

K-5

Teaching with a Full Deck: Card Sorts

Why Card Sorts?

- Build confidence in every student
- Improve student retention on basic foundational skills and assessed knowledge
- Build critical thinking, problem-solving, and communication skills
- Focus on task
- English Language Learners and Special Education students can benefit from this structure

Matching Examples

- Animals and Plants



- Table to Graph

Table

I

Animal Speed Data

Animal	Spd (km/h)
Cheetah	112
Elephant	40
Hare	56
Horse	72
Human	34
Ostrich	66

Graph

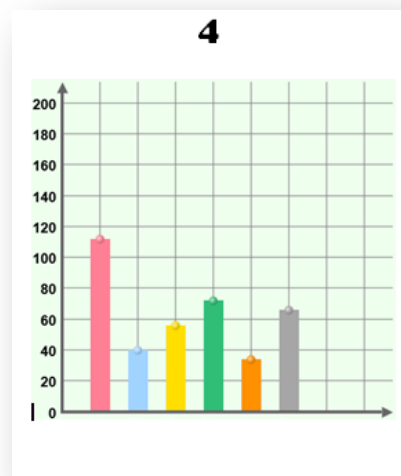


Table to Graph

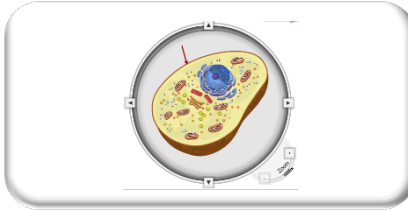
A → 3	B → 16	C → 5	D → 8
E → 7	F → 13	G → 9	H → 1
I → 4	J → 6	K → 2	L → 11
M → 10	N → 15	O → 14	P → 12
Q → 19	R → 18	S → 20	T → 17

Why Matching?

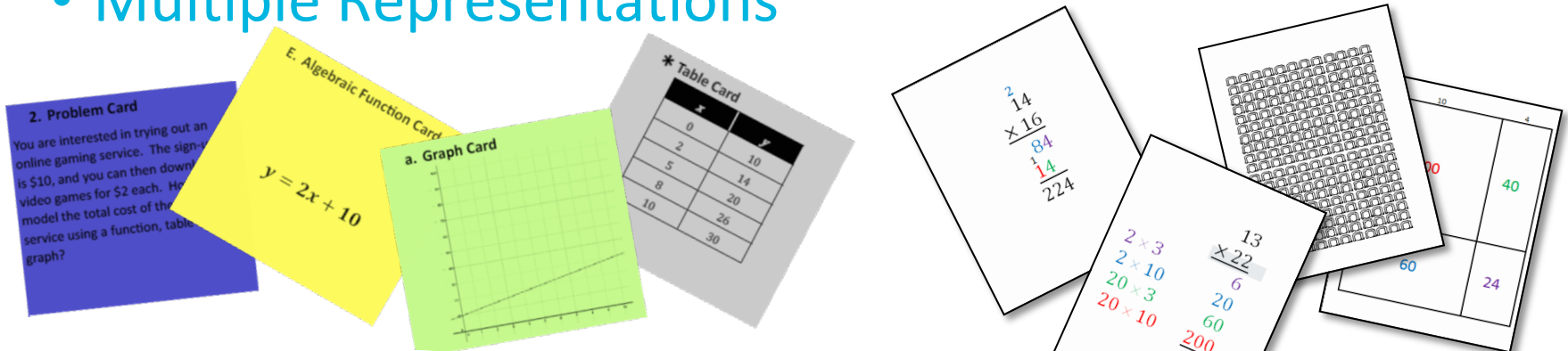
- Build mastery of basic concepts, facts, and ideas
- Knowledge sharing
- Formative assessment
- Symbolic representations
- Communication and scientific/mathematical discourse development
- *Assessment tip:* Use a document camera or digital camera on a cell phone to record their work

Additional Examples

- Animal Cell Structure

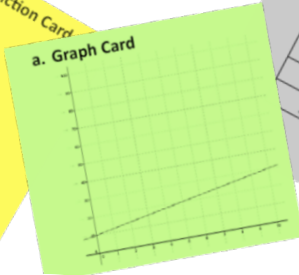
Structure Name	Definition	Illustration
Cell membrane	This surrounds the cell and regulated what enters and leaves the cell.	

