Adapting Linear Functions Card Sort

Overview

This activity draws on participants' prior experiences engaging in the Linear Functions Card Sort and watching and discussing a related video of a linear functions lesson in a classroom. Here, participants consider how they could use the task structure – the card sort – with other content topics.

Objective(s)

Teachers will

- Recognize that mathematics tasks (and their implementation) have different structures that afford different opportunities for participation and learning.
- Identify central features of a "card sort" task
- Brainstorm other uses (content topics) for a card sort-structured task

Materials Needed

Examples of other card sort possibilities (see sample PPT slides in lesson outline)
Paper
Writing utensils
Linear functions card sort task card (one for each group)

Lesson Outline

LAUNCH

Ask participants to recall their previous work (a) engaged in the mathematics of the linear card sort activity and (b) watching a video of a classroom teacher implementing a linear functions lesson.

To help jog our memory and ground us in the task for our activity today, begin by taking out a blank piece of paper and drawing a vertical line down the middle. Label one side "Similarities" and the other "Differences."

Individual Work

Compare the task in the video with the linear functions card sort task we engaged in earlier – what similarities do you see between the tasks? What differences do you notice?

Small Group Share

Share your list with others in your group. Compare your lists. Together, consider additional similarities and differences.

Small Group Discussion

Why might these differences exist?
What does each difference accomplish/support?

EXPLORE

Introduce idea of a "Group Worthy Task" from Lotan (2003)

As Rachel Lotan tells us, many teachers believe that group work and collaborative learning are effective yet too few understand the crucial design elements needed for successful group tasks. She defines "group-worthy tasks" as those with the following five design features:

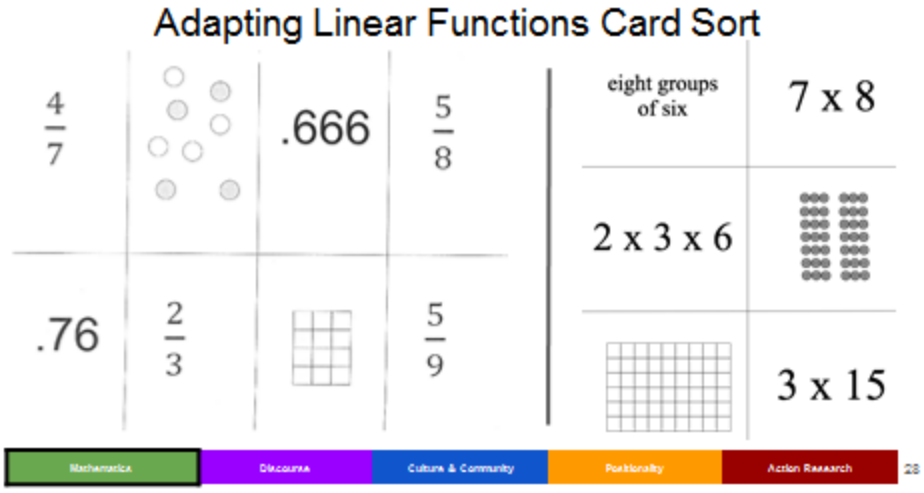
- They are open-ended (e.g., design an experiment, build a model, explore multiple paths) and require complex problem solving
- They provide students with multiple entry points to the task and multiple opportunities to show intellectual competence (e.g., multiple "smarts" needed, Cohen & Lotan, 1997)
- They deal with discipline-based, intellectually important content.
- They require positive interdependence as well as individual accountability.
- They include clear criteria for the evaluation of the group's product.

Small Group Discussion

How does the linear functions card sort task you engaged in previously include each of these five design features?
(have Linear Functions Task Cards available for groups should they wish to see them)

Whole Group

The card sort structure can be used for content besides that which we saw in the linear functions task. For example, a card sort could be used for mathematics content around ordering numbers (left) or for multiplication (right):



Small Group Brainstorm

In your small groups, brainstorm different content with which you might use the card sort structure (~10 min). The goal here is not to go into the specifics of what you would put on every card, but rather to create a list of as many ideas of content as possible for which this card sort structure might apply.

Whole Group Discussion
Have each group share out their ideas for using this structure in other content areas.

SUMMARIZE

Remind participants that EngageNY is an open access curriculum and that the changes they make can be republished and put on the web for use beyond their own classrooms. This is a way they can share with one another as well as with other teachers using EngageNY!

Facilitator Insights and Questions

- If participants are having a hard time thinking of alternative ways to use this task structure, have them consider how cards might differ (e.g., representation, size/ordering, other attributes)

Additional Resources (aka Going Further)

Featherstone, H., Crespo, S., Jilk, L., Oslund, J., Parks, A. & Woods, M. (2011). *Smarter Together! Collaboration and equity in the elementary math classroom.* Reston, VA: National Council of Teachers of Mathematics.	Book with additional resources for complex instruction/ groupworthy math tasks (geared toward elementary school level)
Horn, I. S. (2012). *Strength in numbers: Collaborative learning in secondary mathematics.* Reston, VA: National Council of Teachers of Mathematics.	Book with additional resources for complex instruction/ Groupworhty math tasks (geared toward secondary school level)
https://francesharper.com/complex-instruction/groupworthy-mathematics-tasks/	Website with sample group-worthy tasks

References

Cohen, E. G., & Lotan, R. A. (1997). *Working for equity in heterogeneous classrooms: Sociological theory in practice.* New York, NY: Teachers College Press.

Lotan, R. A. (2003) Group-worthy tasks. *Educational Leadership,* 60(3), 72-75.