

Friday, October 14th Agenda

- Ten Card Puzzle Warm-up
- Finish Math Curse pages
- Swap and read Student Interview questions
- Levels of Cognitive Demand – What are they? What do they mean?
- Math FACT project

Levels of Cognitive Demand

Memorization Tasks

- Learned facts, rules, formulae or definitions or committing them to memory
- Cannot be solved using procedures because a procedure does not exist.
- have no connection to concepts or meaning

What is 6×5 ?

What are the decimal and percent equivalents for the fractions $\frac{1}{2}$ and $\frac{1}{4}$?

What is the formula for calculating area?

What is a polygon?

Procedures Without Connections Tasks

- Algorithmic. Use of the procedure is evident based on prior instruction
 - Requires limited cognitive demand. There is little ambiguity about what needs to be done and how to do it.
 - Focuses on producing 'right' answers rather than developing understanding
 - Requires no explanations, or explanations that focus solely on describing the procedure.
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Write $\frac{5}{8}$ as both a fraction and a decimal.

What is the area of a 6 x 9 rectangle?

What is the perimeter of a square with a length of 6' ?

List the factors of 24.

$$37 + 54 =$$

Procedures With Connections Tasks

- Focus students' attention on using procedures for the purpose of developing understanding
- Procedures have a connection to the underlying concepts
- Usually are represented in multiple ways – diagrams, manipulatives, symbols, problem solving situations
- Require cognitive effort. Although general procedures are followed, they cannot be followed mindlessly. Students need to engage with the conceptual ideas that underlie the procedures to successfully complete task.

Using a hundreds chart, add $25 + 13$

Shade the decimal square to show $.3$

Model $34 + 82$ with place value blocks to find the sum

Draw an array to find the product of 7×8

Draw a rectangle to find the perimeter of a rectangle with a length of 7" and width of 5".

Johnny left home at 7:35 a.m. He arrived at the park 45 minutes later. Use the clock to find out what time Johnny arrived at the park.

'Doing Mathematics' Tasks

- Require complex and non-algorithmic thinking. There is not a predictable, well-rehearsed approach explicitly suggested by the task, task instructions, or a worked-out example.
- Require students to explore and understand the nature of mathematical concepts, processes or relationships
- Require students to access relevant knowledge and experiences and use them to complete the task.
- Require students to analyze the task and actively examine the constraints that may limit possible solution strategies and solutions.

- Require students to monitor, analyze and examine their own cognitive processes.
 - Require considerable cognitive effort and may involve some level of anxiety for the student due to the unpredictable nature of the solution process required.
 - Tasks are non-routine in nature, are intended to explore a mathematical concept in depth, embody the complexities of real-life situations, or represent mathematical abstractions.
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Your school's science club has decided to do a special project on nature photography. Members decided to take a little over 300 photos in a variety of natural settings and in all different types of weather. Eventually they want to display their best photos and enter the State nature photography contest. The club was thinking of buying a 35mm camera, but someone in the club suggested that it might be better to buy disposable cameras instead. The regular camera with autofocus and automatic light meter would cost about \$40.00 and film would cost \$3.98 for 24 exposures and \$5.95 for 36 exposures. The disposable cameras could be purchased in packs of three for \$20.0 with two of the three taking 24 pictures and the third one taking 27 pictures. Single disposables could be purchased for \$8.95.

The club officers have to decide which would be the best option and they have to justify their decisions to the club advisor. Do you think they should purchase the regular camera or the disposable cameras? Write a justification that clearly explains your reasoning.