Investigating river environments- 1

Name: _____

Class: _____

Date:_____

Time:

Total Marks Available:

Total Marks Archived:

Level: IGCSE Mathematics A

Subject: Geography

Exam Board: Edexcel IGCSE Geography- it is however suitable for use by mathematics student of other boards

Topic: Investigating river environments -1

Type: Mark Scheme

To be used by all students preparing for Edexcel IGCSE Geography- Students of other Boards may also find this useful

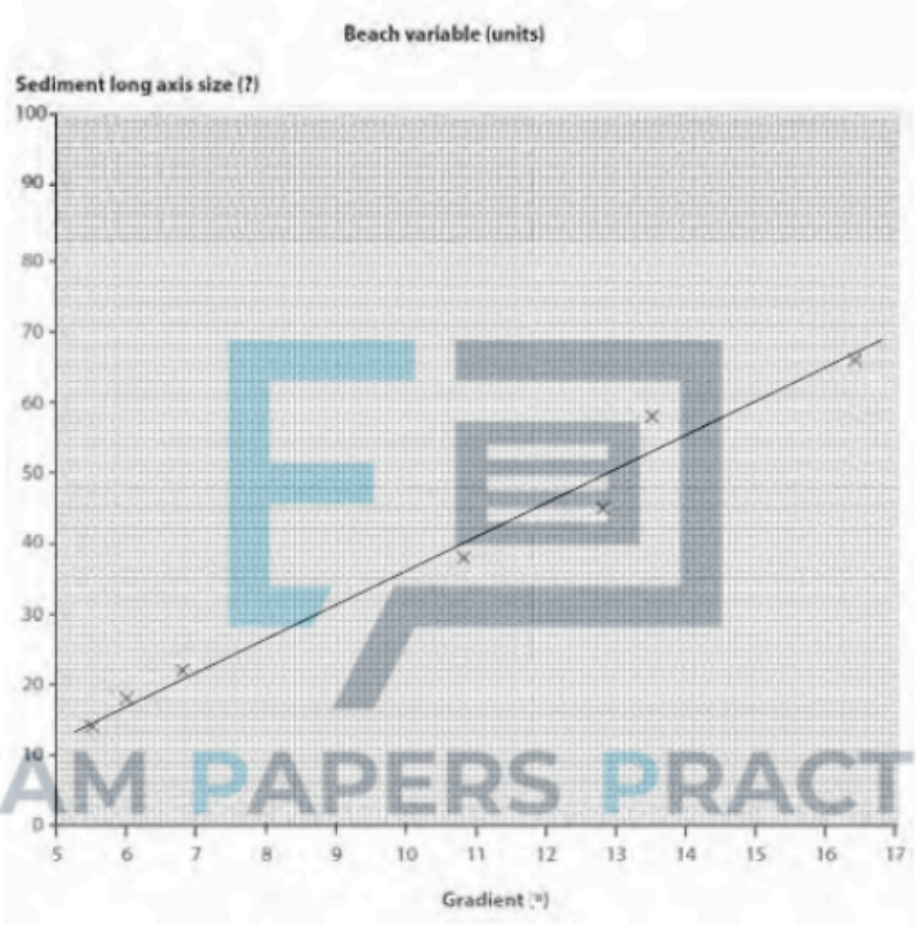
Mark Scheme

Q1.

Question number	Answer	Mark
(i)	**AO3 (1 mark)** A mm (1)	**(1)**

Question number	Answer	Mark
(ii)	**AO4 (2 marks)** Working to show the correct addition of the total width: 15.4 + 13.5 + 12.8 + 12.1 + 10.8 + 6.8 + 6.5 + 6.0 + 5.5 = 89.4 (1) The division of this number by 9, the total number of sampling sites, arriving at a mean, to one decimal place, of 9.9 (1) Maximum of 1 mark for correct answer but no working shown. Accept any other appropriate working.	**(2)**

Question number	Answer	Mark
(iii)	**AO4 (2 marks)** Award 1 mark for each correct plot.	**(2)**

