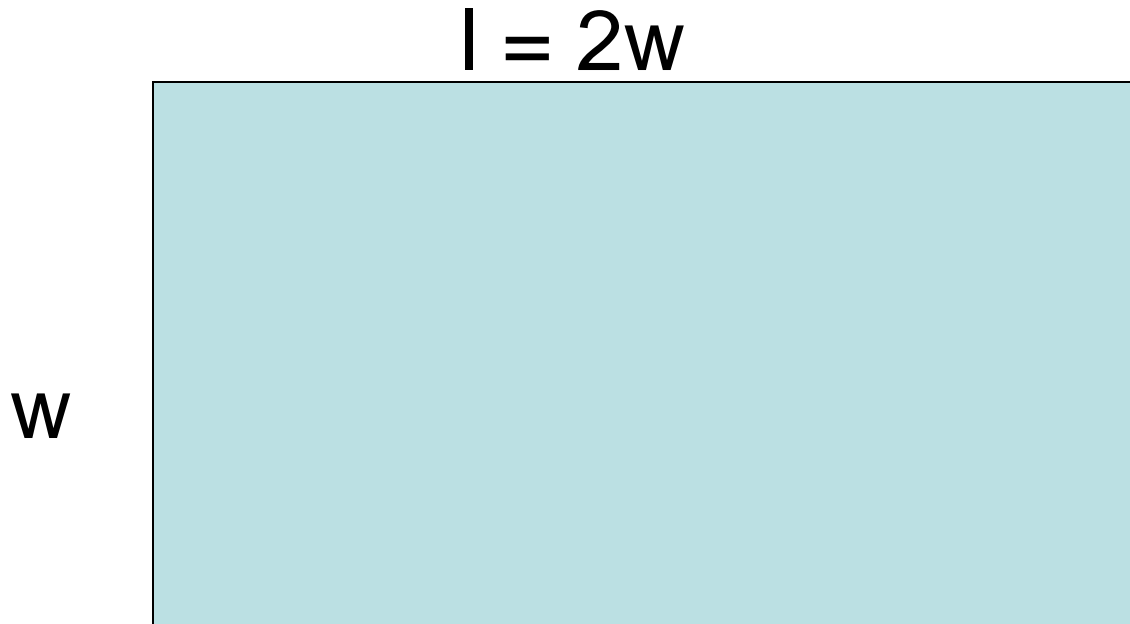
$$\begin{array}{r} -4 \qquad \qquad -4 \\ \hline \end{array}$$

The number is
sixteen.

$$x = 16$$



- The length of a rectangle is two times the width. If the perimeter is 16 feet, what is the width?



$$P = 2l + 2w$$

$$P = 18 \text{ ft}$$

- If $\frac{3}{4}$ pound of coffee costs \$3.75, what does one pound of coffee cost?
- The sum of three consecutive integers is -114. Find the integers.
- The sum of three consecutive odd integers is -75. Find the integers.
- Separate 46 into two parts so that one part is one more than twice as much as the first part. Find each part.
- The sum of the ages of Ruth and her mother is 77 years. The difference in their ages is 27 years. How old is each?

- At this point in the complexity of the problems, the concept of personalizing them so as to empower the student to create their own story problems is brought in. This way they include themselves and their friends/family giving them a personal interest in solving the actual problem.
- Example: _____ has four more CD's than twice as many as _____ has. Altogether, they have sixty four CD's. How many CD's does _____ have?

- The sum of \$127 was divided among 3 people so that the second received \$5 less than twice as much as the first, and the third received \$2 more than the second. How much did each person receive?
- Rosa, who works at a fast food restaurant, received \$9.05 in tips one afternoon, all in quarters, dimes, and nickels. There were ten less dimes than quarters and five less nickels than dimes. How many of each coin was there?

- The sum of the degree measure of two supplementary angles is 180° . If the measure of one of two supplementary angles is eight less than three times the measure of the other, find the measure of each angle.
- The sum of the degree measures of the angles of a triangle is 180° . Two of the angles of a triangle have the same measure and the third angle measures 15 more than each of the other two. Find the measure of each angle.

The End

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Resources

- Teacher-made handouts/ worksheets
- **Developing Skills in Algebra Book A:** (1984; Dale Seymour Publications)
- **Pre-Algebra By Design:** (Jacobs Publishing Company; Phoenix, Arizona)
- **Algebra By Design:** (Jacobs Publishing Company; Phoenix, Arizona)