***MYP Honors Intermediate Algebra/Geometry***

***Learning Goals and Scales: Exponential Unit***

**Scale for Big Idea A: Exponential story via Equation Writing**

**Criterion A**: Knowing and Understanding Year 4 & 5 Rubric **Maximum: 8**

1. **select** appropriate mathematics when solving problems
2. **apply** the selected mathematicals successfully when solving problems
3. **solve** problems correctly in both familiar and unfamiliar situations in a variety of contexts.

|  |  |  |  |
| --- | --- | --- | --- |
| Achievement Level | Proficiency  Level | Level Descriptor | Task Specific Description |
| 7-8 | Score Advanced | The student is able to:  i. **select** appropriate mathematics when solving challenging problems in both familiar and unfamiliar situations  ii. **apply** the selected mathematics successfully when solving these problems  iii. generally **solve** these problems correctly. | Can write equation from novel situations, and be able to show evidence of proficiency from the other bands in the rubric. |
| 5-6 | Proficient | The student is able to:   1. **select** appropriate mathematics when solving challenging problems in familiar situations 2. **apply** the selected mathematics successfully when solving these problems   generally **solve** these problems correctly. | Can write an equation from a table, graph, and / or situation.  Can write equation from non-perfect table (table that omits intermediate values). |
| 3-4 | Partially Proficient | The student is able to:  i. **select** appropriate mathematics when solving more complex problems in familiar situations  ii. apply the selected mathematics successfully when solving these problems  iii. generally solve these problems correctly. | Can identify values for Important parts of an equation but is not yet proficient in equation writing.  Can write equation from table or graph but not yet proficient with situations.  Can identify rule – walk but writes linear equation.  Can demonstrate that exponential functions utilize repeated multiplication.  Can find rule for practically perfect table (no zero). |
| 1-2 | Not Proficient | The student is able to:   1. **select** appropriate mathematics when solving simple problems in familiar situations 2. **apply** the selected mathematics sometimes when solving   iii. generally **solve** these problems correctly. | With help, partial success at score 3-4 and score 5-6 content |
| Score 0.0 | Score 0.0 | The student does not reach a standard indicated by any of the standards below. | Even with help, no success |

**Scale for Big Idea B: Exponential Multiple Representations**

**Criterion A**: Knowing and Understanding Year 4 & 5 Rubric **Maximum: 8**

1. **select** appropriate mathematics when solving problems
2. **apply** the selected mathematicals successfully when solving problems
3. **solve** problems correctly in both familiar and unfamiliar situations in a variety of contexts.

**Scale for Big Idea: Multiple Representations of Functions—Exponential**

|  |  |  |  |
| --- | --- | --- | --- |
| Achievement Level | Proficiency  Level | Level Descriptor | Task Specific Description |
| 7-8 | Score Advanced | The student is able to:  i. **select** appropriate mathematics when solving challenging problems in both familiar and unfamiliar situations  ii. **apply** the selected mathematics successfully when solving these problems  iii. generally **solve** these problems correctly. | Can create appropriate situation to match given exponential model.  Justifies or explains conclusions using multiple representations (Project)  Be able to show evidence of proficiency from the other bands in the rubric.  Can solve a novel problem involving multiple representations of exponential functions |
| 5-6 | Proficient | The student is able to:   1. **select** appropriate mathematics when solving challenging problems in familiar situations 2. **apply** the selected mathematics successfully when solving these problems   generally **solve** these problems correctly. | Can develop table from graph or situation.  Can develop table from equation.  Can use table and graph to calculate solution.  Can identify growth or decay from graph, table, or situation and use knowledge to write equation.  Can justify whether or not a given data set displays exponential behavior. |
| 3-4 | Partially Proficient | The student is able to:  i. **select** appropriate mathematics when solving more complex problems in familiar situations  ii. apply the selected mathematics successfully when solving these problems  iii. generally solve these problems correctly. | Can identify growth or decay from graph, table, equation or situation.  Able to identify rule but not yet able to develop accurate table. |
| 1-2 | Not Proficient | The student is able to:   1. **select** appropriate mathematics when solving simple problems in familiar situations 2. **apply** the selected mathematics sometimes when solving   iii. generally **solve** these problems correctly. | With help, partial success at score 3-4 and score 5-6 content |
| Score 0.0 | Score 0.0 | The student does not reach a standard indicated by any of the standards below. | Even with help, no success |

