

Think About It

Grades 2-12

Sorting activities to help students understand
mathematical concepts

By Bill Atwood

thebillatwood@gmail.com

www.collinsed.com/billatwood.htm

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Sorting Activities for Math

These activities are designed to help students understand mathematical concepts and skills

How to Use the Sorts:

1. Copy onto card-stock. Then cut them up and have students work in pairs to put them back together.
2. Give a partially filled out sort and have students work in pairs to finish it.
3. Have students make their own sorts on index cards or give a blank template to help students get started. Once they make a sort and the teacher checks it, it's ready for others to try!

Type of Sorts:

1. Stand and Sort: Each student receives a card and silently walks around to find others who have a card that goes with the set.
2. Sit and Sort: Students work in pairs or individually to organize the cards into either given categories or self-created categories.

3. Categories defined vs. undefined: In a **defined sort**, the categories are clearly marked and there are usually only 1 or 2 correct answers. For example, there are 4 fractions headers, all in simplified form and in bold. Students must find the equivalent fractions, number line models, area models and word problem which matches each fraction.

In an **undefined sort**, students take the fraction cards and create some order of their own. In these situations, students must impose some order on the cards, sort them, and then name the heading or classification system. For example, pass out random fractions. Students might group the fractions by size, or equivalency, or might group unit fractions together, or fractions that are more than half and less than half, or fractions that convert easily to percent.

Keys to Making a Sort

1. **Deepening understanding of concepts:** In order to make the sorting cards more effective think about how you can expand the way the topic or concept is developed. For example, for a term like perimeter you might give the following: a description; a picture of perimeter; a real world example; the units are used to measure it; and a problem that asks students to find the perimeter. For a number concept like 24 give the following: expanded form, describe the number of tens and ones; even number, sum of the digits is 6; comes after 23, rounds to 20, picture with base tens blocks; tally marks; position on hundreds chart. For triangles: classification by angle; by side length; area; perimeter; and similar triangle. For ratio: similar ratio; fractional form; word form; unit ratio; word problem that matches...
2. **Difficulty levels:** One of the most important things to consider when creating a sort is its challenge level. Often it works best to build in some easy parts and some more rigorous parts. It can also be helpful to have two or three sorts on the same topic for students who finish early or are ready for a more difficult task.
3. **Finishing early:** Have a task ready. Consider the following:
 - a. Have students add more order (go from big to small; organize vertically as well as horizontally (i.e. put all definitions in the same row))
 - b. Have an answer key so students can check it
 - c. Have students make their own sort using a template to guide them

- d. Have students complete a worksheet sort, with some boxes empty
- e. Have some open problems on the sort that need solutions
- f. Have students try a more difficult sort
- g. Quiz Me: one student turns a card over; other student names image of flipped card
- h. Partners choose one sorting group/category and present it to the class

4. **Questions to ask**, while students are working or when they say “finished”

- A. How did you get started? Which did you find easiest to sort? Why?
- B. How are you working together? How do you share the work? What did you do when you got stuck?
- C. Can you think of another way to organize this? Can you organize them from greatest to least? Can you find a way to organize them horizontally as well as vertically?
- D. What if this card was changed to this... What if you added another row, what would it be? Can you think of something that would have made this more difficult?
- E. If I put this card here, why would it be wrong? Can you understand my mistake? What would you tell me to help me to get me on the right track?
- F. Could there be more than one way to sort these?
- G. How do you know you have it correct? Did you make any small mistakes when you were working? How did you correct them?
- H. Did this deepen your understanding at all? Why or why not? What would have made it better?