Edexcel GCSE

Science

Unit SCA: Science Controlled Assessment

Sample Controlled Assessment
Task P1

Paper Reference
5SC04/01

This Controlled Assessment Task may be submitted for moderation in either MAY XXXX or OCTOBER XXXX.

Submission of this Controlled Assessment Task at any other time will result in it being returned to the centre unmoderated with no result issued.

Turn over ▶

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Task P1

Specification reference 1.7

Use converging lenses to:

b investigate factors which affect the magnification of a converging lens (formulae are not needed).

Student Brief

This controlled assessment is about magnification of a convex (converging) lens.

You are going to test the hypothesis that the distance between the object and the lens affects the image size.

Plan an investigation to find out how the distance between the object and the lens affects the image size.

You will be given the following resources:

A convex lens (this could be a standard glass or plastic convex lens or a mobile phone camera lens).

Part A – Planning

How to attempt the task:

You must produce a plan.

The plan must include:

- an explanation of which equipment you need to complete the task. You may want to draw a diagram of how the equipment will be set up
- which variable (or variables) you will change and which you will keep the same
- which measurements you should make to test the hypothesis, explaining how these will test the hypothesis, and including the number and range of measurements
- any risks that are linked to the practical task and how you can reduce these to make your practical task safer.

You should check that the overall plan is clear and will produce a range of results that will test the hypothesis.

Part B – Observations

You are going to test the hypothesis that the distance between the object and the lens affects the image size.

You will test **this** hypothesis using your own method, from Part A.

You should also collect some secondary evidence on how image size is affected by the distance between the object and the lens.

How to attempt the task:

- You should decide on the number and range of measurements you will make.
- Complete the practical task, recording your measurements clearly and accurately.
- Collect some secondary evidence on this task.
- Comment on the quality of the source of this secondary evidence.

Part C – Conclusions

You will need your primary and secondary evidence from the Part B – Observations task and information about the method you used.

How to attempt the task:

You must process your primary and secondary evidence from Part B and present these, using mathematical processes if relevant.

You must produce a conclusion in which you:

- review all of the primary and secondary evidence, then identify and deal with any anomalies
- draw conclusions from this processed evidence to prove or disprove a hypothesis
- show how the data supports the conclusion
- explain how you might change the method if you were going to repeat the investigation
- describe the primary and secondary evidence you might collect to extend your investigation and say why you would collect it.

Assessment criteria for P1

Part A - Planning

Element	Marks		Criteria
Equipment	4	0 marks	Gives no relevant detail
		1–2 marks	a) Chooses some relevant resources/equipment b) Describes reasons for choices
		3–4 marks	a) Chooses most relevant resources/equipment b) Explains reasons for choices and choices are fully relevant to method

Element	Marks		Criteria
Controls (If variables are to be controlled, criteria a1 and b1 will be used. If there are no variables to control, criteria a2 and b2 will be used. The specific criteria needed will be in the controlled assessment task.)	6	0 marks	Gives no relevant controls
		1–2 marks	a1) Identifies one appropriate variable to control b1) Describes how this variable can be controlled OR a2) Identifies one appropriate way to control the task b2) Describes this way of controlling the task
		3–4 marks	a1) Identifies some relevant variables to control b1) Gives an appropriate description of how to control these variables OR a2) Identifies some relevant ways to control the task to produce meaningful results b2) Describes how these ways control the task
		5–6 marks	a1) Identifies a range of variables appropriate to control b1) Gives an appropriate explanation of how to control these variables OR a2) Provides a comprehensive list of relevant ways to control the task to produce meaningful results b2) Explains how these ways control the task

