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Week 3 Math Quiz

Prof:- Dr. Ruiz

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### **Question #1**

**What are at least three shortcomings of the teach by telling approach?**

1. Students get the idea that there is only one way to solve a problem which misrepresents the field of mathematics. Students who may want to explore and do things their own way or try different approaches will feel disempowered.
2. Students become passive learners, dependent on the teacher to present ideas and solutions, rather than independent thinkers with the ability to problem solve on their own.
3. Students are less likely to attempt a new problem, without explicit instructions on how to solve it.
4. It assumes that all students have the necessary background knowledge to understand the teacher's explanation, which is rarely the case.

### **Question # 2**

**Give an example(your own) of a math problem with multiple entry and exit points.**

At a bike show Mary saw 3 wheel bikes(tricycles) and two wheel bikes. She counted 25 wheels all together. How many bikes and tricycles were there?

OO - represents a two wheel bike, and OOO - represents a three wheel bike

OO OO OO OO OO OO  $5 \times 2 = 10$  wheels = **5 bikes**

OOO OOO OOO OOO OOO  $5 \times 3 = 15$  wheels = **5 tricycles**

$10$  wheels +  $15$  wheels =  $25$  wheels

**Or**

OO OO OO OO OO OO OO OO  $8 \times 2 = 16$  wheels = **8 bikes**

OOO OOO OOO  $3 \times 3 = 9$  wheels = **3 tricycles**

$16$  wheels +  $9$  wheels =  $25$  wheels

**Or**

OO  $11 \times 2 = 22$  wheels = **11 bikes**

OOO  $3 \times 1 = 3$  wheels tricycle = **1 tricycle**

### **Question #3**

#### **What is the role of literature in the math classroom?**

Children and adolescent literature are great sources of problems. Pictures, poems, books and media can be used to create high cognitive demand tasks with multiple entry points. An example of literature lending itself to mathematical problems is the children's picture book "Two of Everything" In this folktale, a couple finds a magic pot that doubles whatever is put into it. Students can explore several math problems pertaining to doubles. Teachers can ask students

how many boys/girls will be in the class if they were put in the magic pot. Nonfiction literature (picture books, newspapers, magazines and the web) have the added benefit of students learning about the world around them. Literature connects math to real life and books connect math to other subject areas.(Van de Walle et al., 2019)

**Question # 4**

**Anthony is knitting scarves for gifts for his sister. Each scarf is one yard long and he knits  $\frac{1}{4}$  of a scarf each day. How long will it take him to make 3 scarves? What are two different ways to solve the scarf problem?**

Day 1 $\frac{1}{4}$ scarf	Day 2 $\frac{1}{4}$ scarf	Day 3 $\frac{1}{4}$ scarf	Day 4 $\frac{1}{4}$ scarf
Day 5 $\frac{1}{4}$ scarf	Day 6 $\frac{1}{4}$ scarf	Day 7 $\frac{1}{4}$ scarf	Day 8 $\frac{1}{4}$ scarf
Day 9 $\frac{1}{4}$ scarf	Day 10 $\frac{1}{4}$ scarf	Day 11 $\frac{1}{4}$ scarf	Day 12 $\frac{1}{4}$ scarf

Each color represents a scarf. There are 4  $\frac{1}{4}$  in a whole scarf so each scarf is divided into 4 equal parts. Since Anthony knits  $\frac{1}{4}$  scarf each day, by assigning a day to each quarter, we'll know how many days it will take him to knit 3 scarves.

$$1 \text{ scarf} = 4 \text{ days so } 3 \text{ scarves} = 4 \times 3 = 12 \text{ days}$$

Or

**Division of fractions** - Anthony knits a  $\frac{1}{4}$  scarf each day. To find out how long it will take him to knit 3 scarves, we need to find out how many  $\frac{1}{4}$  are in 3. This is done by division.

Using the keep, switch, flip strategy we divide.

$3 \div \frac{1}{4}$  becomes  $3 \times 4$  (multiply by the reciprocal) = 12

Answer is 12 days.

### **Question # 5**

**How does a teacher decide what student learning objectives should be used for a given lesson? In other words, where do these objectives come from?**

The CCSS in Math provides teachers with the content and skills that students need to know by the end of the school year. When deciding what learning objectives should be used for a given lesson, teachers should use the standards as a guide in determining the learning objectives. By breaking content into daily tasks all content and skills will be covered. Student learning objectives are measurable learning outcomes that students should be able to do by the end of the lesson. Determine what content is important and what mathematical processes or practices will be developed. For example, students will be able to explain the relationships between area and perimeter. Other considerations that go into what learning objectives should be used are:-

1. **Consider your students' needs** - determine the student's background knowledge and prior experience on the topic. What do they already know about the topic? Is the lesson based on a new concept, or is it a continuation of previous lessons, where students' level of some mastery has already been assessed. Make sure that the objectives are not out of reach for students, especially those with learning disabilities. It should also be age appropriate.

2. **Select, design or adapt a worthwhile task** - Does the task reflect the content goals and needs of the students? Does it have potential to engage the students in the Mathematical Practices? Will the task require students to apply problem solving strategies? The answer should be yes to all the above. If the task does fulfill all the requirements, then it should be modified or find a new task.(Van de Walle et al., 2019)

Van de Walle, J. A., Karp, K., Bay-Williams, J. M., Wray, J. A., & Elizabeth Todd Brown. (2019). *Elementary and middle school mathematics : teaching developmentally* (10th ed.). Pearson.