Question number	Answer	Mark
(iv)	**AO4 (1 mark)** Award 1 mark for an accurate line of best fit that shows that the beach sediment long axis size increases with gradient.  	(1)

Question number	Answer	Mark
(v)	**AO3 (2 marks)** Award 1 mark for a reason for the relationship and a further 1 mark through description or explanation, up to a maximum of 2 marks. • Sites where beach particles are smaller are more easily compacted (1), which means the beach gradient will be smaller/more gently sloping (1). • There is less friction when waves are passing over smaller sediment (1) so more material will be carried back down the beach (1). • Areas of larger beach sediment allow more water to pass through (1), decreasing the effect of backwash erosion and increasing the formation of sediment into a steeply sloping beach (1). Accept any other appropriate response.	(2)

Q2.

Question number	Answer	Mark
(i)	**AO4 (2 marks)** Award one mark for correct working, and one mark for correct answer. (25+20+22+18)/4 (1) OR 85/4 (1) 21.3 (1)	(2)

Question number	Answer	Mark
(ii)	**AO3 (1 mark)** Award one mark for suitable sampling strategy named. • Random (1) • Stratified (1) • Systematic (1) • Opportunistic (1)	(1)

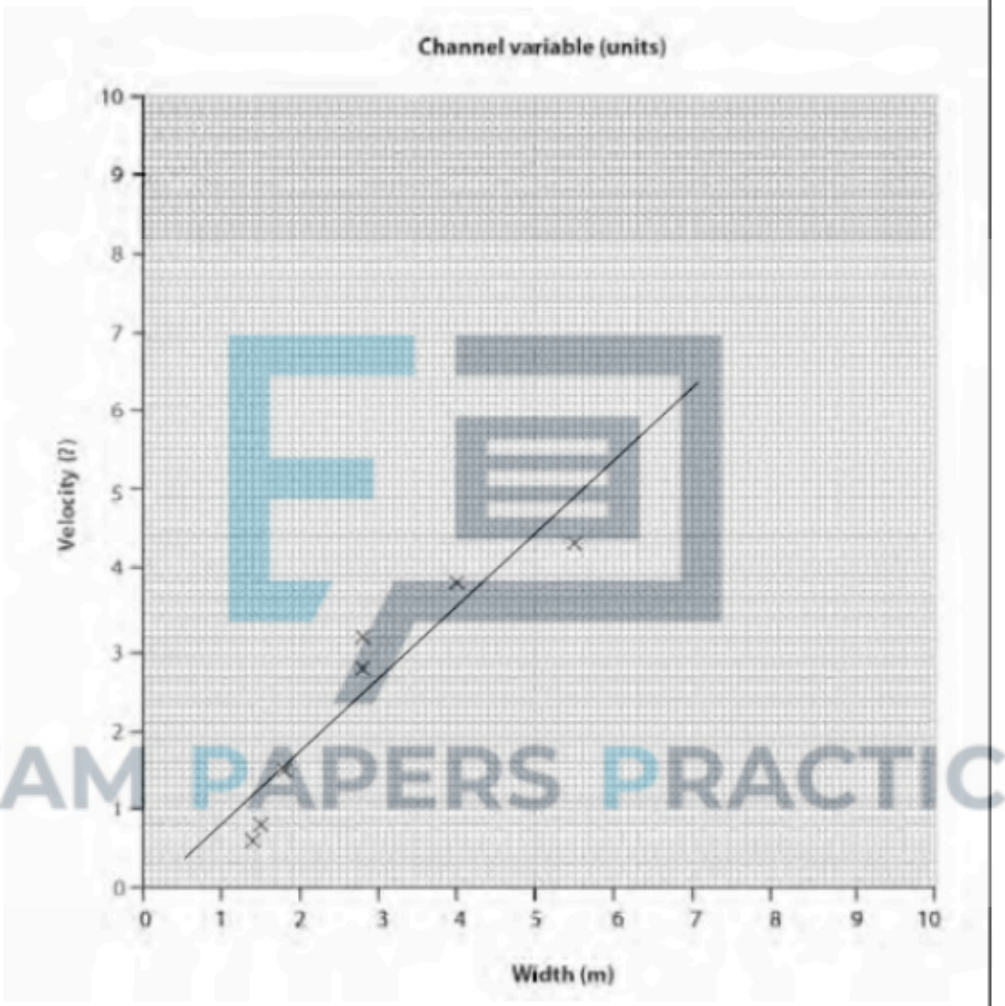
Question number	Answer	Mark
(iii)	**AO3 (2 marks)** Award one mark for suitable reason and a further mark for explanation, up to a maximum of two marks. • Data has a much larger range than other sites (1) which suggest an error may have taken place (in data collection) (1). • As there are only four pieces of data (1) it would have been better to take more readings to reduce the effect of anomalies (1). • The ruler might not be held straight (1) meaning pebble size is recorded incorrectly (1). Accept any other appropriate response.	(2)

