

# **Activity-Based Lessons for Probability and Statistics**

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Middle TN State University  
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# Overview

- **Activity-Based Discovery Learning Lessons**
  - Random CDs
  - Reese's Pieces
- **AP Statistics**
  - Class & Exam



# NSF\* DUE A/I Collaborative Research Project

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- **Adaptation & Implementation of *Activity & Web-Based* Materials in *Post-Calculus* Introductory Probability & Statistics Courses**
    - Goodson-Espy, Lunsford, & Rowell
    - \*Project is partially support by the National Science Foundation. (June 2002 - August 2004).
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# A Collaborative Approach

## A&I Materials into Prob/Stat Courses

U. of AL,  
Huntsville  
Leigh Lunsford



Middle TN St. U.  
Ginger Rowell

Univ. of AL, Huntsville  
Tracy Goodson-Espy

## Independent Assessment of A&I

# The Materials for A&I

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- **“A Data-Oriented, Active Learning, Post-Calculus Introduction to Statistical Concepts Methods, and Theory (SCMT)”**
    - **A. Rossman, B. Chance, K. Ballman**
    - **NSF DUE-9950476**
    - **[www.rossmanchance.com/scmt.html](http://www.rossmanchance.com/scmt.html)**
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# The Materials for A&I

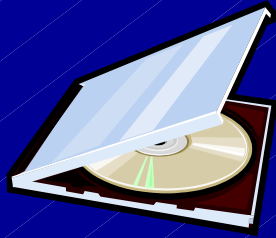
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- **“Virtual Laboratories in Probability and Statistics (VLPS)”**
    - **K. Siegrist**
    - **NSF DUE-9652870**
    - **[www.math.uah.edu/stat/](http://www.math.uah.edu/stat/)**
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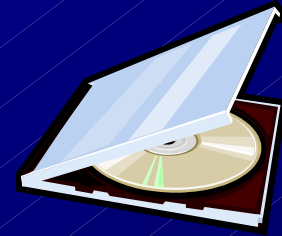
# Collaborative Project Website

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- **Probability & Statistics**
    - **Activities to download**
    - **NCTM standards information**
    - **Links with teaching resources**
  - **[http://www.mathspace.com/NSF\\_ProbStat/index.htm](http://www.mathspace.com/NSF_ProbStat/index.htm)**
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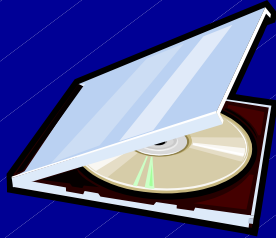


# Random CDs

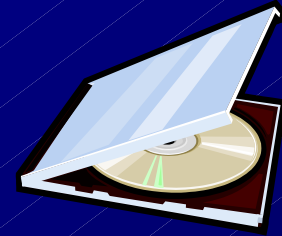


- Topic - equally likely probability
- Activity - random CDs
- Materials
  - 4 index cards & sheet of paper
  - Computer with *Minitab* (optional)
- Prerequisites - limited use of *Minitab* for optional section

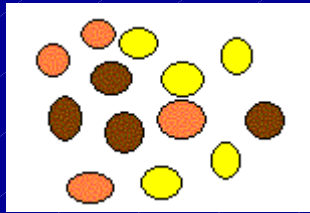




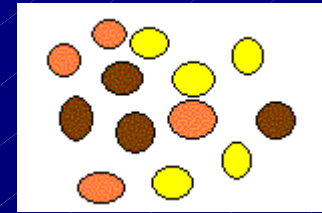
# Random CDs



- Scenario - 4 music CDs are returned at random to 4 jewel boxes
- Exploration - Use simulation to determine what will happen in the long run
- Practice - enumeration to find exact probability



# Reese's Pieces



- Topic - confidence intervals for proportions
- Activity - Reese's Pieces
- Materials - Reese's Pieces candy, access to Internet
- Prerequisites - usually follows confidence intervals for means

# Overview

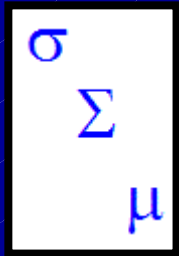
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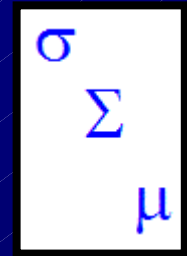
# AP Statistics Websites

