Dear Students,

Welcome to Advanced Placement Statistics! This College Board aligned course is the equivalent of an introductory statistics course offered in colleges and universities, and will thoroughly prepare you for the AP Statistics Exam in May. Statistics—the art of drawing conclusions from imperfect data and the science of real-world uncertainties—plays an important role in many fields. This is an ideal course for students planning to pursue undergraduate studies in fields including Science, Economics, Political Science, Psychology, Sociology, Engineering, and Mathematics.

In order to be successful in this class, we will cultivate the following habits of mind together:
Perseverance: We will work together and persevere—even when the work is very difficult
Courage: We will be courageous in our questioning, creativity, and academic risk taking
Responsibility: We will be responsible—work with academic integrity, be in attendance, prepared, and on time each day
Engagement: We will be minds on, intellectually open, and committed to continual development of our skills in questioning, analyzing, and problem solving.
Together we will build a positive classroom environment that is academically focused, highly structured, and a safe space for challenging both our critical and creative thinking.

Course Description
Students are exposed to four broad conceptual themes:
1. Exploring Data: Describing patterns and departures from patterns
2. Sampling and Experimentation: Planning and conducting a study
3. Making Predictions: Exploring random phenomena using probability and simulation

Students will become proficient at communicating statistical concepts including the validity and pertinence of experimental design, results, and data. Writing complete responses and conclusions is essential and will be stressed throughout the course.

The AP Statistics Exam is on **Wednesday, May 17, 2018 at 12:00pm**. It will be graded on a scale on 1-5, with most colleges offering credit for a 3 or above. With a college credit costing $500 or more, success in this class can save you (and your parents) $1500 or more (not to mention the freedom of having one less required class)!

Types of Questions We Will Be Answering

❖ Your friend says he can hit 80% of all three pointers he shoots, but you watched him only hit 7/10. Is he a liar?
❖ How strong is the relationship between number of hours studied and grade on a test?
❖ By looking at a small group of 10 NEST+m students and 10 Stuyvesant students, is there evidence to show that the average height of NEST+m students is higher than that of Stuyvesant students?

The primary textbook for this course will be *The Practice of Statistics for AP, 5th Edition* by Daren S. Starnes.
Classroom Procedures & Policies

Our K-12 Code of Respect
We respect ourselves
We respect each other
We respect our school community

Attendance and Participation: All students are expected to be in class and on time every day with all required materials, take out their homework, and start the Warm Up. If you know in advance that you will be absent for a specific reason, please let me know as soon as possible and provide documentation signed by a parent. If you are absent, you will find what material was missed the previous day.

Required Materials
- 3 ring binder (I will be distributing paper with holes punched; this is a necessity)
- Loose leaf (You will receive handouts almost daily with problems, data tables, etc, but will need paper for the actual solving of problems.)
- Writing utensil(s)
- Highlighter(s)
- TI-84 calculator

Grading
Summative Assessments (exams, projects): 30%
Formative Assessments (classwork, participation, quizzes): 50%
Homework: 10%
Reflective Practices: 15% (summative assessment reflections, end of unit reflections, goal setting)

Homework
Homework is essential to success in this class. Homework will be assigned approximately every other day. Turn in all homework assignments and projects at the beginning of class on the day that they are due. Homework is posted on the class website (msmercer.weebly.com). There is no excuse for missing homework, even when absent.

Quizzes
Quizzes can be given on any day, announced and unannounced, and may be given to test knowledge of reading assignments and problem sets.

Class Participation: Participation in class is key; merely being present is not enough. Your grade will be reduced if you are consistently unprepared or unwilling to participate.

Academic Dishonesty: Maintain academic integrity. Working together on group projects or homework is fine, but cheating on or quizzes is not tolerated. Students may be referred to the Dean and appropriate action will be taken.

Cell Phone Policy: Phones are not permitted in class unless we are doing an activity that requires them.

Grade Book: Assignments and grades will be posted on PupilPath. Students and parents/guardians will be invited to set up separate accounts to access grades, assignments, and class supplementary materials. Pupilpath will be updated at minimum twice per month.

Digital Portfolio: Twice per semester, students will have a project, written assignment or major assessments uploaded to their bio page on PupilPath with its associated self-reflection and feedback. Portfolio pieces should always be pieces that have been drafted, polished, and given feedback before final submission. When possible, students will be able to choose the assessments uploaded to their portfolio.

Late or Missing Work Policy
Homework: Homework is always in service of our summative assessments. Except in the event of an excused absence, homework handed in 1-7 days late will automatically be scored with a 20% reduced score. Beyond 7 days late, the assignment will be scored with a 35% reduced score.
Summative Assessments, e.g. projects: Except in the event of an excused absence, a summative assessment grade will be lowered by 10% for each day it is late, for a maximum reduction of 50%. If you have an extenuating circumstance, please come see me at least 2 days before the due date.
Quizzes and Exams: Provided your absence was excused, you may schedule a make-up session within one week of your return to school. [Note: this does not apply to the AP Exam]
Excused absences: Students must hand in assignments the week they return to school with a signed note from their parent or guardian. It is your responsibility to complete and hand in all assignments that are due.

Hall Pass Policy: Restroom use should not disrupt classroom instruction. You must sign the logbook each time you enter or leave the class and take the designated hall pass.

A Note about Calculators: We will be using TI-84 graphing calculators every day for homework and in-class activities. If your calculator breaks, if the batteries die, or if you lose it, please let Ms. Mercure know immediately.

Extra Help Schedule
Every Wednesday 2:45 – 3:45pm, Room TBD
A Note to Parents

Occasionally we will discuss risqué topics such as gambling, smoking, and teen alcohol use, among many others. There is a lot of data available on these topics, and we use statistical techniques in class to analyze and draw conclusions from this information. Everything we study is in the context of random human behavior. If there are any issues, please let me know.

