



Geology Merit Badge Workbook - Energy Resources

SCOUTMASTER BUCKY

Scouts participating in a Scoutmaster Bucky merit badge opportunity, whether online or in person, should consider using the Geology merit badge pamphlet for discovery and knowledge, along with the class preparation pages for clarifications, insights, and expectations.

<https://scoutmasterbucky.com/merit-badges/geology/geology-pamphlet.pdf>

<https://scoutmasterbucky.com/merit-badges/geology/geology-cpp.pdf>

REQUIREMENTS 4a, 5b5b, and 6a REQUIRE COUNSELOR APPROVAL.

REQUIREMENTS 4a, 5b5b, and 6a REQUIRE PARENT / GUARDIAN APPROVAL.

REQUIREMENT 5b5a REQUIRES PARENT / GUARDIAN PERMISSION.

REQUIREMENT 1: Define geology.

Notes:

REQUIREMENT 1: Discuss how geologists learn about rock formations.

Notes:

REQUIREMENT 1: In geology, explain why the study of the present is important to understanding the past.

Notes:



Geology Merit Badge Workbook - Energy Resources

SCOUTMASTER BUCKY

REQUIREMENT 2: Pick three resources that can be extracted or mined from Earth for commercial use. Discuss with your counselor how each product is discovered and processed.

RESOURCE #1:

Resource:

How is this resource discovered:

How is this resource processed:

RESOURCE #2:

Resource:

How is this resource discovered:

How is this resource processed:



Geology Merit Badge Workbook - Energy Resources

SCOUTMASTER BUCKY

RESOURCE #3:

Resource:

How is this resource discovered:

How is this resource processed:

REQUIREMENT 3: Review a geologic map of your area or an area selected by your counselor, and discuss the different rock types and estimated ages of rocks represented. Determine whether the rocks are horizontal, folded, or faulted, and explain how you arrived at your conclusion.

Consider using the [Geology Merit Badge Pamphlet](#) for preparation information
This requirement must be reviewed with your merit badge counselor.
BE PREPARED!

Notes:



Geology Merit Badge Workbook - Energy Resources

SCOUTMASTER BUCKY

DO ONE OF THE FOLLOWING (4A or 4B) FOR REQUIREMENT 4

REQUIREMENT 4a: With your parent or guardian's and counselor's approval, visit with a geologist, land use planner, or civil engineer. Discuss this professional's work and the tools required in this line of work. Learn about a project that this person is now working on, and ask to see reports and maps created for this project. Discuss with your counselor what you have learned.

PARENT/GUARDIAN APPROVAL: IS REQUIRED.

Parent's / Guardian's Name

Phone or Email

Parent's / Guardian's Signature

Date ☐ *approved*

COUNSELOR APPROVAL: IS REQUIRED.

Counselor's Name

Phone or Email

Counselor's Signature

Date ☐ *approved*

Person's Name, Title, and Profession to Visit:

Date and Location of Visit:

Current Project Reviewed:



Geology Merit Badge Workbook - Energy Resources

SCOUTMASTER BUCKY

Tools required for this person's work:

Notes:



Geology Merit Badge Workbook - Energy Resources

SCOUTMASTER BUCKY

REQUIREMENT 4b: Find out about three career opportunities available in geology.

Career Opportunity #1:

Career Opportunity #2:

Career Opportunity #3:

REQUIREMENT 4b: Pick one and find out the education, training, and experience required for this profession. Discuss this with your counselor.

Selected Career Opportunity:

Education Requirements:

Training Requirements:

Experience Requirements:

REQUIREMENT 4b: Explain why this profession might interest you.

Notes:



Geology Merit Badge Workbook - Energy Resources

SCOUTMASTER BUCKY

Requirement 5b - Energy Resources Option

REQUIREMENT 5b1: List the top five Earth resources used to generate electricity in the United States.

Earth Resource #1:

Earth Resource #2:

Earth Resource #3:

Earth Resource #4:

Earth Resource #5:



Geology Merit Badge Workbook - Energy Resources

SCOUTMASTER BUCKY

REQUIREMENT 5b2: Discuss source rock, trap, and reservoir rock - the three components necessary for the occurrence of oil and gas underground.

Source Rock:

Trap:

Reservoir Rock:



Geology Merit Badge Workbook - Energy Resources

SCOUTMASTER BUCKY

REQUIREMENT 5b3: Explain how each of the following items is used in subsurface exploration to locate oil or gas: reflection seismic, electric well logs, stratigraphic correlation, offshore platform, geologic map, subsurface structure map, subsurface isopach map, and core samples and cutting samples.

