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| cid:image001.jpg@01D0E877.2BB181B0 | **GIS MYP Science Department**  **Grade 7&8 Unit 1 – The Scientific Method (formative assessment)** | | Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| Key concept | Related concepts | Global context | |
| **Relationships** | **Evidence Function** | **Scientific and technical innovation –** methods | |
| **Statement of inquiry:**  **Methods** for the collection of **evidence** of **relationships** depend on their **function** | | | |

Criterion B: Inquiring and designing

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|  | **i. What are you going to investigate?** | **ii. What do you think is going to happen?** | **iii. What are you going to measure?** | **iv. How are you going to do your investigation?** |
| 1-2 | * You write a research question but it doesn’t have the necessary information | * You say what you think will happen to the DV | * You state the variables (IV and DV at least) | * You have a method but it is lacking steps telling you how to change the IV and/or measure the DV, or is difficult to follow. |
| 3-4 | * You state a research question that could work, but it is not in the correct format | * You say what you think will happen to the DV when the IV is increased | * You say (correctly) what the IV and DV are and how to control/measure them * You give 2-3 control variables * Your method contains instructions to take relevant data | * You write a method, but it will not allow you to take sufficient data. * You have considered safety |
| 5-6 | * You write a research question in the correct format, containing the IV, DV and a CV | * You say what you think will happen to the DV when the IV is increased. * You briefly explain why, using science | * You say (correctly) what the IV and DV are and how you will control/measure them * You give 2-3 control variables and say how you will measure them * Your method contains brief instructions to take 5 data points, repeated for reliability | * You have an equipment list. * You write a method, which will allow you to take enough data (5 data points, repeated for reliability), but some points need more explanation * You have given safety instructions which are specific to this investigation. |
| **7-8** | * **You state a research question in the correct format, containing the IV, DV and a CV.** * **You have given background information to explain the science needed to understand the RQ** | * **You say what you think will happen to the DV when the IV is increased** * **You clearly explain why, using correct science** | * **You say (correctly) what the IV and DV are and how you will control/measure them** * **You give 4-5 control variables, say how you will measure them** * **Your method contains clear instructions to take 5 data points, which are repeated for reliability** | * **You have an equipment list.** * **You write a method, which will allow you to take enough data (5 data points, repeated for reliability) and is clear, complete and logical** * **You have given safety instructions which are specific to this investigation.** |

Criterion C: Processing and evaluating

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|  | **i. What data do you have?** | **ii. What does the data mean?** | **iii. Does your prediction fit the data?** | **iv. What does the data tell you about your method?** | **v. How could you improve your method?** |
| 1–2 | * You have correctly collected data * You have presented your data either as a table or a graph | * You have described your graph. * You have made a correct statement to say what your graph shows. | * You say whether your hypothesis is correct | * You comment on the quality of your data. * You give 1-2 suggestions of weakness about your investigation. | * You give 2 ways that your investigation could be improved. |
| 3–4 | * You have correctly collected data * You have correctly organized your raw data in a table with correct headings and units * Your table has a title | * You have described your graph. * You have made a correct statement to say what happens to the DV when the IV increases. | * You correctly say whether your hypothesis is correct | * You correctly comment on the quality of your data, with evidence. * You give 2 suggestions of weakness about your investigation. | * You give 2 ways to improve your investigation that would benefit the scientific investigation. * Your improvements name specific pieces of apparatus (where appropriate) |
| 5–6 | * You have correctly collected data. * You have correctly organized your raw data in a table with correct headings and units * You have calculated average and produced a processed data table * Your tables have titles | * You have described your graph. * You have made a statement to say what happens to the DV when the IV increases. * You have briefly explained why this happens. | * You say whether your hypothesis is correct and explain why | * You correctly comment on the quality of your data, with evidence. * You give 3 or more suggestions of weakness about your investigation. | * You give 3 or more ways to improve your investigation that would benefit the scientific investigation. * Your improvements name specific pieces of apparatus (where appropriate) |
| **7–8** | * **You have correctly collected data.** * **You have correctly organized your raw data in a table with correct headings and units** * **You have calculated average and produced a processed data table** * **Your tables have titles** * **You have produced an appropriate graph from your data.** | * **You have described your graph.** * **You have made a statement to say what happens to the DV when the IV increases, if possible, noting a mathematical relationship.** * **You have explained why this happens using correct scientific reasoning** | * **You say whether your hypothesis is correct giving details** * **You give evidence connecting your graph/data to your hypothesis.** | * **You correctly comment on the quality of your data, with evidence.** * **You give 3 or more suggestions of weakness about your investigation.** * **You discuss the effect of the weakness on the data.** | * **You give 3 or more ways to improve your investigation that would benefit the scientific investigation.** * **You discuss why you would make each improvement.** * **Your improvements name specific pieces of apparatus (where appropriate).** |

Factors affecting the flight time of a paper airplane

Criterion B

**1) Background Information**

* *Give us an overview of this experiment, how you chose your IV and DV*

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**2) Research Question?**

* *Include the independent, dependent (and main control) variables in the question.*
* *Use the correct format.*

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**3) Hypothesis?**

* *“I think that if I increase the IV , then the DV will increase/decrease because … ”*
* *In what way will the DV change? Linear, get faster/slower…? Why?*
* *Use scientific principles and language here to* ***explain*** *your prediction.*

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**4) Independent variable?**

* *What variable are* ***you*** *going to change?*
* *How are you going to measure it, what are its units?*

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**5) Dependent variable?**

* *What is going to change because you changed the independent variable?*
* *How are you going to measure it, what are its units?*

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**6) Control variables?**

* *What things must you keep the same in* ***all*** *experiments to make sure that the* ***only*** *thing that changes in each experiment is the independent variable?*
* *How are you going to measure them?*

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| Variable | How will you keep it the same/measure it? |
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**7) Apparatus list**

* *Everything you need –* ***including size*** *(eg 100ml beaker)*

**8) Method**

* *A numbered list of instructions that anyone could follow.*
* *Draw a diagram/put in photos to help.*
* *Tell people what to measure, how to measure it and how many times to repeat each step.*
* *Remember 5 different values for the independent variable with repeats to get an average for each value*

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Safety considerations

* *What materials or steps do we need to take care with? Be specific to this investigation.*

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**Criterion C**

**9) Results**  (can be done in excel)

* Draw a table with ALL the results below (including units in the heading, and a title)
* Add another table to make averages (including units in the heading, and a title)
* Add comments with any relevant observations/descriptions after the table.
* Draw a graph of the results (x axis is the independent variable) add labels to the axes (with units) add a trendline and a title.

**10) Conclusion**

* *Describe the shape of the graph.*
* *Make a simple statement to give the relationship between the IV and DV ( as the IV increases, the DV….)*
* *Can you make a more complicated observation (how does the DV increase or decrease – linear, curve…?)? Can you use maths (as the IV doubles, the DV doubles, for example)?*
* *Is this what your hypothesis predicted? Completely? Why/why not?*
* *Try to explain your results using scientific language and ideas from the unit you are studying.*

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**11) Evaluation**

* *Does the data/graph look reliable? (Are your individual results close to the averages/line on the graph?)*
* *Refer to your graph in your explanation.*
* *Did your investigation gave you the right/enough data to answer your research question?*
* *Complete the table below.*

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| Weaknesses  *Which parts of your investigation*  *made the results not perfect? Why?* | Suggested improvement  *Give specific suggestions for*  *each weakness in the other column*  *and explain why they will improve the investigation* |
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