

# DOINGWHATWORKS



## Slideshow

FULL DETAILS AND TRANSCRIPT

### The Power of Worked Examples

Kettle Moraine High School, Wisconsin • March 2008

Topic: How to Organize Your Teaching

Practice: Examples With Practice

#### Highlights

- Alternating between worked examples and student practice allows teachers to efficiently correct misconceptions and target particular areas of struggle.
- It is important to walk through the key steps of a process in explaining a worked example to students.
- Teachers should use a “fading” approach for worked examples to gradually increase the skill level and confidence that students have to solve problems.
- Including variation in the types of practice problems given to students helps them learn new concepts better.

#### About the Site

Kettle Moraine High School

Wales, WI

#### Demographics

96% Caucasian

2% Hispanic  
1% African American  
1% Asian  
10% Special Education/Disabled  
4% Eligible for Subsidized Lunch  
99.6% English Proficient

Mathematics teachers at Kettle Moraine High School adopted a new curriculum in 2004 to promote student mastery of concepts over time and to target support for students who typically struggle with traditional algebra and geometry programs. Distinctive features of the department's new approach to mathematics include:

- requiring students to explain their thinking and process for solving problems, both orally and in writing,
- use of manipulatives, visuals, and real-life scenarios to make abstract mathematical concepts more concrete,
- alternating worked problems with student practice when introducing new material,
- use of daily quizzes to review topics introduced days or weeks earlier,
- homework sets and tests designed to include at least 50% review topics,
- spiraling curriculum where new units build on concepts from previous units, and even previous courses, and
- Math Lab staffed by teachers throughout the day to support struggling students and strategic review of material.

## Full Transcript

Presentation Title: The Power of Worked Examples

Kettle Moraine High School, Wales, Wisconsin

Geometry teacher Mike Comiskey designs his lessons so that worked examples alternate with problems for students to practice on. This allows students to efficiently correct misconceptions and areas of struggle as they arise. In this lesson, Mr. Comiskey uses this approach to introduce the concept of linear scale factor.

Slide #1: The Hands-On Hook

Before he models the first worked example, Mr. Comiskey begins with a hands-on activity the students can complete without knowing the formula they are about to learn. He gives them triangular flags of different sizes, with double triple, or quadruple base lengths of the smallest triangle. By moving them around,

students find that they can fit four small flags into the medium flag, nine into the large, and sixteen into the largest triangle. This activity introduces his students to the concept of linear scale factor and how to calculate the areas for similar triangles of increasing size.

#### Slide #2: Walking through a Worked Example

Mr. Comiskey shows the correlation between the increase in side length and the increase in area of the triangles the students had been working with. He models how to use the drawings and calculations that are useful in these kinds of geometry problems.

#### Slide #3: Fading Examples into Problems

“Fading” examples gradually transition students from observing fully worked examples to completing problems without any aid. In this practice problem, Mr. Comiskey provides only the drawings and lengths of the sides. Students must calculate the areas and determine the linear scale factor without any other teacher input. By requiring students to provide an increasing percentage of the later steps to a problem, students build confidence and expertise. Teachers can also take note of which steps students struggle with and review them with the class.

#### Slide #4: Providing Variation in Practice

As students learn mathematical concepts, it’s important to provide examples and practice problems that introduce complicating factors. While this may put more stress on students as they grapple with new concepts, research shows that it pays off in better understanding and post-test performance. Here, Mr. Comiskey introduces problems involving irregular shapes to the class. As his students apply their understanding of linear scale in this new context, he reinforces the main concept of correlating side length with area for similar shapes.

#### Slide #5: The Immediate Impact

Instead of waiting to see the results of eight practice problems to discover any misconceptions or struggles, Mr. Comiskey has gone back and forth between demonstrating a worked example and having his students practice with a similar problem. After 20 minutes, his students are ready to apply what they’ve learned to a new set of homework problems about linear scale factors. If they realize that they need more support with this type of problem, an online tutorial is available to provide step-by-step hints and solutions to the homework problems assigned from the textbook.