Marzano’s Strategies via Foldables®

Helping students customize their learning in HS/MS Math

Kristin Arterbury (Region 12) and Robbin Lewis (Region 18)
Guiding Questions

• What are some guiding standards that will help me create purposeful Foldables®?

• What are some examples of math content embedded in Foldables®?

• What are some folds that I can begin using in my classroom?
• “Foldables® divide data (or concepts, ideas, skills) and make them visual or graphic with a kinesthetic integration.”

• Dinah Zike, 2008
• Foldables® are...
  – structures for organizing information.
  – life-long learning tools that students can take with them.
Foldables®

- Speed up communication
- Help organize information
- Are easy-to-understand
- Show complex relationships
- Clarify concepts with few words
- Convey ideas and understanding
A Teacher’s Testimony:

• Decreased time at the copy machine
• Discipline referrals cut in half
• Student ownership in learning
  – Journals/notes not lost in hallway
  – Students won’t give up the journal
• Phenomenal Test Gains
  – Teacher effect score increase
One way to aide in Differentiation: CUSTOMIZE

- to modify or build according to individual or personal specifications or preference
Customizing Student Learning:

• It’s about inviting students to be co-creators of their own learning and then giving them the space, tools, and support to do so.
Marzano Strategies

• One of the primary goals of the McREL Study was to identify those instructional strategies that have a high probability of enhancing student achievement for all students in all subjects at all grade levels.

• McREL - Midcontinent Research for Education and Learning
A Foldable® with Four Tabs

- ENVELOPE fold
- Take out the salmon(peach) colored Sheet to create this fold.
  - Always start with a perfect square.
  - Fold and Crease the two diagonals.
  - Fold-in each vertex to the center.
• What are some guiding standards that will help me create purposeful Foldables®?

Standards for Purposefulness

Support NCTM’s Process Standards

Promote Reasoning and Sense Making

Marzano Strategies
• What are some guiding standards that will help me create purposeful Foldables®?

Standards for Purposefulness

Support NCTM’s Process Standards

Promote Reasoning And Sense Making

Marzano Strategies
What’s our Standard for Purposefulness?

National Standards

- Reasoning and Proof
- Problem Solving
- Communication
- Connections
- Representations

Research-Based Strategies

Marzano Strategies
1. Identifying similarities and differences
2. Summarizing and Note Taking
3. Reinforcing Effort and Providing Recognition
4. Homework and Practice
5. Nonlinguistic Representations
6. Cooperative Learning
7. Setting Objectives and Providing Feedback
8. Generating and Testing Hypotheses
9. Cues, Questions, and Advance Organizers
Reasoning and Sense Making
Reasoning and Sense Making

- CSCOPE AND THE 5E

5E Lesson Model:
Engage Explore/Explain, Explore/Explain, Explore/Explain, Elaborate Evaluate
Differentiation Summary

- Model the use of Foldables® as organizational structures for math content.
- Gradually guide students to organize the content with their own choices of Foldables®.
- Make the Foldables® purposeful – Use the NCTM process standards and Marzano’s strategies to create research-based learning opportunities for ALL students.
• Summarizing and Note Taking
  – *Mini-Journals* (see blue booklet)
Notched Booklet
Foldable®

• Summarizing and Note Taking
  – *Mini-Journals* (see *blue booklet*)
Notched Booklet Foldable

- Steps to solve a problem
- Vocabulary
- Summary of Ways to Solve quadratics
- Summary of how to identify whether a linear relationship is proportional
- Summary of converting between fractions, decimals and percents
- Summary of geometric figures
Notched Booklet Foldable

• Making a notched booklet
  – STEP 1 Fold paper in half together (2 or more sheets)
  – STEP 2 Cut a small snip at each end (on the fold)
Notched Booklet Foldable

- Making a notched booklet
  - STEP 3 Separate the pages (divide the paper in 2 stacks)
Notched Booklet Foldable

• Making a notched booklet
  – STEP 4 Shave (remove as little as possible) the two ends off of one pile and the middle off of the other
Notched Booklet Foldable

• Making a notched booklet
  – STEP 4 Shave (remove as little as possible) the two ends off of one pile and the middle off of the other

This is what you should have:
Notched Booklet Foldable

• Making a notched booklet
  – STEP 5 Take the pile with the notches and slide the notched pages (folded like a taco) into the pages with the missing middle.

TACO IN THE OVEN:
Notched Booklet
Foldable

• Making a notched booklet
  – STEP 6 Straighten your paper and hook the notches in place. You have a notched booklet!
Which one doesn’t belong?

- Marzano Game from *Vocabulary Games for the Classroom*
  - *Cooperative Learning*
  - *Providing Feedback*
  - *Similarities and Differences*
  - *Providing Recognition*
  - *Practicing Vocabulary*
  - *Summarizing Content*
Which one doesn’t belong?

