



Muse Machine 2019 Summer Institute-Inspired Lesson Plan

Snap Geometry

Developed by Corrinne Fischer

Northmont High School

Clayton, OH

Lesson Plan Summary:

Not everyone sees a connection between the arts and mathematics. One creative teacher does it on a consistent basis. Corrinne Fischer, math teacher at Northmont High School, consistently incorporates creative principles into her classroom. During the Muse Machine 2019 Summer Institute, which Corrinne attended, the presenters used ideas throughout the workshop that helped keep participants engaged and aided them in seeing the ways that movement and rhythm can help students remember difficult content. Ping Chong + Company, the guest artists, inspired Corrinne to use the Snap Game to increase understanding of geometry and the use of the Frayer Model. The result is a lesson that can be incorporated into any math teacher's instructional process. Proof positive that a creative teacher can inspire any subject area!

Name: Corrinne Fischer	School: Northmont HS	Subject: Geometry	Date 12.14.19
Inspiration: Like many, I was inspired about using circle time to begin each day during the 2019 Muse Machine Summer Institute with Ping Chong + Company. One of the activities we did during this workshop was a snapping game. Not only was this activity engaging and fun, but it did also not require any talking and participants had to focus, listen, and make eye contact: all productive behaviors of an effective classroom environment helping to foster teamwork and respect for fellow classmates.			
Title: Snap Geometry			
I. <u>OVERVIEW</u>	A. Summary: After playing several rounds of the snap game, the teacher will begin a class discussion about how the game's movements correspond to geometry. Students will use these basic movements and their knowledge of the undefined terms of geometry to create movements and communal (team) definitions for vocabulary words using Frayer Models. After sufficient time to complete the assignment, the class will return to the main circle where small groups will present. A whole class discussion will end the class. B. Standards: <u>G.CO.1</u> Know precise definitions of ray, angle, circle, perpendicular line(s), parallel line(s), and line segment, based on the undefined notions of point, line, distance along a line, and arc length. <u>SMP #6</u> Attend to precision. Mathematically proficient students try to communicate precisely to others. They try to use clear definitions in discussion with others and in their own reasoning. They state the meaning of the symbols they choose, including using the equal sign consistently and appropriately. They are careful about specifying units of measure and labeling axes to clarify the correspondence with quantities in a problem. They calculate accurately and efficiently and express numerical answers with a degree of precision appropriate for the problem context. In the elementary grades, students give carefully formulated explanations to each other. By the time they reach high school they have learned to examine claims and make explicit use of definitions. C. Objectives/Outcomes: I can use snaps and movements to represent vocabulary words. I can collaborate and communicate effectively with my team to build Frayer Models. D. Teaching Approach: workshop E. Assessment/Product: • Student groups will complete a Frayer Model for their assigned/chosen geometric terms. • A "C" rubric is given to students, but a full rubric can be used as well. • The student groups will complete self and peer evaluations.		