Q3.

Question number	Answer	Mark
(i)	**AO3 (1 mark)** B m/s (1)	(1)

Question number	Answer	Mark
(ii)	**AO4 (2 marks)** Working to show the correct addition of the total width: 1.4 + 1.5 + 1.8 + 2.1 + 2.8 + 2.8 + 3.5 + 4.0 + 5.5 = 25.4 (1) The division of this number by 9, the total number of sampling sites, arriving at a mean, to one decimal place, of 2.8 (1). Maximum of 1 mark for correct answer but no working shown. Accept any other appropriate working.	(2)

Question number	Answer	Mark
(iii)	**AO4 (2 marks)** Award 1 mark for each correct plot.	(2)

Question number	Answer	Mark
(iv)	**AO4 (1 mark)** Award 1 mark for an accurate line of best fit that shows that width increases with velocity.  	(1)

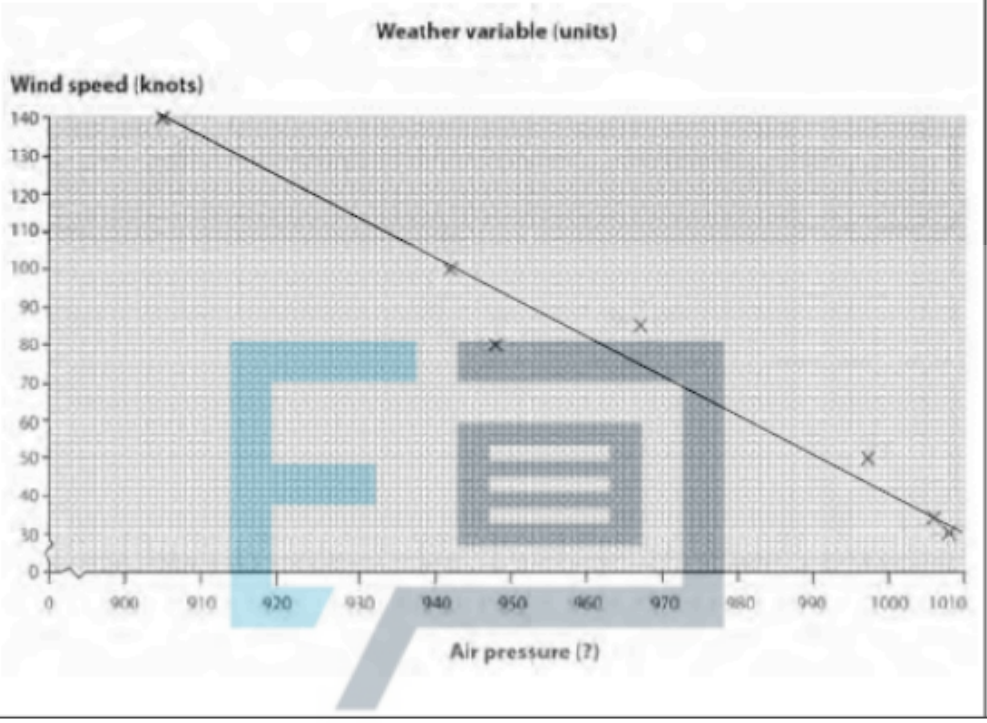
Question number	Answer	Mark
(v)	**AO3 (2 marks)** Award 1 mark for a reason for the relationship and a further 1 mark through description or explanation, up to a maximum of 2 marks. • An increase in velocity will cause more (hydraulic) erosion (1), which will cause the channel to widen (1). • Wider rivers could have a larger hydraulic radius (1), which means that there is less friction, increasing velocity (1). Accept any other appropriate response.	(2)

Q4.

