IB Math HL Exploration Outline Worksheet Group #:\_\_\_\_\_\_\_\_\_\_ Period: \_\_\_\_\_\_\_\_\_\_

Names\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Marks\_\_\_\_/20 for Outline of A, B, C, D

Marks \_\_\_\_\_/10 for Use of Mathematics, E

**Type your concise responses in the space provided (five pages limit).** At the beginning of period 5/17, Friday.

**I will be grading each item (you will not earn full credit because you team turned in)**

**A: Communication** This criterion assesses the organization and coherence of the exploration. A well-organized exploration contains an introduction, has a rationale (which includes explaining why this topic was chosen), describes the aim of the exploration and has a conclusion. A coherent exploration is logically developed and easy to follow with graphs, tables, etc. in the appropriate place in the document, not at the end.

**Aim**: Goal or purpose of your work **Rationale**: Reasoning behind your decision

The Aim & Rationale for your Exploration must be incorporated into the opening paragraph of your paper. It should be a straightforward statement of the goal of your work, the reason(s) for choosing this goal, and how you will attempt to accomplish your goal.

1. Write a concise paragraph that describes the Aim & Rationale of your Exploration. (This will be a draft of your opening paragraph!)

2. How will you organize the presentation of your ideas?

3. What visuals will you use?

4. What will you include in your conclusion?

**B: Mathematical Presentation** This criterion assesses to what extent the student is able to: use appropriate mathematical language (notation, symbols, terminology); define key terms, where required; use multiple forms of mathematical representation such as formulae, diagrams, tables, charts, graphs and models, where appropriate.

Students are expected to use mathematical language when communicating mathematical ideas, reasoning and findings and use appropriate technology.

1. Define key terms (terms that are not common knowledge but are helpful in reading your work).

2. What degree of accuracy will be appropriate?

3. What forms of mathematical representation will be appropriate? (Formulae, diagrams, tables, charts, etc.). Be specific. Show the steps of mathematics (including the data and the examples).

**C: Personal Engagement** This criterion assesses the extent to which the student engages with the exploration and makes it their own. Personal engagement may be recognized in different attributes and skills. These include thinking independently and/or creatively, addressing personal interest and presenting mathematical ideas in their own way.

1. Why this topic is meaningful to you?

2. If you could answer any questions about this topic, what would they be? For example, “I wonder if . . .?”  “Why does this happen . . .?”

3. What global perspective/historical context/community or personal impact can you include?

4. How will you make your paper unique through independent thought and/or creative use of mathematics?

**D: Reflection** This criterion assesses how the student reviews, analyzes and evaluates the exploration. Although reflection may be seen in the conclusion to the exploration, it may also be found throughout the exploration.

1. How will you know and demonstrate whether your data and/or model are reasonable?

2. How will you know and demonstrate whether your mathematics and conclusion are reasonable?

3. How will you know and demonstrate whether you have accomplished your aim?

4. How will you evaluate your exploration in light of your personal interests and/or the moral, ethical, historical and international implications of your results?

5. What are the limitations and/or possible extensions of your work?

6. In what other ways should you evaluate/analyze/consider the merit of your exploration?

**E: Use of Mathematics** Students are expected to produce work that is commensurate with the level of the course, meaning the math is either part of the syllabus, or at a similar level or beyond, not solely based on math listed in the prior learning. Marks are given based on math that is relevant, on level, correct and for demonstration of knowledge and understanding. **This section will be marked total of 10 points. In order to achieve all possible points your work in mathematics must be all complete and detailed with supporting evidence and justification.**

Direction of this section : Type all of the mathematics (Math Type or Equation Editor!!) that you intend to include in your final paper. This should include any assumptions, data, formulas and reasons for using them, equations and their explanations, algebraic manipulation, explanation of steps taken, results, and anything else that could be considered the math part of your exploration.

What general mathematical strategies do you anticipate using in the course of your IA? Choose at least two of the following and explain how you will use these strategies.

* + Patterns
  + Finding a best fit function to model data
  + Applications to different contexts
  + Problem solving techniques or/and proof
  + Links to other areas of mathematics
  + Insights gained from different perspectives
  + Other (specify)

Show your IA topic of the mathematical process (**you may want to include all steps of mathematical work here)**. I expect this section will be about 2-3 pages of your work. If your work is incomplete, then you will loss points.

Explain how does the use of mathematics support the aim of your exploration? What is the evidence?