

# 2010

## RAILROADING PROGRAM OVERVIEW & WORKBOOK



PLUM STREET STATION

MERIT BADGE UNIVERSITY

OVERLAND TRAILS COUNCIL

7/31/2010

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FEBRUARY 2010

Information in this booklet was accurate at the time of publishing.  
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Program Overview & Workbook was reviewed by  
MBU Staff/Committee.

## RAILROADING PROGRAM OVERVIEW

**COUNSELOR:** tba

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

**LOCATION:** Plum Street Station  
603 North Plum  
Grand Island, NE 68801

**TRANSPORTATION:** Transportation is provided

**ADDITIONAL COSTS:** None

**CLASS SIZE:** 15

**BRING TO CLASS:** Railroading merit badge pamphlet.  
Railroading 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 3 & 8).  
Complete information on the "Application for Merit Badge" including Scoutmasters signature.

**CURRICULUM:** Requirements 1, 2, 4, 5, 6, & 7 will be completed during class (part two of the workbook). Pre-requisites will also be reviewed during class.

**CLASS HIGHLIGHTS:** Central Community College has made available the Railroad Engineering Simulator for use by Scouts. This simulator is used for training Union Pacific Engineers.



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

1. Do THREE of the following:
  - a) Name three types of modern freight trains. Explain why unit trains are more efficient than mixed freight trains.
  - b) Name one class I or regional railroad. Explain what major cities it serves, the locations of major terminals, service facilities and crew change points, and the major commodities it carries.
  - c) Using models or pictures, identify 10 types of railroad freight or passenger cars. Explain the purpose of each type of car.
  - d) Explain how a modern diesel or electric locomotive develops power. Explain the terms dynamic braking and radial steering trucks.
2. Do the following:
  - a) Explain the purpose and formation of Amtrak. Explain, by the use of a timetable, a plan for making a trip by rail between two cities at least 500 miles apart. List the times of departure and arrival at your destination, the train number and name, and the type of service you want.
  - b) List and explain the various forms of public/mass transit using rail as the fixed-guide path.
3. **Do ONE of the following:**
  - a) **Name four departments of a railroad company. Describe what each department does.**
  - b) **Tell about the opportunities in railroading that interest you most and why.**
  - c) **Name four rail support industries. Describe the function of each one.**
  - d) **With your parent's and counselor's approval, interview someone employed in the rail industry. Learn what that person does and how this person became interested in railroading. Find out what types of schooling and training are required for this position.**
4. Explain the purpose of Operation Lifesaver and its mission.
5. Do THREE of the following:
  - a) List five safety precautions that help make trains safer for workers and passengers.
  - b) Explain to your merit badge counselor why railroad rights-of-way are important for safety.
  - c) List 10 safety tips to remember when you are near a railroad track (either on the ground or on a station platform) or aboard a train.
  - d) Tell your counselor about the guidelines for conduct that should be followed when you are near or on railroad property. Explain the dangers of trespassing on railroad property.

- e) Tell what an automobile driver can do to safely operate a car at grade crossings, and list three things an automobile driver should never do at a grade crossing.
  - f) Tell how to report a malfunction of grade crossing warning devices.
  - g) List safety precautions a pedestrian should follow at a public crossing.
6. Explain the appearance and meaning of the following warning signs and devices: advance warning sign, pavement markings, crossbucks, flashing red lights, crossing gates.
7. Do EACH of the following:
- a) Explain how railroad signals operate and show two basic signal types using color or configuration.
  - b) Explain the meaning of three whistle signals
  - c) Describe a way to signal a train for an emergency stop.
  - d) Explain the use and function of the EOTD (end-of-train device or FRED (flashing rear end device) used on the last car of most trains.

