

Astronomy Project Space Colony (New Home)

A WebQuest

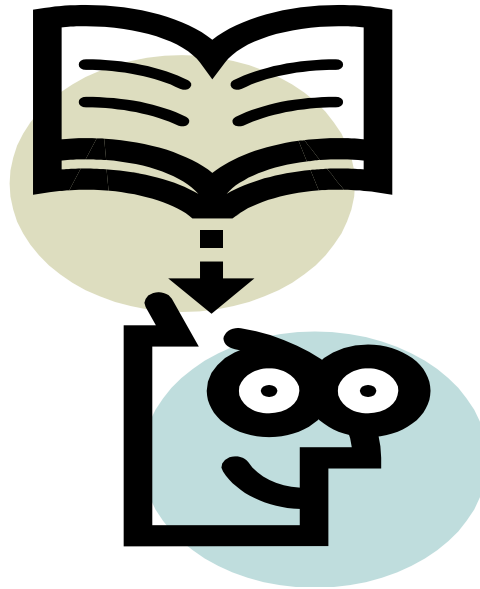
For

Glenwood Community High School

Science 9

Designed by Brad Rasmussen

rasmussb@glenwood.k12.ia.us



[Introduction](#) | [Task](#) | [Process](#) | [Resources](#) | [Evaluation](#) | [Conclusion](#)

Introduction

Technology is on the move and new ideas to address new issues are being developed. You are an engineer, an inventor, and a designer. You are designing a space colony, possibly on the moon or Mars. This colony will need to have the same conditions, which allow life to exist on Earth. The requirements for life will need to include, but not limited to a source of energy, gravity, food, water, air, temperature, waste removal, and shelter. Humans also would like to have a family, communication tools, recreation facilities, entertainment opportunities, and a mode of transportation. One of the transportation vehicles will need to be designed for use to travel around the colony and the other one to travel back and forth between the colony and the Earth. This colony will need to be environmentally friendly. The new materials used to build your colony could be part of the next generation of our Bio-engineers. NASA would be interested in this process as it could benefit space travel and space colonization. You will be presenting your prototype and report to a group of NASA executives the purpose and reasons as to why your design is needed. Engineers, inventors, and designers need to be concerned about the costs of materials, efficiency of the design, the comfort of the all living things, safety of the product, and many other details.

Task

You are an engineer, an inventor, and a designer and you are to design and build a space colony. This colony will include Living Quarters, Work Areas (Labs, etc.), Greenhouses, Solar Arrays, Recreational and Entertainment Areas, Communication Center (Antennas, etc.), Resource Facilities (Mining and Manufacturing), Docking Facilities (Supplies, etc.), Escape System, and other areas you feel are necessary. The idea of environmentally friendly is an essential part of your design. You will present your idea to a group of NASA executives with the purpose and reasons your design is the one for the future.

Supporting Information

In the world, we are asked to be responsible. We have been taught and shown to take care of our belongings and the belongings of others. We have been asked to share with others. We have been asked to make decisions and have faced consequences. We have chosen sides and shown emotions. We have had to compromise. We have been on winning sides and losing sides. We have hurt and been hurt. We have been taught and have taught. We learned some lessons well and others we continue to learn. There are times we have struggled and almost given up, but we learned from these times. We have learned there are risks and benefits to all decisions. We now face this task and need to work through a procedure and establish a product and presentation (report) based on facts. We need to develop the best product for the future.

Humans and all organisms have certain conditions which need to be met if they are to survive. Earth can provide these conditions and organisms can survive, but the conditions are in limited supply. Space, planets, and moons have harsh environments, which makes it impossible for life to survive without support systems. Space colonies will need to provide a contained environment with all of the conditions needed to live. This will be a very complex mission with many considerations to be addressed.



A better idea!

Process

*****The objective – What are you going to learn?*****

You will design and build a space colony and write a report.

You will need to conduct research (define, identify, and collect information) on the task and on the topic to be explained in your report.

You will need to analyze this information to help you design and build your space colony. You will also use this data to explain various topics relating to astronomy.

You will need to share your ideas and plans to a group of NASA Executives.

You will need to evaluate your work.

