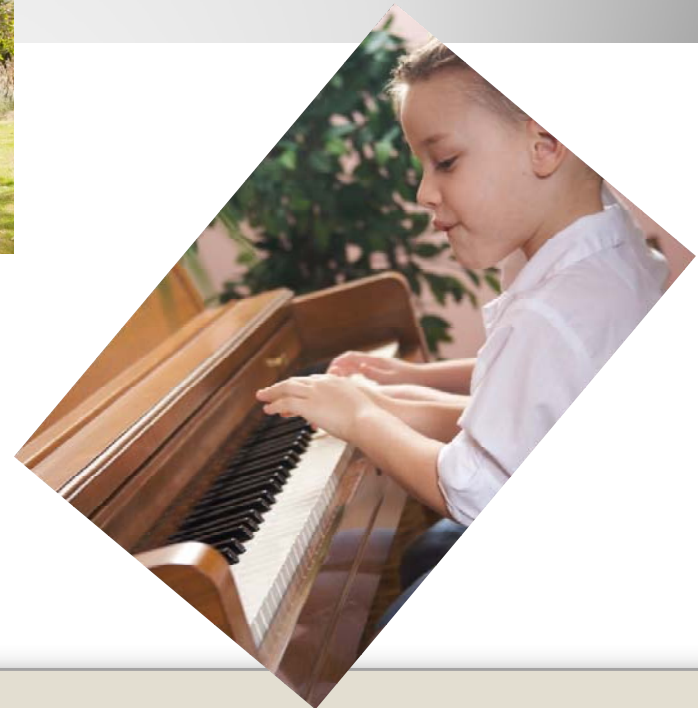


Sheltered Instruction

Strategies for Teaching Math and Science to
English Language Learners (ELLs)

PCTM, November, 2009
Pittsburgh, PA



Credit:



The Kolak Group, 2002. Texas Education Agency.

- Math
 - Mode
- Science
 - Stimuli



Verbal-Visual Word Association

Vocabulary Term

Personal Association

Definition

Non-Example

Sample....

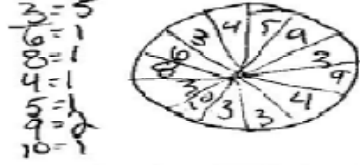
Verbal Visual Word Association

<p>Mode</p>	<p><u>mode</u> → <u>most</u></p> <p>They both start with mo</p>
<p>The number(s) or item(s) that appear most often in a set of data</p> <p>IMOW: The number that appears most.</p>	<p>If there was a list of numbers to and I wanted to know what number came out the most I would use mode.</p>

Koltek Group Inc.

ESL Strategies that Work

Verbal Visual Word Association

<p>Mode</p>	<p>How many times</p> 
<p>The number(s) or item(s) that appear most often in a set of data</p> <p>IMOW: Number or Item the is shown the most.</p>	<p>which number is shown the mode on the spinning wheel?</p> <p>(Answer 3)</p>

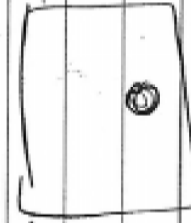
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ESL Strategies that Work

Math example

Vocabulary Term =
stimuli

Personal Association =



Definition =

an external or internal change
cause by a response.

Sentence =

My friend gives me a cool stimulus
when she goes to my house.

Science Example



- Math:
 - Percent
- Science:
 - Skeletal System

Image Streaming

Image Streaming Process....

Student A: Talk about everything that you know about percents.

Student B: Listen.

Student B: Talk about everything that you know about percents.

Student A: Listen.

Student A and B share information on what they each talked about and how the topics are related to one another.

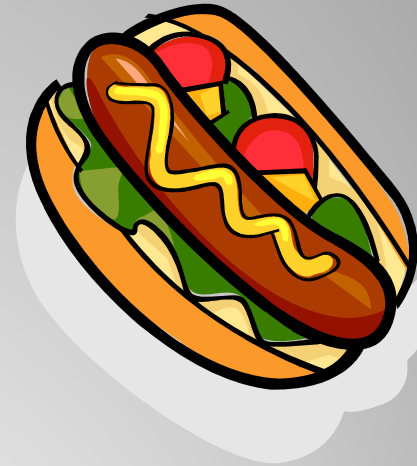
Math Example



- Word Families
- Math
 - Addition Property of Equality
- Science
 - Landforms

Interactive Word Wall

Directions:



1. Cut your construction paper into thirds.
2. Fold each paper in half (hotdog style).
3. On the outside-front write the word.
4. On the inside at the top, write the definition of the word.
5. On the inside at the bottom, write an example of the word, or use the word in a sentence.
6. Write your name on the back of each word.

