
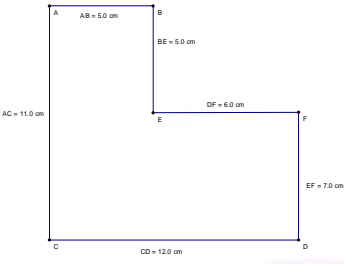



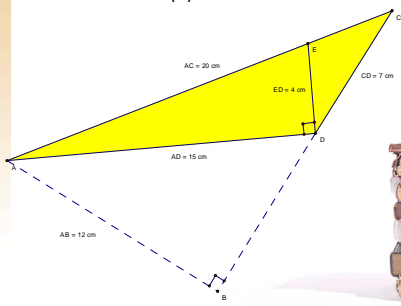

Creating Effective
Mathematics Concept Lessons
Session 4



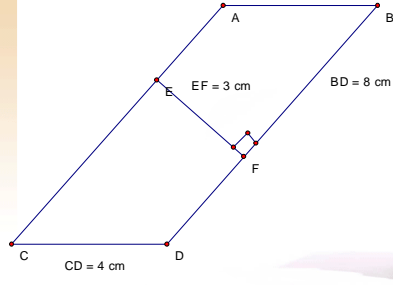

A little "pop quiz"
Find the Area (1)

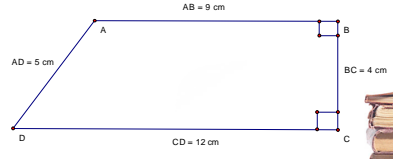

A little "pop quiz"
Find the Area (2)

A little "pop quiz"
Find the Area (3)





A little "pop quiz"
Find the Area (4)

Let's return and check our answers

- What did you know?
- What didn't you know?

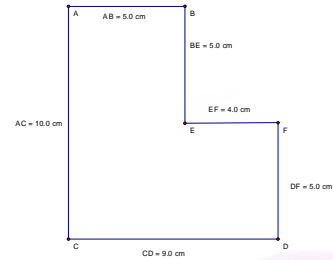


My turn to teach mathematics!

- Please know that typically I would have LARGE sheets with the figure already drawn on it...however short notice precluded bringing these materials.
- Let's look at a problem similar to the first problem on the quiz. Sketch this out on paper.



New Area problem to try



Directions

- Find the area of the given figure. Explain in words and in symbols (show a mathematical equation) how you found the area.
- Once you have found one way, try to figure out other ways you can find the area.

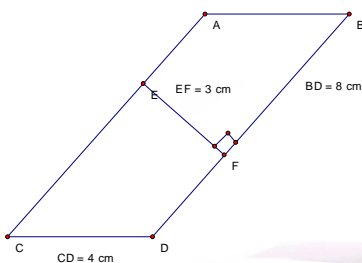


REPORT

- Report the different ways you've found (I'll show on the computer)
- Categorize the different ways into two or three groups
- Name the categories
- Why will these work?



Use one of your methods to find the area of the following



A Concept Lesson

- Planning this type is not easy – but WELL worth the reward.
- BONUS –You don't have to spend four days reviewing, in fact, finding the area of ANY figure becomes much easier.
- Concepts build on one another



How do we do this?

- A short story about my life...
- Japanese Lesson Study
- Iron sharpens Iron



Need to know the concept

- Addition is...
- Subtraction is...
- Multiplication is...
- Division is...
- Fractions are...
- Decimals are...



Tools to find out more

- Mathematics Journals
- Your school's upper level math teachers
- Internet resources
- Take a college course



Key Questions

1. How can I help students use what they already know in order to help them build up an understanding of what they are trying to learn?
2. What building blocks help form the basis for understanding a particular concept?
3. What manipulatives can be used to help students have a concrete example of the abstract notion?



Interactive Model

- Motivation: A problem that uses prior knowledge but goes far enough to leave the students wondering.
- Area lesson – Figure over graph paper. How could I figure out the number of blocks without counting?




Interactive Model

- Input
 - Activities to let the students begin to explore the nature of the concept with which you are working.
 - Area Lesson: Finding as many different ways to do this. (Key was to have a "clue" question prepared to move them beyond non-creative thinking)




Interactive Model

- Processing Activities
- THESE ARE KEY!
- An activity that the *students* do to organize, summarize, make sense of what they have been doing.
- Area Lesson: Categorizing the different ways or journaling what they learned




Interactive Model

- Assessment
- Check to make sure they got it.
- Area Lesson – try out your method on the parallelogram





What other concepts?

- FRACTIONS
 - What is it? → Equivalent → Comparing fractions → Adding/Subtracting (CD) → Multiplication → Division
- Measurement
 - What is a each type of measurement? (linear, area, space) → Why use a standard unit? → What units do we use? → SKILLS



Where can you find out more?

- *Elementary and Middle School Mathematics* by John M. Van de Walle
 
- *Teaching Student-Centered Mathematics* (Either K-3 or 5-8) also by John Van de Walle
 
- The MANY Reform curricula:
(Everyday Mathematics, Mathematics Trailblazers, Investigations)

