(RANDOM) SAMPLING OF BAKED GOODS

LEARNING IN PLACE

Grade 7 Math

Student Name: _____ Date: _____

In the video, you saw how the Miksch family's oven was used to provide baked goods to the townspeople of Salem prior to the arrival of the bakery. The Moravian church regulated the sale of all items in Salem at this time, including baked goods. The church used statistical information to help decide what was sold, the price of items, and how many items were to be produced.

Imagine that you are part of the governing body of the Moravian church in Salem. Determine your response to the following scenarios.

Scenario 1:

Henrietta Miksch needs to increase the number of ginger cakes she sells. She is planning to conduct a survey to determine the townspeople's preferences for various ginger cake recipes. The three survey methods Henrietta is considering are listed below.

Determine if each survey option would produce a random sample. If so, how do you know? If not, what conditions have been violated? Explain your answers in the table.
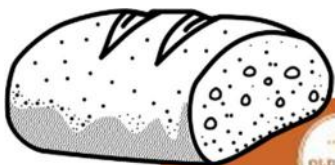
Survey Method #1: Henrietta writes all the townspeople's names on cards. She pulls 20 of the cards out in a draw to determine who will complete the survey.
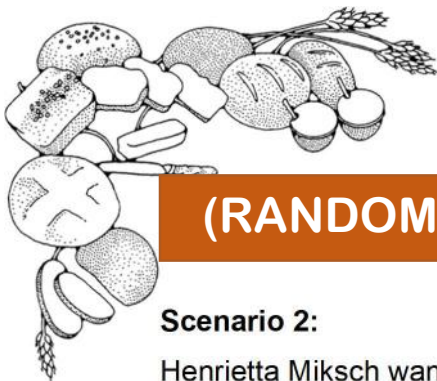
Survey Method #2: Henrietta surveys the first 20 townspeople who come to buy ginger cakes.

Survey Method #3: Henrietta surveys every third townsperson who walks by her home on Tuesday afternoon until she reaches 20 people.

Survey Method	Does this produce a random sample?	Explain why or why not.
#1		
#2		
#3		

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Scenario 2:

Henrietta Miksch wants to make sure she is putting similar amounts of candied orange peel and almonds in her sugar biscuits. She selects a random sample of 25 sugar biscuits from batches she baked over the course of a week. She determines the proportion of candied orange peel to almonds ranges from 0.57 – 0.61. She is satisfied with this variation.

1. Of the following reasons, which one gives the best explanation for the differences Henrietta found in the sample proportions. Circle your answer.

    a. Henrietta doesn't always count the amount of candied orange peel and almonds correctly.

    b. There are too many sugar biscuits in the sample size for the proportions to be the same.

    c. Sample proportions differ from one random sample to another.

    d. Henrietta miscalculates the proportions of candied orange peel to almonds in some of the sugar biscuits.

2. If Henrietta repeats this statistical study next week, which of the following proportions would most likely cause her to be unsatisfied with the results? Circle your answer.

    a. 0.59

    b. 0.49

    c. 0.60

    d. 0.57

Scenario 3:

Salem has heard some complaints about Henrietta's bread not being consistently the same size but costing the same price. You are to find out if this claim is true. You have weighed a random sample of 15 loaves of bread each week over the course of 2 weeks. Here are the weights of the bread loaves in grams:

    <u>WEEK 1</u>: 502, 510, 498, 495, 501, 494, 499, 505, 502, 507, 497, 500, 499, 496, 503

    <u>WEEK 2</u>: 500, 496, 499, 502, 505, 500, 498, 502, 497, 499, 502, 498, 496, 503, 504

1. What is the range of weights of Henrietta's bread? _____

2. What is the median weight of Henrietta's bread? _____

3. What is the mean weight of Henrietta's bread? _____

4. If the cost of bread is 3 pence per 500-gram loaf, is Henrietta's bread, on average, fairly priced? _____

5. What weight of bread loaf was most common during this 2-week sample? _____

6. Based on this 2-week sample, would a customer more likely receive a loaf of bread <u>over</u> 500 grams or <u>under</u> 500 grams? _____