3-D Graphic Organizers to Teach, Organize Information and Formatively Assess

Wisconsin Math Council
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Session 218
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School District of Mauston
Goals for Today

● 3-D Graphic Organizers?
● Why-How-When do we use them?
● Types of and Create models
● Brainstorm your uses for
  ◦ teaching
  ◦ organizing information
  ◦ formatively assessing
At a recent NCTM Nat’l...
And more...
And then some more.
On brightly-colored paper students will show varied ways to address vocabulary, make content connections, practice mathematical skills with use of pictures, math tools and strategies.

These types of graphic organizers make memorable teaching moments for students to interact with new and old knowledge to increase their skills and understandings.

As teachers, it provides us with evidence of learning (without using worksheets) and student products to display!
Graphic Organizer Research

- Help students see connections within content.
- Visual-kinesthetic learning which supports the current thinking on brain-based education.
- Note-taking aid/stores information.
- Becomes a habit for learning.

Dinah Zike, Foldables
Douglas Fisher and Nancy Frey, Authors and Professors at San Diego State Univ.
For Graphic Organizers to Be Effective...

- Taught with specific types/styles in mind, and then students choose which type best suit the situation.
- Should promote interaction among students.

Dinah Zike, Douglas Fisher, Nancy Frey
• Easier for students to grasp math concepts
• Student-made study guides
• Creative format for projects, research and computation
• Replace teacher-generated with student-generated materials
• Compare/Contrast, Cause/Effect, Similarities/Differences
• Immerse into previously learned vocabulary within a context of new info
• Graphs, tables, charts, models, and diagrams (like Venn)
• Math Journaling
• Alternative assessment
• Integrate language arts, science and social studies into mathematics
• Student ownership of the math curriculum

Dinah Zike
Getting Started with Ideas:
Spend time looking at an upcoming unit.

Vocabulary
Key Concepts
Challenging Skills
Make Connections
Review
Practice
Assess Learning
Half Sheet-Sized Booklet

“hamburger” and “burrito” folds and cutting; NO STAPLES OR TAPE!!!
Two sheets of paper, fold in AT THE SAME TIME into halves, “hamburger style.”

On the fold side, make two notches with your scissors about an 1/8 of an inch into the paper and 1 inch on either side of the paper.
Separate. Now to cut. Red lines are cut lines. Cut only a SLIVER OF THE PAPER AWAY.

When you open up this page, there will be a hole to slide the other paper through...

This page you will open up and roll “burrito style with the notch made rolled INSIDE the tube you make. Do not roll tightly. Insert into the hole of the other sheet and gradually open it up to glide it to place to make the booklet...
Now you have your own no tape, glue or staples booklet that you can write notes in! You can certainly add more pages if you wish...just make more “burrito-style” pages, roll them together and ease in the original page with the large hole. Label the front of your booklet with “3-D Graphic Organizers.”

The label, etc. on the outside is the main idea; inside is scaffolded instruction.
As you plan to use 3-D graphic organizers, find “groupings” of knowledge that students need to learn.

2s? 3s? 4s? 5s...?
Discuss some concepts that seem to be challenges for your students. What are they? Group them in 2s, 3s, 4s, 5s... Share with each other. Write your ideas inside page 1 of your new booklet!
Door or Tab Models
2-, 3-, 4-, 5-, 6-...
Fold to make the proper creases which guide students to possible cutting.
Divisibility Rules

Determine if the following numbers are divisible by: 2, 3, 4, 5, 6, 8, 9, 10

1. 162 - 2, 4, 6
2. 25 - 5
3. 57 - 3
4. 208 - 2, 4
5. 144 - 2, 3, 4, 6, 9
6. 3518 - 2, 3, 4, 9
7. 450 - 2, 3, 5, 6, 9, 10
8. 3400 - 2, 4, 5, 10
If you don’t want to deal with the baggies...

use in an Interactive Notebook...

Runde’s Room
Let's make…

Link
Teach, Organize, Assess

Now think about how you’d teach, help children to organize their ideas or formatively assess with this type of 3-D graphic organizer...write in your booklet.

Turn and talk.
1 Single Sheet Mini-Book

no staples or tape or glue...
**Notice the direction of the numbers / words!

6. Cut your paper.
Time to “Taco Fold!”
Pyramid(s)

(Tape or glue needed to complete.)
Luke counted the number of times people sharpened their pencils in class for a week. He counted: 13, 12, 12, 17, 9 and 8. Determine the mean (rounded to the nearest tenth), median, mode and range of the numbers.

