STEM Collaborative Cataloging Project

Bubble Science Lesson Plan

Context (InTASC 1,2,3)

Lesson Plan Created By: Benjamin L. Strand
Created:
Lesson Topic: Rainbow Area/Perimeter (Math & Art)
Grade Level: 3rd Grade
Duration: 90 minutes/120 Minutes (2 sessions)
Kit Contents: http://odin-primo.hosted.exlibrisgroup.com/nmy:nmy_all:ODIN_ALEPH007372996

Desired Results (InTASC 4)

Purpose: The purpose of this lesson is for students do a hands-on activity to explore area and perimeter.

North Dakota Visual Arts Content Standards:

- Visual Arts Standards: Structure and Function
  - 4.2.1 (Kindergarten – Grade 4) Students identify specific visual art elements (such as line, shape, value*, textures, colors, form, and spaces) in a work of art that pertain to its structure.

North Dakota Mathematics Content Standards:

- Measurement and Data: understand concepts of area and relate area to multiplication and to addition.
  - MD. 7b (Grade 3) Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real-world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning.
  - MD. 8 (Grade 3) Solve real world and mathematical problems involving perimeters of polygons.

Objectives:

Students will:

1. Build bubble wands.
2. Solve perimeters of different polygons.
3. Build different polygons.
4. Explain area and how to solve area.
5. Create a bubble drawing using multiple art techniques.

Assessment Evidence (InTASC 6)

Evidence of meeting desired results:

- Oral Assessment with each student.
- Observation of building/solving.

Learning Plan (InTASC 4,5,7,8)

Instructional Strategy: (Check all that apply)

☐ Direct ☑ Indirect ☑ Independent ☑ Experiential ☑ Interactive

Technology Use(s): (Check all that apply)

☐ Student Interaction ☐ Align Goals ☐ Differentiate Instruction ☑ Enhance Lesson

☐ Collect Data ☐ N/A

Hook and Hold:

Let the students know that you will be exploring perimeter and area today using bubbles. Then say "by the way, I know a sweet video that shows giant bubbles in slow motion! But I'm sure you don't want to see that……" Then the kids will probably start begging! Then say "but I'm not sure Mr.Mrs. (principal's name) would like that we are watching that video…" Then they will probably beg even more! Then whisper "If you promise me that we will work super hard, I guess we can sneak it, but it is our little secret!".

- Show them this video: https://www.youtube.com/watch?v=q4BByh4zrWs

Materials:

DAY ONE:

- Bubble Science kit
- Newspaper/paper towels
- Yard stick/tape measure
- Extra straws
- Extra bubble formula
- Tray for bubble formula
- String/Yarn
- Tape
- Rulers
- Pencils for kids
- "Activity Sheet"
- Device with internet connection and projector

DAY TWO:

- Circle shaped objects (to trace)
- Oil Pastels
- Pencils
- Black construction paper
- Device with internet connection and projector
- Printout of Bubble Examples

Procedures:

1. Once you are done with the hook and hold, have the students work on the area/perimeter review on their own. When they are done, have them flip their sheet over!
2. Once everyone is done, go over the examples on the board and get across the point "perimeter = all sides & area = length X width". Remind them that area needs to have the label square units.
3. Collect their review.

4. Lay out newspaper/paper towels on the floor or desk, whichever you will be doing the activity on!
5. Demonstrate how to make the square out of string and straws. Show them how you measure the string to 24 inches. Show them how you cut 2 straws to 6 inches each.
6. Next, show the students how to put the string through the 2 straws and tie it on the end.
7. Once this is done, they can hold the straw pieces (one piece in each hand) and pull it apart until it is in the shape of a square.
8. Explain to them that the perimeter (all sides) is the string and straw! Should be 24 inches.
9. Now tip the square shape in the bubble formula and explain to them that the bubble formula part, or what is inside the string, is the area. "To find area we do length times width". Ask them how long each side is? 6 inches. "So what is the length?" 6 inches "What is the width, or how wide?" 6 inches. "So length, 6 inches, times width, 6 inches, equals what?" 36! "Remember, area is square units, so in this case it is square what?" 36 square inches!

1. Have the students do their own now with a partner or group of 3. Have them measure a string to be 32 inches. Have them cut the straws to 8 inches. Then let them find the perimeter and area. "Don't forget your label!"
2. Repeat this with a 16 inch string and 4 inch straws.
3. Repeat again with whatever lengths you want to do!
4. Once you are done with this, let them create different polygons (triangles, quadrilaterals, pentagons, hexagons, octagons, and decagons) and be ready to share the perimeter of their polygon!
5. To review, find the area of your classroom and the perimeter of your classroom as a whole class using a yard stick or tape measure!

DAY TWO:

1. Review perimeter! Perimeter = all sides
2. Let the students know that you are going to do a drawing of bubbles. Show them pictures of real bubbles using a google search. What do you see?
3. Hopefully the students talk about the colors they see and the shape. If not, talk about those properties.
4. Hand out black construction paper.
5. Let the students know that they can use any of the circle shaped objects to trace to make circles on their black construction paper.
6. The next step is to go over the pencil circles with white oil pastel.
7. Do an example bubble for the students in front of class

showing them that the bubble is symmetrical, because it is reflecting the same thing on the top and the bottom. So for instance, if you put a blue "shiny" on one side, you need to do the same on the opposite.

8. Also show them that there needs to be mostly black on the circle, because they are transparent.
9. Once the students are all done putting "shinny's" on their bubbles, have the students use string to measure the distance around each bubble. Then have the students measure the string to find the perimeter of each bubble.
10. Have the students put the perimeter of each bubble in small print inside the bubble.
11. Display the bubbles in the classroom as a perimeter review!

- **Summary:** In this two day lesson plan, students will use kinesthetic activities to learn and interact with perimeter and area. They will use rulers to measure distances and use the proper formula (add all sides, or multiply length times width) to solve problems. They will also do an art project and use their perimeter knowledge to measure the perimeter of their bubbles in their art project.

Reflection (InTASC 9)

Reflect On:

- *Preparation*
- *Planning*
- *Teaching*
- *Student Engagement and Participation*
- *Evidence of Student Learning*

Standards

Council of Chief School Officers. (2011, April) *Interstate Teacher Assessment and Support Consortium (InTASC) model core teaching standards: a resource for state dialogue*. Washington DC. Retrieved from http://www.ccsso.org/documents/2011/intasc_model_core_teaching_standards_2011.pdf

North Dakota Department of Public Instruction. (2011) *North Dakota English mathematics content standards.* Bismarck, ND. Retrieved from https://www.nd.gov/dpi/uploads/87/math.pdf

North Dakota Department of Public Instruction. (2000) *North Dakota visual arts content standards.* Bismarck, ND. Retrieved from https://www.nd.gov/dpi/uploads/87/visual_arts.pdf

This project was made possible in part by the Institute of Museum and Library Services. [SP-02-15-0044-15]