Reflection Seismic:

Electric Well Logs:

Stratigraphic Correlation:

Offshore Platform:



Geology Merit Badge Workbook - Energy Resources

SCOUTMASTER BUCKY

Geologic Map:

Subsurface Structure Map:

Subsurface Isopach Map:

Core Samples and Cutting Samples:



Geology Merit Badge Workbook - Energy Resources

SCOUTMASTER BUCKY

REQUIREMENT 5b4: Using at least 20 data points provided by your counselor and create a subsurface structure map.

Consider using the [Geology Merit Badge Pamphlet](#) for preparation information

This requirement must be reviewed with your merit badge counselor.

BE PREPARED!

REQUIREMENT 5b4: Use the subsurface structure map you created to explain how subsurface geology maps are used to find oil, gas, or coal resources.

Oil:

Gas:

Coal:



Geology Merit Badge Workbook - Energy Resources

SCOUTMASTER BUCKY

DO ONE OF THE FOLLOWING (5B5A or 5B5B) FOR REQUIREMENT 5B5

REQUIREMENT 5b5a: Make a display or presentation showing how oil and gas or coal is found, extracted, and processed. You may use maps, books, articles from periodicals, and research found on the internet (with your parent or guardian's permission). Share the display with your counselor or a small group (such as your class at school) in a five-minute presentation.

Be sure to bring your display or presentation to share with your merit badge counselor
Consider using the [Geology Merit Badge Pamphlet](#) for preparation information
This requirement must be reviewed with your merit badge counselor.
BE PREPARED!

PARENT/GUARDIAN PERMISSION: IS REQUIRED.

Parent's / Guardian's Name

Phone or Email

Parent's / Guardian's Signature

Date ☐ *permission*

Notes:



Geology Merit Badge Workbook - Energy Resources

SCOUTMASTER BUCKY

REQUIREMENT 5b5b: With your parent or guardian's and counselor's permission and assistance, arrange for a visit to an operating drilling rig. While there, talk with a geologist and ask to see what the geologist does onsite. Ask to see cutting samples taken at the site.

Site Name and Location:

Geologist's Name you met with:

Date and Time of Visit:

PARENT/GUARDIAN APPROVAL: IS REQUIRED.

Parent's / Guardian's Name

Phone or Email

Parent's / Guardian's Signature

Date ☐ *approved*

COUNSELOR APPROVAL: IS REQUIRED.

Counselor's Name

Phone or Email

Counselor's Signature

Date ☐ *approved*

Notes:



Geology Merit Badge Workbook - Energy Resources

SCOUTMASTER BUCKY

DO ONE OF THE FOLLOWING (6A, 6B, 6C, or 6D) FOR REQUIREMENT 6

REQUIREMENT 6a: Visit a science museum or the geology department of a local university that has fossils on display. With your parent or guardian's and counselor's approval, before you go, make an appointment with a curator or guide who can show you how the fossils are preserved and prepared for display.

Place to Visit:

PARENT/GUARDIAN APPROVAL: IS REQUIRED.

Parent's / Guardian's Name

Phone or Email

Parent's / Guardian's Signature

Date ☐ *approved*

COUNSELOR APPROVAL: IS REQUIRED.

Counselor's Name

Phone or Email

Counselor's Signature

Date ☐ *approved*

Place to Visit:

Notes:



Geology Merit Badge Workbook - Energy Resources

SCOUTMASTER BUCKY

REQUIREMENT 6b: Visit a structure in your area that was built using fossiliferous rocks. Determine what kind of rock was used and tell your counselor the kinds of fossil evidence you found there.

Place and Location to Visit:

Rock Used:

Fossil Evidence:



Geology Merit Badge Workbook - Energy Resources

SCOUTMASTER BUCKY

REQUIREMENT 6c: Visit a rock outcrop that contains fossils. Determine what kind of rock contains the fossils, and tell your counselor the kinds of fossil evidence you found at the outcrop.

Place and Location to Visit:

Rock that fossils are contained in:

Fossil Evidence:

REQUIREMENT 6d: Prepare a display or presentation on your state fossil. Include an image of the fossil, the age of the fossil, and its classification. You may use maps, books, articles from periodicals, and research found on the internet (with your parent or guardian's permission). Share the display with your counselor or a small group (such as your class at school). If your state does not have a state fossil, you may select a state fossil from a neighboring state.

Consider using the [Geology Merit Badge Pamphlet](#) for preparation information
Be sure to bring your display, or evidence of, to share with your merit badge counselor

This requirement must be reviewed with your merit badge counselor.

BE PREPARED!

PARENT/GUARDIAN PERMISSION: IS REQUIRED.

