

GCSE Astronomy Coursework

A1 & B1 Lunar Features

Produce a series of naked-eye drawings (A1) or telescopic drawings and/or photographs (B1) of three lunar surface features. Use them to show their changing appearance at different lunar phases.

To clarify you are concentrating on THREE specific features (craters/seas) and seeing how they change with the phase of the Moon. This will take a few months to do because of the weather and you may want to observe as many phases as possible. Check the weather forecast and plan ahead - whenever there is a clear night look at the Moon! Only draw what you can see and allow yourself time to make an accurate detailed sketch. You will see more features if you wait for the Moon to reach its highest point and also if you choose a dark location away from city lights. If you are taking photos through binoculars or a telescope you may wish to take some practise shots first to determine the correct f-stop, ISO and exposure time settings.

To locate the Moon use 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

To find Moon rise and Moon set and percentage illumination use www.timeanddate.com

For weather try www.metoffice.gov.uk

See our useful guides for help on how to carry out observations and take photographs of various objects:

http://www.rmg.co.uk/upload/pdf/APY_guide.pdf

<http://www.rmg.co.uk/whats-on/exhibitions/astronomy-photographer-of-the-year/how-to-photo-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
- > **B1 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
- > Limits of location noted
- > Alternative locations suggested
- > Mention of the weather forecast
- > Range of dates and times to observe & why (lunar phase, altitude, hour angle of Moon)

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)

- > More than one phase observed
- > **B1 only:** All camera settings listed (if used)
- > Location stated (latitude & longitude)
- > Date and time stated
- > 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.

- > Position of Moon and proximity to meridian (hour angle/altitude)
- > Percentage illumination of the Moon (according to phase)
- > All figures labelled and referenced in text

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)

- > 3 features labelled and identified correctly
- > Description of how features change with phase
- > Explanations for their changing appearance

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 of drawings evaluated
- > **B1 only:** Quality of photos evaluated
- > Comparison with images of the Moon
- > 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. |