**Scale for Big Idea C: Problem Solving –Exponential Functions**

**Criterion A**: Knowing and Understanding Year 5 Rubric **Maximum: 8**

At the end of Year 5, students should be able to:

1. **select** appropriate mathematics when solving problems
2. **apply** the selected mathematicals successfully when solving problems
3. **solve** problems correctly in both familiar and unfamiliar situations in a variety of contexts.

|  |  |  |  |
| --- | --- | --- | --- |
| Achievement Level | Proficiency  Level | Level Descriptor | Task Specific Description |
| 7-8 | Score Advanced | The student is able to:  i. **select** appropriate mathematics when solving challenging problems in both familiar and unfamiliar situations  ii. **apply** the selected mathematics successfully when solving these problems  iii. generally **solve** these problems correctly. | Uses sophisticated math language/equations/tables/graphs to communicate solutions  Showing multiple ways to solve the problem  Developing a unique method to solve.  Relates the mathematical idea to other mathematical concepts  Be able to show evidence of proficiency from the other bands in the rubric. |
| 5-6 | Proficient | The student is able to:   1. **select** appropriate mathematics when solving challenging problems in familiar situations 2. **apply** the selected mathematics successfully when solving these problems   generally **solve** these problems correctly. | Incorporate multiple big ideas to solve a novel problem  Uses accurate math language/equations/tables/graphs to communicate solutions(This includes solving graphically i.e. system of equations) |
| 3-4 | Partially Proficient | The student is able to:  i. **select** appropriate mathematics when solving more complex problems in familiar situations  ii. apply the selected mathematics successfully when solving these problems  iii. generally solve these problems correctly. | Reasoning is only partially correct (or correct in only part of the problem) |
| 1-2 | Not Proficient | The student is able to:   1. **select** appropriate mathematics when solving simple problems in familiar situations 2. **apply** the selected mathematics sometimes when solving   iii. generally **solve** these problems correctly. | With help, partial success at score 3-4 and score 5-6 content |
| Score 0.0 | Score 0.0 | The student does not reach a standard indicated by any of the standards below. | Even with help, no success |

**Scale for Big Idea D: Reasonable solutions/predictions—Exponential Functions**

**Criterion A**: Knowing and Understanding Year 5 Rubric **Maximum: 8**

At the end of Year 5, students should be able to:

1. **select** appropriate mathematics when solving problems
2. **apply** the selected mathematicals successfully when solving problems
3. **solve** problems correctly in both familiar and unfamiliar situations in a variety of contexts.

|  |  |  |  |
| --- | --- | --- | --- |
| Achievement Level | Proficiency  Level | Level Descriptor | Task Specific Description |
| 7-8 | Score Advanced | The student is able to:  i. **select** appropriate mathematics when solving challenging problems in both familiar and unfamiliar situations  ii. **apply** the selected mathematics successfully when solving these problems  iii. generally **solve** these problems correctly. | Given a situation, can make an optimal decision as whether to model it using linear or exponential function.  Can solve novel problem using exponential function skills.  Explain limitations of a model (i.e. population can’t continue at an exponential rate)  Be able to show evidence of proficiency from the other bands in the rubric. |
| 5-6 | Proficient | The student is able to:   1. **select** appropriate mathematics when solving challenging problems in familiar situations 2. **apply** the selected mathematics successfully when solving these problems   generally **solve** these problems correctly. | Can use calculator to determine solution given a situation.  Identify and apply inputs and outputs to solve problems.(this includes the ability to solve graphically and interpret answer as reasonable given the context of the problem) |
| 3-4 | Partially Proficient | The student is able to:  i. **select** appropriate mathematics when solving more complex problems in familiar situations  ii. apply the selected mathematics successfully when solving these problems  iii. generally solve these problems correctly. | Can find output given an input. |
| 1-2 | Not Proficient | The student is able to:   1. **select** appropriate mathematics when solving simple problems in familiar situations 2. **apply** the selected mathematics sometimes when solving   iii. generally **solve** these problems correctly. | With help, partial success at score 3-4 and score 5-6 content |
| Score 0.0 | Score 0.0 | The student does not reach a standard indicated by any of the standards below. | Even with help, no success |