**8. Select ONE of the following special-interest areas and complete the requirements.**

**a) Model Railroading**

**With your parent's and counselor's approval, do TWO of the following:**

- 1) Draw a layout of your own model railroad or one that could be built in your home. Design a point-to-point track or loop with different routings. Include one of the following: turnaround or terminal or yard or siding.**
- 2) Build one model railroad car kit or one locomotive kit.**
- 3) Name the scale of four popular model railroad gauges. Identify the scale of four model cars or locomotives.**
- 4) Locate the Web site of four model railroad-related manufacturers or magazine publishers. Print information on their products and services and discuss the information with your counselor.**
- 5) Build one railroad structure (from scratch or using a kit), paint and weather the structure, mount it on your layout or diorama, and make the surrounding area on the diorama scenic.**
- 6) Alone or with others, build a model railroad or modular layout including ballast and scenery. Make electrical connections and operate a train. Describe what you enjoyed most.**
- 7) Participate in a switching contest on a timesaver layout and record your time.**

**b) Railfanning**

- 1) Visit a railroad museum, historical display, or a prototype railroad-sponsored public event. With permission, photograph, videotape, or sketch items of interest. Explain what you saw and describe your photos, sketches, or videotape.**
- 2) Purchase tickets and ride a scenic or historic railroad. Under supervision, photograph the equipment and discuss with your counselor the historic significance of the operation.**

- 3) Locate the Web site of four rail historical groups, then find information on the history of the rail preservation operations and purpose of each group. Talk with a member of one of the groups and find out how you might help.
- 4) Plan a trip by rail between two points. Obtain a schedule and explain when the train should arrive at two intermediate points. Purchase the tickets and make the trip. Explain to your counselor what you saw.



Name \_\_\_\_\_

3. continued

**OR**

- c) Name four rail support industries. Describe the function of each one.

<i>Rail support industries</i>	<i>Describe function</i>

**OR**

- d) With your parent's and counselor's approval, interview someone employed in the rail industry. Learn what that person does and how this person became interested in railroading. Find out what types of schooling and training are required for this position.

<i>Person interviewed:</i>
<i>What they do:</i>
<i>How they became interested in railroading:</i>
<i>Types of schooling:</i>
<i>Types of training:</i>

Name \_\_\_\_\_

- 8. Select ONE of the following special-interest areas and complete the requirements.

