

Name: Key

Date: \_\_\_\_\_

Statistics

## Random Rectangles Activity

**Judgment Sample** – On page 2, select 5 rectangles that, in your judgment, are representative of the rectangles on page 2. Record the size of your five rectangles and find their mean.

$$\frac{52}{(18)} + \frac{66}{(12)} + \frac{01}{(1)} + \frac{62}{(4)} + \frac{85}{(3)} = \frac{38}{5} \quad \text{mean} = \underline{7.6}$$

**Simple Random Sample (SRS)** – On page 3, the rectangles are numbered 00 to 99, use a random number table to choose five rectangles at random. Locate the corresponding rectangles and record their size and find the mean.  $\text{randint}(0, 99, 5) = \{93, 49, 9, 40, 64\}$

$$\frac{93}{(6)} + \frac{49}{(4)} + \frac{9}{(1)} + \frac{40}{(8)} + \frac{64}{(1)} = \frac{20}{5} \quad \text{mean} = \underline{4}$$

**Cluster Random Sample** – On page 4, the rectangles on page 2 have been reproduced with lines drawn dividing the rectangles into clusters of five rectangles. Number the regions 00 to 19. Use a random number table to choose one cluster. Locate the corresponding cluster and record the size of all five rectangles and find the mean.  $\text{randint}(0, 19, 1) = \{7\}$

$$\frac{4}{(1)} + \frac{4}{(1)} + \frac{10}{(1)} + \frac{18}{(1)} + \frac{1}{(1)} = \frac{37}{5} \quad \text{mean} = \underline{7.4}$$

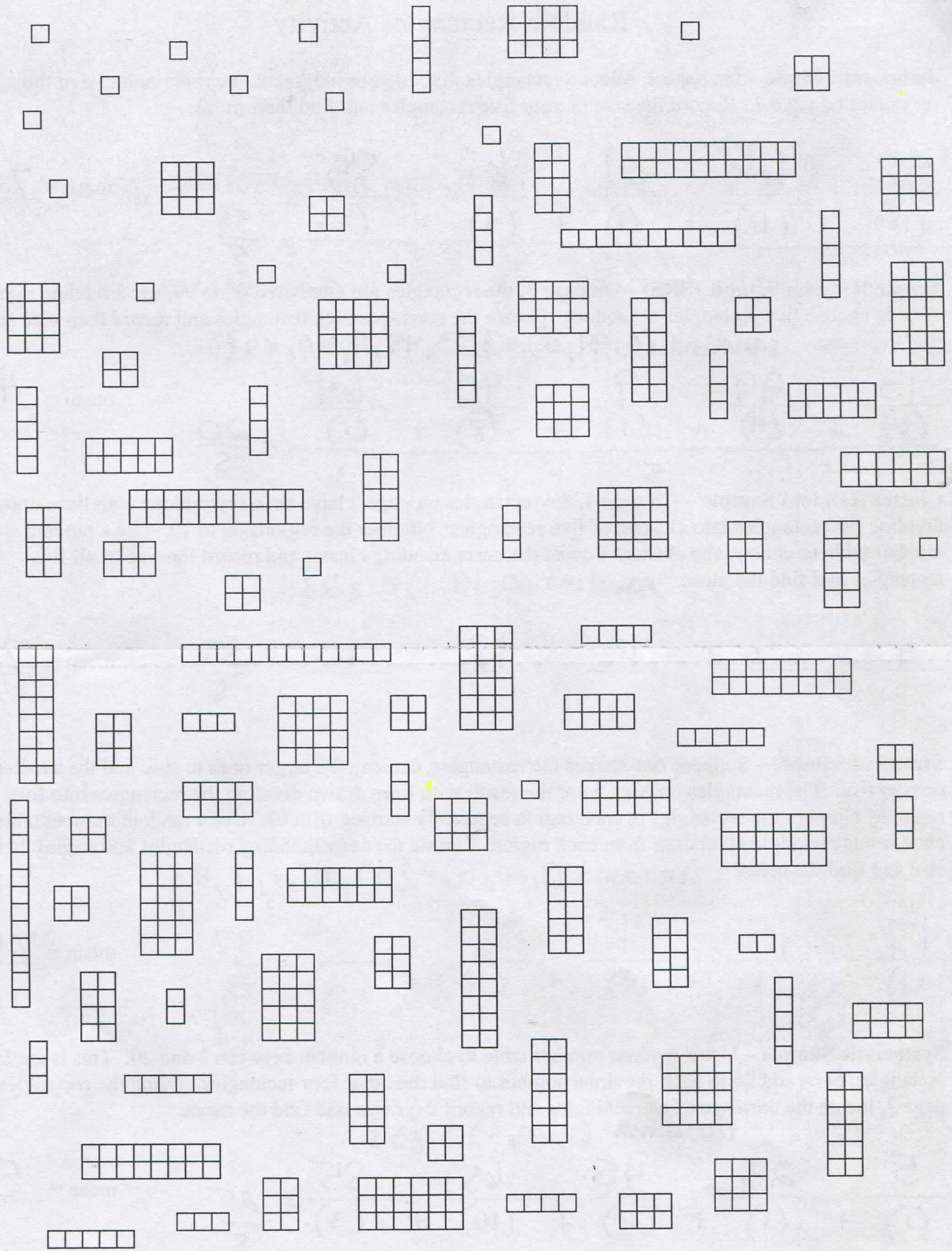
**Stratified Sample** – Suppose one shakes the rectangles, causing the larger ones to sink and the smaller ones to rise. The rectangles on page 5 are the result with lines drawn dividing the rectangles into five regions. Number the rectangles in each region separately starting with 01. Use a random number table to choose one rectangle at random from each region. Locate the corresponding rectangles and record their size and find the mean.  $\text{randint}(1, 20, 5) = \{17, 15, 1, 8, 8\}$