Problem from commoncoresheets.com
Shutterfolds
They don’t ALWAYS have to look perfect! Limit the “accents,” if you can.
Communative Property
+, x

Associative Property
+, x

Identity Property
+ , x

Property of Zero

Rules of Divisibility

- It is even, (end with 0, 2, 4, 6, 8)
- It ends in a 5 or a 0.
- A number is divisible by 4 if the number is divisible by 2 twice.
- A number is divisible by 6 if it’s divisible by both 2 and 3.
- A number is divisible by 7 if the number minus twice the last digit is divisible by 7.
- A number is divisible by 8 if the last three digit is divisible by 8.
- A number is divisible by 9 if the sum of the digits is divisible by 9.
- A number is divisible by 10 if it ends in 0!
What are your thoughts about what would be inside this one?
Is rounding a problem in your classroom? Here’s an idea using a shutterfold and a one hundred chart.
Teach, Organize, Assess

Now think about how you’d teach, help children to organize their ideas or formatively assess with these types of 3-D graphic organizers...write in your booklet.

Turn and talk.
To teach concepts...tools.
Three folds, fold in so they overlap. Make fact families.

Circles!
Two different colors. Cut a radius line on each circle. You can pinch and crease to the center for a cut line.

Insert each one through the radii cuts.

Then, watch!

Circles!
Circles!

free on Pinterest
Pockets

Tape needed to secure.
To organize information...
Flip Book

This example shows 6 pages made with 3 sheets of paper.

image from: shelleygrayteaching.com
So you remember for later…
Take 2, 3, or 4 sheets of paper (can be different colors).

Place them on top of each other, but stagger their placement by about \( \frac{1}{2} \) to 1 inch from the top for each piece of paper you have. Remain consistent with each sheet placement.

When you have all sheets in hand staggered, make one fold toward you and make it so the two sheets that touch on top and below are also staggered the same amount.

Fold and make sure the crease is through all sheets of paper (use a firm tabletop to press down).

Two or three staples near the top of the fold going through all sheets of paper is best to finish it off before filling in the organizer.

Cut to make partitions, if needed, to show relationships.
fractions:
- thirds
- fourths
- fifths
- sixths
- eighths
- tenths

fractional parts:
- 1/2
- 1/2
- 1/4
- 1/4
- 1/8
- 1/8
- 1/8
- 1/8
- 1/8
- 1/8

1 whole
Teach, Organize, Assess

Now think about how you’d teach, help children to organize their ideas or formatively assess with these types of 3-D graphic organizers...write in your booklet.

Turn and talk.
Projects and displays and assessing what they’ve learned!
Working 4 the Classroom blogspot.
Math Standards Poster
12 x 18 poster

Assign a chapter from your textbook; poster must include:

- title
- subtitles
- standards
- key vocabulary
- rules or steps
- examples
- word problems

Choice between two:
- flow map
- flip book
- shutterfold
- 4 door
- 2, 3 or 4 tab/door

Use textbook, notebook (could also gather on-line info and note sources).
Bonus!
Assessing and Student Goal Setting
Assessment Rubric Possible Criteria...

Knowledge and understanding of topic.

Accuracy of math content.

Graphics relate to the topic.

Design and layout is organized to show knowledge clearly.

Uses appropriate math vocabulary for the topic and grade level.
Assessment Rubric; do not suggest...

- neatness
- creativity
- grammar
- spelling

Try bonus points...
Goal setting with students...

from: tonyas treats for teachers
Teach, Organize, Assess

Now think about how you’d teach, help children to organize their ideas or formatively assess with these types of 3-D graphic organizers...write in your booklet.

Turn and talk.
Hidden Panel

Uses 1 ½ sheets of **cardstock**
2 different colors.
Follow the directions in the handout.

Can add or delete blocked sections based on the number of cuts made in the center.

Link to handout
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Teach, Organize, Assess

Turn and talk.

Tell about 2 ideas you’re taking with you...to someone you haven’t spoken to today! :-)

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Using 3-D Graphic Organizers to Teach, Organize Information and Formatively Assess

Session 218
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What is a Foldable™?

Research on their use:
http://www.dzacademy.com/research/page25.html

Websites with examples:
https://belmontteach.wordpress.com/tag/foldables/
https://sciencewithmsbarton.wordpress.com/tag/foldable/
http://www.csun.edu/~krowlands/Content/Academic_Resources/Foldables/Basic%20Foldables.pdf
http://www.greenninja.org/workshop2012/archive2012/TL-foldables!!!%5B1%5D.pdf
https://foldables.wikispaces.com/Foldables
http://www.wde.state.wv.us/strategybank/DirectionsforFoldedBooks.html
http://www.aldenschools.org/webpages/hstotz/resources.cfm
http://www.ateacherstreasure.com/p/foldifun-factory.html
http://www.livebinders.com/play/play/238188
http://msmathwiki.pbworks.com/w/page/52113488/Foldables

Foldable Project Link
http://working4theclassroom.blogspot.com/2012/04/open-house-pizzazz-project-1.html

Assessing Folder

Graphic for 100 Chart
https://focusonmath.wordpress.com/tag/100-chart/