

Name: _____ Hour: _____ Date: _____

Which color M&M is the most common part two?



The company that makes milk chocolate M&Ms claims the following distribution: 13% Brown, 14% Yellow, 20% Orange, 16% Green, 24% Blue, and 13% Red. Is this true?

1. Record the information from yesterday.

Observed values: Brown: _____ Yellow: _____ Orange: _____ Green: _____ Blue: _____ Red: _____

Expected values: Brown: _____ Yellow: _____ Orange: _____ Green: _____ Blue: _____ Red: _____

Test statistic: $\chi^2 =$ _____

2. Check conditions:

Random:

10%:

Large counts: Which expected count is the lowest? Are all of the expected counts greater than 5?

3. Calculate the P-value.

For this test $df = n - 1$, but n represents the number of categories (colors).

What is the df for this test? _____

What is the test statistic for this test? _____

Use Table C to find the P-value: _____

4. Make a conclusion. Use $\alpha = 0.05$.

5. Which color M&M had an observed value the farthest from the expected?

Name: _____ Hour: _____ Date: _____

Do the data provide significant evidence that the company was lying about the distribution of colors of M&Ms? Use $\alpha = 0.05$

STATE: Hypotheses:

Significance level:

PLAN: Name of procedure: chi-square test for goodness of fit

Check conditions:

DO: Picture:

Specific Formula:

Work:

Test statistic:

P-value:

CONCLUDE:

What parts of the usual 4-step process are missing in this test?

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Chi-Square Test for Goodness of Fit: 4 Steps

Important ideas:

Check Your Understanding

A traffic light is installed to allow traffic from a seldom used side street to cross a 4-lane highway. Because the side street doesn't get a lot of traffic the light is set to provide a red light for the side street 80% of the time, yellow 5% of the time, and green 15% of the time. A resident who must pass through the light several times per day is suspicious that the light is not functioning according to the claimed distribution. He sets up a trail camera and programs it to snap a picture of the light at 200 randomly selected times throughout the day. Here are the results: Red: 173, Yellow: 13, and Green: 14.

- a. Do these data provide convincing evidence that the light is not functioning according to the claimed distribution?

STATE: Hypotheses:

Significance level:

PLAN: Name of procedure:

Check conditions:

DO: Specific Formula:

Picture:

Work:

Test statistic:

P-value:

CONCLUDE:

- b. If there is convincing evidence of a difference in the distribution of car color, perform a follow-up analysis.