

## An Overview of the AP Statistics Program

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## The Growth Continues!

<u>YEAR</u>	<u>EXAMS</u>	<u>% PASSING</u>
1997	7,500	62.2
1998	15,500	59.7
1999	25,000	57.1
2000	34,118	53.7
2001	41,609	59.7
2002	49,824	56.8
2003	58,230	61.9
2004	65,878	59.8
2005	The latest projection is 77,000!	

## Grading the AP Exam

- Rubrics (scoring standards) are drafted by the Chief Reader
- The Test Development Committee reviews the rubrics and refines the free response questions
- Rubrics are revised and the Test Development Committee reviews the rubrics for a second time (approximately 6 months after the first review)
- The Chief Reader makes final revisions to the draft rubrics for the pre-reading meetings

## Pre-Reading Meetings

- Four days before the reading begins question teams composed of high school teachers and college and university professors arrive at the reading site (Lincoln, Nebraska) to begin sample selection
- Student samples are selected from hundreds of exam booklets to form training packets and revisions are made to the draft rubrics
- The leadership team, which consisted of 43 leaders in 2004, conducts practice briefings (training sessions) and final decisions are made on scoring

## A Typical Reading Day

- A briefing is held to train the readers on how to score a particular question
  - 240 readers scored approximately 66,000 exams in 2004
  - Each reader scored at least three different questions during the seven day reading
- Readers go to reading rooms and work with a partner on one folder of exams (25 exams in a folder) and then begin scoring other folders
- Two Leaders are in each reading room to answer scoring questions and backread scored exams

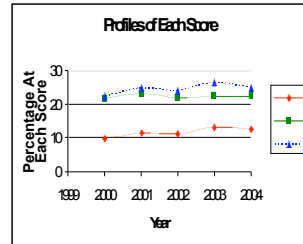
## Holistic Grading

- We use a five point scoring system that is probably very different from any system you have ever used to grade papers, projects, or exams:
  - 4 Complete Response
  - 3 Substantial Response
  - 2 Developing Response
  - 1 Minimal Response
  - 0

### Grade Setting

- Each student receives a composite score (100 possible points – 50 for multiple choice section and 50 for the free response section)
- Grades are set based on the distribution of the composite scores.
  - 5 – Extremely well qualified
  - 4 – Well qualified
  - 3 – Qualified
  - 2 – Possibly Qualified
  - 1 – No recommendation

### Student Performance (over 5 years)



### Highlights from 2004 Reading

- Overall performance on the multiple choice questions was better than the previous two years.
- The scores on the free response questions were lower than the previous two years.
- The overall average was down slightly, but very close to the averages in 2002 and 2003.

### The Best and Worst of 2004

- The best news is that all six questions showed good discrimination across the entire range of scores.
- The most discouraging news is that students continued to perform poorly on standard problems dealing with statistical inference.

### Common Student Errors (2004 Edition)

- Many students provided solutions with no justification or an incomplete justification. Students need to be encouraged to show all of their work and justify their answers.
- Students failed to read the problems carefully and then provided information that was not relevant to the questions that were asked.
- Communication of statistical analyses and concepts continues to be a problem.

### College Comparability Study

- College students from selective to highly selective colleges and universities across the country completed free response questions 1, 5, and 6.
- Consider the logistical hurdles that must be dealt with when trying to complete this type of study.
  - Contact time, content of the course, text, quality of students, vocabulary, format of the test, etc.

### Institutions Participating in the College Comparability Study

Baylor University  
California Polytechnic State University  
Columbia University  
George Washington University  
Oberlin College  
Ohio State University  
Texas A&M  
The College of New Jersey  
University of California -Davis  
University of Wisconsin -Milwaukee

### Results of the College Comparability Study

- AP Statistics students did much better on the exam than college students
  - The averages for the college students on all three free response questions (1, 5, and 6) were substantially below the corresponding averages for the AP students.
  - The multiple choice scores were better for AP students.
- In short, AP students stand out in every comparison that was made with college students.
- This is very encouraging and exciting news, not only for the AP Statistics Program, but for everyone involved with statistics education.

### Recommendations for Teachers

- Emphasize conceptual understanding and communication over mechanics.
- Be sure that students are comfortable reading output from statistical software – integrating computer use into your course is preferable.
- Emphasize the importance of **checking** conditions for statistical procedures.
- Ask your students to answer questions in context.

### More Suggestions

- Give your students time to discuss and debate their solutions in a group setting.
- Provide as many practical applications and problems as possible. Students need to practice applying the concepts they have learned before they get to the AP Exam.
- Writing assignments are essential for success – communication continues to be an area of weakness for many students.

### A Clarification from the AP Statistics Test Development Committee

- Geometric distributions were recently introduced to the AP Statistics Content Outline under the Probability content area.
- On the AP Statistics examination, students will be expected to calculate probabilities for geometric distributions. However, no additional formulas will be provided on the three pages of formulas that are available for reference during the exam administration. (Students will not be expected to know the formulas for the mean and standard deviation of a geometric random variable.)

### Professional Development Opportunity

- Please consider getting more involved in the AP Statistics Program by becoming a reader.
- We have been unable to hit our target of 60% college and 40% school readers.
- To complete the online application, just point your web browser to AP Central ([apcentral.collegeboard.com](http://apcentral.collegeboard.com))
- A new module on Design and Sampling will soon be available at The College Board Store.