In this team project you will apply what you have learned about probability this year to design and conduct an investigation. The investigation should follow the guidelines below and include a statement of your goals, and a conclusion about what you data show. Your team will present the project to your peers.

Key Aspects:

* Work with another student
* Present your project and findings
* Determine at least TWO probabilities
* Possible Project Types:  
  \* Survey – Survey Monkey/Google – Actual survey {Need Informed Consent Paperwork}  
  \* Experiment – Flip coins, Stuffed Oreos, Socks in a drawer, … {Use Theoretical Probability}  
  \* Data Mining – Two way table, Personal Probability
* Get Project Approved – Research Plan

Guidelines

1) For this project choose at least TWO events which interest you and your partner.   
2) Design a Research Plan for your study.

3) Meet with your teacher to get suggested modifications and approval. Get approval from the IRB as required.

4) Collect at least 200 data points.

5) Create a data collection mechanism.

6) Display your data in at least two ways.

7) Evaluate your data: What does your data show about the probabilities and compare this to your expectations/hypothesis.

8) Present your project to the class.

Personal Probability Definition: A personal probability of an outcome is a number between 0 and 1 that expresses an individual’s judgment of how likely the outcome will happen.

For a Survey of Humans:

A complete research plan is required as described below.

The research plan is to include the following:

A. Question or Problem being addressed

B. Hypothesis/Goals

C. Description in detail of method or procedures

The following are important and key items that should be included when formulating ANY AND ALL research plans.

• Procedures: Detail all procedures and experimental design to be used for data collection

• Data Analysis: Describe the procedures you will uses to analyze the data that answer research question or hypothesis

Human Subjects Research

• Subjects: Describe who will participate in your study (age range, gender, racial/ethnic composition). Identify any vulnerable populations (minors, pregnant women, mentally disabled or economically disadvantaged).

• Recruitment: Where will you find your subjects? How will they be invited to participate?

• Methods: What will participants be asked to do? Will you use any surveys, questionnaires or tests? What is the frequency and length of time involved for each subject?

• Risks: What are the risks or potential discomforts (physical, psychological, time involved, social, legal etc.) to participants? How will you minimize the risks?

• Benefits: List any benefits to society or each participant.

• Protection of Privacy: Will any identifiable information (e.g. names, telephone numbers, birthdates, email addresses) be collected? Will data be confidential or anonymous? If anonymous, describe how the data will be collected anonymously. If not anonymous, what procedures are in place for safeguarding confidentiality? Where will the data be stored? Who will have access to the data? What will you do with the data at the end of the study?

• Informed Consent Process: Describe how you will inform participants about the purpose of the study, what they will be asked to do, that their participation is voluntary and they have the right to stop at any time.

**Rubric**

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| --- | --- | --- | --- |
| **Objective** | **3** | **2** | **1** |
| **Data Magnitude [10 points]** | 200 or more data points were collected | 199 to 100 data points were collected | Less than 100 data points were collected |
| **Data Display and Organization [25 points]** | Use of at least two of the following: Two-Way Table, Venn Diagrams, Graphs, and/or Tree Diagrams.  Data is correctly displayed showing all data collected with titles identifying and separating the data.  Any graph is done neatly with titles and labels  Numbers given accurately represent the data collected Nspire, Word, Power Point, Excel | Most data is correct recorded on the chart. Titles are incomplete or do not reflect the data Graph is done with Excel but is not correctly done | Chart is incomplete  Chart is not neatly completed No graph |
| **Conclusion [10 points]** | Summary reflects the topic chosen and the data collected.  Conclusions are drawn based on data collected. | Summary and conclusions are given but are incomplete | Little or no conclusions or summaries are given |
| **Presentation [25 points]** | Statement of the problem is complete and clear.  At least two graphical representations of the data/probabilities.  Explanation of the process use to collect the data.  Statement of the results of the project with conclusions and projections.  Appropriate interaction with audience | A few missing aspects with minor missteps. | Major items missing and inappropriate actions. |
| **Use of Mathematics [15 points]** | Correct and appropriate application of mathematics principals of probability | A few minor and cosmetic errors | Limited understanding of mathematical concepts shown. |
| **Language Arts [5 points]** | Probability terms, vocabulary, correct and appropriate grammar (written and oral). Report is submitted digitally in Word or other appropriate application. [Nspire, Power Point, Excel] | A few missteps that confuse and cloud understanding | Unacceptable usage and major missing terms and vocabulary |
| **Following Directions/Protocols [10 points]** | No violations | Few minor violations | Major violations |