

# Chi-Squared Tests For GOF

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## Summary

### The Hypotheses

$H_0$  : The claimed distribution is true  
 $H_a$  : The claimed distribution is not true

- Write these in context

### Expected Values

- The probability of getting an outcome times the number of total outcomes
  - If 16% of fruit loops are green, and you have 100 fruit loops, then the expected number of fruit loops is 16
  - $P_i * n$

### Calculate Chi-Squared Value

$\chi^2$  is Chi-squared

$$\chi^2 = \sum_{n=1}^i \frac{(x - P_i * n)^2}{P_i * n} \text{ or...}$$
$$\chi^2 = \sum_{n=1}^i \frac{(observed - expected)^2}{expected}$$

### Calculator

- Use state tests for p-value
- Use  $\chi^2cdf$  in calc for p-value

### Example

See [Chi Squared Test for the Digits of PI](#)

## Possible Applications

### Probabilities

- Generally only used for data with categories(colors of fruit loops)
- Potentially could be used for means? (see: [Required Code Testing](#); could be used to determine shooter margin)

## Handwritten

Chi Squared notes

$H_0$ : The claimed distribution is true  
 $H_a$ : The claimed distribution is not true

} in context

Expected value:  $p_i * n$

$\chi^2 \rightarrow$  Chi-Square statistic  
 $\chi^2 = \sum \frac{(obs - exp)^2}{exp}$   
df: # of categories - 1  
\* Use  $\chi^2cdf$  in calc for p-value