Name _____ Date _____ Period _____

Strawberry Fields Forever 

The school club you are a part of has been given a 10 foot by 10 foot plot of land to plant a garden. Your club decided to plant a strawberry garden in hopes of selling strawberry shortcake at the Garden Grove Strawberry Festival this year.

Task 1: Sampling with Strawberries

You have been assigned the task find out approximately how many strawberry shortcakes you can sell at the festival and need to know the average number of strawberries on each plant. Each cell in the attached table that your teacher will give you represents a plant. The number in the cell tells how many strawberries are on that particular plant.

1) Because counting the number of strawberries on all the plants is too time-consuming, you decide to choose 10 1-foot square sections, at random, to find the average number of strawberries the field will yield. To simulate the random selection, place your 10 by 10 plot of land on the floor. Drop 10 small objects onto the chart. Use these numbers for the 10 random plants. Note: If your object bounces off the paper, re-drop that object.

a. How many strawberries are on each of the ten random plants you picked?

_____, _____, _____, _____, _____, _____, _____, _____, _____, _____

b. What is the mean number of strawberries on the 10 plants that were randomly selected?

2) a. Your friends thinks that his method is silly, and you should just average the number of strawberries on the 10 plants in the first row. What is the mean number of strawberries on these 10 plants?

b. What type of sampling method did you use?

3) Reflect: a. How do the averages you got with each sampling method compare?

b. Calculate the mean for the entire population _____. How do the means you got with each sampling method compare to the mean for the entire population?

c. Why do you think the first method gave a closer average than the second method?

4) If it takes 8 strawberries to make one strawberry shortcake, how many strawberry shortcakes will your club potentially be able to sell?

5) If the school gave you another plot of land that was 4 x 4, approximately how many strawberries would that field yield?

Task 2: Why Use Random Sampling?

Review: When information is being gathered about a group, the entire group of objects or individuals, is called the _____. A _____ is part of the population chosen to represent the entire group.

A sample in which every person, object, or event has an equal chance at being selected is called a _____ _____. A random sample is more likely to be representative of the entire population than other sampling methods.

Use the inquiry lab you just completed to answer the questions below:

1) a. What is the population? b. What is the sample?

2) Why was the method of dropping small objects onto the poster considered random sampling?

2) If this were an actual field, why might the first row of the field be considered a biased sample?

3) How can a sample be used to make *inferences* about a population?

Read and discuss the three scenarios below with your table. Which of the three scenarios would be considered a biased sample? WHY?

A) A random sample of students at a middle school shows that 10 students prefer listening to rock, 15 students prefer listening to hip-hop, and 25 students do not listen to any music while they are exercising. It is concluded that half the students prefer no music while exercising.

B) Every tenth person who walks into a department store is surveyed to determine his or her music preference. Out of 150 customers, 70 stated they prefer rock music. The manager concludes that about half the customers prefer rock music.

C) The customers of a music store are surveyed to determine their favorite leisure time activity. The results show that 85% of people like to listen to music in their leisure time.

Teacher Directions: Strawberry Fields Forever

Materials

- Copies of Strawberry Fields Forever – 1 per student
- Copies of Strawberry Fields Forever Garden – 1 per pair of students
- 10 beans, paperclips or other small object – set of 10 per pair of students
- Calculator, 1 per pair

Pass out a copy of Strawberry Fields Forever to each student, but not the other materials yet. Have a student volunteer read the opening scenario and the first part of Task 1. Demonstrate to students how they will be conducting their sample with the map and beans, or small objects. Ask a few students to explain what they will be doing when they get the materials.

Task 1: Sampling with Strawberries

Put students into pairs and pass out the beans, or small objects and the maps. Have students complete question 1. Allow for about 10 minutes for sampling and finding the mean, as you walk around and monitor students. Note: You may want to collect student data from each pair, and then find the mean to compare to the mean of the entire map (found in 3b) to demonstrate that the larger the sample, the closer to the mean.

Have students continue on with question 2 and 3. Once students have finished these two items, have pairs share their results, having a class discussion regarding student answers. Possible answers to 3c include:

- The result was biased because it was not representative of the entire population. This could be because:
    - Outside plants might have been damaged by wind, rain, human traffic
    - Outside plants might be more susceptible to rodents or rabbits

Students will continue with a partner to work on questions 4 and 5, which are a review of simple arithmetic and proportional reasoning.

Task 2: Why Use Random Sampling?

This section is meant to be a review of sampling, and key terms, such as random sampling, bias, population and inference. Have students work through this page with their partner. Once most students are finished, have student volunteers come to the front to present their answers, and justify their reasoning. The last task is a review of biased sampling. This could be a good ticket-out-the-door for the day lesson.

Answer Key

A) not biased B) not biased

c) biased (they asked people in a music store if they like music!)

12	18	18	14	20	11	15	9	12	10
59	65	77	40	33	56	66	51	88	50
6	56	44	75	44	77	56	60	53	72
44	62	67	57	41	63	44	33	64	65
75	75	57	60	76	67	56	78	55	44
71	47	76	63	57	67	63	46	54	55
66	71	75	76	44	70	44	67	65	62
73	58	66	75	67	78	61	43	56	55
65	74	81	60	74	37	78	88	22	45
49	54	79	83	75	76	38	78	48	56