Roundtable Discussion: What Strategies Positively Impact English Language Learners in a Mathematics Classroom?

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Mathematics is a language. Like English, or Latin, or Chinese, there are certain concepts for which mathematics is particularly well suited: it would be as foolish to attempt to write a love poem in the language of mathematics as to prove the Fundamental Theorem of Algebra using the English language.

~ R. L. E. Schwarzenberger
Activity: Turn and Talk

Why is language (speaking, reading, writing, listening) important in a math classroom?

How do you meet the needs of students in your class who do not speak English as their first language?
Vocabulary

Frayer Model

Frayer Model Diagram

Definitions

Characteristics

Examples

Non-Examples
## Mathematics should be fun.

~ Peter J. Hilton

### Vocabulary

#### Sort It Out

<table>
<thead>
<tr>
<th>minus</th>
<th>plus</th>
<th>add</th>
<th>subtract</th>
</tr>
</thead>
<tbody>
<tr>
<td>$4 + 6$</td>
<td>$8 + 3$</td>
<td>$10 - 7$</td>
<td>$9 - 5$</td>
</tr>
<tr>
<td>$4 + 6 = 10$</td>
<td>$8 + 3 = 11$</td>
<td>$10 - 7 = 3$</td>
<td>$9 - 5 = 4$</td>
</tr>
</tbody>
</table>

![Dice Images]

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The text reads: "Mathematics should be fun. ~ Peter J. Hilton"
Vertices, Of Course!
(Tune: London Bridge)

Vertices are where lines meet, where lines meet, where lines meet.
Vertices are where lines meet, but tell me, what’s a line?
Lines are straight and never end, never end, never end.
Lines are straight and never end, but tell me what’s a ray?
Rays go on in just one way, just one way, just one way.
Rays go on in just one way, but tell me what’s a segment?
Segments are lines that end in points, end in points, end in points.
Segments are lines that end in points, but tell me what’s a point?
Points are vertices, of course. Vertices, of course. Vertices, of course!
Points are vertices, of course, that name the things they’re on.
Vocabulary

Are You Sleeping?

What is Area?
(to the tune of Are You Sleeping?)

What is area? What is area?
Length times Width, Length times Width
Multiply two sides
Only use two sides
To get the area
That’s the area
Vocabulary

What is the purpose of using different strategies to teach vocabulary in a math classroom?

How are you teaching vocabulary in your classroom?

Name one thing you would be willing to start doing to improve vocabulary understanding in your math classroom.
Visuals / Manipulatives

Graphic Organizers

**Save**
- Using a piggy-bank
- Want to buy a bicycle
- Keeping it in a jar

**Spend**
- Buy ice cream
- Order a pizza
- Buy a new sweater

**Donate**
- Canned food drive
- Buy for an “Angel Tree” child at Christmas
- Give away old books
Mathematics should be fun.

Peter J. Hilton

Visuals / Manipulatives

Anchor Charts

Adding Fractions
Steps
1) Add whole #s
2) Find a common denominator
3) Add the fractions

Dividing Fractions
Method 1
1. Flip the second fraction
2. Change the ÷ to a x
3. Multiply straight across the numerator and denominator

Method 2
\[
\frac{a}{b} \div \frac{c}{d} = \frac{a \times d}{b \times c}
\]

Rates
A comparison of two quantities using different units of measure.
EXAMPLE: \( \frac{150 \text{ miles}}{5 \text{ hours}} \)

Unit Rates
A rate where the second quantity is one.
EXAMPLE: \( \frac{30 \text{ miles}}{1 \text{ hour}} \)
Mathematics should be fun.

- Peter J. Hilton

**Visuals / Manipulatives**

**Foldables**

- **Scalene**
  - **All sides are different lengths**

- **Isosceles**
  - **Two sides are the same length**

- **Equilateral**
  - **All sides are the same length**

- **Acute**
  - **All angles are less than 90°**

- **Right**
  - **The largest angle is exactly 90°**

- **Obtuse**
  - **The largest angle is greater than 90°**
What is the purpose of using a variety of visuals and/or manipulatives in a math classroom?

How are you using visuals and/or manipulatives in your classroom?

Name one way you would be willing to start visuals and/or manipulative to improve content understanding in your math classroom.
Verbal Communication

Every Student Gets a Chance

Repetition
Sentence Frames

__________ is greater than ________
I think _____ belongs in this group because_____
To find percentage, divide _____ by _____

Partners

Games
Chunk and Chew (10 and 2)
Turn and Talk
Verbal Communication

Small Groups

Everyone has a role:

Recorder – writes down notes on group’s discussion

Time Keeper – keeps group on task and on time

Presenter – shares resulting information with the class

Facilitator – encourages everyone to participate and share ideas

Summarizer – checks that everyone agrees with and understands the ideas the group has developed

Materials Manager – gets and returns materials needed for assignment
Verbal Communication

Small Groups

Numbered Heads Together

You Are the Teacher
Verbal Communication

What is the purpose of using different types of verbal communication in a math classroom?

How are you using verbal communication in your classroom?

Name one way you would be willing to start using verbal communication to improve content understanding in your math classroom.
Interventions

New Comers Club

Leveled Groups

How do you work with older students that are new to the country?

How do you work with students that have no English?

What do you do when their English is not progressing?
Students do not learn how to speak mathematics by memorizing definitions, but by hearing these words frequently and having many opportunities to use them in context.

~ Mathematical Thinking at Grade 3, p. 21

Thank you
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