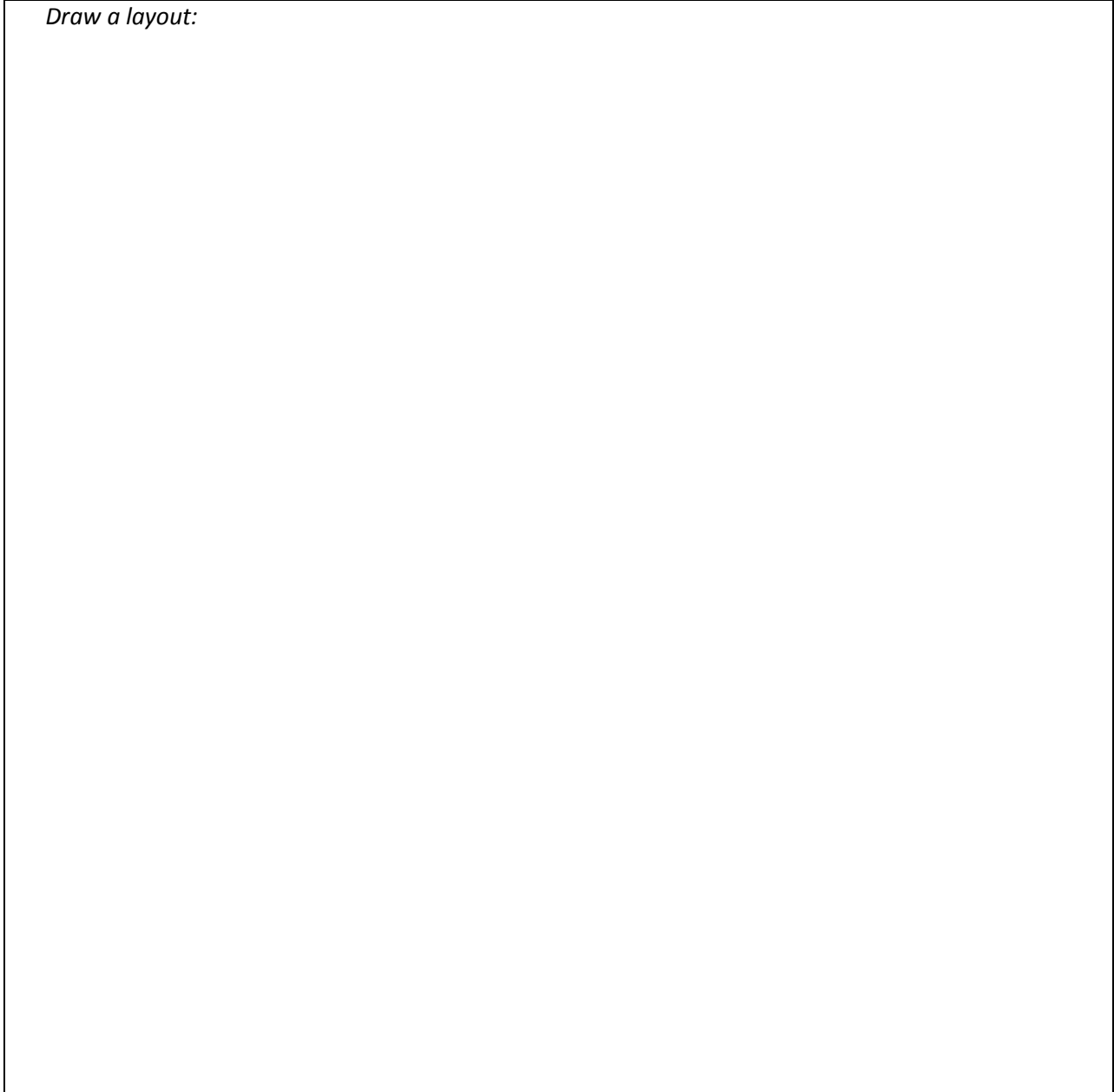
**MODEL RAILROADING**

- a) Model Railroading**

With your parent's and counselor's approval, do TWO of the following:

- 1) Draw a layout of your own model railroad or one that could be built in your home. Design a point-to-point track or loop with different routings. Include one of the following: turnaround or terminal or yard or siding.

*Draw a layout:*



Name \_\_\_\_\_

Model Railroading Option, continued

**AND/OR**

2) Build one model railroad car kit or one locomotive kit.

*Build a railroad car kit or locomotive kit:*


**AND/OR**

3) Name the scale of four popular model railroad gauges. Identify the scale of four model cars or locomotives.

*Name the scale of four popular model railroad gauges:*

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*Identify the scale of four model cars or locomotives:*


**AND/OR**

4) Locate the Web site of four model railroad-related manufacturers or magazine publishers. Print information on their products and services and discuss the information with your counselor.

*Web sites:*


*Attach the information to this workbook:*


Name \_\_\_\_\_

Model Railroading Option, continued

**AND/OR**

- 5) Build one railroad structure (from scratch or using a kit), paint and weather the structure, mount it on your layout or diorama, and make the surrounding area on the diorama scenic.

*Build a railroad structure:*


**AND/OR**

- 6) Alone or with others, build a model railroad or modular layout including ballast and scenery. Make electrical connections and operate a train. Describe what you enjoyed most.

*Build a model railroad or modular layout:*


*Describe what you enjoyed most:*


**AND/OR**

- 7) Participate in a switching contest on a timesaver layout and record your time.

*Record your time in a switching contest:*




**RAILROADING WORKBOOK, PART ONE, p.7**

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Name \_\_\_\_\_

- 3) Locate the Web site of four rail historical groups, then find information on the history of the rail preservation operations and purpose of each group. Talk with a member of one of the groups and find out how you might help.

