Lesson Title: Using Art to Solve Situational Questions
Course: 6th Grade Mathematics
Designer: Annissa Foster

Learning Outcomes/Intentions

Formal Unit Outcome(s): N6.2 Demonstrate understanding of factors and multiples (concretely, pictorially, and symbolically) including:
• determining factors and multiples of numbers less than 100
• relating factors and multiples to multiplication and division
Indicator(s): h. Solve situational questions involving factors, multiples, and prime factors.

Objective: Students will solve situational questions that involve factors and multiples, using art to deepen and pictorially demonstrate their understandings.

Mathematical Processes: Learners will be able to **communicate** by sharing their findings during the group discussion. Students will use **visualization** to represent concepts involving factors and multiples.

Essential Questions:
Can you use art to solve a situational question involving factors? Can you use art to solve a situational question involving multiples? Can you find more than one way to solve questions involving multiples and factors?

First Nations Content

N/A

Assessment Evidence

Formative Assessments (Assessment for Learning):
Learners will show they achieved the outcomes through mostly informal processes.
Questioning - See below
Students will also be given feedback throughout the lesson through class discussion as the teacher evaluates how students are doing.

Summative Assessments (Assessment of Learning):
N/A

Materials

Power Point
Pencil for each student
Small notebook of unlined paper for each student

Learning Plan

Learning Experiences & Instruction:

Engage:

Have slide show prepared on screen.

The first slide will read “Math is art.” Begin a discussion with the whole class. Allow students to volunteer their answers by raising their hands and being called upon.

Ask: “why might someone agree with this statement?”

Allow discussion. After a few opinions have been made, propose the inverse

Ask: “Why might someone disagree with this statement?”

Allow discussion. Once a few opinions have been made, move to the second slide.

The second shows a picture of numbers written and organized in a unique pattern (below).

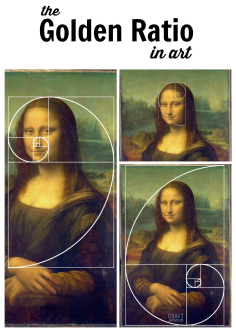
Ask: Can you see any math in this picture? Allow discussion, no need to correct students at this stage.

The third slide shows a clip of “pendulum painting”. (Show students only a minute or two of the video: https://www.youtube.com/watch?v=UlJdwEQwK3c).

Again ask students if they can see any math in the picture? Allow discussion, if needed, prompt students with our discussion of patterns from a previous lesson.

The fourth slide shows a picture of the “Mona Lisa”.

Ask: Do you see any math in this art? Allow discussion. Change slides to another picture of the “Mona Lisa” but this copy has the outline of the “Golden Ratio” over the painting.



Once again ask, “Can you see any math in this picture?” Allow discussion.

Once the discussion has died down, inform the students that they will be making art today in math. But in order to do so, the students will need their own sketchbook. Pass out notebooks to students.

Explore:
Once all students have finished their sketchbooks. Inform students that "As we can see, math can create beautiful art. We enjoy it every day. But we can also use art to help us understand math." Change to the sixth slide. The slide poses the first problem:
Eggs are packaged in cartons of 6. Which of these numbers of eggs can be packaged in a full carton? How do you know?

A) 33 B) 36

Say: "Solving math problems can be a challenge, one way to overcome the challenge is by drawing art. What could I draw to help me understand the problem?" (Answers: Draw out the eggs in cartons of 6)
Demonstrate for students by drawing out one carton of six eggs.
Say: I'm going to represent my picture with a number.
Draw a 6 next to the carton of eggs. Tell students that I will need to draw another carton since I'm not yet close to one of my answers. Draw another carton, and draw an arrow from the 6 next to the first carton, to the second carton and write 12. Repeat this process one more time, completing 18 eggs.
Ask: I could continue drawing, however is there a pattern developing that you notice? (Yes, going up by 6). Does this process remind us of another lesson we've completed? (Finding multiples/skip counting). Which of these numbers can be packaged in full cartons? (36). How do we know? (because we used skip counting to show 36 is a multiple of 6).
Change to the seventh slide. The slide poses the second problem:
Julia and Sandhu bought packages of granola bars. Each package has the same number of bars. Julia and Sandhu each have a total of 12 bars. What is one way the bars could be packaged?
Ask: "What could we draw to help us understand the problem?" (Answers: Draw Julia and Sandhu, Draw the granola bars, I don't know.)
Write down the students' ideas.
Say: I think I'm going to draw Julia and Sandhu (draw them on the board). I also think I'm going to draw 12 granola bars for each of them (draw 12 granola bars for each underneath, which is 24 total). Now, the question states that each package needs to have the same number of bars, so I'm going to group these into even groups and see if I have any left over.
Draw a circle around the bars in groups of 4.
Say: I can see that I will have 6 boxes, each will have 4 granola bars inside, giving me a total of 24 granola bars.
Write the multiplication equation 4x6=24 on the board.
Ask: Does this process remind us of another lesson? (Investigating factors). Can you find another way to group the bars?
Give students a few minutes to come up with their own answers, then discuss them with the class.
Change to the eighth slide. Read aloud the third and fourth question:

Burger patties are sold in packages of 5. Buns are sold in packages of 8. You need about 40 burgers for a barbeque, and you do not want any leftover patties or buns. How many packages of each should you buy? How do you know?
Macy has 36 photos of her favorite gorilla at the Calgary Zoo. She wants to arrange the photos in groups that have equal numbers of rows and columns. What is one arrangement Macy can make?
Have students work independently on these problems, creating their own art that represents the problem.

Reflection