$$\frac{17}{(1)} + \frac{15}{(3)} + \frac{1}{(5)} + \frac{8}{(12)} + \frac{8}{(16)} = \frac{37}{5} \quad \text{mean} = \underline{7.4}$$

**Systematic Sample** – Use a random number table to choose a number between 1 and 20. This is the first rectangle. Now add 20 to each previous number to find the other four rectangles. Using the rectangles on page 3, locate the corresponding rectangles and record their size and find the mean.  $\text{randint}(1, 20, 1) = \{5\}$

$$\frac{5}{(1)} + \frac{25}{(1)} + \frac{45}{(10)} + \frac{65}{(10)} + \frac{85}{(3)} = \frac{25}{5} \quad \text{mean} = \underline{5}$$





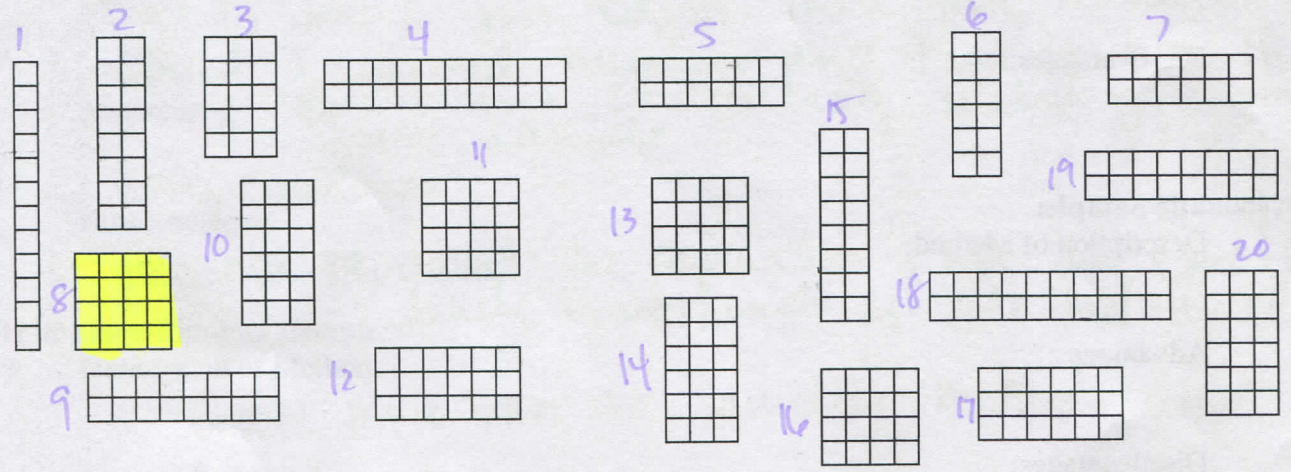
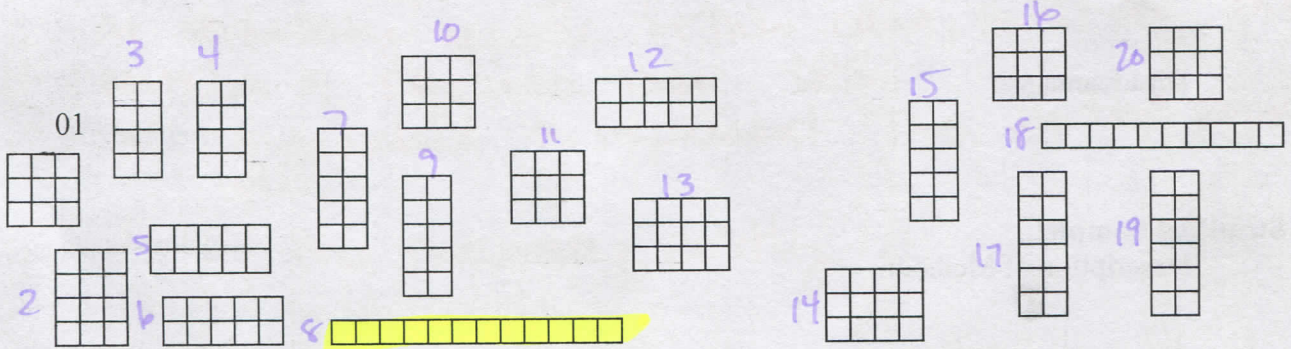
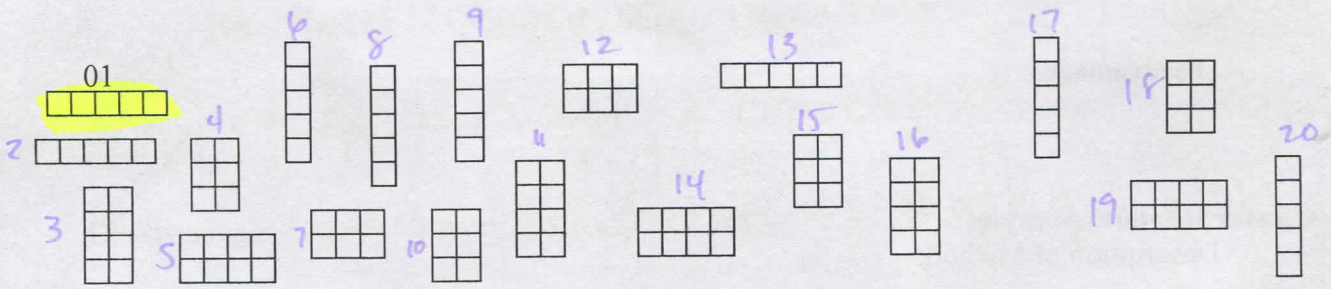
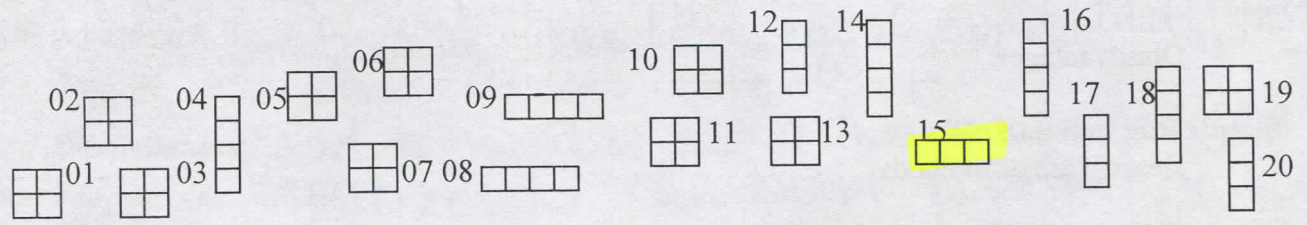
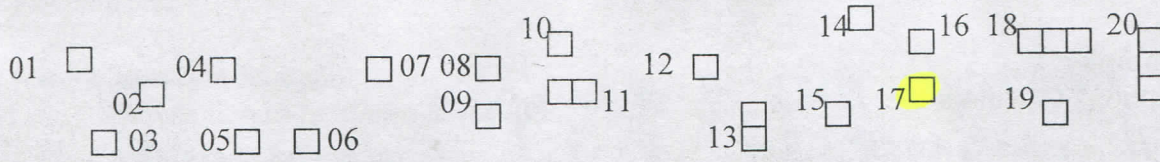


