Name _____ Date _____

MATH EXTENSION—PROBLEM OF THE WEEK

Investigation 1: Environmental Factors

1. A girl made a ladybug cage. Her cage has five sides. Each side has a length of 28 centimeters (cm). The cage is 20 cm high. What is the shape of her cage's base called? What is the perimeter of the base?

2. A boy wants to build rectangular beetle cages to study beetle behavior. He wants all the sides on the base of his cages to be at least 10 cm long. He also wants the base area to equal 576 cm^2.

   The boy needs help to find all the possible lengths and widths for the base of the cages. He used only whole centimeters to measure, with no fractional parts.

   What are all the possible dimensions for the rectangular base?

   The boy has decided to make the height of each cage 10 cm. If he fills the container to capacity, how much soil will he need for each cage?

Name _____ Date _____

MATH EXTENSION—PROBLEM OF THE WEEK

Investigation 2: Ecosystems

A student wants to set up a tropical-fish aquarium. She has $20.00 to spend on the fish. The store has four types of fish for her tank. She wants at least one of each type of fish. There is no tax charged on fish. She wants to have $2.00 or less left after she buys all of her fish.

Type of fish	Cost per fish	Length of fish
Angelfish	$2.98	7 cm
Lampeye	$1.59	3 cm
Mollies	$1.35	4 cm
Neon tetras	$1.70	2 cm

a. What combination of fish could she buy? How much money will she have left? Show all your work.

b. The student's parents agreed to buy the aquarium tank for her new fish. The student remembers from her aquatic-environments project that tropical fish need 1 liter of water for every 3 centimeters (cm) of fish length in the aquarium. What size aquarium in full liters do her fish need? Show your work.

Bonus problem

Can you find another combination of fish the student could buy? What size tank does she need for these fish?

Name _____ Date _____

MATH EXTENSION—PROBLEM OF THE WEEK

Investigation 3: Brine Shrimp Hatching

A boy wants to set up an experiment to find out the best salt concentration to hatch brine shrimp. He has six containers that hold 0.75 liter of water. He will use a spoonful of brine shrimp eggs per container. He starts with 1/8 of a spoon of salt for the first container.

	Amount of Salt Used
Container 1	1/8 spoon of salt
Container 2	Twice as much salt as he put in container 1
Container 3	Twice as much salt as he put in container 2
Container 4	Twice as much salt as he put in container 3
Container 5	Twice as much salt as he put in container 4
Container 6	Twice as much salt as he put in container 5

How much salt does the boy need for all six containers? Show all your work. Use drawings or tables to help you.

A girl set up a series of six experiments. She wanted to find out the best salt concentration for hatching brine shrimp. She put 1 liter of water and 1 little spoon of brine shrimp eggs in six containers. Then she added a different amount of salt to each container.

	Amount of Salt Used
Container 1	8 spoons of salt
Container 2	Half as much salt as she put in container 1
Container 3	Half as much salt as she put in container 2
Container 4	Half as much salt as she put in container 3
Container 5	Half as much salt as she put in container 4
Container 6	Half as much salt as she put in container 5

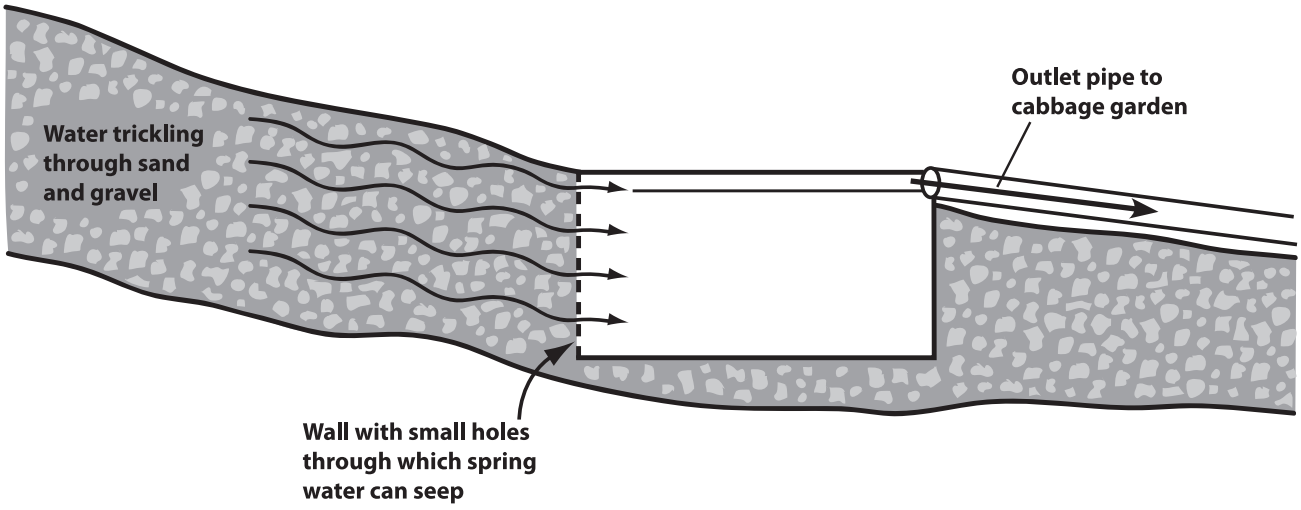
How much salt did the girl need for all six containers? Show all your work. Use drawings or tables to help you.

Name _____ Date _____

MATH EXTENSION—PROBLEM OF THE WEEK

Investigation 4: Range of Tolerance

A student needs water for his cabbage garden. On a hillside above the garden there is a spring with water flowing underground. The student built a spring box to collect the underground water for his cabbage. He put a pipe from the spring box to his garden.



The spring box needs to fill to the top with water before it will flow into the garden.

On the first day, the water level came up 5 centimeters (cm) in the spring box during the night, and then went down 3 cm during the day. The second day, the water level went up another 5 cm at night and down 3 cm during the day. This continues every night and day.

The spring box measures 20 cm from the bottom to the top of the box where the pipe is attached.

On what day or night will water first flow into the student's cabbage garden?