

Statistics

Quarter Four

THE MICE SQUAD



“Luck is Statistics taken personally.”

-Penn Jillette

Essential Understanding

Statistics is perhaps the most applicable aspect of Mathematics, giving numbers power in defining our daily lives. We can find trends in the weather, our favorite sports teams, job searching... the list goes on and on. When we gather numbers describing our favorite pastimes or obligations, making sense of them gives you the power to only make sense of the past, but also predict the future. This quarter, we will continue to address some important trends in our society and acquiring the tools to make meaningful arguments to support our inferences.

Overview

Lessons will be given in class. You will have multiple mini lessons throughout the week. If you are struggling with a concept, it is your responsibility to review the lessons and ask questions. I will answer any questions you have during the lesson but after that we will follow the “three before me” principle. You must ask three of your peers before you ask me for help.

Quizzes will be given in the middle and the end of every chapter to assess what you have completed in the past three to four lessons. I will give you warning well in advance in the case of exceptions. If we have enough time, the day prior to quizzes will be review days, which will be your opportunity to clarify concepts or ask last minute questions.

Materials

Math Journal: I encourage use of your math journal during lessons and work time. I advise you to use your math journal to take notes during lessons and to work on assignments. Make sure it is neat and organized. Any and all important information from the lessons should be kept in this journal.

Three Prong Folder/Binder: For organizational purposes, please bring a folder or binder in to file supplementary material and worksheets which may be handed out over the course of this quarter. Quizzes and assessments will be handed out on loose paper, so it is extremely important to hold onto them for review!

Calculator: I recommend purchasing a scientific calculator for class period and tests. There will be a number of problem sets throughout the year which may require numerous calculations. Cell phones WILL NOT be permitted to be used as an alternative.

General Guidelines:

Problem Sets – 40% of your grade is based on completing each homework assignment.

Homework Assignments Are Recommended Problems For Learning. The completion of homework assignments will not impact your grade positively or negatively. It is recommended that you do the assignments or similar math problems in order for you to understand and retain the concepts. Use the work period to ask for help from your peers and teacher.

Quizzes – Quizzes make up 30% of your grade and you must complete each quiz prior or on the date it is scheduled. **Remember: you can always use your notebook on quizzes and exams.** You must make at least 80% to “pass” the quiz. If you do not pass a quiz, you may retest using a similar exam.

Assessments– Exams make up 30% of your grade. If you do not pass an exam, you may retest using a similar exam. You must have passed the quizzes prior to taking the corresponding exam. If you do not take the exam on the scheduled date (which is subject to change of course), it will be marked as missing in Power School.

Final Assessment – The final will make up 40% of your grade. You will not be able to make up the final exam. That is why it is important that you record the notes from the lessons and you do the suggested homework assignments. Practice the concepts in order to master them. **Your final project is also a part of your final assessment grade.**

Lessons: Statistical Analysis of Experiments

Big Ideas:

- 1) Creating Order out of Seemingly Random Tests
- 2) Approximating probability histograms via normal curves
- 3) Understanding Well-Chosen Sample Groups
- 4) Tests of Significance

Vocabulary:

- | | |
|-----------------------------|---|
| 1) Expected Value | 5) Stratified/Clustered/Multistage Sampling |
| 2) Standard Error | 6) Null Hypothesis |
| 3) Probability Histogram | 7) Z-score |
| 4) The Normal Approximation | 8) Box Model |

Individual/Group Work:

Guiding Question 1: How can we accommodate for the seeming randomness of repeated tests? What techniques have we already learned which we can apply to real world scenarios?

Chapter 17: The Expected Value and Standard Error

- ___ 17.1: The Expected Value
 - ___ p.290 (1-7)
- ___ 17.2: The Standard Error
 - ___ p.293 (1-7)
- ___ 17.3: Using the Normal Curve
 - ___ p.296 & p.297 (1-8)
- ___ 17.4: A Shortcut
 - ___ p.299 (1-4)

Assessment: Chapter 17 (May 4th)

Guiding Question 2: How can we use our knowledge of the Normal Curve to approximate probabilistic outcomes?

Chapter 18: The Normal Approximation for Probability Histograms

- ___ 18.1: Introduction
- ___ 18.2: Probability Histograms
 - ___ p.312 (1-6)

- ___ 18.3: Probability Histograms and the Normal Curve
- ___ 18.4: The Normal Approximation
 - ___ p.318 (1-6)
- ___ 18.5: The Scope of the Normal Approximation
 - ___ p.324 (1-9)

Assessment: Chapter 18 (May 16th)

Guiding Question 3: How can we effectively choose a sample group which properly reflects the tendencies of a whole population?

Sampling

- ___ Notes on various sampling techniques Powerpoint
- ___ Research on the sampling techniques learned
- ___ Sampling Techniques Worksheets

Guiding Question 4: How can we numerically explain how confident we are in results of experiments? What are some examples of tests which do so?

Chapter 26: Tests of Significance

- ___ 26.1: Introduction
 - ___ p.476 & p.477 (1-5)
- ___ 26.2: The Null and the Alternative
 - ___ p.478 (1-5)
- ___ 26.3: Test Statistics and Significance Levels
 - ___ p.481 (1-8)
- ___ 26.4: Making a Test of Significance
 - ___ p.482 (1-5)
- ___ 26.5: Zero-One Boxes
 - ___ p.486 (1-9)

Assessment: Chapter 26 (June 9th)

FINAL ASSESSMENT (Week of June 12th):

_____ Final Assessment Chapters 17, 18, 26, (plus some sampling questions)

_____ Final Project (Completed During Week 1)

Readings

Freedman, David. *Statistics 4th Edition*. W.W. Norton & Company, 2007. Print.

Links

Kahn Academy videos on statistics concepts:

<https://www.khanacademy.org/math/probability#table-of-content>