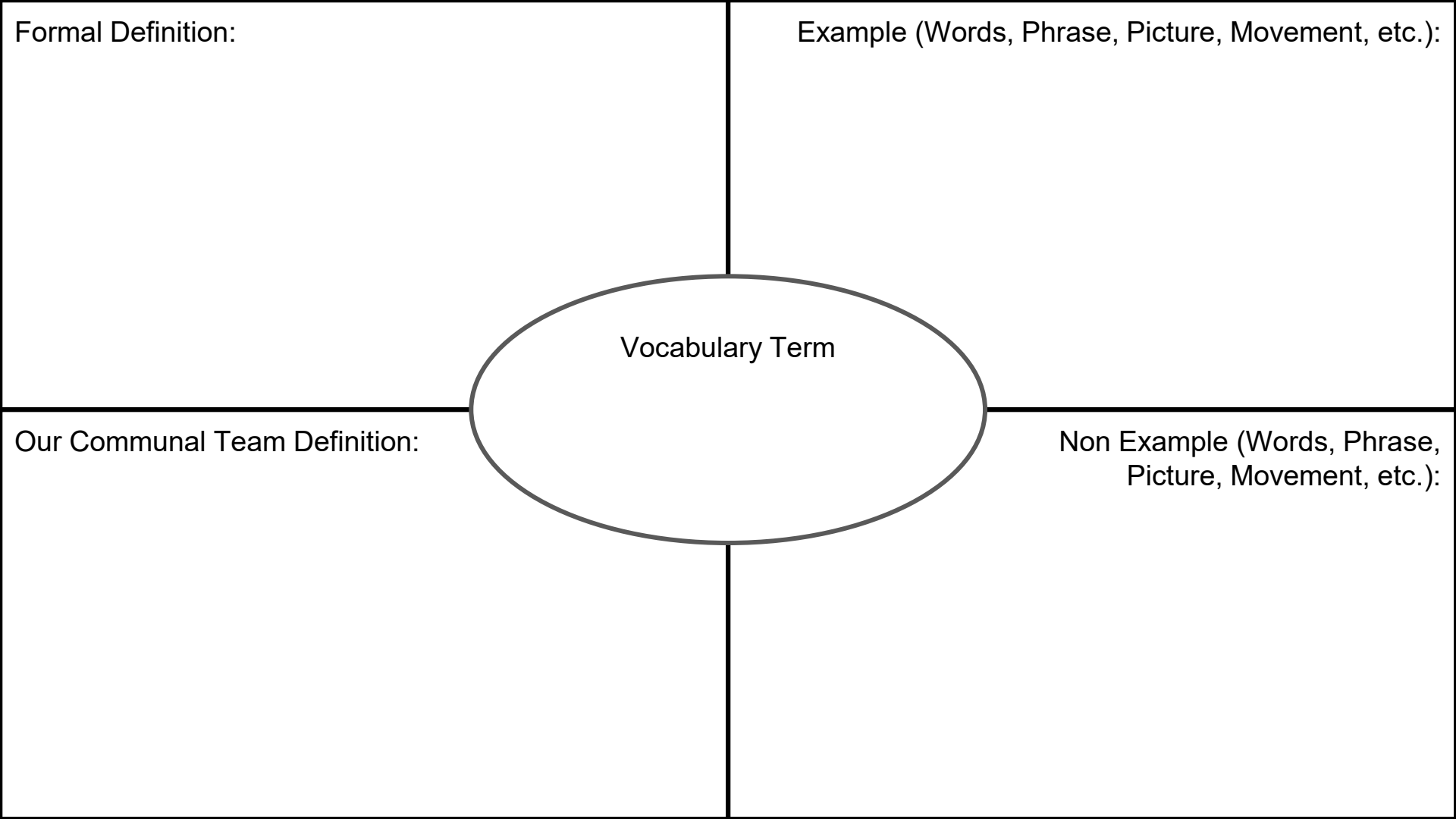
II. <u>LESSON PREPARATION</u>	A. Teacher Needs: • PowerPoint presentation • Participation rubric • Ample space for whole class circle • Timer • Document camera • Patience a. Teacher Information: My students were already aware of circle time and the snap game. Play a few times “randomly” before implementing this lesson. Though it was my full intention to present a list of vocabulary terms for students to choose from, I thoroughly enjoyed allowing the teams to brainstorm a list of words <i>they have</i> learned. It brought an extra level of student voice to this lesson. Also, if your classroom environment does not support a “bidding war,” simply use a multi-sided number cube or random number generator to choose teams. b. Helpful Hints: Let go! It is so hard for us to give up control in our classrooms but sometimes it is so worth it! Setting timers really helped them stay on task and allowed me to circulate the room as teams worked. B. Student Needs: • Access to notes, dictionary, etc. to look up formal definitions • Writing utensils • Movement Frayer Models • “C” rubrics or full rubric a. Prior Knowledge: Ideally students would have practice with the snap game prior to this lesson. They should also have a basic knowledge of the undefined geometric terms or vocabulary words you choose. b. Student Voice: Choice of words and movements. c. Vocabulary: Your choice! Use whatever mathematical language is appropriate to your lesson.
III. <u>EVIDENCE/ASSESSMENT OF OUTCOMES</u>	Students’ completed Frayer Models, rubrics and the teacher’s participation rubric
IV. <u>ENDURING UNDERSTANDINGS</u>	Mathematics is a finite subject but there is flexibility in the ways it can be used.
V. <u>LEARNING PLAN</u>	A. Hook: Play the snap game as a community building tool or warm-up before adding in mathematical concepts. B. Prompt: <i>After snap game is played.</i> <u>Teacher:</u> What could a snap represent in Geometry? C. Essential Question: How can snaps and movements represent words? D. Teacher and Student Performance Tasks: The snap game as demonstrated by Ping Chong + Company started with a single person in the center. They snap, with their hand close to their chest, then “throw” the snap to someone in the circle, making eye contact, and

	snapping to “point” at them. This person “catches” the snap and “throws” it back to the center. This continues randomly within the circle until the center person decides to end the game. Variations include no person in the center, adjustments for those who cannot snap, and sending multiple snaps. <i>Whole Class Warm-up Snap Game</i> • Version 1 with teacher in center • Version 2 as full circle • Version 3 with smaller groups (2-3 teams per circle) • Version 1 repeats <i>Whole Class Discussion in circle about objectives</i> • Project assignment requirements and “C” rubrics distributed <i>Small Group Work time</i> • Teams choose their vocabulary words • Give them a list or let them brainstorm their own list • Teams should not complete the same words. You can “bid” for words if time allows • Teams create and practice movements and complete Frayer Models E. Final Review: <i>Whole Class</i> • Concentric circles sharing with one student team in the middle • Team’s Frayer Model projected on screen with document camera • Team presents movement together • Reporter reads term and communal (team) definition, explains connections between movements and their definition.
VI. <u>LESSON REFLECTION</u>	As there are so many concepts and vocabulary terms in Geometry as a whole, it is challenging to see enduring understanding without giving a vocabulary quiz. However, the students were talking about the lesson the next day and students in other classes were upset that they did not get to participate. I am planning on revamping how vocabulary is used throughout the rest of the year in all my classes using similar ideas from this lesson. Ideally, I would have three days like this per unit: one at the beginning of the unit, one in the middle and one at the end. You could even give them back their same Frayer Models or give them to other teams to critique.

