



A Partner in Education
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Plankton Puzzle

Math Post Activity for 7th Grade

This activity meets the following benchmarks:

111.23 Mathematics, Grade 7

- 7.12 (A)
- 7.13 (A) (B)

Objectives:

- Students will learn about cell counting.
- Students will be able to estimate the amount of plankton in a sample of water.

Time: 45 minutes

Materials:

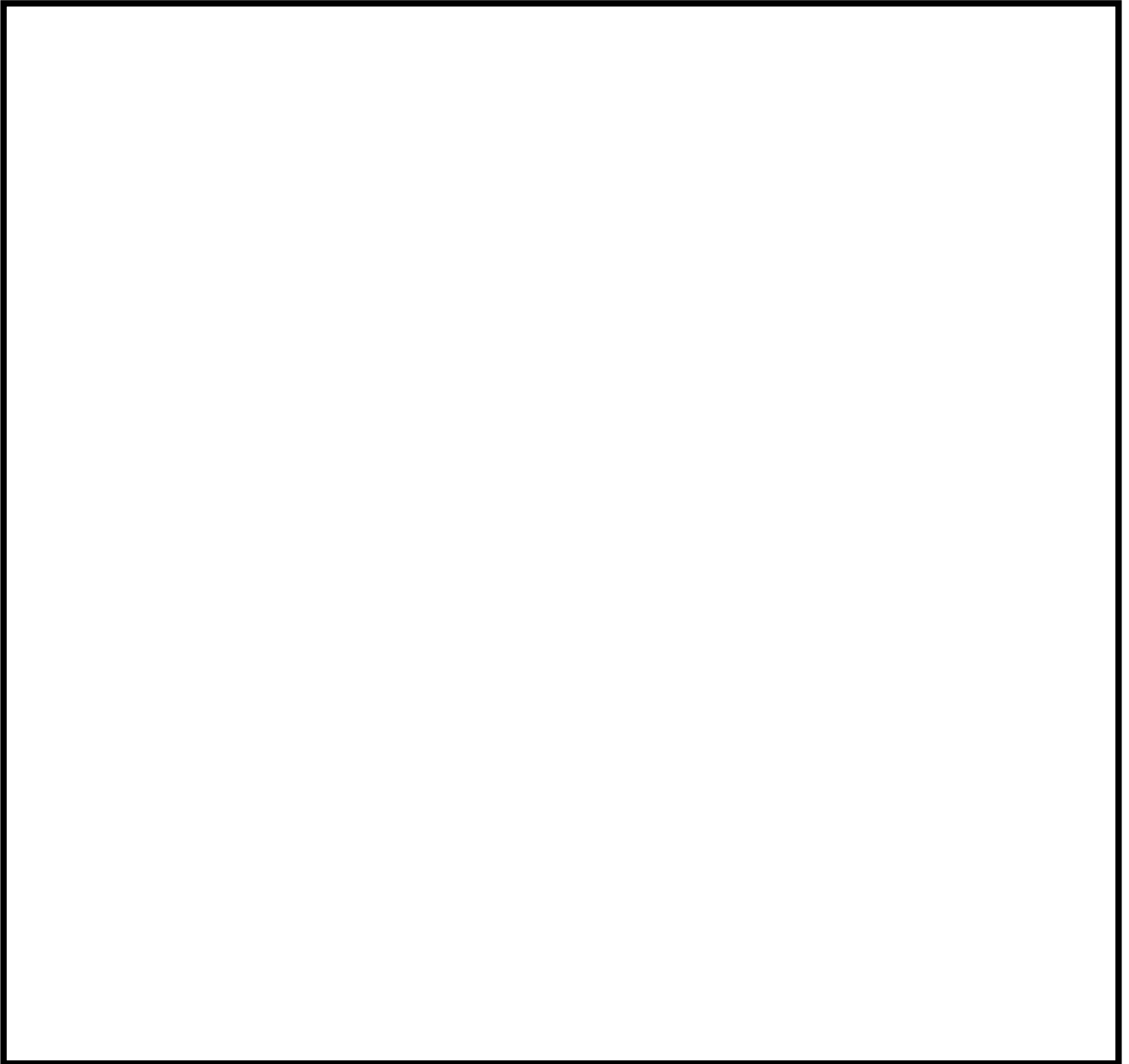
- 1 cup of mixed sequin (blue, green, gold, red, silver, misc color)
- Measuring cup
- Measuring spoon
- *Cell Counting Grid* (1 per student)
- *Answer Worksheet* (1 per student)
- Calculators

Procedure:

1. Pass out one *Cell Counting Grid* worksheet and one *Answer Worksheet* to each student.
2. Place entire bag of sequin in a measuring cup.
3. Place 1-2 tablespoons of sequin on each grid.
4. Have the students follow the directions on the *Answer Worksheet*.
5. Once numbers 1 and 2 have been completed on the *Answer Worksheet*, label the chalkboard with the colors of the plankton and have students come up one at a time to write their sums on the chalkboard.
6. Elect one student to add up the sums of each color from the entire class.
7. Have the students complete the rest of the activity on their worksheet.
8. At the end, explain how this method can be used to determine the numbers of plankton in a large amount of water, such as an area of the oceans.

Cell Counting Grid

Note: The square represents one cell from the haemocytometer grid.



Answer Worksheet

1. Count the different colors of sequin on the grid, (representing different species of plankton), and write their numbers in the table below.

Plankton Type	Number Counted in Grid
Blue	
Green	
Gold	
Red	
Silver	
Other (misc colors)	

2. Determine the numbers of each type of plankton per milliliter (ml) using the formula below, "X" represents the different types of plankton.

$$X (10)^4 = \# \text{ of plankton per ml}$$

Plankton Type	Amount per milliliter (ml)
Blue	
Green	
Gold	
Red	
Silver	
Other (misc colors)	

For example, if I counted 8 red pieces of sequin on my grid, to determine the amount of red plankton animals in 1 milliliter of water:

$$8(10)^4 = 8 (10*10*10*10)$$

$$10*10*10*10 = 10,000$$

$$10,000*8 = \mathbf{80,000 \text{ red plankton in 1 ml of water.}}$$

3. Using the values from the chalkboard, write the total number of plankton (class count) of each type in the table.

Plankton Type	Total Number Plankton (class count)
Blue	
Green	
Gold	
Red	
Silver	
Other	

4. Use the formula below to determine the average number of each kind of plankton per ml.

$$\frac{\text{Sum } X}{N} = \text{Average number of plankton per ml}$$

N= Sample size (number of students in the class)

X= Plankton

Plankton Type	Average Number of Plankton per Milliliter
Blue	
Green	
Gold	
Red	
Silver	
Other	

For example, if there was a total of 200 red plankton, and there were 25 students in the class, then the average per ml would be:

$$\frac{200}{25} = 8 \text{ red plankton per ml on average}$$

5. From the table in question 4 we know the average of each type of plankton per ml, now determine total numbers of each type of plankton in the entire cup of sequin. Use the formula below to calculate this.

If 1 cup = 256 ml, then
 $256 * X =$ total of all plankton X in entire sample

Type of Plankton	Total Number in Entire Sample
Blue	
Green	
Gold	
Red	
Silver	
Other	

For example, if there was an average of 8 red plankton for 1 ml of water, then the total number of red plankton for the entire sample would be:

$8 * 256 = 2.048$ red plankton per cup

6. After determining the amount of plankton in 1 cup of sampled 'ocean water', what kind of conclusion could you make about the health of the water from which the sample was taken? Use the space below to make a conclusion.