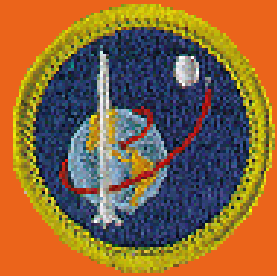


2010

SPACE EXPLORATION PROGRAM OVERVIEW & WORKBOOK



CENTRAL COMMUNITY COLLEGE
MERIT BADGE UNIVERSITY
OVERLAND TRAILS COUNCIL

7/31/2010



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(WILL BE COMPLETED DURING CLASS)

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(MUST HAVE UNIT LEADER SIGNATURE PRIOR TO CLASS)



FEBRUARY 2010

Information in this booklet was accurate at the time of publishing.
Boy Scouts Requirements 2010, Copyrighted Boy Scouts of America
Program Overview & Workbook was reviewed by
MBU Staff/Committee.

SPACE EXPLORATION PROGRAM OVERVIEW

COUNSELOR: tba

C/O: Overland Trails Council
PO Box 1361
Grand Island, NE 68802-1361

LOCATION: Central Community College

TRANSPORTATION: N/A

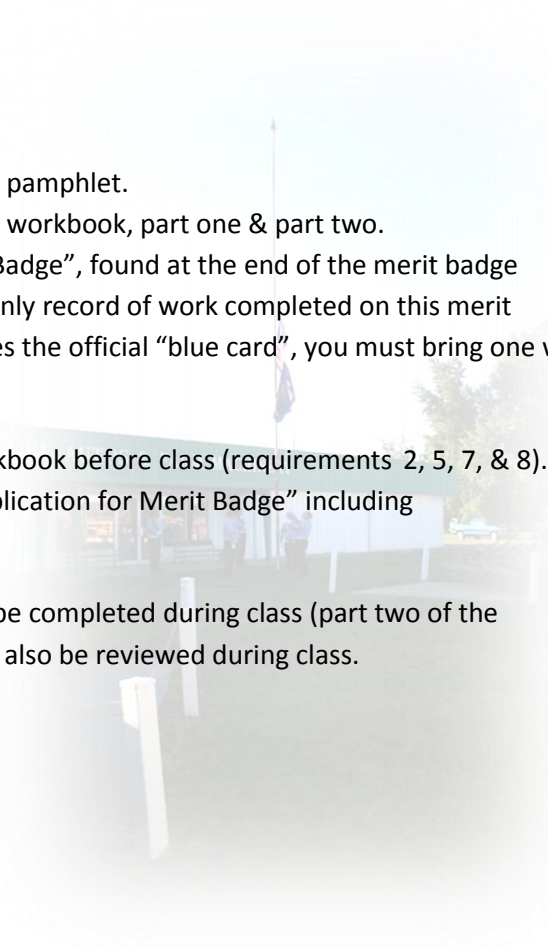
ADDITIONAL COSTS: \$16.00

CLASS SIZE: 10

BRING TO CLASS: Space Exploration merit badge pamphlet.
Space Exploration merit badge workbook, part one & part two.
Signed "Application for Merit Badge", found at the end of the merit badge workbook. (This will be your only record of work completed on this merit badge.) If your Council requires the official "blue card", you must bring one with you to class.

PRE-REQUISITES: Complete Part One of the workbook before class (requirements 2, 5, 7, & 8).
Complete information on "Application for Merit Badge" including Scoutmasters signature.

CURRICULUM: Requirements 1, 3, 4, & 6 will be completed during class (part two of the workbook). Pre-requisites will also be reviewed during class.





SPACE EXPLORATION

Boy Scouts Requirements 2010

PRE-REQUISITE REQUIREMENTS ARE PRINTED IN **ITALICS &**
MUST BE COMPLETED BEFORE CLASS.