The image displays a collection of 100 numbered rectangles, each with a unique shape and orientation. The rectangles are scattered across the page, and several are highlighted in yellow. The highlighted rectangles are: 01 (a single square), 05 (a 2x2 square), 09 (a single square), 25 (a single square), 40 (a 2x2 square), 45 (a 3x2 rectangle), 49 (a 2x2 square), 52 (a 3x3 square), 65 (a 2x3 rectangle), 66 (a 1x10 horizontal bar), 85 (a 1x3 vertical bar), and 93 (a 2x2 square). The other rectangles are not highlighted and include various shapes such as 1x1 squares, 1x2 horizontal bars, 2x1 vertical bars, 2x2 squares, 3x1 horizontal bars, 1x3 vertical bars, 3x2 rectangles, 4x1 horizontal bars, 1x4 vertical bars, 4x2 rectangles, 5x1 horizontal bars, 1x5 vertical bars, 5x2 rectangles, 6x1 horizontal bars, 1x6 vertical bars, 6x2 rectangles, 7x1 horizontal bars, 1x7 vertical bars, 7x2 rectangles, 8x1 horizontal bars, 1x8 vertical bars, 8x2 rectangles, 9x1 horizontal bars, and 1x9 vertical bars.



00 	01 	02 	03 	
04 	05 	06 	07 	
08 	09 	10 	11 	
12 	13 	14 	15 	16 
17 	18 	19 		







this is based on your specific  
answers

pg.6

Analysis:

**Judgement Sample:**

Description of Method: I picked numbers I liked.

Advantages: easy, fast

Disadvantages: totally biased

**Simple Random Sample:**

Description of Method: I used my calculator to randomly select the rectangles that were pre-numbered

Advantages: Completely random

Disadvantages: Hard to number entire population  
Can misrepresent the population

**Cluster Random Sample:**

Description of Method: split up the groups based on their location on the page. Then SRS from the groups.

Advantages: Easy to split

Disadvantages: Not necessarily representative of the entire population

**Stratified Sample:**

Description of Method: Split up groups based on certain criteria. In this case based on the number of squares.

Advantages: Very representative of the population  
unbiased

Disadvantages: very time consuming and can be expensive

**Systematic Sample:**

Description of Method: Used the calculator to get the random to get "5" then add "20" over and over until sample size is complete.

Advantages: quick easy

Disadvantages: not representative of the population



## Discussion:

### Simple Random Sample:

Description of Method:

assign a # to each object/subject/individual then randomly select "n" samples from the population.

Advantages:

completely random, equal opportunity, fast

Disadvantages:

Hard to number all of the population, can misrepresent the entire population

### Cluster Random Sample:

Description of Method:

group objects/subjects/individuals based on their geographic location.

Advantages:

easy to cluster & convenient

Disadvantages:

not representative of the population

### Stratified Sample:

Description of Method:

split up the entire population based on something specific. In this case, split by the number of squares. Then SRS.

Advantages:

guaranteed to represent the entire population well.

Disadvantages:

time consuming, costly

### Systematic Sample:

Description of Method:

Randomly select a number and that is where you begin. Then you randomly select a second number and that is how many you count continuously until you make your sample.

Advantages:

Easy, convenient

Disadvantages:

does not represent the population & not an equally likely opportunity for all individuals.

### Multi-Stage Random Sample:

Description of Method:

Choose more than one sampling methods and apply.