- **Was the goal attained? Why or why not? Be specific!**
- **What were some problems you encountered? Explain.**
- **What went well? Explain.**
- **If you HAD to make a change, what would it be? Explain why? EVERYONE MUST ANSWER THIS QUESTION!**
- **Etc.**

Humans are in constant conflict with new ideas, because of their attitudes, feelings, and traditions. You need to be aware of consumer interests, consumer safety, and the concerns of environment while working on this project.



You will be working in groups of 4 and each of you will have a job. You will need a leader, record keeper, and procurement officers. You will be responsible for caring out the task and also evaluating each of your peers as you work through the process.

Procedure/Directions

1. You need to state the problem you are trying to solve in your own words.

Cover page

- state the problem
- your name
- your class period
- the date
- your teacher's name
- a picture or drawing of your prototype rocket

2. You need to gather data by doing research. You will need to use at least 4 sources.

- one book
- one website (from the pre-selected options on the resource page)
- one reference book (encyclopedia, handbook, etc.)
- one article from SIRS Researcher

You will include a MLA style bibliography which you can create on Noodle Tools.

This information needs to be researched and included in your project and/or report.

- Materials to build the space colony
- Demonstrate an understanding of earth science facts, concepts, principles, theories, and models which are important
- Demonstrate an understanding of energy in the earth system
- Demonstrate an understanding of how energy is transferred (Light – Refraction - Reflection – Sight – Etc.)
- Demonstrate an understanding of the origin and evolution of the earth system

Sun – Gravity – Food – Water – Air – Temperature – Waste Removal – Shelter

Relationships (Family and Friends) - Communication – Recreation – Entertainment

Transportation – And Others

- Demonstrate an understanding of the origin and evolution of the universe (Sun – Planets – Moons – Etc.)
- Demonstrate an understanding of the relationship between science and technology
- Demonstrate an understanding of the role science and technology play in their career pathway

This information also needs to be researched and included in your report.

3. You will develop a plan for designing and building your space colony.

You will also need to write your report and will share this information with the NASA executives.

- Was the goal attained? Why or why not? Be specific!
- What were some problems you encountered? Explain.
- What went well? Explain.
- If you HAD to make a change, what would it be? Explain why? **EVERYONE MUST ANSWER THIS QUESTION!**
- Etc.

4. You will share your space colony and report.

5. You will reach a conclusion and be able to support your thoughts with facts.

You need to staple your paper in the top left corner.



Resource Page

Manuscript

[Astronomy Powerpoint](#)

Websites

www.lpi.usra.edu/education/explore/colonies/activity_glance.shtml

www.lpi.usra.edu/education/explore/colonies/activity.shtml

www.iowaaaaonline.org/

Books

[Are We Moving To Mars?](#)

[Space Colonies](#)

Magazine Articles

[Discover Magazine – Space and Space Colonies](#)

[2005 – July and September](#)

[2006 – February and October](#)

[2007 – September](#)

[Scientific American – Space and Space Colonies](#)

[National Geographic – Space and Space Colonies](#)

[Business Week – 2007 September and October](#)

Reference Books

Bibliography

[Astronomy Book – The Cosmos](#)

[Noodle Tools](#)

[Understanding the Sun and Solar System Plasmas](#)

[Astronomy and Astrophysics](#)

[Science Saurus](#)

[World Book Encyclopedia](#)

[Introduction](#) | [Task](#) | [Process](#) | [Resources](#) | [Evaluation](#) | [Conclusion](#)



Astronomy: To The Moon Or Mars!

Glenwood Community High School
Mr. Rasmussen

EVALUATION

ASTRONOMY REPORT RUBRIC

[Printable Page](#)

ASTRONOMY STANDARDS

[Printable page](#)

SCORING DESCRIPTIONS

[Printable Page](#)

[Introduction](#) [Task](#) [Process](#) [Resources](#) [Conclusion](#)