Element	Marks		Criteria
Risks	4	0 marks	No relevant detail given
		1–2 marks	a) Identifies a relevant risk which is specific to the task b) Suggests measure(s) to manage the risk
		3–4 marks	a) Identifies most of the relevant risks which are specific to the task b) Method reflects how risks need to be managed
Overall plan	4	0 marks	Gives no relevant method
		1–2 marks	a) Method is logically ordered to produce results b) Chooses range of data/observations that would test the hypothesis
		3–4 marks	a) Method is logically ordered to produce results and includes an explanation of why it would test the hypothesis b) Chooses range of data/observations that would test the hypothesis and explains why the range was chosen
Total marks	**18**		

Part B - Observations

Element	Marks		Criteria
Primary evidence and recording	4	0 marks	Collects no primary evidence
		1 mark	Records some data/observations that are appropriate for the topic
		2 marks	Collects a suitable range of data/observations and records some appropriately (depends on the practical)
		3 marks	Collects a suitable range of data/observations and records all appropriately (depends on the practical)
		4 marks	Collects a suitable range of data/observations and records all appropriately (depends on the practical) and records further/repeat data
Secondary evidence	2	0 marks	Collects no secondary evidence
		1 mark	Collects and records secondary evidence relevant to the hypothesis in a way appropriate for the topic
		2 marks	Collects and records secondary evidence relevant to the hypothesis in a way appropriate for the topic. Comments on the quality of the sources of secondary evidence
Total marks	**6**		

Part C - Conclusions

Element	Marks		Criteria
Processing evidence	4	0 marks	Evidence is not processed
		1–2 marks	a) Attempts to process all collected evidence, using appropriate mathematical skills b) Attempts to present the processed evidence in a way appropriate for the topic
		3–4 marks	a) Processes all collected evidence in a way that is appropriate to the task, using appropriate mathematical skills b) Presents processed evidence in a way that allows conclusions to be drawn
Quality of evidence	4	0 marks	Makes no comments on the quality of the evidence
		1–2 marks	a) Comments on the quality of the primary evidence, dealing with anomalies appropriately (if no anomalies in evidence candidates need to state this) b) Comments on the quality of the secondary evidence, dealing with anomalies appropriately (if no anomalies in evidence candidates need to state this)
		3–4 marks	a) Explains any adjustments to the evidence needed, or decision not to exclude evidence b) Takes account of anomalies in primary and secondary evidence when processing evidence (using all evidence if no anomalies)

Element	Marks		Criteria
Conclusions based on evidence	6	0 marks	Makes no relevant conclusions
		1–2 marks	a) Provides a conclusion based on all collected evidence, but does not link it to the hypothesis b) Attempts to explain the conclusion using all collected evidence, including appropriate mathematical relationships
		3–4 marks	a) Provides a conclusion which refers to the hypothesis based on all collected evidence b) Explains the conclusion using the evidence, including appropriate mathematical relationships
		5–6 marks	a) Provides a conclusion which refers to the hypothesis based on all collected evidence and relevant scientific ideas b) Explains the conclusion using relevant scientific ideas and all collected evidence, including appropriate mathematical relationships
Evaluation of conclusion	4	0 marks	Makes no relevant evaluation
		1–2 marks	a) Evaluates conclusion based on all collected evidence b) Suggests how all collected evidence can be improved to provide stronger support for the conclusion
		3–4 marks	a) Evaluates conclusion based on all collected evidence and relevant scientific ideas b) Suggests how all collected evidence can be improved and extended to provide stronger support for the conclusion

Element	Marks		Criteria
Evaluation of method	6	0 marks	Makes no relevant evaluation
		1–2 marks	a) Identifies a strength or weakness in the method b) Suggests how to improve method and justifies comments made
		3–4 marks	a) Describes strengths or weaknesses in the method and reasons for any anomalies b) Suggests how to improve method and justifies comments made relating to the quality of the evidence collected (including reasons for anomalies)
		5–6 marks	a) Describes strengths and weaknesses in the method and relates them to the hypothesis, and reasons for any anomalies b) Suggests how to improve method, justifying comments made relating to the hypothesis and how better quality evidence could be produced (including reasons for anomalies)
Total marks	**24**		