Parent's / Guardian's Name

Phone or Email

Parent's / Guardian's Signature

Date

☐

permission



Geology Merit Badge Workbook - Energy Resources

SCOUTMASTER BUCKY

State	Age	Common name	Binomial nomenclature
Alabama	Eocene	Basilosaurus whale	<i>Basilosaurus cetoides</i>
Alaska	Pleistocene	Woolly Mammoth	<i>Mammuthus primigenius</i>
Arizona	Triassic	petrified wood	<i>Araucarioxylon arizonicum</i>
Arkansas	N/A	N/A	N/A
California	Pleistocene	Saber-toothed cat	<i>Smilodon fatalis</i>
Colorado	Jurassic	Stegosaurus	<i>Stegosaurus stenops</i>
Connecticut	Jurassic	dinosaur tracks	<i>Eubrontes giganteus</i>
Delaware	Cretaceous	Belemnite	<i>Belemnitella americana</i>
Washington, D.C.	Cretaceous	Capitalsaurus	<i>nomen nudum only</i>
Florida	Oligocene - Miocene	agatized coral	<i>Cnidaria, Anthozoa</i>
Georgia	Cretaceous - Miocene	shark tooth	undetermined
Hawaii	N/A	N/A	N/A
Idaho	Pliocene	Hagerman horse	<i>Equus simplicidens</i>
Illinois	Pennsylvanian	Tully Monster	<i>Tullimonstrum gregarium</i>
Indiana	Pleistocene	Jefferson's ground sloth	<i>Megalonyx jeffersonii</i>
Iowa	N/A	N/A	N/A
Kansas	Cretaceous	Flying reptile	<i>Pteranodon</i>
Kentucky	Mississippian	brachiopod	undetermined
Louisiana	Oligocene	petrified palmwood	<i>Palmoxydon</i>
Maine	Devonian	Pertica plant	<i>Pertica quadrifaria</i>
Maryland	Miocene	murex snail / gastropod	<i>Ecphora gardnerae gardnerae</i>
Massachusetts	Jurassic	dinosaur tracks	undetermined
Michigan	Pliocene - Pleistocene	American mastodon	<i>Mammut americanum</i>
Minnesota	Pleistocene	Giant Beaver	<i>Castoroides ohioensis</i>
Mississippi	Eocene	Basilosaurus and Zygorhiza whales	<i>Basilosaurus cetoides</i> <i>Zygorhiza kochii</i>
Missouri	Pennsylvanian	Sea lily	<i>Delocrinus missouriensis</i>



Geology Merit Badge Workbook - Energy Resources

SCOUTMASTER BUCKY

State	Age	Common name	Binomial nomenclature
Montana	Cretaceous	Duck-billed dinosaur	<i>Maiaasaura peeblesorum</i>
Nebraska	Pleistocene	Woolly Mammoth Columbian Mammoth Imperial Mammoth	<i>Mammuthus primigenius</i> <i>Mammuthus columbi</i> <i>Mammuthus imperator</i>
Nevada	Triassic	Shonisaurus	<i>Shonisaurus popularis</i>
New Hampshire	N/A	N/A	N/A
New Jersey	Cretaceous	duck-billed dinosaur	<i>Hadrosaurus foulkii</i>
New Mexico	Triassic	Coelophysis	<i>Coelophysis bauri</i>
New York	Silurian	sea scorpion	<i>Eurypterus remipes</i>
North Carolina	Oligocene - Pleistocene	Megalodon Shark tooth	undetermined
North Dakota	Paleocene	shipworm-bored petrified wood	<i>Teredo</i> petrified wood
Ohio	Ordovician	trilobite	<i>Isotelus maximus</i>
Oklahoma	Jurassic	Saurophaganax	<i>Saurophaganax maximus</i>
Oregon	Eocene	Dawn redwood	<i>Metasequoia occidentalis</i>
Pennsylvania	Devonian	trilobite	<i>Phacops rana</i>
Rhode Island	N/A	N/A	N/A
South Carolina	N/A	N/A	N/A
South Dakota	Cretaceous	Triceratops	<i>Triceratops horridus</i>
Tennessee	Cretaceous	bivalve	<i>Pterotrigonia thoracica</i>
Texas	Cretaceous	Pleurocoelus	<i>Pleurocoelus nanus</i>
Utah	Jurassic	Allosaurus	<i>Allosaurus fragilis</i>
Vermont	Pleistocene	Beluga whale	<i>Delphinapterus leucas</i>
Virginia	Miocene - Pliocene	scallop	<i>Chesapecten jeffersonius</i>
Washington	Pleistocene	Columbian Mammoth	<i>Mammuthus columbi</i>
West Virginia	Pleistocene	Jefferson's ground sloth	<i>Megalonyx jeffersonii</i>
Wisconsin	Ordovician - Silurian	trilobite	<i>Calymene celebra</i>
Wyoming	Eocene	Knightia	<i>Knightia</i>

This list is not meant to be complete and may not reflect all current or variable fossils for each state
N/A simply implies either unknown or unofficial / proposed may exist