



11-6 Additional Practice

Introduction to Hypothesis Testing

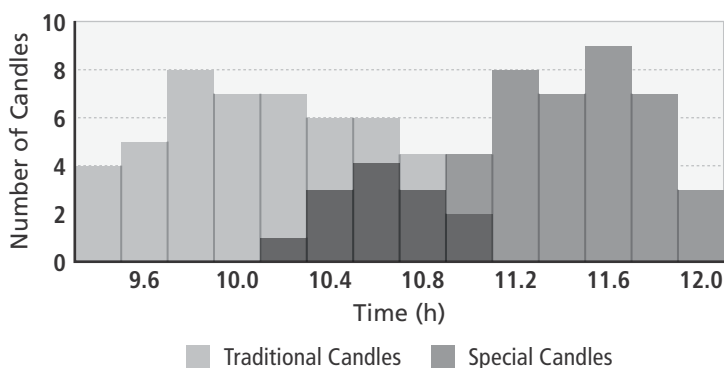
1. Terrence made 94.8% of his putts within 5 feet of golf-ball holes with his old putter. With a new putter, he now makes 97.4% of the same putts. Write a null and alternative hypothesis for a statistical study to evaluate the population parameter P , the proportion of putts made after using the new putter.
2. An apple orchard claims that their bags of apples have a mean weight of 5.14 lbs. and a standard deviation of 0.08 lbs. A quality assurance specialist tests the weight of 100 bags to determine whether the bags are the correct weight. The sample has a normal distribution and a mean weight of 5.11 lbs. The specialist is testing the following hypothesis.

$$H_0: \mu = 5.14$$

$$H_a: \mu \neq 5.14$$

- a. What is the margin of error?
- b. Does the test support the null hypothesis? What does this mean for the orchard?

3. Special Candles Co. claims that their special wax will last longer than traditional candles. A study compares a group of traditional candles with those manufactured by Special Candles Co. Does the graph of the results give evidence to support the claim?



4. Only 50.9% of 18–24 year olds voted in a recent presidential election. A college samples 100 students within that age range, and finds that 53% of them voted. They want to know if the percent of student voters aged 18–24 is more than the percent of those 18–24 year olds who voted in the general population. Write hypotheses for this situation and run a simulation to test the hypotheses using a spreadsheet or calculator. What hypothesis does the simulation support?



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Introduction to Hypothesis Testing

1. Terrence made 94.8% of his putts within 5 feet of golf-ball holes with his old putter. With a new putter, he now makes 97.4% of the same putts. Write a null and alternative hypothesis for a statistical study to evaluate the population parameter P , the proportion of putts made after using the new putter.

$H_0: P \leq 0.948$, $H_a: P > 0.948$

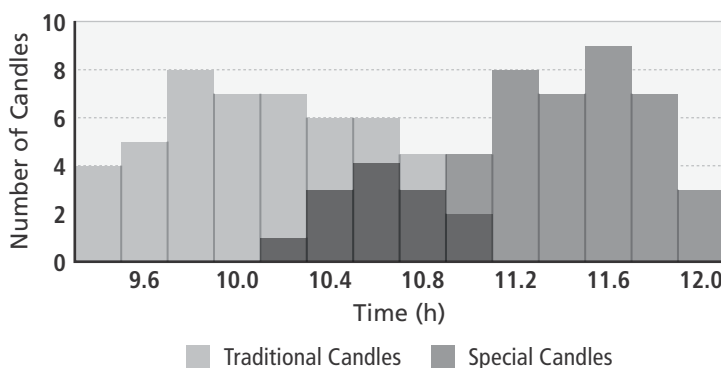
2. An apple orchard claims that their bags of apples have a mean weight of 5.14 lbs. and a standard deviation of 0.08 lbs. A quality assurance specialist tests the weight of 100 bags to determine whether the bags are the correct weight. The sample has a normal distribution and a mean weight of 5.11 lbs. The specialist is testing the following hypothesis.

$$H_0: \mu = 5.14$$

$$H_a: \mu \neq 5.14$$

- a. What is the margin of error? **0.016**
- b. Does the test support the null hypothesis? What does this mean for the orchard? **No; the bags are not within a reasonable range of the population parameter, so the orchard needs to either add apples to the bags or claim the bags weigh less.**

3. Special Candles Co. claims that their special wax will last longer than traditional candles. A study compares a group of traditional candles with those manufactured by Special Candles Co. Does the graph of the results give evidence to support the claim? **Yes; the mean for**



the traditional candles is 10.148 and the mean for the special candles is 11.27, so the special candles do last longer.

4. Only 50.9% of 18–24 year olds voted in a recent presidential election. A college samples 100 students within that age range, and finds that 53% of them voted. They want to know if the percent of student voters aged 18–24 is more than the percent of those 18–24 year olds who voted in the general population. Write hypotheses for this situation and run a simulation to test the hypotheses using a spreadsheet or calculator. What hypothesis does the simulation support? **Answers may vary. Sample: $H_0: P \leq 0.509$, $H_a: P > 0.509$; my simulation finds 95% of samples have between 48% and 54% voting, so the null hypothesis is supported.**