

PROJECT 2EXCEL CURRICULUM TEMPLATE MATHEMATICS

“What’s the ME in Measurement?” Grade 3
Unit: Volume and Surface Areas, Chapter 3, Lesson 3
Karen Rogers Edition

OVERARCHING PROGRAM MODEL: *Mentoring Mathematical Minds* series (M^3) – framework that identifies big mathematical ideas, explores a mathematical concept through real world material manipulations followed by development of theoretical concept, using mathematical language. Students are required to investigate a concept through exploration activities, and then communicate their understanding through writing (Mathematician’s Journal) and discussion. For this unit on volume and surface area, the concept goals include: (1) *understanding the concepts of volume and capacity*; (2) *using base two conversions within the English system of volume measurement*; (3) *using benchmarks to estimate measurements and conversions*; (4) *matching mathematical understanding with application*.

ACADEMIC COMPONENTS:

- Measurement and estimation applications
- Reflections on own questions about concept
- Small and whole group discussion on conceptual questions

INTERDISCIPLINARY CONNECTIONS: Science (cooking), Mathematics (measurement), Language (writing)

GIFTED EDUCATION COMPONENTS:

- **Complexity** – different ways to make 72 gallons of lemonade, using Colonial American volume measurement systems; also measuring displacement of ice cubes when measuring volume of lemonade (must measure both volume of ice cubes and liquid; also, measuring surface area of table and constructing patchwork tablecloth for party of colored paper
- **Methods of Inquiry** – Using conversion charts
- **Evaluation** – thinking beyond cards on frosting a cake
- **Real World Problems/Applications** – lemonade and cake for a party

EMOTIONAL/SUPPORT COMPONENTS:

- Persistence with Think Beyond reflections
- Reflection on own understanding in mathematician's journal

BEHAVIORAL COMPONENTS:

- Planning and thinking ahead
- Flexibility – trying things different ways
- Cooperating with others in party planning

SOCIAL COMPONENTS:

- Throwing the party
- Thinking about what others would enjoy (empathy)
- Considering others' needs and preferences
- Providing options for individual or group party
- Including all members of class in a dynamic way –discussion of feelings of inclusion and exclusion concerning parties
- Measuring surface area required for personal comfort zone (elbow room) with discussion of various student measurements

PHYSICAL LEARNING ENVIRONMENT MODIFICATIONS:

- Making actual model of cake using 1-unit cubes
- Baking and frosting an actual cake
- Building a model of two cakes with the same volume but different shapes to see if surface area is the same
- Building cakes with marshmallows and measuring volume and surface areas