

PICTON HIGH SCHOOL

Creating Opportunities Achieving Success



YEAR 12 Investigating Science

Assessment Task 1

Due Date: Friday 7th December 2018	Assessment Name: Perform an Investigation
Mark: /60	Weighting: 15%

INS12-3 conducts investigations to collect valid and reliable primary and secondary data and information
INS12-4 selects and processes appropriate qualitative and quantitative data and information using a range of appropriate media
INS12-5 analyses and evaluates primary and secondary data and information
INS12-7 communicates scientific understanding using suitable language and terminology for a specific audience or purpose

SCLS6-2 plans an investigation individually or collaboratively to obtain primary or secondary data and information
SCLS6-3 participates in investigations individually or collaboratively to collect primary or secondary data and information

TASK DESCRIPTION:

Choose an investigation either from the list or from your own interest. The investigation should be based on an observation that you would like to look further into.

- Does how hard the water is boiling affect how long it takes to cook pasta?
- What is the relationship between the weight of an object and the amount of water it displaces?
- What is the relationship between the boiling point of a liquid and its cooling effect?
- How does the amount of salt in water affect the boiling point of the water?

Develop an appropriate method to carry out the investigation. Make sure you cover all of the necessary concepts (independent, dependent and controlled variables, repetition, reliability, validity etc.).

Perform the investigation in class and gather suitable data.

Prepare a written report for submission by the due date which includes Abstract, Question, Aim, Hypothesis, Materials, Safety, Method, Results, Discussion, Conclusion and Further Investigation.

Marking Guidelines

11/12-3 conducts investigations to collect valid and reliable primary and secondary data and information

	Conducts investigations to collect valid primary and secondary data and information.
A (9-10)	Investigation report shows that the student has a clear understanding of how to collect valid data (data that can be used appropriately to answer the question/hypothesis) by ensuring that the investigation involves controlling all necessary variables and/or using a large sample sizes.
B (7-8)	Investigation report shows that the student has an understanding of how to collect valid data (data that can be used appropriately to answer the question/hypothesis) by ensuring that the investigation involves controlling some variables and/or using a large sample sizes.
C (5-6)	Investigation report shows that the student has collected data but gives little indication as to how they ensured the data was valid (data that can be used appropriately to answer the question/hypothesis). There may be little information about how variables were controlled and/or sample sizes are small (e.g. <10).
D(3-4)	Investigation report shows that the student has collected data but gives no indication as to how they ensured the data was valid (data that can be used appropriately to answer the question/hypothesis). There may be no information about how variables were controlled and/or sample sizes are small (e.g. <10).
E (0-2)	Data is collected but there is no explicit basis for gauging how valid it is (whether it can be used appropriately to answer the question/hypothesis). There is no information about how variables were controlled and sample sizes are small (e.g. <10).

	Conducts investigations to collect reliable primary and secondary data and information.
A (9-10)	Investigation report shows that the student has a clear understanding of how to collect reliable data (data that can be replicated by others who follow the same investigation method) by ensuring that the investigation includes specific details about the method used and how the relationship between the Independent and Dependent variables was tested and measured.
B (7-8)	Investigation report shows that the student has an understanding of how to collect reliable data (data that can be replicated by others who follow the same investigation method) by ensuring that the investigation includes details about the method used and how the relationship between the Independent and Dependent variables was tested and measured.
C (5-6)	Investigation report shows that the student has collected data but gives little indication as to how they ensured the data was reliable (data that can be replicated by others who follow the same investigation method). The report may lack details about the method used and not be clear about the how the relationship between the Independent and Dependent variables was tested and measured.
D(3-4)	Investigation report shows that the student has collected data but gives no indication as to how they ensured the data was reliable (data that can be replicated by others who follow the same investigation method). The report lacks details about the method used and is not clear about the how the relationship between the Independent and Dependent variables was tested and measured.
E (0-2)	Data is collected but there is no explicit basis for gauging how reliable it is (whether it can be replicated by others who follow the same investigation method). There is no explicit understanding about the relationship between the Independent and Dependent variables.

11/12-4 selects and processes appropriate qualitative and/or quantitative data and information using a range of appropriate media

	Selects and processes appropriate qualitative and/or quantitative data and information using a range of appropriate media.
A (9-10)	Records all quantitative data that is appropriate to the investigation and included in an appendix. Appropriate parts of the data are chosen to process using mathematical and/or graphical procedures using appropriate media. All processed data are presented using an appropriate medium.
B (7-8)	Quantitative data is recorded and included in an appendix. There is evidence that there has been a selection process to choose the most appropriate data. The data has been processed to some extent, but may have some errors, lack of clarity or inaccuracies in what has been done. All processed data are presented using an appropriate medium
C (5-6)	Quantitative data is only recorded as part of the report and is processed as part of the “Results” section of the report. No evidence of selection of appropriate data is present and the data has been processed to some extent, but may have some errors, lack of clarity or inaccuracies in what has been done. The medium used for the presentation is not appropriate.
D (3-4)	Few pieces of data are included and are recorded as part of the report. There may be a rudimentary processing of the results and the processed results may have some errors, lack of clarity or inaccuracies in what has been done. The medium used for the presentation is not appropriate.
E (0-2)	Very little quantitative data is presented and it is either not processed or processed in a very simplistic manner. The medium used for the presentation is not appropriate.