Question number	Answer	Mark
(i)	**AO3 (1 mark)** c mb (1)	(1)

Question number	Answer	Mark
(ii)	**AO4 (2 marks)** Working to show the correct addition of the total width: 30 + 35 + 50 + 70 + 85 + 100 + 125 + 140 + 80 = 715 (1). The division of this number by 9, the total number of days, arriving at a mean, to one decimal place, of 79.4 (1) Maximum of 1 mark for correct answer but no working shown. Accept any other appropriate working.	(2)

Question number	Answer	Mark
(iii)	**AO4 (2 marks)** Award 1 mark for each correct plot.	(2)

Question number	Answer	Mark
(iv)	**AO4 (1 mark)** Award 1 mark for an accurate line of best fit that shows wind speed increases with air pressure.  	(1)

Question number	Answer	Mark
(v)	**AO3 (2 marks)** Award 1 mark for a reason for the relationship and a further 1 mark through description or explanation, up to a maximum of 2 marks. • When air pressure is lower, warm air will rise (1) and cooler air will often move in to replace it more quickly, leading to stronger winds (1). • When air pressure is higher air is descending (1), which reduces the formation of cloud and leads to lighter winds (1). Accept any other appropriate response.	(2)

Q5.

Question number	Answer	Mark
	AO4 (2 mark) A number of sampling techniques could be identified: Stratified (1) • The proportions of the sub-sets must be known (1) otherwise results will be possibly bias (1) Random (1) • Can lead to poor representation of data or area or the area being studied (1) so conclusions may not be trusted (1) • There may be practical constraints in terms of time (1) and problems to access certain parts of the study area. (1) Systematic (1) • Can leave sampling "gaps" (1) as not all points have an equal chance of being selected (1) Accept any other appropriate response.	**(2)**

Q6.

Question number	Answer	Mark
	AO4 (2 mark) A number of sampling techniques could be identified: Stratified (1) • The proportions of the sub-sets must be known (1) otherwise results will be possibly bias (1) Random (1) • Can lead to poor representation of data or area or the area being studied (1) so conclusions may not be trusted (1) • There may be practical constraints in terms of time (1) and problems to access certain parts of the study area. (1) Systematic (1) • Can leave sampling "gaps" (1) as not all points have an equal chance of being selected (1)	**(2)**

Q7.

Question number	Answer	Mark
	A number of sampling techniques could be identified: Stratified (1) • The proportions of the sub-sets must be known (1) otherwise results will be possibly bias (1) Random (1) • Can lead to poor representation of data or area or the area being studied (1) so conclusions may not be trusted (1) • There may be practical constraints in terms of time (1) and problems to access certain parts of the study area. (1) Systematic (1) • Can leave sampling "gaps" (1) as not all points have an equal chance of being selected (1)	(2)

Q8.

Question number	Answer indicative content
	AO3 (4 marks) AO4 (4 marks) **Marking instructions** Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the level based mark scheme below. **Indicative content guidance** The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. This question is about the candidates making a judgement of the value of the resources identified in helping them plan their Geographical enquiry. Candidates are expected to make a judgement on each of the resources. Candidates should identify strengths, weaknesses, and alternative resources which would support them in planning the enquiry. AO3 • By using the Bradshaw model we are able to understand what we should expect along the course of a river profile. This will help us pick our sites for measurement. • The risk assessment in very helpful in the enquiry as it allows us to focus on safety and plan how we reduce the risks of the enquiry to ourselves. • Location is important in any enquiry however the map isn't very helpful as it covers too wide an area, this means It would be difficult to identify the best place for the enquiry. • Candidates will potentially take a view on which of the resources are most important. Better responses will make a judgement with a justification e.g. All of the resources have a use to greater or lesser extent, in this instance the risk assessment is the most important/ high level of impact in planning the enquiry to ensure that the people carrying out the enquiry are safe.