- Multiple Representations



2. Problem Card
You are interested in trying out an online gaming service. The sign-up fee is \$10, and you can then download video games for \$2 each. How would you model the total cost of the service using a function, table, or graph?

E. Algebraic Function Card
 $y = 2x + 10$

a. Graph Card


* Table Card

x	y
0	10
2	14
5	20
9	26
10	30

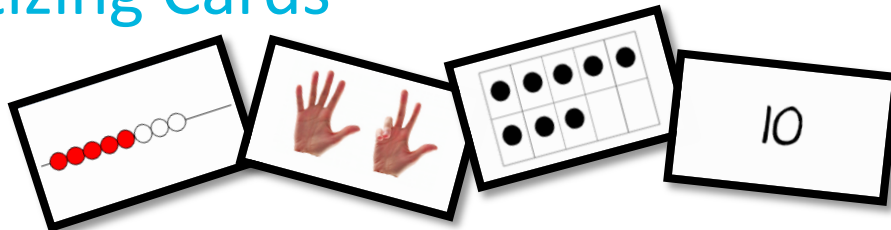
2 14
x 16
84
14
224

2 x 3
2 x 10
20 x 3
20 x 10

13
x 22
6
20
60
200
286

10 40
60 24

- Subitizing Cards

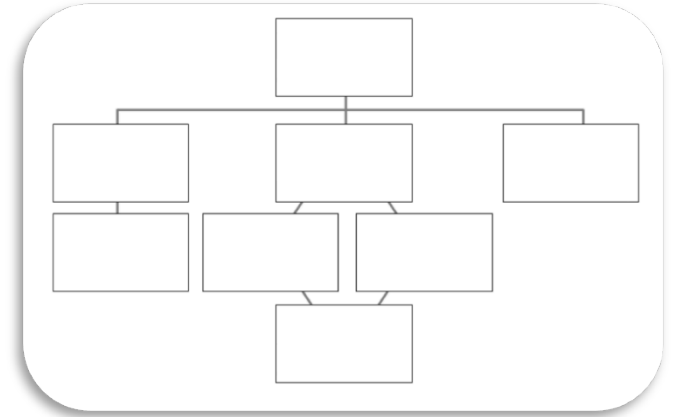


<https://www.youtube.com/watch?v=A26BgIOSxo4>

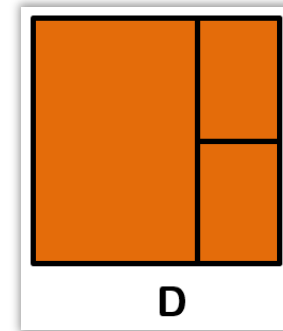
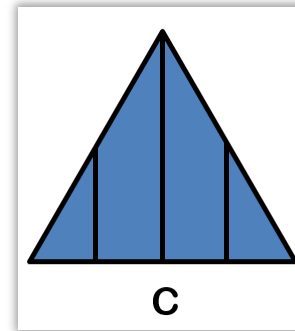
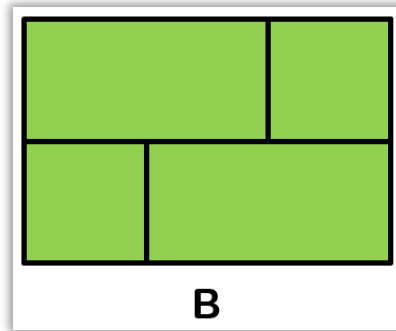
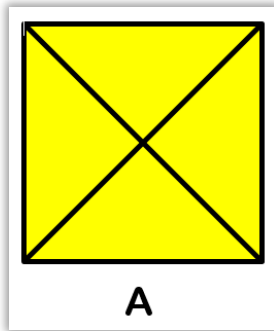
Sorting & Classifying