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- [http://www.collegeboard.com/student/testing/ap/sub\\_stats.html](http://www.collegeboard.com/student/testing/ap/sub_stats.html)
  - [http://apcentral.collegeboard.com/repository/ap03\\_cd\\_statistics\\_04\\_4328.pdf](http://apcentral.collegeboard.com/repository/ap03_cd_statistics_04_4328.pdf)
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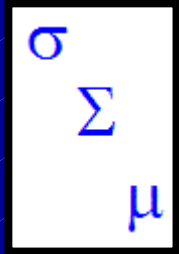


# AP Statistics Course

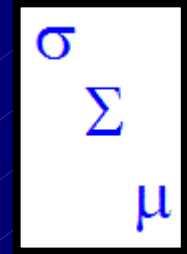


- **Topics to Cover**
  - **Data Exploration (patterns)**
  - **Planning Statistical Studies**
  - **Modeling using Probability**
  - **Statistical Inference**

*Source: 2004 Course Description for AP Statistics. [www.collegeboard.com](http://www.collegeboard.com)*

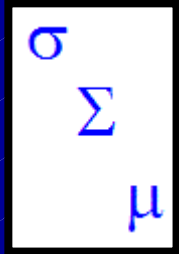


# AP Statistics Course

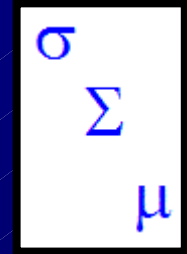


- **Data Exploration (patterns)**
  - **Graphical methods - Interpretation**
  - **Numerical methods - Interpretation**
  - **Look for patterns & departures from patterns**

*Source: 2004 Course Description for AP Statistics. [www.collegeboard.com](http://www.collegeboard.com)*

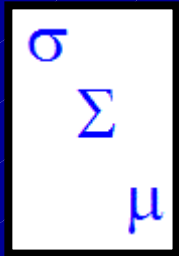


# AP Statistics Course



- **Planning Statistical Studies**
  - **Decide**
    - + **What to measure**
    - + **Method for data collection**
    - + **Method for data analysis**

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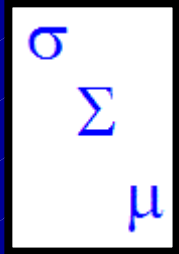
# AP Statistics Course



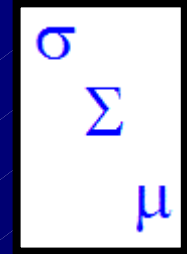
- **Modeling using Probability**
  - **Relative frequency probability**
  - **Independence**
  - **Normal distribution**
  - **Sampling distributions**

*Source: 2004 Course Description for AP Statistics. [www.collegeboard.com](http://www.collegeboard.com)*





# AP Statistics Course

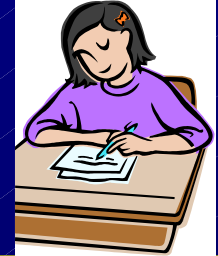


- **Statistical Inference**
  - **Confidence Intervals**
    - + **Methods & Interpretation**
  - **Hypothesis Testing**
    - + **Methods & Concepts**

*Source: 2004 Course Description for AP  
Statistics. [www.collegeboard.com](http://www.collegeboard.com)*



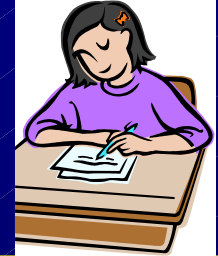
# AP Statistics Exam



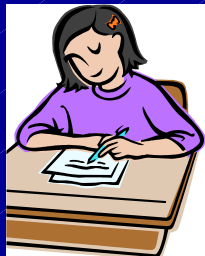
- **Question Types**
  - **Multiple-choice questions**
    - +90 minutes
  - **Free-response**
    - +90 minutes
- **Each section equally weighted**



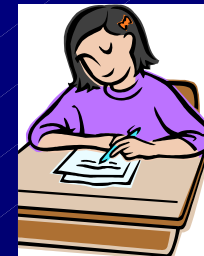
# AP Statistics Exam



- **AP Exam Grades**
  - **5 - Extremely well qualified**
  - **4 - Well qualified**
  - **3 - Qualified**
  - **2 - Possibly qualified**
  - **1 - No recommendation**



# AP Statistics Exam



- **2004 Exam Date: May 4**
- **Grade Reports: Early July**
- **Technology**
  - **Graphing calculators (exam)**
  - **Computers (interpret output on exam)**
- **Formulas - some provided**

# Review

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# Contact Information

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