	AO4 • Fig 4a provides us with a set of characteristics related to movement along the river profile • Fig 4b shows potential risks of the rivers enquiry • Fig 4c shows us the area where the study is taking place

Question number	Answer	
Level	**Mark**	**Descriptor**
	0	No rewardable material.
Level 1	**1–3**	• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements that are supported by limited evidence. (AO3) • Uses some geographical skills to obtain information with limited relevance and accuracy, which supports few aspects of the argument. (AO4)
Level 2	**4–6**	• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Uses geographical skills to obtain accurate information that supports some aspects of the argument. (AO4)
Level 3	**7–8**	• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently, leading to judgements that are supported by evidence throughout. (AO3) • Uses geographical skills to obtain accurate information that supports all aspects of the argument. (AO4)

Q9.

Question number	Answer indicative content
	AO3 (4 marks) AO4 (4 marks) **Marking instructions** Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the level based mark scheme below. **Indicative content guidance** The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. This question is about the candidates making a judgement of the value of the resources identified in helping them plan their Geographical enquiry. Candidates are expected to make a judgement on each of the resources. Candidates should identify strengths, weaknesses, and alternative resources which would support them in planning the enquiry.

- By using the model in 5a we are able to understand what we should expect the beach profile to look like. This will help us pick our sites for measurement.
- The risk assessment in very helpful in the enquiry as it allows us to focus on safety and plan how we reduce the risks of the enquiry to ourselves.
- Location is important in any enquiry however the map isn't very helpful as it covers too wide an area, this means It would be difficult to identify the best place for the enquiry.
- Candidates will potentially take a view on which of the resources are most important. Better responses will make a judgement with a justification e.g. All of the resources have a use to greater or lesser extent, in this instance the risk assessment is the most important/ high level of impact in planning the enquiry to ensure that the people carrying out the enquiry are safe.

AO4

- Fig 5a provides us with a beach profile model which changes through the seasons.
- Fig 5b shows potential risks of the coastal enquiry
- Fig 5c shows us the area where the study is taking place

Question number	Answer	
Level	**Mark**	**Descriptor**
	0	No rewardable material.
Level 1	**1–3**	• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements that are supported by limited evidence. (AO3) • Uses some geographical skills to obtain information with limited relevance and accuracy, which supports few aspects of the argument. (AO4)
Level 2	**4–6**	• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Uses geographical skills to obtain accurate information that supports some aspects of the argument. (AO4)
Level 3	**7–8**	• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently, leading to judgements that are supported by evidence throughout. (AO3) • Uses geographical skills to obtain accurate information that supports all aspects of the argument. (AO4)

Q10.

Question number	Answer indicative content
	AO3 (4 marks) AO4 (4 marks) **Marking instructions** Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the level based mark scheme below. **Indicative content guidance** The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. This question is about the candidates making a judgement of the value of the resources identified in helping them plan their Geographical enquiry. Candidates are expected to make a judgement on each of the resources. Candidates should identify strengths, weaknesses, and alternative resources which would support them in planning the enquiry. AO3 • By using the to see in an extreme weather event. • The risk assessment in very helpful in the enquiry as it allows us to focus on safety and plan how we reduce the risks of the enquiry to ourselves. • Location is important in any enquiry however the map isn't very helpful as it covers too wide an area, this means It would be difficult to identify the best place for the enquiry. • Candidates will potentially take a view on which of the resources are most important. Better responses will make a judgement with a justification e.g. All of the resources have a use to greater or lesser extent, in this instance the risk assessment is the most important/ high level of impact in planning the enquiry to ensure that the people carrying out the enquiry are safe.

	AO4 • Fig 6a provides us with a model of cyclone characteristics this enables us to make judgements against our own data. • Fig 6b shows potential risks of conducting an enquiry of this nature. This will be helpful to students planning and enquiry as it will help them to identify level of risk and decide how best to manage the risk. • Fig 6c shows us the area where the study is taking place. This will be valuable to the students as it will enable them to identify any factors Human/physical that need to be considered when identifying data collection sites. Accept any other appropriate response.

