Candidate 1 Assignment – Rock permeability

The evidence for this candidate has achieved the following marks for each section of this course assessment component.

Section	Marks available	Marks awarded		Comments
1. Aim	1	1		The aim clearly describes the purpose of the experiment.
2. Underlying environmental science	3	3		A good understanding of relevant environmental science is demonstrated, with appropriate discussion of permeability, uptake of water from soil by plants, and the relevance of permeability to crop production.
3. Data collection and handling	6	a	1	The overall experimental procedure can be visualised from the description provided.
		b	1	The raw data is sufficient. Three types of rock particle are assessed. Measurements for each have been repeated three times, and an average calculated. (Calculation of the average is considered in section 3d).
		c	0	The experimental data is presented in a table. The mark was not awarded for the following reasons: ♦ there is no reference to time in the table heading or column headings ♦ display of time (seconds) is inconsistent, with some expressed to whole seconds and others to hundredths of a second.
		d	1	The mean (average) values are correctly calculated. These are included in the table of results, which is acceptable.
		e	1	The secondary data/information is from a diagram referring to plant roots accessing water and is relevant to the aim.
		f	0	The URL for the secondary source is incomplete. It should be referenced as directed in the candidates instructions, in sufficient detail to be retrieved by a third party.
4. Graphical presentation	4	a	0	The graph produced is based on the experimental data but the format is not appropriate to the data. Although time is a variable that can be displayed in a line graph, the soil types are categories (discrete data) rather than measurements (continuous data) and a bar graph is appropriate in this case.
		b	1	The categories are clearly laid out on the *x*-axis.

				The *y*-axis scale is suitable for the range of the data values (see plotting of data points in section 4d).
		c	0	The *x*-axis label should refer to rock particle types (or similar) rather than soil types as soil does not feature in this experiment. The *y*-axis label should refer to 'average time (seconds)'. Ideally, it should reflect the column heading in the table but the candidate has omitted this information in the table (considered in section 3d).
		d	0	The points have been plotted, and joined with an appropriate line, but it is very difficult to check the accuracy of points expressed to 2 decimal places on this scale. Ideally, the average times would be rounded to the nearest second before plotting.
5. Analysis	1	1		The experimental data have been compared with information from the internet source, and a relationship has been identified between soil permeability and root uptake of water at different soil depths.
6. Conclusion	1	1		The conclusion is valid and largely relates to the aim. Based on the drainage times recorded in the experimental data table, the samples containing larger rock particles demonstrated a higher permeability.
7. Evaluation	2	0		Recognition that the experiment would be improved by using soil in place of rock particles is identified as a factor that could have a significant effect, but lacks reference to reliability, accuracy or precision. Minimisation of the effect should also be discussed.
8. Structure	2	a	0	The title provided is not appropriate; it refers to rock permeability and the experiment relates to soil permeability.
		b	1	The report is clear and concise and flows in a logical manner.
Total	**20**	**12**		

Candidate 2 Assignment – The effect of air pollution on lichen

The evidence for this candidate has achieved the following marks for each section of this course assessment component.

Section	Mark available	Mark awarded		Comments
1. Aim	1	0		The aim must clearly describe what is to be investigated. The aim provided is not sufficiently specific, inferring pollution in general rather than air pollution.
2. Underlying environmental science	3	3		A good understanding of relevant environmental science is demonstrated, with appropriate discussion of sources of emissions, impact of the emissions on human health and the environment, and the lichens themselves as indicator species.
3. Data collection and handling	6	a	0	The description of the methodology incorrectly states that lichens were gathered, when it was information that was gathered. This information relates to the coverage of trees by three forms of lichen.
		b	1	The raw data from the fieldwork is sufficient, with three trees assessed at each of three sites. The average column of the table is considered in section 3(d).
		c	1	The fieldwork data is presented in a table which has appropriate headings. The lichen score is indicated to be based on the key provided in the report.
		d	0	The mean values (averages) from the fieldwork data have been calculated, but one of the calculated values is incorrect.
		e	1	A table of data relevant to the aim is included. The data was obtained from an internet source.
		f	1	A reference for the source of the data is included, referenced in sufficient detail to allow it to be retrieved by a third party.
4. Graphical presentation	4	a	1	A bar graph is selected, which is the correct format for this type of data.
		b	1	The *x*-axis labels and *y*-axis scale are all suitable.
		c	0	The *y*-axis label and unit (score) have been omitted.
		d	1	Minor gridlines have been omitted, but average values have been rounded and correctly plotted and are easily checked.

5. Analysis	1	1		A valid comparison is made between the fieldwork data and the secondary source of data.
6. Conclusion	1	1		Information in the analysis section provides a valid conclusion linking types of lichens present and location-specific levels of pollution.
7. Evaluation	2	1		The methodology for measuring the extent of the lichens on the trees is correctly identified as a factor which could be expected to have a significant impact on the accuracy of the fieldwork data. Minimising this factor by 'measuring' how much of each lichen type is present on the trees is not realistic.
8. Structure	2	a	1	The title was informative.
		b	1	The report was clear and concise, and flowed in a logical manner.
Total	**20**	**15**		