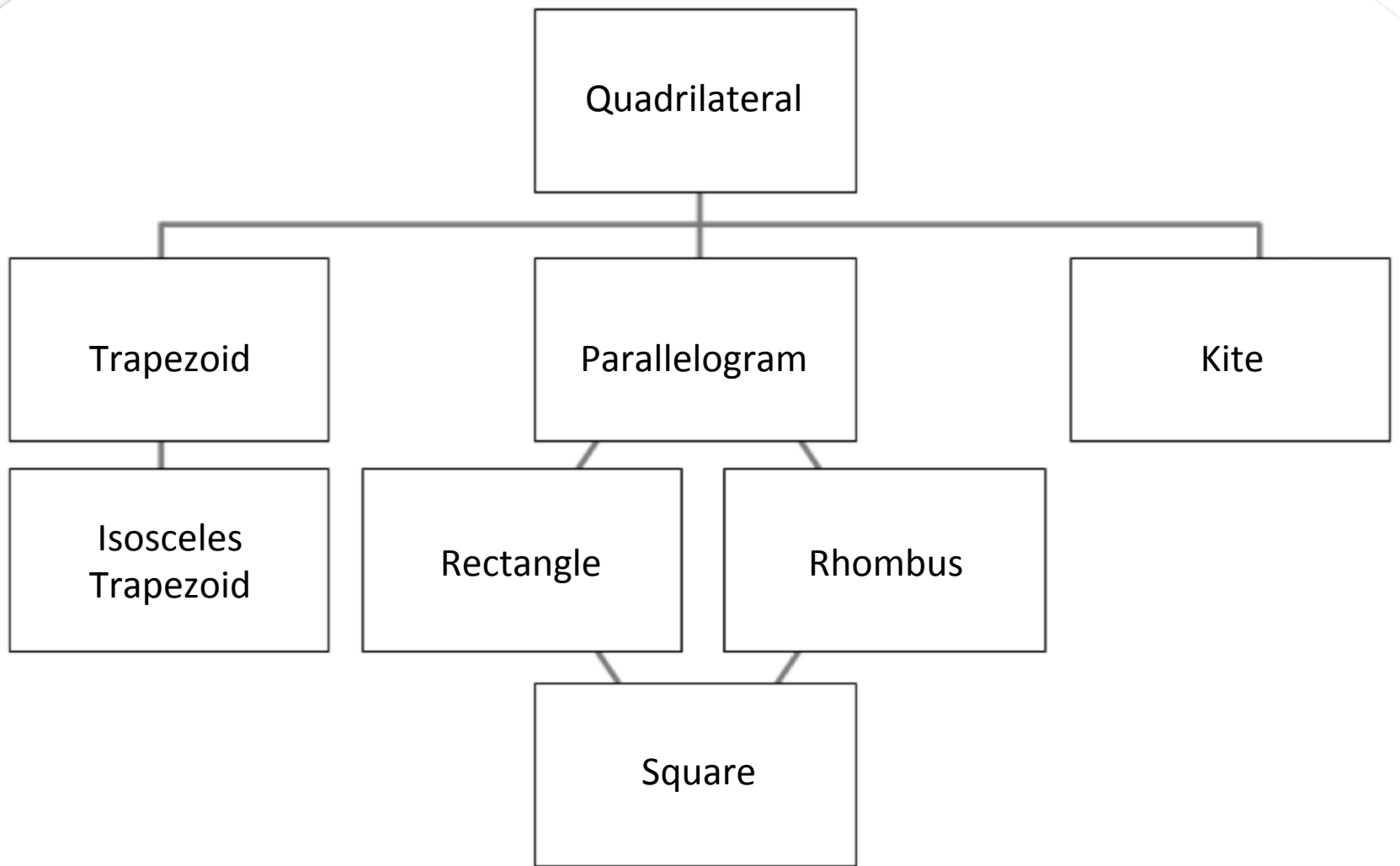
- Quadrilaterals

- Use 8 named card pieces
- Place onto template
- Justify your decision with a mathematical statement



