Title: City Planners

Subject Matter Emphasis and Level: Understanding communities, understanding area and perimeter; Third grade

Author: Kim Phillips

School District: Chamberlain

Email: kim.phillips@k12.sd.us

Brief Description of the Lesson/Unit:

Students will choose a community to represent in 3-D form. Communities will be chosen based on those we’ve studied in social studies. Students will determine perimeter and area of the community. Students will create a blueprint of their community. Finally, students will use a scale drawing to construct a three-dimensional model of their community.

SD Content Standards:

3.G.1.1. Students are able to recognize and compare the following plane and solid geometric figures: square, rectangle, triangle, cube, sphere, and cylinder.

3.M.1.4. Students are able to select appropriate units to measure length (inch, foot, mile, yard); weight (ounces, pounds, tons); and capacity (cups, pints, quarts, gallons).

3.G.1.1. Students are able to identify and use map components.

3.G.2.1. Students are able to identify reasons people move and how it affects their communities.
Stage 1: Identify Desired Results

1. What enduring understandings are desired?

There are real life applications for mathematical and social studies concepts. There are many different types of communities. Communities exist in various forms (urban, suburban, and rural). Students will demonstrate the use of area and perimeter in creating a community.

2. What essential questions will guide this unit and focus teaching/learning?

How are mathematical concepts like area and perimeter useful in the real world? How does understanding communities effect ones role as a community member? What planning must be done in developing the physical layout of a community?

3. What key knowledge and skills will students acquire as a result of this unit?

Students will appreciate the real life application for math and social studies. Students will have a greater knowledge of perimeter and area. They will apply that knowledge in the construction of a three dimensional community. Students will be able to identify 2 and 3 dimensional shapes. Students will display the physical components of a community.

4. What prior learning, interests, misconceptions, and conceptual difficulties might be brought to this unit?

Students should have some experience with perimeter and area. Understanding scale and using a blueprint to make a 3-D model may pose some challenges. Work space may also be challenging. A large work space will be required to work on and store the projects. Materials to serve as 3-D representations will come from home. Students will work with a partner for some steps of the process. They will each have the opportunity to create their own final product. Ability will be considered in grouping students.

Stage 2: Determine Acceptable Evidence

1. What evidence will show that students understand?
Performance Tasks:

- Activity sheets
- Blueprint
- Hands-on work with geoboard Activity
- 3-D model

Other Evidence:
A checklist with dates will be used to guide students through the process. A rubric for both the blueprint and the 3-D model will be used to assess those steps.

Unprompted Evidence: (observations, dialogues, etc.)

- Conferences about blueprints
- Teacher observation

Student Self-Assessment

- Conversations with partner

Stage 3: Plan Learning Experiences and Instruction

1. What sequence of teaching and learning experiences will equip students to develop and demonstrate the desired understandings?

Major Learning Activities:

1. The teacher will introduce the project by reading *How a House is Built* by Gail Gibbons and *Building a House* by Byron Barton. We will also go over the checklist to familiarize students with the steps involved in the process.
2. The city engineer will visit our classroom and share maps and blueprints and talk about how his job and mathematics are related to his work. Students will discover the uses of geometry and measurement in planning a city. They will also begin to understand scale through the viewing of the maps and blueprints.

3. Next, teacher and students will look through social studies text for examples of communities. In small groups, students brainstorm components of different communities and list in three categories (urban, suburban, rural).

4. Students develop strategies for finding the perimeter and area for rectangles and triangles using geoboards and graph paper. Students learn to appreciate how measurement is a critical component to planning their community.

5. From their work with geoboards, students draw a two-dimensional blueprint of their community using graph paper.

6. Students will use various objects found at home or school to build a three-dimensional model form their two-dimensional blueprint. Objects will represent features of the community.

**Materials & Resources (technology & print):**

- Activity sheets (some modifications will need to be made to make sheets appropriate for a community project) found at: illuminations.nctm.org (lessons, 3-5, Junior Architects)
- Geoboards and geobands
- Geoboard E-Example available on the NCTM web site
- 1-inch graph paper
- Materials for construction of 3-dimensional model (clay?, empty containers from home, geometric nets, poster board or foam board)
- Someone, either a contractor or city engineer to visit us
- Maps and blueprints
- Rubrics
- Checklist

**Management:**

Modeling
Planning sheets to guide the process
Peer helper
Time line of steps

**Support Services and Special Teacher Notes:**
Teacher chooses partners for this project

**Extensions and Adaptation:**

This project will require much modeling and constant checking on student understanding and progress. Insist that students keep up with deadlines.

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**Stage 4: Plan Differentiation**

2. **What differentiated instruction strategies are being used in this lesson/unit?**

**Differentiated Process:**

- Planning sheets
- Graphic organizers
- Student selection of community
- Multiple intelligence:
  - Verbal-linguistic: discussion with partners and teacher-student conferences
  - Logical mathematical: work with perimeter, area and scale
  - Visual-spatial: blueprint, using manipulatives to create 3-D model
  - Bodily-Kinesthetic: hands-on projects (geoboard work)
  - Interpersonal: discussion with partner
  - Intrapersonal: choice of community allows students to “place” themselves in the community they choose.
  - Naturalist: choice of community allows students to “place” themselves in the community they choose (Urban).
**Differentiated Content:**

Peer assistance
Visual work
Hands-on construction

**Differentiated Product:**

Student choice of community to represent
Student choice of materials
Hands-on work
Interest