One of these things is not like the other...
Which one doesn’t belong?

Square  Parallelgram
Rectangle  Right Triangle
Which one doesn’t belong?

These three are alike because ____________ and ____________ is the one that doesn’t belong because. . .
Which one doesn’t belong?

These three are alike because _______________ and _______________ is the one that doesn’t belong because...
Which one doesn’t belong?

These three are alike because _______________ and _______________ is the one that doesn’t belong because...
Which one doesn’t belong?

These three are alike because ____________ and ______________ is the one that doesn’t belong because...
These three are alike because __________ and __________ is the one that doesn’t belong because...
Communication using ELPS sentence stems:

- These three are alike because

__________________________________

and _____________ is the one that doesn’t belong because. . .

__________________________________
Which one doesn’t belong?

- Work in teams or small groups.
- Each team has a flag that they raise when they have the answer.
  (or use colored cups – see next slide 😊)
- Share answers. (Verbal AND Written)
- Correct answers get points.
- Best explanation gets extra points.

*From Vocabulary Games for the Classroom by Marzano and Carleton*
Which one doesn’t belong?

WAIT – Still thinking.

Ready – Come check!
Which one doesn’t belong?

Refer to the CSCOPE first six weeks overview for grades 6-12 on your table. Create your own “Which One Doesn’t Belong” example on the template provided.
Four-door shutter fold and other Tabbed Foldables®

• Frayer Model
• Graphic Organizer
• Notes and Summary
• Similarities and Differences
• Practice
• Nonlinguistic Representations
4-Door Shutter Fold
4-Door Shutter Fold

Variable(s)
Constant
Exponent(s)
Coefficient(s)

Classifying Triangles

Acute

Obtuse

Right

Characteristics
- all angles are acute

Examples

Characteristics
- one angle is a right angle
- the triangle has a hypotenuse

Examples

Characteristics
- one angle is an obtuse angle
- the triangle is equilateral as well
- all sides are equal

Examples
Is the graph an even function or odd function?
Shutter Fold

Learning → Mastery

New → Practicing → Quiz me → Know (I can teach someone)
Great way to develop vocabulary!

Great flashcards for PRACTICE At home!
# Math Ideas for Tabbed Foldables®

## 2-Tab, 3-Tab, 4-Tab

<table>
<thead>
<tr>
<th>2-Tab</th>
<th>3-Tab</th>
<th>4-Tab</th>
</tr>
</thead>
<tbody>
<tr>
<td>Examples/Nonexamples</td>
<td>Mean, Median, Mode</td>
<td>SSS, SAS, ASA, AAS</td>
</tr>
<tr>
<td>Prime and Composite</td>
<td>Fraction, Decimals, Percents</td>
<td>Sum, difference, product, quotient</td>
</tr>
<tr>
<td>Rational and Irrational</td>
<td>Sine, Cosine, and Tangent</td>
<td>Quadrant I, Quadrant II, Quadrant III, Quadrant IV</td>
</tr>
<tr>
<td>Domain and Range</td>
<td>Translation, Rotation, Reflection</td>
<td>Complete the square, find x-intercepts, factor and solve, quadratic formula</td>
</tr>
<tr>
<td>Permutations and Combinations</td>
<td>Length, Area, Volume</td>
<td>Center, Radius, diameter, Circumference</td>
</tr>
</tbody>
</table>
VENN Diagrams

- Summarizing Content
- Identifying Similarities and Differences
- Graphic Organizers
- Nonlinguistic Representations
Classifying angle pairs:

WORD BANK
- Vertical Angles
- Corresponding Angles
- Supplementary Angles
- Complementary Angles
- Linear Pair of Angles

Take out the pastel purple VENN Diagrams. Let’s Create this One!
Classifying angle pairs:

- Supplementary Angles
- Corresponding Angles
- Complementary Angles
- Vertical Angles
- Linear Pair of Angles
Classifying angle pairs:

Adjacent

Can be Either Adjacent or Nonadjacent

Nonadjacent

Linear Pair of Angles

Adjacent

complementary angles

complementary angles

adjacent

supplementary angles

adjacent

nonadjacent

nonadjacent

\( \angle 1 \) and \( \angle 2 \) are vertical angles

\( \angle 1 \) and \( \angle 2 \) are corresponding angles
More VENN Diagrams

Comparing/Contrasting Parent Functions
More VENN Diagrams

Comparing/Contrasting
Linear relationships:
Proportional VS. Nonproportional
More VENN Diagrams

Let’s Create this One!
More VENN Diagrams

- More VENN Ideas
  - Skew lines and parallel lines
  - Congruent and Equal
  - Imaginary numbers and Real numbers
  - Polygons and Polyhedrons
  - Evaluate and
Guiding Questions

• What are some guiding standards that will help me create purposeful Foldables®?

• What are some examples of math content embedded in Foldables®?

• What are some folds that I can begin using in my classroom?