- Partitioning

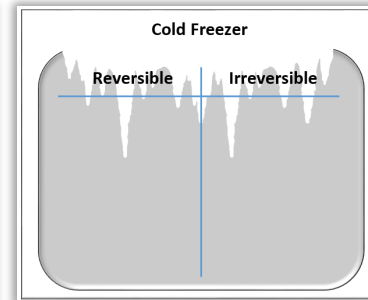
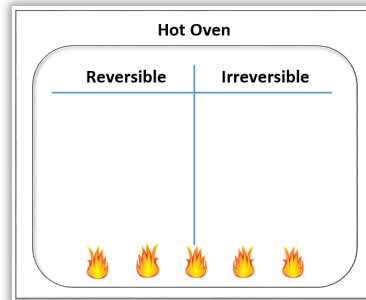




- Mars Landscape Cards



- Reversibility



- Tortoise or Hare



Classifying & Sorting Debrief

1. What made you decide to put that card in this category (and not this other one)?
2. What do cards in this group have in common?
3. How can we tell? Where do we see that [thing they have in common] on this card?
4. Are there any cards you are unsure about?

An illustration of a hand with a white cuff and a black sleeve pointing towards a white sign. The background is a solid green color.

Table Talk!

At your tables, brainstorm
additional examples
of Matching and Classifying
& Sorting activities

Sequencing & Procedures

- Dividing Mixed Numbers Algorithm

Sort the steps and intermediate calculations to solve the problem:

Divide: $41/4 \div 22/5$

- Experimental Procedure: A Matter of Vibration?

Organize the experimental procedure and evaluate if additional steps are required.

Argumentation

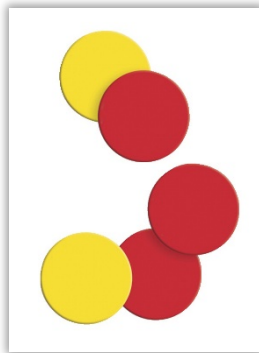
- Pass out the cards equally to each player like in a card game.
- Person 1: Place a card in the center of the table.
 - *Must provide justification for placing the card.*
- Person 2 plays a card before/after the previously played card with justification.
- Play continues until all cards are played and the group agrees with the placement
 - *Consensus: “I can, and will, publicly support it.”*
- Stay and Stray

Argumentation

What is the greatest invention of the 20th Century?



What is the best mathematical tool?



Why engage students in argumentation?

- Decrease teacher talk, increase student talk
- Discover students reasoning and thinking
- Help identify misconceptions
- Allow students to make meaning by reaching consensus
- Science is about explaining phenomena, and argumentation helps advance scientific discovery

Claim-Evidence-Reasoning

- **Claim:** *the answer to the posed question or problem*

What do you know?



- **Evidence:** *data and observations that support the claim*

How do you know that?



- **Reasoning:** *the rule or scientific principle that describes why evidence supports the claim*


Why does your evidence support the claim?





Is air matter?

HIGH

Evidence Card 4
A balloon filled with air sinks to the ground.

Evidence Card 9
If we pump more air into a basketball, the weight of the ball increases. 

Evidence Card 8


Evidence Card 11


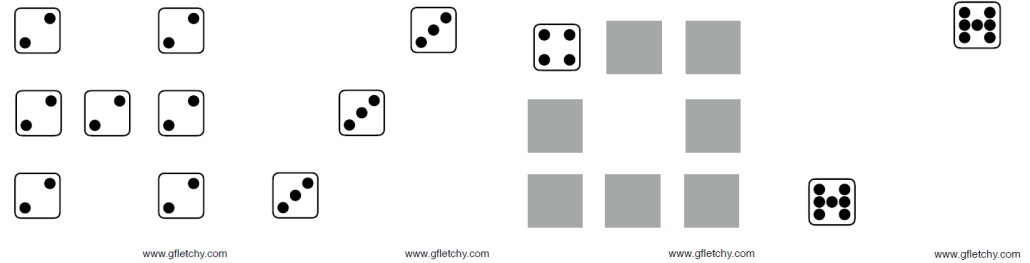
Evidence Card 2
We can walk right through air.

