SMARTER TOGETHER!

Collaboration and Equity in the Elementary Mathematics Classroom

CONTACT INFORMATION

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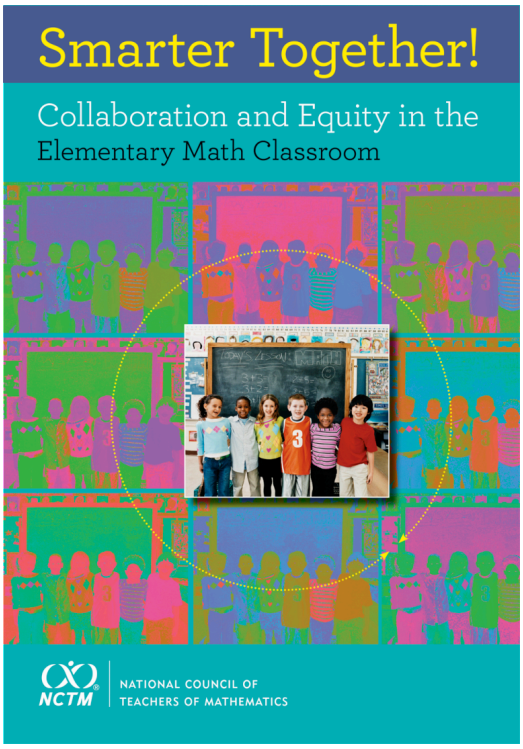
OTHER RESOURCES

Cohen, Elizabeth. *Designing Groupwork*, 2nd ed. New York: Teachers College Press, 1994.

Erickson, Tim. *United we solve: Math problems for groups, grades 5-10.* Oakland, CA: eeps media, 1996.

Goodman, Jan M. *Group Solutions: Cooperative Logic Activities for Grades K-4.* Berkeley, CA: Lawrence Hall of Science, 1992.



Helen Featherstone, Sandra Crespo, Lisa Jilk, Joy Oslund, Amy Parks, & Marcy Wood. *Smarter Together! Collaboration and Equity in the Elementary Classroom*. Reston, Va: NCTM, 2011.

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STATUS IS….

Belief that **some people are smarter** and **more worthy** of being heard or directing activity than others. Thus those who are *assumed* to be smarter have more opportunities to **get smarter and appear smarter**!

EXAMPLES OF ROLES

Facilitator

Gets the team off to quick start
Makes sure everyone understands the task
Organizes the team to complete the task
Keeps track of time

"Who knows how to start?"
"Does everyone get what to do?"
"I can't get it yet… can someone help?"
"We need to keep moving so we can…"
"Let's find a way to work this out."

Resource Monitor

Collects supplies for the team
Calls the teacher over for a team question
Cares for and returns supplies
Organizes clean up

"I think we need more information."
"I'll call the teacher over"
"We need to clean up. Can you… whi l…?"
"Do we all have the same question?"

Recorder / Reporter

Gives update statements on team's progress
Makes sure each member of the team records the data
Organizes and introduces report

"We need to keep moving so we can…"
"I'll introduce the report, then…"

"Did everyone get that in your notes?"

These roles were originally created by the teachers in the Mathematics Department of Railside High School.

Questioner

Asks questions about the group's activity an individual contributions:

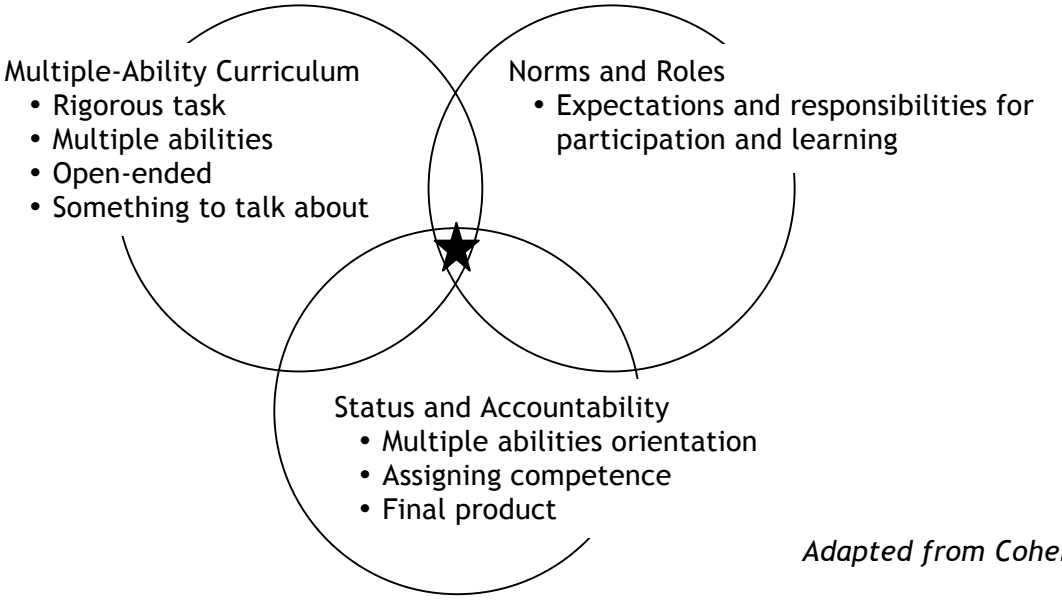
"Could you explain that?"
"What is an example of ----?"
"What's another way we could ---?"