Contract for Learning

After reading this curriculum letter, please share it with your parents, then complete and sign the contract for learning below. Both student and parent/guardian must sign.

I will collect all signed contracts on Monday, September 11. The signed contract will count as your first homework grade.

Students:
I have read the Course Curriculum Letter for AP Statistics and fully understand the course expectations. I agree to cultivate the habits of mind described in the Curriculum Letter and fulfill the requirements of the English 11 curriculum to the best of my ability.

Student Name: ______________________________________ Signature: _____________________________________

Email Address: _______________________________________

Students please check one:
[ ] I already have a PupilPath Parent account and understand how to login and check my child’s grades
[ ] I do not have a PupilPath account and need registration / login instructions
[ ] I have a PupilPath account but cannot login. I need directions for resetting my account.

Parents/Guardians:
I have read the Course Curriculum Letter for AP Statistics and fully understand the course expectations.

Parent/Guardian Name: _______________________________ Signature: _____________________________________

Phone Number: _________________________________ Email Address: ______________________________________

Parents please check one:
[ ] I already have a PupilPath Parent account and understand how to login and check my child’s grades
[ ] I do not have a PupilPath account and need registration / login instructions
[ ] I have a PupilPath account but cannot login. I need directions for resetting my account.

“We three statisticians went duck hunting. The first shot six inches above a duck. The second shot six inches below it. The third shouted, ‘We got it!’”

-Mark Paulos

“33.7% of all statistics are made up on the spot.”

-Ms. Mercure
Course Outline
All dates are subject to change
Not all exams and projects are outlined here

Unit 1 – Data Analysis
September 7 – October 13

Essential Questions:
1. How can we summarize and draw conclusions about distributions of data using histograms?
2. How can we construct and interpret stem and leaf plots (stemplots) to display data?
3. How can we describe shapes of distributions and draw conclusions using mean and median?
4. How can we draw conclusions from five number summaries and boxplots?
5. How can we identify outliers in numerical data?
6. How can we match boxplots to corresponding histograms?
7. How can we describe how manipulations in data affect summary statistics?
8. How can we describe the major features of distributions?
9. How can we find and interpret standard deviation?
10. Data Analysis Exam
11. How can we compare similar distributions?
12. How can we analyze distributions of categorical data?
13. How can we solve problems using percentiles and ogives?
14. How can we calculate and interpret \( z \)-scores?
15. How can we apply \( z \)-scores to distributions?
16. How can we solve problems using normal distributions and percentiles? (Day 1)
17. How can we solve problems using normal distributions and percentiles? (Day 2)

Summative Assessments:
Data Analysis Project: Due 9/26
Exam 1: 9/28
Exam 2: 10/12

Unit 2 – Simulations, Surveys, Bias and Experimentation
October 16 – October 26

Essential Questions:
1. How can we describe randomness and its importance?
2. How can we design simulations with random number tables?
3. How can we use simulation to predict the results of elections?
4. How can we describe and differentiate between sampling procedures? (Day 1)
5. How can we describe and differentiate between sampling procedures? (Day 2)
6. How can we describe and differentiate between sampling procedures? (Day 3)
7. How can we describe and identify biases? (Day 1)
8. How can we describe and identify biases? (Day 2)

Summative Assessment:
Sampling and Bias Quiz: 10/26

Unit 3 – Experiment Design
October 30 – November 9
Essential Questions:
1. How can we apply the principles of experimental design?
2. How can we diagram controlled experiments?
3. How can we identify lurking and confounding variables?
4. How can we use blocking to reduce the effects of confounding variables? (Day 1)
5. How can we use blocking to reduce the effects of confounding variables? (Day 2)
6. How can we improve experiments with blinding?
7. How can we create experiments using a matched pairs design?

Summative Assessment:
Experiment Design Test: 11/9

Unit 4 – Introduction to Probability
November 10 – TBD

Essential Questions:
1. How can we use the law of large numbers to discuss random behavior?
2. How can we use basic probability rules?
3. What is conditional probability? (Day 1)
4. What is conditional probability? (Day 2)
5. How can we solve problems using conditional probability and tree diagrams?
6. How can we solve problems using discrete probability distributions?
7. How can we solve problems using the properties of discrete probability distributions?
8. Special Probability Problems
9. How can we find the standard deviation of a discrete distribution?
10. How can we compare expected values to observed values in probability games?
11. How can we find the probabilities with normal distributions?
12. How can we find probabilities by using normalcdf?
13. How can we solve special problems with the normal distribution?
14. How do we describe the distributions of combinations of random variables?
15. How can we solve problems using combinations of random variables?
16. How can we solve problems using combinations of random variables? (Day 2)
17. How can we solve problems using binomial probability?
18. How can we solve problems using binomial probability (exactly)?
19. How can we solve problems using binomial probability with “at least” and “at most”?
20. How can we solve problems using combinations of binomial probability and normal probability?
21. Expected Value and Roulette

Summative Assessments:
Probability Quiz 1: Date TBD
Probability Quiz 2: Date TBD
Probability Test: Date TBD

Unit 5 – Sampling Distributions

Essential Questions:
1. How can we create and interpret sampling distributions?
2. How can we find probabilities using sampling distributions?
3. How can we solve problems using normal, binomial, and sampling distributions?
4. How can we describe and identify a geometric probability distribution?
5. How can we solve problems using sampling distributions for sample proportions?
6. What are biased and unbiased estimators?

**Summative Assessment:**
Sampling Distributions Test: Date TBD