LOW

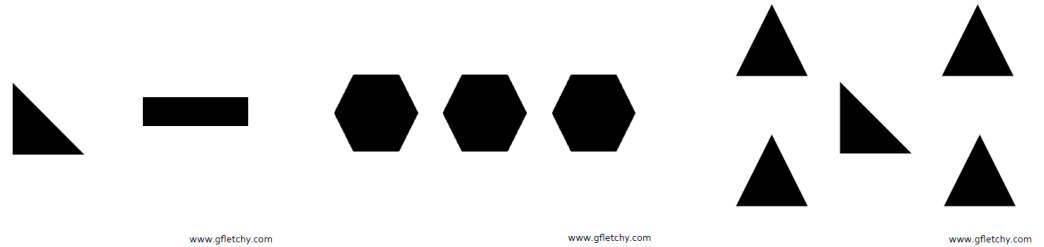
- Possible Claim:
Air is matter.
- Evidence:
 - Volume of balloon increases as we add more air to it.
 - Mass of ball increases as we pump more air into it.
- Reasoning:
This shows that air has volume and mass which are the characteristics of matter.

Subitizing Cards

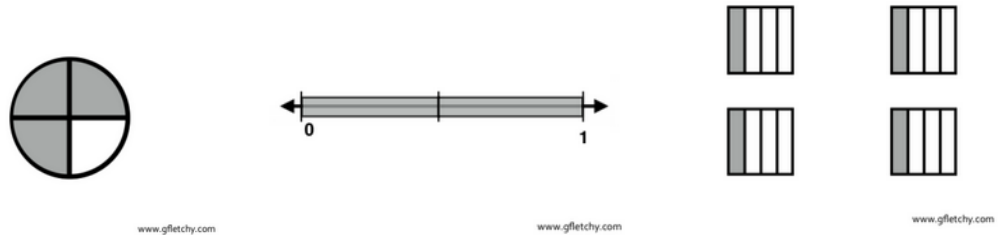
- Multiplication Cards



- Geometry Cards



- Fraction Cards



Clothesline

Chris Shore - www.clotheslinemath.com

Kristen Acosta - <https://kristenacosta.com/clotheslines/>

The Structure:

My primary routine for the clothesline activity is as follows:

- Leave the Benchmark numbers with a few blanks and a black marker next to the clothesline.
- Give a Tent Set to a group of students to go place on the clothesline. I write these values on the board for all to see.
- The group may add, move, remove or create Benchmarks as needed.
- Students at their desks are creating their own number line on a lapboard.
- Ask the class if they agree with the group's response on the clothesline. Discuss the disagreements and errors.
- Have all students record on the **Answer Document** once there is consensus.

MPJ

Name: _____
Date: _____

The Clothesline

For each set, record the given values, expressions or drawings. After the discussion of their placement on the clothesline, record them on the number line.

1. _____

2. _____

3. _____

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“The important thing about designing card sorts is that there is room for **student reasoning** and **access to evidence**. We want students to disagree, so we need to design the cards so that there will be **opportunities for students to argue and defend different ideas**. This is what will help them construct & critique arguments and identify commonalities across items (e.g. looking for and make use of mathematical structure). Multiple representations including visual representations, such as area models or diagrammatic representations, engage students in **sense making** and provide options for multiple ways of thinking.”

- Dr. Katherine McNeil,
Professor of Science Education at Boston College

Thank you!

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Download all resources at: <http://bit.ly/CardSorts>