Encourages participation
Enforces use of norms

"Remember, no talking outside the team."
"We need to work on listening to eacl member of the team."

Substitutes for absent roles

THREE CIRCLES OF COMPLEX INSTRUCTION



Adapted from Cohen, 199

No One is an Island
Task Card

Adapted by Marcy Wood from *Island Maps*,
http://web.stanford.edu/class/ed284/csb/

Materials

- Set of 30 island cards
- Paper and something to write with
- Blank grids (one for each group member)

Task

As a group, find the singleton card. Then create a list of the fewest number of attributes that differentiates the singleton card from the others.

Directions:

1. Hand out all of the cards to everyone in the group.
2. No looking at other's cards.
3. No trading cards.
4. No drawings or diagrams of island cards.

Group Final Product:

Minimal list of attributes that differentiates the singleton card.

Individual Final Product:

On a blank grid, each person must draw a unique island that varies from the singleton island by only one attribute.

Norms:

Everyone contributes.
Discuss and decide together.
What more can we learn from this?

Island Cards are available online at:
http://web.stanford.edu/class/ed284/csb/

Facilitator

Gets the team off to quick start
Makes sure everyone understands the information on the task card.
Organizes the team so they can complete the task
Keeps track of time
Substitutes for absent roles
- "Who knows how to start?"
- "I can't get it yet… can someone help?"
- "We need to keep moving so we can…"
- "Let's find a way to work this out."

Resource Manager

Makes sure the team is using all resources well, especially people.
Collects supplies for the team
Calls the teacher over for a team question
Cares for and returns supplies
Organizes clean up
- "I think we need more information here."
- "I'll call the teacher over"
- "We need to clean up. Can you… while I…?"
- "Do we all have the same question?"

Recorder / Reporter

Gives update statements on team's progress
Makes sure each member of the team records the data
Organizes and introduces report
- "We need to keep moving so we can…"
- "I'll introduce the report, then…"
- "Did everyone get that in your notes?"

Adapted from Amy McDonald

Reflection Leader

Helps the group reflect on their work during the task and at the end.
Asks questions about the group's activity:
- "What strategies have we used?"
- "What worked?"
- "What isn't working/didn't work?"

Ordering Numbers - Multiplication
Task Card

By Marcy Wood

TASK: As a group, arrange the cards so the quantities they represent are ordered from least to greatest. Your group **must use a different strategy** each time you place or rearrange any cards. Find as many unique strategies as you can.

Directions:

1. Hand out all of the cards. Each person must have at least one.
2. Write your name ON THE FRONT of your card(s).
3. You may ONLY touch or move your card(s). No one else may touch or move your cards.

After the cards are arranged:

As a group, choose any two cards. Using the strategies you developed as you ordered the number cards, make a list of many possible multiplication expressions whose product is between the quantities represented on the two cards. Be sure everyone in your group can explain all of the variations.

Individual Final Product:

Each person must describe *in writing* each different strategy for ordering the quantities on the number cards.

Norms:

Explore until time is up.
Everyone takes turns.
Everyone records.

Ordering Numbers
Task Card

By Larisa Velasco and Marcy Wood

Directions:
1. Hand out all of the cards. Each person must have at least one.
2. Write your name ON THE FRONT of your card(s).
3. You may ONLY touch or move your card(s). No one else may touch or move your cards.