Question number	Answer	
Level	**Mark**	**Descriptor**
	0	No rewardable material.
Level 1	**1–3**	• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements that are supported by limited evidence. (AO3) • Uses some geographical skills to obtain information with limited relevance and accuracy, which supports few aspects of the argument. (AO4)
Level 2	**4–6**	• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Uses geographical skills to obtain accurate information that supports some aspects of the argument. (AO4)
Level 3	**7–8**	• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently, leading to judgements that are supported by evidence throughout. (AO3) • Uses geographical skills to obtain accurate information that supports all aspects of the argument. (AO4)

Q11.

Question number	Answer	Mark
	AO3 (4 marks) Award 1 mark for an advantage of systematic sampling and a further 1 mark for an explanation of this advantage, up to a maximum of 2 marks. Award 1 mark for a disadvantage of systematic sampling and a further 1 mark for an explanation of this disadvantage, up to a maximum of 2 marks. Advantages: • it is more straightforward than random sampling (1) as a random sampling grid doesn't necessarily have to be used as sampling, it just has to be at uniform intervals (1) • sampling sites are an equal distance apart along the stretch of the river (1), which means that good coverage of the river can be more easily achieved than using random sampling (1) • sample sites are an equal distance apart (1), which ensures that no part of the river is under- or over-sampled (1). Disadvantages: • this systematic sampling strategy is more biased than random sampling (1) as not all parts of the river have an equal chance of being selected (1) • this systematic sampling strategy doesn't use existing information (1), which means that it might lead to under- or over-representation of a particular pattern (1) • significant changes along the river might be missed (1), which might skew the results/give a slightly biased representation (1). Accept any other appropriate response.	**(4)**

Q12.

Question number	Answer	Mark
	AO3 (4 marks) Award 1 mark for an advantage of systematic sampling and a further 1 mark for an explanation of this advantage, up to a maximum of 2 marks. Award 1 mark for a disadvantage of systematic sampling and a further 1 mark for an explanation of this disadvantage, up to a maximum of 2 marks. Advantages: • it is more straightforward than random sampling (1) as a random sampling grid doesn't necessarily have to be used as sampling, it just has to be at uniform intervals (1) • sampling sites are an equal distance apart along the beach profile (1), which means that good coverage of the beach can be more easily achieved than using random sampling (1) • sample sites are an equal distance apart (1), which ensures that no part of the beach profile is under- or over-sampled (1). Disadvantages: • this systematic sampling strategy is more biased than random sampling (1) as not all parts of the beach profile have an equal chance of being selected (1) • this systematic sampling strategy doesn't use existing information (1), which means that it might lead to under- or over-representation of a particular pattern (1) • significant changes along the beach profile might be missed (1), which might skew the results/give a slightly biased representation (1). Accept any other appropriate response.	**(4)**

Q13.

Question number	Answer	Mark
	AO3 (4 marks) Award 1 mark for an advantage of systematic sampling and a further 1 mark for an explanation of this advantage, up to a maximum of 2 marks. Award 1 mark for a disadvantage of systematic sampling and a further 1 mark for an explanation of this disadvantage, up to a maximum of 2 marks. Advantages: • it is more straightforward than random sampling (1) as systematic sampling just has to be at uniform intervals during the time period (1) • sampling times are equally spaced out during the weather event (1), which means that good coverage of the event can be more easily achieved than using random sampling (where under- or over-representation may occur) (1) • sampling times are evenly spaced (1), which ensures that no part of the weather event is under- or over-sampled (1). Disadvantages: • this systematic sampling strategy is more biased than random sampling (1) as not all parts of the day/week have an equal chance of being selected (1) • this systematic sampling strategy doesn't use existing information (1), which means that it might lead to under- or over-representation of a particular weather event (1) • significant changes during a weather event/throughout the year might be missed (1) which might skew the results/give a biased representation (1). Accept any other appropriate response.	**(4)**