1. Tell the purpose of space exploration and include the following:
 - a) Historical reasons
 - b) Immediate goals in terms of specific knowledge
 - c) Benefits related to Earth resources, technology, and new products
2. **Design a collector's card, with a picture on the front and information on the back, about your favorite space pioneer. Share your card and discuss four other space pioneers with your counselor.**
3. Build, launch, and recover a model rocket.* Make a second launch to accomplish a specific objective. (Rocket must be built to meet the safety code of the National Association of Rocketry. See the "Model Rocketry" chapter of the *Space Exploration* merit badge pamphlet.) Identify and explain the following rocket parts.
 - a) Body tube
 - b) Engine mount
 - c) Fins
 - d) Igniter
 - e) Launch lug
 - f) Nose cone
 - g) Payload
 - h) Recovery system
 - i) Rocket engine
4. Discuss and demonstrate each of the following:
 - a) The law of action-reaction
 - b) How rocket engines work
 - c) How satellites stay in orbit
 - d) How satellite pictures of Earth and pictures of other planets are made and transmitted
5. **Do TWO of the following:**
 - a) **Discuss with your counselor an unmanned space exploration mission and an early manned mission. Tell about each mission's major discoveries, its importance, and what we learned from it about the planets, moons, or regions of space explored.**
 - b) **Using magazine photographs, news clippings, and electronic articles (such as from the Internet), make a scrapbook about a current planetary mission.**
 - c) **Design an unmanned mission to another planet or moon that will return samples of its surface to Earth. Name the planet or moon your spacecraft will visit. Show how your design will cope with the conditions of the planet's or moon's environment.**
6. Describe the purpose, operation, and components of ONE of the following:
 - a) Space shuttle
 - b) International space station

7. Design an inhabited base located on the Moon or Mars. Make drawings or a model of your base. In your design, consider and plan for the following:
 - a) Source of energy
 - b) How it will be constructed
 - c) Life-support system
 - d) Purpose and function
8. Discuss with your counselor two possible careers in space exploration that interest you. Find out the qualifications, education, and preparation required and discuss the major responsibilities of those positions.

*If local laws prohibit launching model rockets, do the following activity: Make a model of a NASA rocket. Explain the functions of the parts. Give the history of the rocket.

SPACE EXPLORATION WORKBOOK

PART ONE, PRE-REQUISITIES



Name _____
Unit # _____ District _____
Council _____

Part One of the workbook must be completed before class.

Bring the entire workbook (part one and part two) with you to class.

Also bring the "Application for Merit Badge" signed by your scoutmaster (included at the end of the workbook).

- 2. Design a collector's card, with a picture on the front and information on the back, about your favorite space pioneer. Share your card and discuss four other space pioneers with your counselor.

Design a collector's card:

<i>front</i>	<i>back</i>
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Share your card and discuss four other space pioneers:

Name _____

- 5. Do TWO of the following:
 - a) Discuss with your counselor an unmanned space exploration mission and an early manned mission. Tell about each mission's major discoveries, its importance, and what we learned from it about the planets, moons, or regions of space explored.

Unmanned space exploration mission:

Major discoveries:

Its importance:

What we learned:

Early manned mission:

Major discoveries:

Its importance:

What we learned:

- b) Using magazine photographs, news clippings, and electronic articles (such as from the Internet), make a scrapbook about a current planetary mission.

Make a scrapbook about a current planetary mission:

<i>Initial:</i>	<i>date:</i>
-----------------	--------------

Notes/comments:

(attach your scrapbook to this workbook)

Name _____

5. continued

- c) Design an unmanned mission to another planet or moon that will return samples of its surface to Earth. Name the planet or moon your spacecraft will visit. Show how your design will cope with the conditions of the planet's or moon's environment.

Design an unmanned mission to another planet or moon:

The planet or moon your spacecraft will visit:

--

How will it cope with the conditions of the planet's or moon's environment:

