

# GCSE Astronomy Coursework

## A5 & B5 Drawings or Photos of Celestial Event

Produce a series of drawings (A5) or detailed telescopic drawings or photographs (B5) to record the passage of a suitable celestial event, for example a transit, occultation or comet.

Venus and Mercury are the two inferior planets (planets that orbit between the Earth and the Sun). Their orbits are slightly inclined with respect to the Earth's orbital plane but sometimes they pass in between the Earth and the Sun – this is called a transit. Dates for the next set of transits can be found here: <http://eclipse.gsfc.nasa.gov/transit/transit.html>

When an object is eclipsed by another object in the sky it is called an occultation. Information about future occultations and all other celestial events can be found here: [www.theguardian.com/science/series/starwatch](http://www.theguardian.com/science/series/starwatch)

Comets are balls of ice and rock that exist in two regions in the outer Solar System: the Kuiper Belt and the Oort Cloud. Occasionally they are knocked and are sent flying past the planets. When they reach the Sun the ice sublimates leaving behind a tail. A list of visible comets can be found here: [www.ast.cam.ac.uk/~jds/future.htm](http://www.ast.cam.ac.uk/~jds/future.htm)

To locate objects use [www.stellarium.org](http://www.stellarium.org) or alternatively download an app for your mobile: [http://downloads.bbc.co.uk/tv/guides/BBC\\_Stargazing\\_Live\\_2012\\_Mobile\\_App\\_guides.pdf](http://downloads.bbc.co.uk/tv/guides/BBC_Stargazing_Live_2012_Mobile_App_guides.pdf)

To find sunrise, sunset, moonrise and moonset times and the phase of the Moon use [www.timeanddate.com](http://www.timeanddate.com)

Check the weather forecast - [www.metoffice.gov.uk](http://www.metoffice.gov.uk)

See our useful guides for help on how to carry out observations and take photographs of various objects: [www.rmg.co.uk/discover/astronomy-photographer-competition/how-to-guides](http://www.rmg.co.uk/discover/astronomy-photographer-competition/how-to-guides)

For examples of reports with moderator comments visit the Edexcel GCSE Astronomy website: <http://www.edexcel.com/quals/gcse/gcse09/astronomy/Pages/default.aspx>

Here you will find two documents that will help you write a report: Under 'Controlled assessment' download 'Controlled Assessment Teacher Support Book' and under 'Teacher Support Materials' download 'GCSE Astronomy Teachers Guide'.



Below is a checklist of points that you should include in your report. Remember to reference all sources of information and to label all images, diagrams and tables and refer to them in the text e.g. Table 1, Figure 1 etc.

## Design (5 marks)

- > All equipment listed
- > **B5 only:** All set-up details of binoculars/telescope/camera listed (aperture size, magnification, field of view, ISO, f-stop, exposure time, focal length/zoom, tripod)
- > Astronomical terms explained
- > Rise and set times of the Moon
- > Phase of Moon and position of Moon taken into account
- > Limits of location noted
- > Alternative locations suggested
- > Suitable celestial event
- > Explanation of why it was chosen
- > Explanation of how to find the object
- > Mention of the weather forecast & reference
- > Range of dates and times to observe & why (presence of Moon, hour angle of object)

Edexcel marking guidelines:

0	No procedure designed.
1	Outline a simple procedure for the observations, using basic astronomical terminology.
2-3	Astronomical knowledge and understanding used to decide on the most appropriate site,time, equipment for observations.Spelling, punctuation and grammar used with reasonable accuracy. Limited use of astronomical terminology.
4-5	Detailed astronomical knowledge and understanding used to design the most appropriate observing programme with a range of sites, times and instruments evaluated. Spelling, punctuation and grammar used with considerable accuracy. Good range of astronomical terminology used correctly.

## Observation (5 marks)

- > Appropriate celestial event recorded
- > **B5 only:** all camera settings listed (if used)
- > Limiting magnitude stated
- > Location stated (latitude & longitude)
- > Date and time stated
- > Night vision acquired & maintained (red light used)
- > Weather
- > Seeing

### Antoniadi scale

A five-point scale to indicate the quality of seeing:

I – perfect seeing, without a quiver

- II – slight undulations, with moments of calm lasting several seconds
- III – moderate seeing, with larger tremors
- IV – poor seeing, with constant troublesome undulations
- V – very bad seeing, scarcely allowing the making of a rough sketch.

- > Positions of objects stated with reference
- > Proximity to zenith (hour angle/altitude)
- > All figures labelled and referenced in text
- > Description/details of the object

Edexcel marking guidelines:

0	No observations completed.
1	Simple observations completed, providing some data. A few observational details included.
2-3	Sound observations completed and recorded, providing adequate data for the task. Clear and accurate observational details included.
4-5	Excellent programme of observations completed and recorded, providing conclusive data for the task. Full observational details included clearly and accurately.

## Analysis (5 marks)

- > **B5 only:** Software used to process images if camera used
- > Apparent magnitudes of objects stated
- > Description and explanation of observations

Edexcel marking guidelines:

0	No analysis on the observations.
1	Simple comments on what is shown by the observations, using basic astronomical terminology.
2-3	Conclusions or calculations derived from observational data used to address the task set. Spelling, punctuation and grammar used with reasonable accuracy. Limited use of astronomical terminology.
4-5	Full analysis of the observational data, resulting in clear conclusions related to the task set. Spelling, punctuation and grammar used with considerable accuracy. Good range of astronomical terminology used correctly.

## Evaluation (5 marks)

- > Accuracy and quality of observations evaluated
- > Comparison with other images
- > Limitations of project explored
- > Suggested improvements to project
- > Suggested extension to project

Edexcel marking guidelines:

0	No evaluation of the observation.
1	Simple comment on the accuracy of the observations, using basic astronomical terminology.
2-3	Supported statement of the accuracy of the observational data obtained.

	Feasible suggestions for improvements or extensions to the observations. Spelling, punctuation and grammar used with reasonable accuracy. Limited use of astronomical terminology.
4-5	Clearly reasoned quantitative assessment of the accuracy of the observational data obtained. Detailed suggestions for improvements or extensions to the observations. Spelling, punctuation and grammar used with considerable accuracy. Good range of astronomical terminology used correctly.