TASK: As a group, arrange the cards so the quantities they represent are ordered from least to greatest. Your group **must use a different strategy** each time you place or rearrange any cards. Find as many unique strategies as you can.

AFTER the cards are arranged:
As a group, choose any two cards. Using the strategies you developed as you ordered the number cards, make a list of all possible numbers between those two cards. Be sure everyone in your group can explain all of the variations.

Individual Final Product:
Each person must describe *in writing* each different strategy for ordering the quantities on the number cards.

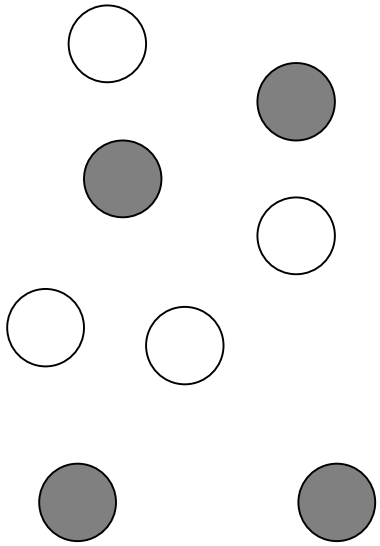
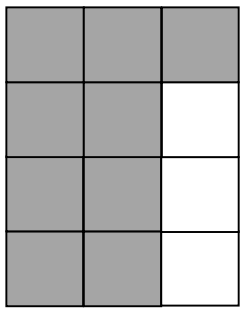
Norms:
Explore until time is up.
Everyone takes turns.
Everyone records.

CI Task Information

Please include any information on this form that might help others implement the task you've designed. Feel free to add more information or leave areas blank.

Task Title:	Ordering Numbers
Task Authors:	Larisa Velasco & Marcy Wood
Learning Goals	
Objectives (mathematical and/or pedagogical):	Use multiple strategies to compare fractions and decimals.
Common Core Content Standards Addressed:	3.NF.A.3a Understand two fractions as equivalent if they are the same size. 3.NF.A.3b Recognize and generate simple equivalent fractions. *3.NF.a.3d Compare two fractions with the same numerator or the same denominator by reasoning about their size. 4.NF.A.1 Explain why a fraction a/b is equivalent to a fraction (nxa)/(nxb) by using visual fraction models. *4.NF.A.2 Compare two fractions with different numerators and denominators. 4.NF.C.7 Compare two decimals to hundredths by reasoning about their size.
Common Core Standards for Mathematical Practice Addressed:	MP6 Attend to precision MP3 Construct viable arguments and critique the reasoning of others MP1 Make sense of problems and persevere in solving them
Set up Information	
Specific Norms	• Everyone records (make sure everyone is writing and understands all of the strategies) • Everyone contributes (only the person who "owns" the card can move it)
Specific Roles	I've done this with and without roles
Multiple abilities	• Logical reasoning • Visual reasoning • Making sense of pictures • Making sense of fractions, decimals, and percents • Thinking creatively • Ordering based on quantity • Finding connections • Communicating ideas • Relying on others
M*aterials* to prepare	Copy and cut up number cards so that each group has one set
Handouts that should accompany the task	None – just number cards
Task Enactment	
Launch	I use the multiple abilities orientation as my launch. I found that it helps to emphasize that everyone should thoroughly read the task card before they start.
Closure	Mathematics • Comparing to benchmark fractions (1/2 and whole)

	• Repeating decimals • Various interpretations of the visual representations (9/3, 9/12, 3/9, 3/12, 12/9, and 12/3) • Any other interesting moves Groupwork • Add to sentence strips • "What did people in your group do that helped the group work on the mathematics?" • Refer to the participation quiz to highlight moves that were especially productive
Any specific directions?	As participants engage in the task, be sure they are only moving cards with their names on them. Also watch to see whether there are groups in which one person has all of the cards in front of him/herself. Has this person taken over the task?
Possible variations – how might this task be adjusted for different content or grade level?	This task can be easily adapted for different content and grade levels. For example, the number cards can be changed so they are all fractions or unit fractions. Also, I have made a variation with multiplication expressions, but this can also be easily changed to work with small quantities for kinder or for addition expressions. There is also a variation that has fractions represented using flags.

$\frac{4}{7}$		.666	$\frac{5}{8}$
.76	$\frac{2}{3}$		$\frac{5}{9}$