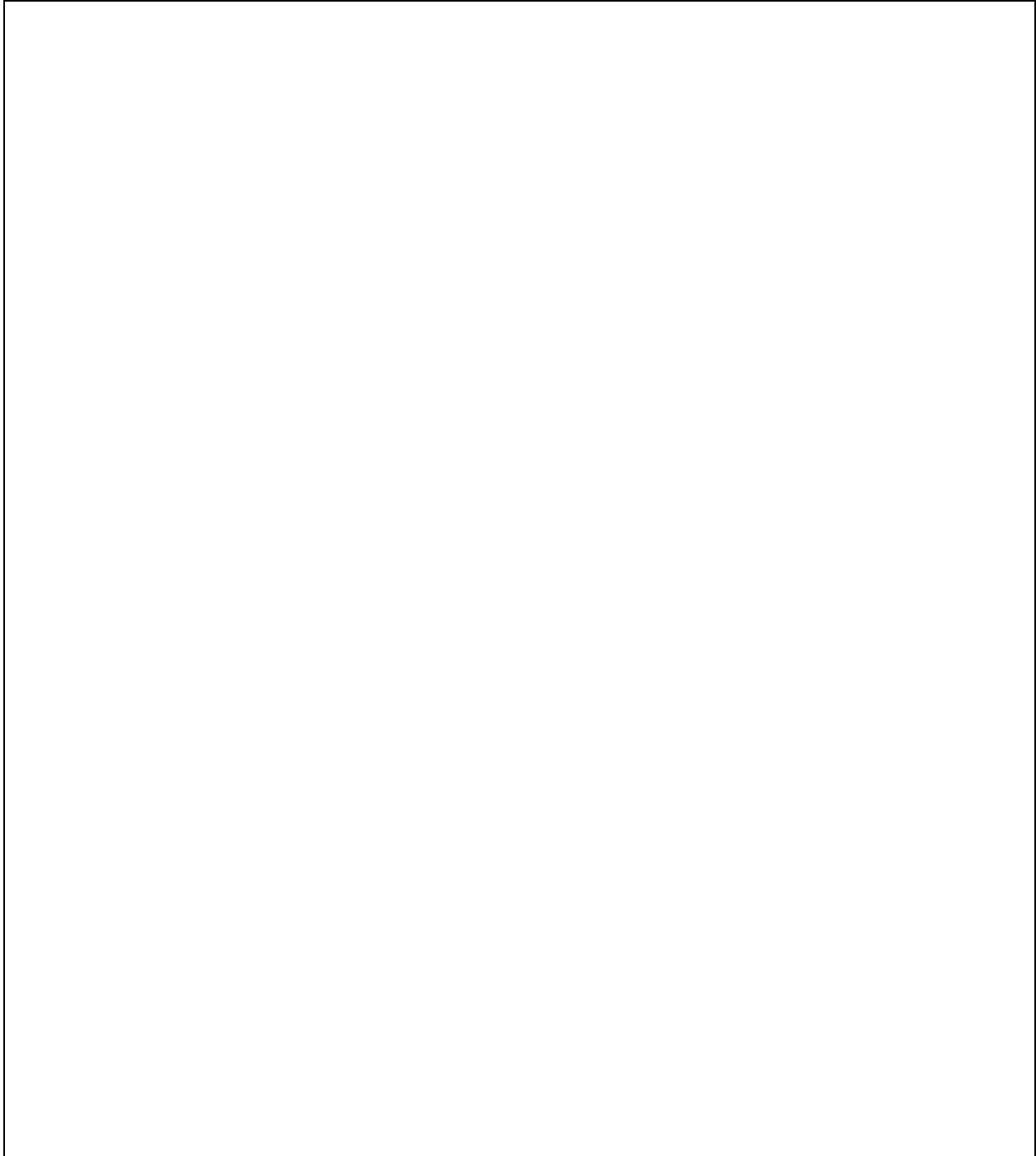
drawing of design

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Name _____

- 7. Design an inhabited base located on the Moon or Mars. Make drawings or a model of your base. In your design, consider and plan for the following:

Design an inhabited base located on the Moon or Mars:



Name _____

7. continued

- a) Source of energy

Source of energy:

Drawing:

--

Name _____

7. continued

- b) How it will be constructed

Construction:

Drawing:

Name _____

7. continued

- c) Life-support system

Life-support system:

Drawing:

Name _____

7. continued
<input type="checkbox"/> d) Purpose and function
<i>Purpose and function:</i>

<input type="checkbox"/> 8. Discuss with your counselor two possible careers in space exploration that interest you. Find out the qualifications, education, and preparation required and discuss the major responsibilities of those positions.
<i>Careers:</i>
<i>Career choice one:</i>
<i>Qualifications:</i>
<i>Education:</i>
<i>Preparation required:</i>
<i>Major responsibilities:</i>
<i>Career choice one:</i>
<i>Qualifications:</i>
<i>Education:</i>
<i>Preparation required:</i>
<i>Major responsibilities:</i>



SPACE EXPLORATION WORKBOOK

PART TWO, CLASS CURRICULUM

Name _____
Unit # _____ District _____
Council _____

Part Two of the workbook will be completed during class.

- 1. Tell the purpose of space exploration and include the following:
 - a) Historical reasons

Historical reasons:

- b) Immediate goals in terms of specific knowledge

Immediate goals:

- c) Benefits related to Earth resources, technology, and new products

Benefits:

Name _____

- 3. Build, launch, and recover a model rocket.* Make a second launch to accomplish a specific objective. (Rocket must be built to meet the safety code of the National Association of Rocketry. See the “Model Rocketry” chapter of the *Space Exploration* merit badge pamphlet.) Identify and explain the following rocket parts.