Mr. Rasmussen
Glenwood Community High School
Summer 2007

Astronomy Report Rubric

CATEGORY	5	4	3	NI
Cover page	A quality cover is attached to report with all the required information included. One image is included that supports the theme of the research report.	A quality cover is attached to report with all the required information included. No image is included.	A cover is attached to report with most of the required information included. No image is included.	No cover or a poor cover is attached to report with most of the required information not included. No image is included.
Amount of Information, Knowledge	All topics are addressed and all questions answered with at least 2 sentences about each. Able to answer all questions relating to the topic when asked	All topics are addressed and most questions answered with at least 2 sentences about each. Able to answer most questions with demonstrable knowledge	All topics are addressed, and most questions answered with 1 sentence about each. Able to answer some questions.	One or more topics were not addressed. Is not able to answer any questions that are brought up by the report.
Quality of Information	Information clearly relates to the main topic. It includes several supporting details and/or examples.	Information clearly relates to the main topic. It provides 1-2 supporting details and/or examples.	Information clearly relates to the main topic. No details and/or examples are given.	Information has little or nothing to do with the main topic.
Sources	All required sources (information and graphics) are accurately documented in MLA format.	All required sources (information and graphics) are accurately documented, but a few are not in MLA format.	All required sources (information and graphics) are documented, but many are not in MLA format.	All required sources are not used and sources are not documented using MLA format.
Mechanics and Formatting	No grammatical, spelling or punctuation errors. Typed in either New Times Roman or Ariel font. The document is in 12 point type and is double-spaced. There are no extra lines between paragraphs.	Almost no grammatical, spelling or punctuation errors. Typed in either New Times Roman or Ariel font. The document is in 12 point type and is double-spaced.	A few grammatical, spelling, or punctuation errors. Mostly typed in either New Times Roman or Ariel font. The document is in 12 point type.	Many grammatical, spelling, or punctuation errors. Typed.
Handouts, Appendices, Visual Aids	All handouts, appendices and visual aids are organized, easy to locate, relevant to the report and documented.	All handouts, appendices and visual aids are fairly organized, easy to locate, relevant to the report and documented.	Any handouts, appendices and visual aids are present and relate to the report. They are not documented	No handouts, appendices and visual aids are present.

Evaluation: Astronomy

Astronomy Standards	5	4	3	N. I.
The student will demonstrate an understanding of earth science facts, concepts, principles, theories, and models which are important.				
The student will demonstrate an understanding of energy in the Earth system.				
The student will demonstrate an understanding of the origin and Evolution of the Earth system.				
The student will demonstrate an understanding of the origin and evolution of the universe.				
The student will demonstrate an understanding of the relationship between science and technology.				
The student will demonstrate and understanding of the role science and technology play in their career pathway.				

Benchmark				
The student knows how to evaluate their plan and why their product should be used.				

Complex Reasoning Processes				
The student will act responsibly. The student will display reliability and basic work ethic.				
The student will cooperate. The student works well with diverse individuals and in diverse situations.				
The student will be respectful. The student will demonstrate leadership skills.				
The student will develop decision making skills. The student will apply decision making techniques.				
The student will solve problems. The student will apply basic trouble shooting and problem solving techniques.				
The student will analyze situations. The student understands and applies basic principles of logic and reasoning.				
The student will support her/his conclusion. The student will understand and apply basic principles of presenting an argument.				
The student will communicate effectively. The student demonstrates competencies in speaking, reading, listening, and writing as tools for learning.				

Scoring Descriptions

5	Exemplary	An efficient high quality attempt has been made to demonstrate the outcomes with a few errors revealing an outstanding understanding of the outcomes.
4	Proficient	A clear and advanced attempt has been made to demonstrate the outcomes, but some minor errors have been made revealing a competent understanding of the outcomes.
3	Satisfactory	An adequate attempt has been made to demonstrate the outcomes, but some factual errors have been made revealing a sufficient understanding of the outcomes.
N. I.	Needs Improvement	A limited attempt or no attempt has been made to demonstrate the outcomes and/or major errors have been made revealing a lack of understanding of the outcomes.



Conclusion

Change is the only constant in life. If there is one thing you can always count on, it is change will happen! Technology is like change, in with the new and out with old!

You will need to answer one of the following items to conclude your paper.

Why should the building of a lunar base or a Mars base be an international project?

What are some of the problems crews living in space or on the moon will have to face?

What hardships will the first space colonists on Mars have to endure?

If you were living in a space colony, what would miss most about living on Earth?

If you were born in a space colony, what would your life be like? How would your life be different?