Is this gender discrimination?

A local engineering firm had to conduct a series of layoffs recently. They will lay off 10 people. The company has 180 employees that could be laid off. All are equally qualified so the company decides to use a lottery system to be carried out by the manager to decide who will be laid off. The manager posts a list of the employees to be laid off. Five employees are women and 5 are men. One of the women claims this is gender discrimination and starts a lawsuit against the company.

1. The manager responds, “How could there be gender discrimination when half of the employees laid off were female and half were male?” What additional information do you need to evaluate this statement?

2. How can you investigate the gender discrimination claim? Detail a process that could be used.

3. Complete your investigation below.

4. What percentage of the dots represent half or more females being laid off?

5. Interpret this percentage in context.

6. Do you have convincing evidence of gender discrimination? Explain.
Check Your Understanding

Calcium is a vital nutrient for healthy bones and teeth. The National Institutes of Health (NIH) recommends a calcium intake of 1300 milligrams (mg) per day for teenagers. The NIH is concerned that teenagers are not getting enough calcium, on average. Is this true?

1. State appropriate hypotheses for performing a significance test. Be sure to define the parameter of interest.

Researchers decide to perform a test using the hypotheses stated in #1. They ask a random sample of 20 teens to record their food and drink consumption for 1 day. The researchers then compute the calcium intake for each student. Data analysis reveals that $\bar{x} = 1198$ mg and $s_x = 411$ mg. Researchers performed a significance test and obtained a P-value of 0.1404.

2. Explain what it would mean for the null hypothesis to be true in this setting.

3. Interpret the P-value.

4. What conclusion would you make at the $\alpha = 0.05$ level?