Build, launch, and recover a model rocket:

Make a second launch to accomplish a specific objective:

- a) Body tube
- b) Engine mount
- c) Fins
- d) Igniter
- e) Launch lug
- f) Nose cone
- g) Payload
- h) Recovery system
- i) Rocket engine

Identify and explain the above rocket parts:

<i>Body tube</i>	
<i>Engine mount</i>	
<i>Fins</i>	
<i>Igniter</i>	
<i>Launch lug</i>	
<i>Nose cone</i>	
<i>Payload</i>	
<i>Recovery system</i>	
<i>Rocket engine</i>	

Name _____

- 4. Discuss and demonstrate each of the following:
- a) The law of action-reaction

Action-reaction:

- b) How rocket engines work

Rocket engines:

- c) How satellites stay in orbit

Orbit:

- d) How satellite pictures of Earth and pictures of other planets are made and transmitted

How pictures are made and transmitted:

ORGANIZATIONS and WEB SITES

(Whenever you go online, be sure you have your parent's permission first.)

American Institute of Aeronautics and Astronautics

<http://www.aiaa.org>

European Space Agency

<http://www.esa.int>

Galileo 1/45 Scale Model

<http://www.jpl.nasa.gov/galileo/model.html>

Goddard Space Flight Center

<http://www.gsfc.nasa.gov>

Great Images in NASA

<http://grin.hq.nasa.gov>

Jet Propulsion Laboratory

<http://www.jpl.nasa.gov>

Johnson Space Center Space center Houston

JSC web site <http://www.nasa.gov/centers/johnson/home/index.html>

SCH web site <http://www.spacecenter.org>

Opportunities at NASA

<http://www.nasa.gov/about/career/index.html>

Junior Engineering Technical Society

<http://www.jets.org>

Kennedy Space Center

<http://www.nasa.gov/centers/kennedy/home/index.html>

Marshall Space Flight Center

<http://www.nasa.gov/centers/marshall/home/index.html>

National Aeronautics and Space Administration

<http://www.nasa.gov>

National Association of Rocketry

<http://www.nar.org>

National Space Society

<http://www.nss.org>

Planetary Society

<http://www.planetary.org>

Smithsonian national Air and Space Museum

<http://www.nasm.si.edu>

SPACE EXPLORATION WORKBOOK

Notes



APPLICATION FOR MERIT BADGE

Name: _____

Address: _____

City: _____

State: _____

Is a registered _____ Boy Scout,
 _____ Varsity Scout,
 _____ Venturer,

of _____ No. _____
Troop, team, crew, ship

District: _____

Council: _____

MERIT BADGE UNIVERISTY

Merit Badge: **Space Exploration**

Counselor: _____

Address: Overland Trails Council

PO Box 1361

2808 O'Flannagan

Grand Island, NE 68802-1361

Phone: 308-382-3717

email: mbuotc@yahoo.com

and is qualified to begin working for this merit badge and has completed the following pre-requisite requirements:

SECTION A PRE-REQUISITE REQUIREMENTS

Requirement No. and letter	Date of Approval	Counselor Initial	Requirement No. and letter	Date of Approval	Counselor Initial
2					
5					
7					
8					

The applicant has personally appeared before me and demonstrated to my satisfaction that he has met all pre-requisites requirements for the above stated merit badge and is ready to attend his assigned MBU class.

Signature of Unit Leader _____ Date _____

SECTION B APPLICANTS RECORD

Requirement No. and letter	Date of Approval	Counselor Initial	Requirement No. and letter	Date of Approval	Counselor Initial
1					
3					
4					
6					

The applicant has personally appeared before me and demonstrated to my satisfaction that he has completed all requirements in **SECTION B** above for the

Merit Badge: **Space Exploration**

Name of Counselor: _____

Signature of Counselor _____ Date _____

SCOUT INSTRUCTIONS

- Complete your name, address, city, unit type & number, district, & council on the Application for Merit Badge.
- Your unit leader must sign the Application for Merit Badge before attending class.
- All other information is already printed on the Application for Merit Badge; please make sure all information is correct.
- The merit badge counselor is registered & approved for this merit badge and is on the MBU Counselor's List.
- Read the merit badge pamphlet.
- Attend the merit badge class.
- Always meet with your counselor along with a buddy (a Scout, friend, or parent)
- Have your merit badge worksheet with you when you attend class.
- **If the merit badge pre-requisites are not completed before class, you will not be able to complete the merit badge during this weekend event, you will have to follow up with your Unit's Advancement Chair when you return home**
- **PLEASE BE AWARE THAT SOME COUNSELORS WILL NOT ALLOW YOU TO ATTEND THEIR CLASS WITHOUT PRE-REQUISITES COMPLETED—CLASS CURRICULUM IS DEPENDENT ON PRE-REQUISITE WORK BEING COMPLETED!**

COUNSELOR INSTRUCTIONS

- Never meet alone with a Scout.
- Verify all information & merit badge name on Application for Merit Badge is correct.
- Sign your name on the line at the bottom of **"SECTION B APPLICANTS RECORD"**.