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: χ^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?

Name: _____ Hour: _____ Date: _____

Chi-Square Test for Goodness of Fit: 4 Steps – Day 2

Important ideas:

Check Your Understanding

Does the warm, sunny weather in Arizona affect a driver's choice of car color? Cass thinks that Arizona drivers might opt for a lighter color with the hope that it will reflect some of the heat from the sun. To see if the distribution of car colors in Oro Valley, near Tucson, is different from the distribution of car colors across North America, she selected a random sample of 300 cars in Oro Valley. The table shows the distribution of car color for Cass's sample in Oro Valley and the distribution of car color in North America, according to www.ppg.com.

Color	White	Black	Gray	Silver	Red	Blue	Green	Other	Total
Oro Valley sample	84	38	31	46	27	29	6	39	300
North America	23%	18%	16%	15%	10%	9%	2%	7%	100%

1. Do these data provide convincing evidence that the distribution of car color in Oro Valley differs from the North American distribution?

STATE: Hypotheses: Significance level:

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

Check conditions:

DO: Specific Formula: Picture:

Work:

Test statistic:

P-value:

CONCLUDE:

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