*Web sites:*

1

*Rail preservation operations:*

*Purpose of group:*

2

*Rail preservation operations:*

*Purpose of group:*

3

*Rail preservation operations:*

*Purpose of group:*

4

*Rail preservation operations:*

*Purpose of group:*

*Talk with a member of one group:*






## RAILROADING WORKBOOK PART TWO, CLASS CURRICULUM

Name \_\_\_\_\_  
 Unit # \_\_\_\_\_ District \_\_\_\_\_  
 Council \_\_\_\_\_

**Part Two of the workbook will be completed during class.**

1. Do THREE of the following:
- a) Name three types of modern freight trains. Explain why unit trains are more efficient than mixed freight trains.

*Modern freight trains:*

1

2

3

*Explain why unit trains are more efficient than mixed freight trains:*


**AND/OR**

- b) Name one class I or regional railroad. Explain what major cities it serves, the locations of major terminals, service facilities and crew change points, and the major commodities it carries.

*Name one class I or regional railroad:*

--

*What major cities it serves:*


*Locations of major terminals:*


*Service facilities and crew change points:*

--	--

*Major commodities it carries:*


Name \_\_\_\_\_

1. continued

**AND/OR**

- c) Using models or pictures, identify 10 types of railroad freight or passenger cars. Explain the purpose of each type of car.

<i>Type of Car</i>	<i>Purpose</i>
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

**AND/OR**

- d) Explain how a modern diesel or electric locomotive develops power. Explain the terms dynamic braking and radial steering trucks.

*Explain how a diesel or electric locomotive develops power:*


*Explain the terms:*

<i>Dynamic braking</i>	
<i>Radial steering trucks</i>	





Name \_\_\_\_\_

5. continued

**AND/OR**

- c) List 10 safety tips to remember when you are near a railroad track (either on the ground or on a station platform) or aboard a train.

*Safety tips to remember when you are near a railroad:*

1
2
3
4
5
6
7
8
9
10

**AND/OR**

- d) Tell your counselor about the guidelines for conduct that should be followed when you are near or on railroad property. Explain the dangers of trespassing on railroad property.

*Guidelines for conduct when near or on railroad property:*


*Dangers of trespassing on railroad property:*


Name \_\_\_\_\_

5. continued

**AND/OR**

- e) Tell what an automobile driver can do to safely operate a car at grade crossings, and list three things an automobile driver should never do at a grade crossing.

*What an automobile driver can do to safely operate a car at grade crossings:*


*Things an automobile driver should never do at a grade crossing:*

1
2
3

**AND/OR**

- f) Tell how to report a malfunction of grade crossing warning devices.

*How to report a malfunction of grade crossing warning devices:*


**AND/OR**

- g) List safety precautions a pedestrian should follow at a public crossing.

*Safety precautions a pedestrian should follow at a public crossing:*


Name \_\_\_\_\_

6. Explain the appearance and meaning of the following warning signs and devices: advance warning sign, pavement markings, crossbucks, flashing red lights, crossing gates.

*Explain the appearance and meaning of the following:*

<b>Warning Sign</b>	<b>Appearance</b>	<b>Meaning</b>
<i>Advance warning sign</i>		
<i>Pavement markings</i>		
<i>Crossbucks</i>		
<i>Flashing red lights</i>		
<i>Crossing gates</i>		



Name \_\_\_\_\_

7. continued

- d) Explain the use and function of the EOTD (end-of-train device or FRED (flashing rear end device) used on the last car of most trains.

*Use and function of the EOTD:*


## ORGANIZATIONA and WEB SITES

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

Amtrak

<http://www.amtrak.com>

Federal Railroad Administration

<http://www.fra.dot.gov>

National Model Railroad Association

<http://www.nmra.org>

National Railway Historical Society

<http://www.nrhs.com>

Operation Lifesaver

<http://www.oli.org>

### **Magazines**

*Model Railroader*

<http://www.trains.com/mrr/>

*Railfan & Railroad*

<http://www.railfan.com>

*Railroad Model Craftsman*

<http://rrmodelcraftsman.com>

*Railway Age*

<http://www.railwayage.com>

*Trains*

<http://www.trains.com/tre/>

# RAILROADING 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: **Railroading**

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
3					
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					
2					
4					
5					
6					
7					

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: **Railroading**

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"**.