Building Lessons for All Students

Gallery Workshop for Grades 9-12

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Lesson Design Overview

Thinking Skills Objectives – Big Picture

Mastery Objectives – What to *KNOW* and *DO* – Curriculum

Involvement – Developing and Maintaining Engagement

Activities –What to do to develop skills/understanding

Coverage – Skill or Concept

WHY

Introduction

- What are the Essential Questions that students should answer as part of the Enduring Understanding (or the larger concept)? These are sometimes identified in curriculum framework.

WHAT

- Statement of Objective: Indicators for what students should know and be able to do.
- Rationale: *Why* or *how* the concept fits into the larger content, perhaps with real world connections.

HOW

- Specifics: Statement of time frame, materials, agenda
- Pre-assessment: Finding out what students know or can do already – oral questioning, quick list, warm-up, differentiation preparation.
- Vocabulary: Clarify terms of possible confusion and conduct activities to promote comprehension of terms.

Engagement/Instruction

- Activities: Graphic organizers, flow charts, time lines, task size (individual, paired, or group), reading passages, video clips, responding to questions, reporting, practice exercises, prompts, development of rubric, portfolio activities, differentiation, enrichment
- Checking for Understanding: Planned breaks in flow to confirm understanding – oral questioning, show of hands, pre-arranged signals

Assessment

- Determining comprehension or mastery: Oral questioning, graded or ungraded written response, quiz-test, checklist for understanding, rubric, differentiation occurs [formative and summative]

Closure

- Summarization of events and concepts, verbal or written connections beyond lesson, response to Essential Question (not always possible)
- Business: Homework, scheduling, future tasks, announcements

Written and Taught Curriculum

Assessed Curriculum

Sources: *Understanding by Design* and *The Skillful Teacher*, as well as personal experience

Topic: _____

Introduction

WHY

- Essential Question(s):
- Enduring Understanding:

WHAT

- Statement of Objective:
- Rationale:
- Specifics:
- Pre-assessment:
- Vocabulary:

Engagement/Instruction

HOW

- Activities:
- Checking for Understanding:

Assessment

- Determining comprehension or mastery:

Closure

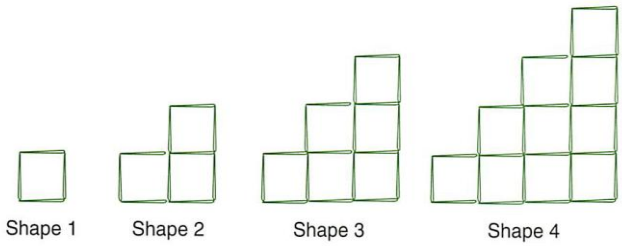
- Summary:
- Business:

Written and Taught Curriculum

Assessed Curriculum

Sources: *Understanding by Design* and *The Skillful Teacher*, as well as personal experience

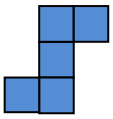
Building with Toothpicks

STAGE ONE	 1. Use a pattern from the shapes to determine the perimeter of the fifth shape in the sequence. Show or explain how you arrived at your answer. 2. Write a formula that you could use to find the perimeter of any shape *n*. Explain how you found your formula.
STAGE TWO	3. Create a table and a graph of the first seven shapes in the pattern. What rule did you use to continue the pattern? Explain how you determined your rule. 4. How would the pattern differ if you used triangles instead of squares?
STAGE THREE	5. Determine the explicit and recursive formulas for finding the perimeter of the n^{th} figure. 6. What would be the perimeter of the 100^{th} figure?

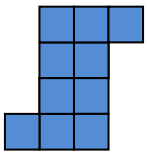
Activity adapted from *Friel, S., Rachlin, S., Doyle, D., Nygard, C., Pugalee, D., & Ellis, M. (2001). Navigating through Algebra in grades 6-8. Reston, VA: NCTM.*

Sequence of Tiles

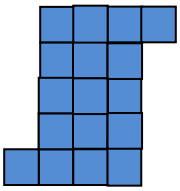
STAGE ONE



Shape 1



Shape 2



Shape 3

1. Use a pattern from the shapes to determine the number of tiles in the fourth shape in the sequence. Show or explain how you arrived at your answer.

2. Write a formula that you could use to find the number of tiles in any shape *n*. Explain how you found your formula.

STAGE TWO

3. Create a table and a graph of the number of tiles in the first seven shapes in the pattern. What rule did you use to continue the pattern? Explain how you determined your rule.

4. How would the pattern differ if you used triangles instead of squares?

STAGE THREE

5. Determine the explicit and recursive formulas for finding the number of tiles in the n^{th} figure.

6. What would be the number of tiles in the 100^{th} figure?

Activity adapted from *Friel, S., Rachlin, S., Doyle, D., Nygard, C., Pugalee, D., & Ellis, M. (2001). Navigating through Algebra in grades 6-8. Reston, VA: NCTM* and Friel, S. N., & Markworth, K. A. (2009). A framework for analyzing geometric pattern tasks. *Mathematics Teaching in the Middle School*, *15*(1), 24-33.

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