11/12-5 analyses and evaluates primary and secondary data and information

	Analyses primary and secondary data and information.
A (9-10)	Clear evidence that the data that was gathered has had appropriate operations performed on it to make it relevant to the question being investigated. Original data is available and the analysed data (tabulated and graphed as appropriate) are included.
B (7-8)	Evidence that the data that was gathered has had appropriate operations performed on it to make it relevant to the question being investigated. Original data is available and the analysed data (tabulated and/or graphed) are included.
C (5-6)	Some evidence that the data that was gathered has had some operations performed on it to make it relevant to the question being investigated. Original data may not be available and the analysed data (perhaps tabulated or graphed) are included.
D (3-4)	There is data presented but not in a cogent or systematic manner. There may be some attempt to analyse the data, but it is rudimentary and may not answer the question being investigated.
E (0-2)	There is either no data presented or the data presented is haphazard and very rudimentary. Some of the data may be irrelevant

	Evaluates primary and secondary data and information.
A (9-10)	All data is included in an appendix. Clear evidence that the data that was gathered has been considered and only the most relevant data used. Clear evidence that the student has made informed decisions about which information is most accurate, valid and reliable.
B (7-8)	Data is included in an appendix. Evidence that the data that was gathered has been considered and some data excluded as being invalid or unreliable. Evidence that the student has made some decisions about which information is most accurate, valid and reliable.
C (5-6)	Data is included in an appendix. Some evidence that the data that was gathered has been considered but all data is used. Student has made some attempt to ensure data is accurate, valid and reliable.
D (3-4)	Data is presented but there is little evidence that the student has evaluated the data and chosen to use only parts of it. Data is presented as part of the body of the report. Data is of low quality and there has been little effort to use only the most relevant information.
E (0-2)	Data is presented but there is no evidence that the student has evaluated the data and chosen to use only parts of it. Data is presented as part of the body of the report or not included. Data is of low quality and there has been no effort to use only the most relevant information.

11/12-7 communicates scientific understanding using suitable language and terminology for a specific audience or purpose

	Communicates scientific understanding using suitable language and terminology for a specific audience or purpose.
A (9-10)	Information is communicated using suitable language (including an extensive use of scientific terminology) with appropriate explanations where needed, depending on the intended audience.
B (7-8)	Information is communicated using suitable language (including the use of some scientific terminology) with appropriate explanations where needed, depending on the intended audience.
C (5-6)	Information is communicated using suitable language (including little use of scientific terminology) with appropriate explanations where needed, depending on the intended audience.
D (3-4)	Information is communicated but uses language that is too complex or too simple for the intended audience. There is some use of scientific terminology but without appropriate explanations and the presentation does not allow for a particular audience.
E (0-2)	Information is communicated poorly, with little regard for the audience. The scientific terminology (if used) is beyond the understanding of the presenter and is not explained.

Lifeskills Marking Guidelines.

	SCLS6-2 plans an investigation individually or collaboratively to obtain primary or secondary data and information
A (10 -9)	Plans the investigation individually. Includes all sections required for a full scientific report. There is a valid Hypothesis, a Method that is presented clearly and appropriately and clear planning for how the Results will be set out.
B (8 – 7)	Takes a leading role in planning the investigation in collaboration with another student(s). Includes all sections required for a full scientific report. Some aspects of the report lack clarity or are not fully covered.
C (6 – 5)	Gives assistance to another student(s) in planning an investigation. The Report covers most aspects of the requirements for a scientific report but may lack some features and lack organisation.
D (4 – 3)	Follows another student(s) and gives limited input into the plan for the investigation. The report has few details and lacks many of the features of a scientific report.
E (2 – 0)	Has little input into the planning of the investigation and collects very little data or information.

	SCLS6-3 participates in investigations individually or collaboratively to collect primary or secondary data and information
A (10 – 9)	Participates individually. Shows a focussed effort throughout the investigation and submits the investigation report on time. The information collected is clearly related to the investigation being carried out and the amount is proportional to the time spent collecting it.
B (8 – 7)	Participates individually or takes a leading role in performing the investigation with another student(s). Shows a focussed effort for most of the time doing the investigation. The information gathered is quite comprehensive, related to the investigation and is indicative of the time spent on it.
C (6 – 5)	Takes a supportive role in performing the investigation with another student(s). Shows a fairly focussed effort while performing the investigation. The information gathered is adequate and has some relationship to the time given for the investigation.
D (4 – 3)	Works with other students to perform an investigation. Is involved in minor ways in the performance of the investigation. Helps to collect some of the information.
E (2 – 0)	There is little interest or cooperation in performing the investigation. May be disruptive or disinterested. The quality and extent of the information gathered is limited.