Make your own....

Addition Property of Equality

$$5 = 5$$
$$5+1 = 5+1$$
$$6 = 6$$

(front)

$$a = b$$
$$a+c = b+c$$

(top of
inside
flap)

Whatever you add to
one side, add to the other.
So the sides are equal.

(bottom
of
inside
flap)

Multiplicative Inverse Property

$$\frac{2}{7} \times \frac{7}{2} = 1$$

(front)

$$\frac{a}{b} \times \frac{b}{a} = 1$$

$$a \neq 0$$

$$b \neq 0$$

(left inside
flap)

If you multiply
the first
number by its
reciprocal
the answer
is one

(right inside
flap)

Math example

MATH

Example

Circle
Square
Triangle
Rectangle

Nonexample

Sphere
Box
Pyramid
Cylinder

Science

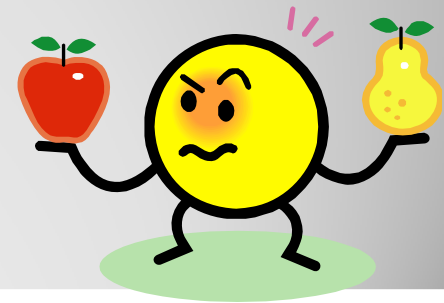
Example

Mountain
Plateau
Plains
Hills

Nonexample

Magma
Mineral
Sediment
Fossil

Concept Attainment



- Open Sorts
 - Students create their own categories to sort words learned
- Closed Sorts
 - Students categorize words based on categories already established by the teacher



Word Sorts

Word Sorts

Sort the following phrases into categories. Name your categories carefully.

-3 *3 feet under water

0 *remain at the same level

+150 *deposit of \$150

+4 *4 feet above sea level

+5 *increased 5 degrees

+40 *altitude of 40 feet

+6 *earned 6 extra points

-2 *penalized 2 points

0 *gained zero points

-8 *loss of \$8

+10 *advance 10 steps

-9 *decreased 9 inches

-40 *descent 40 feet

-100 *withdrew \$100

+800 *profit of \$800

Negatives

3ft under water

Penalized 2 points

loss of \$8

decreased 9 inches

descent 40 feet

Withdrew \$100

Positives

deposit of \$150

4 feet above sea level

increased 5 degrees

altitude of 40 feet

earned 6 extra points

advanced 10 steps

profit of \$800

Neither Positive nor Negative

remain at the same
level

gained zero
points

Math Example

Primary pollutants

Secondary pollutants

Ozone

Smog

Volcanic ash

Vehicle exhaust

Soot

Industrial air pollution

Oxides

Nitrogen oxides

Sulfur dioxide

Chemicals

Ultraviolet rays

Ozone hole

Oxygen

Categories???



Science Example

V. Digestive System

1. Stomach
2. Colon
3. Esophagus
4. Pectum
5. Large Intestine

VI. Nervous System

1. Brain
2. Spinal Cord
3. Axon
4. Dendrite
5. Motor Neuron

Word Sort

CIRCLES

RECTANGLES

BOTH CIRCLES AND RECTANGLES

Pi (π)

$A = \pi r^2$

$A = bh$ or lw

Perimeter

Circumference

Degrees inside equal 360

Radius

Base

Height

Diameter

Width

Length

Right angles

Two dimensional

Closed or Open Sort??

Science Examples

- Muscle Musculo
- Cranium Craneo
- Veins Venas
- Nerves Nervios



Math Examples

- Estimation Estimacion
- Geometric Geometrico
- Multiples Multiplos
- Units Unidades

Cognates

Good for ALL students
.....especially good for English Language
Learners!!

