Ordering Numbers – Multiplication

Task Title:	Ordering Numbers - Multiplication
Task Authors:	Marcy Wood (adapted from task by Larisa Velsaco & Marcy Wood)
Learning Goals	
Objectives (mathematical and/or pedagogical):	Use multiple strategies to compare different representations of multiplication.
Common Core Content Standards Addressed:	3.OA.1 Interpret products of whole numbers, e.g., interpret 5×7 as the total number of objects in 5 groups of 7 objects each. 3.OA.5 Apply properties of operations as strategies to multiply and divide. Examples: If $6 \times 4 = 24$ is known, then $4 \times 6 = 24$ is also known. (Commutative property of multiplication.) $3 \times 5 \times 2$ can be found by $3 \times 5 = 15$, then $15 \times 2 = 30$, or by $5 \times 2 = 10$, then $3 \times 10 = 30$. (Associative property of multiplication.) Knowing that $8 \times 5 = 40$ and $8 \times 2 = 16$, one can find 8×7 as $8 \times (5 + 2) = (8 \times 5) + (8 \times 2) = 40 + 16 = 56$ (Distributive property.) 3.DVM.C Students learn to code composition of splits as multiplication and can state the associated division problem. 3.DVM.D Relate multiplication and division problems to rectangular area (e.g., 3 inches $\times$ 4 inches = 12 square inches) and Cartesian products (e.g., 3 pants $\times$ 2 shirts = 6 possible outfits).
Common Core Standards for Mathematical Practice Addressed:	MP6 Attend to precision MP7 Look for and make use of structure 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	In order to succeed at this task, your group will need to do the following: • Logical reasoning • Visual reasoning • Making sense of pictures

	• Making sense of numbers and expressions • Thinking creatively • Ordering based on quantity • Finding connections • Communicating ideas • Relying on others None of us is good at all of these things, but we are each good at some of them. Together your group has the abilities you need to be successful.
M*aterials* to prepare	Copy and cut up number cards so that each group has one set Copy task cards – 2 for each group of 4 students
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 • Solve expression • Compare factors • Compare groups of • Decompose numbers • Use visual representation 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 large numbers, but this can also be easily changed to work with small quantities for kinder or for addition expressions.

Suggested Roles (Adapted from Amy McDonald)

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.

Calls the teacher over for a team question

Collects supplies for the team

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?"

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

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, put the cards in order from least to greatest. Try to compare cards **without solving** the expression on the card. Find many different ways to compare the cards.

Individual Product:
Each person must describe *in writing* at least three different ways you compared cards.

After the cards are in order:
Create a number line using the cards. Can you find a way to place the cards on the number line without solving the expressions on the cards?
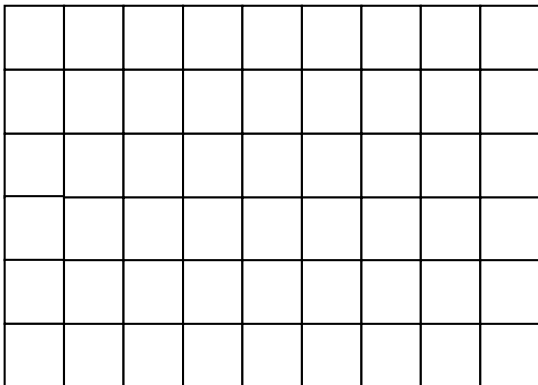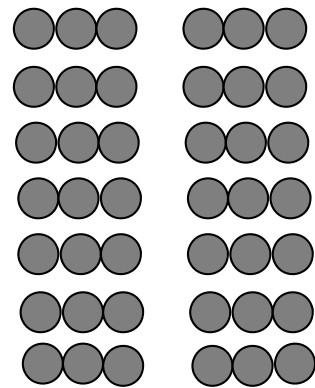
Norms:
Explore until time is up.
Everyone takes turns.
Everyone records.

eight groups
of six

7 x 8

2 x 3 x 6

3 x 15