Snap Geometry

Muse Machine Lesson 2019

- Snap Game
- Frayer Models with Movements
- Grading
 - 1 point for term and spelling
 - 3 points for correct formal definition
 - 3 points for correct Communal (Team) Definition
 - 4 points for Example Movement and Demonstration
 - 4 points for NON Example Movement and Demonstration



Rubric for Evaluation of Class Participation

Performance Elements or Criteria	Inadequate (0 point)	Developing but below expectations (1 points)	Accomplished/ Meets Expectations (2 points)	Exemplary/Displays leadership (3 points)	Score
Level of Engagement and active participation	Student never contributes to class discussion; fails to respond to direct questions	Few contributions to class discussion; Seldom volunteers but responds to direct questions	Proactively contributes to class discussion, asking questions and respond to direct questions	Proactively and regularly contributes to class discussion; Initiates discussion on issues related to class topic	
Listening Skills	Does not listen when others talk, interrupts, or makes inappropriate comments	Does not listen carefully and comments are often nonresponsive to discussion	Listens and appropriately responds to the contributions of others	Listens without interrupting and incorporates and expands on the contributions of other students	
Relevance of Contribution to topic under discussion	Contributions , when made, are off-topic or distract class from discussion	Contributions are sometimes off-topic or distracting	Contributions are always relevant	Contributions are relevant and promote deeper analysis of the topic	
Preparation	Student is not adequately prepared; Does not appear to have read the material in advance of class	Student has read the material but not closely or has read only some of the assigned material in advance of class	Student has read and thought about the material in advance of class	Student is consistently well-prepared; Frequently raises questions or comments on material outside the assignment	

Frayer Model "C" Rubric

This rubric shows what the average student would submit for this assignment.

Category	Completeness	Definitions	Movements	Presentation
Max Point Value	2 points	6 points	8 points	4 points
Description "C" Work	All 5 sections of the Frayer Model are complete	Definitions are correct or have 1-2 small errors including spelling and grammar. Communal (Team) Definition is very similar to formal definition.	Movements are mostly accurate for the example and non-example and/or are partially represented on the Frayer Model.	Definitions are read quietly and/or presenter needs prompted. Movements appear slightly unrehearsed and/or presenters need prompted.

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Frayer Model Teacher Rubric

Team Members Names: _____

Period: _____

Category	Completeness	Definitions	Movements	Presentation
Max Point Value	2 points	6 points	8 points	4 points
Description "A/B" Work	All 5 sections of the Frayer Model are complete, organized, and/or easy to read.	Definitions are correct or have 1 small error including spelling and grammar. Communal (Team) Definition is unique from or similar to formal definition.	Movements are accurate for the example and non-example and are completely represented on the Frayer Model.	Definitions are read without need for prompting with appropriate volume. Movements appear rehearsed and/or presenters do not need prompted.
Description "C" Work	All 5 sections of the Frayer Model are complete	Definitions are correct or have 1-2 small errors including spelling and grammar. Communal (Team) Definition is very similar to formal definition.	Movements are mostly accurate for the example and non-example and/or are partially represented on the Frayer Model.	Definitions are read quietly and/or presenter needs prompted. Movements appear slightly unrehearsed and/or presenters need prompted.
Description "D/F" Work	At least one section of the Frayer Model is complete.	Definitions are mostly correct or have 3 or more small errors including spelling and grammar. Communal (Team) Definition is too similar or identical to formal definition.	Movements are inaccurate for the example and non-example and/or are not represented on the Frayer Model.	Definitions are read quietly and/or presenter needs prompted. Movements appear unrehearsed and/or presenters need prompted.

Comments:

Total score: _____ / 20

BE BOLTS

Announcements:

- Grades updated:
 - 1. Looking ahead to next class again
 - 2. All right, you look back, you ahead
- Pacing: Remind each other
 - 1. L.A.P. 3 days 2) 1/2 of 1/2 understanding
 - 3) 1/2 of 1/2 understanding
 - 4) 1/2 of 1/2 understanding
- P.A.R.K.I.D.A.Y. - Good! at least 1 good!
 - 1. Look at day, especially in school, especially

math.khan.com

Snap Geometry

How to find the answer 2019

- Snap = point
- R = right = segment
- T = top = side
- B = bottom = side

- Snap Game
- Paper Folding with Geometry

