In these activities you will make conjectures about differences between two populations and compare two populations and make informal inferences about the difference between them. After completing the activities, discuss and/or present your findings to the rest of the class.

Activity 1 [Pages 2.2 and 2.3]

1. Which of the following results is unlikely to occur by chance when sampling from this district? Give an example from the TNS activity to support your reasoning.

   Sample 1: Boys' mean minus girls' mean was 0.

   Sample 2: Boys' mean minus girls' mean was –3.

   Sample 3: Boys' mean minus girls' mean was –1.

   Sample 4 Boys' mean minus girls' mean was 0.5.

2. Go to page 2.3. These samples come from surveys of students in another district.

   a. Look at the distributions, then go to page 2.2 and **Reset**. How do the distributions on page 2.2 compare to the distributions on page 2.2?

   b. Go back to page 2.3 and generate 10 samples. Looking at the last two samples, would you say there was a difference between the number of hours per week boys and girls typically spend doing homework?

c. Did any simulation ever produce results where, on average, boys did more homework than the girls? Explain your reasoning.

d. Generate at least 100 samples. Describe the simulated distribution of sample differences. What would you conclude about the number of hours spent per week on homework by boys and by girls in this district?

3. Which of the outcomes below would be least likely to occur by chance when sampling from this district? Give an example from the TNS activity to support your reasoning.

Sample 1: Boys' mean minus girls' mean was 0.

Sample 2: Boys' mean minus girls' mean was –3.

Sample 3: Boys' mean minus girls' mean was –1.

4. Suppose you drew random samples of 20 boys and 20 girls from another district and asked them about the number of hours they spent on homework each week.

   a. Interpret the following statement: Mean girls – mean boys = 2.5

   b. Write an equation showing that a sample of boys spent more time, on average, doing homework than girls.

   c. Marcus said all you needed to know was the means of a random sample from two populations and a small difference between the two means, like 1.5, would be evidence that the populations are different. What would you say to Marcus? Give an example to explain your answer.

Activity 2 [Pages 2.2 and 2.3]

1. Work with several partners to investigate comparing differences in means when the sample sizes for each sample both increase. Using sample sizes of 10, 40, 60 and 100, generate simulated sampling distributions of the sample means for pages 2.2 and 2.3.

   a. Fill in the table for the spread of the means in each distribution.

Sample size	Page 2.2- sampling distribution of the difference in means	Length of interval: |max-min|	Page 2.3- spread of difference in means	Length of interval: |max-min|
10				
40				
80				
100				

   b. Compare your distributions with those of your partners. What conjecture would you make about how sample size affects the distributions of the differences in sample means for the number of hours of homework for boys and girls?

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