**Holistic Rubric: Planning Experimental Investigations (4th Grade)**

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| --- | --- | --- | --- |
|  | **Beginning** | **Satisfactory** | **Advanced** |
| **Student’s plan Includes…** | * Clear steps for repeatability * Quantitative measurements for comparisons | Beginning, plus   * Controls as evidence of a “fair test” * Purposeful selection of appropriate measurement tools | Satisfactory, plus   * Multiple trials for evidence of a pattern |
| **Student can predict impact of…** | * Following different steps * Using qualitative instead of quantitative measures | Beginning, plus   * Having missing controls * Using different measurements (e.g., time vs. distance) * Using different measurement tools (e.g., ruler vs. tape measure) | Satisfactory, plus   * Changing number of trials |

**Formative Assessment Checklist: Multiple trials**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | 1) Notices variability in outcomes of trials | 2) Expresses decreased confidence in single trial due to possible error | 3) Expresses decreased confidence in single trial due to possible natural variation | 4) Expresses confidence on a pattern of data from multiple trials | 5) Predicts impact of changing number of trials |
| Group A | Student 1 |  |  |  |  |  |
| Student 2 | X | X |  |  |  |
| Student 3 | X | X – shook fur really hard |  |  |  |
| Student 4 |  |  |  |  |  |
| Group B | Student 5 | X | X |  |  |  |
| Student 6 | X | X |  |  |  |
| Student 7 |  |  |  |  |  |
| Student 8 |  |  |  |  |  |
| Group C | Student 9 | X |  |  | X – Seed B stuck most of the time | X – If only did once, wouldn’t know seed B would stick |
| Student 10 |  |  |  |  |  |
| Student 11 | X | X |  |  |  |
| Student 12 | X | X |  |  |  |
| Group D | Student 13 | X | X |  |  |  |
| Student 14 |  |  |  |  |  |
| Student 15 | X |  |  |  |  |
| Student 16 |  |  |  |  |  |
| Group E | Student 17 | X |  | X – Some dandelion seeds have more fluff than others |  |  |
| Student 18 |  |  |  |  |  |
| Student 19 |  |  |  |  |  |
| Student 20 |  |  |  |  |  |