Archaeology Merit Badge
PART ONE
Eric Cutright, January 2022
Scoutmaster Troop 1029 (F)
Archaeology Merit Badge

Your Troop 1029 Merit Badge Counselor
Dr. Eric “Indiana Jones” Cutright (a.k.a. Mr. Eric)

Part 1 – Summary of Requirements, Introduction, Site Sampling, Mock Dig

Part 2 – Artifact ID/Preservation, Dating, Cool Archaeological Sites around the world

Part 3 – Artifact ID, Looting, Time Capsules, YOUR Requirement 7 and 8 presentations

Part 4 - Experimental Archaeology, Cool Careers in Archaeology
Meet your crazy Merit Badge Counselor!

Mr. Eric. For Life™
Meet Mr. Eric - Your Crazy Merit Badge Counselor – 1/5

• I’ve been a Scout Leader for 17 years
  – For the past 2 years, I’ve been SM for girl’s Troop 1029 in C’ville
  – For 4 years before that, I was SM for boy’s Troop 1028
  – Before being SM, I was an ASM and before that, a Cub Scout leader in the mighty Pack 77 in Charlottesville, VA
  – I’ve been a Scouts BSA MBC for around 12 years, I teach 57 !!
  – I had a terrible Troop as a youth Scout, and didn’t get very far 😞

• I have four sons
  – Alec (22), Luke (20), Marc (17), Kyle (16)
  – I was their Den leader for all 5 ranks in Cub Scouting (lots of PWD cars!)
  – I have 2 Eagle Scouts – Alec and Marc
Meet Mr. Eric - Your Crazy Merit Badge Counselor – 2/5

• Mr. Eric’s job #2 (Scouts is #1, duh!) – Electrical Engineer
  – B.S., M.S., and Ph.D. in Electrical Engineering from UVA
  – I also minored in Archaeology as an undergrad!
  – I’m a safety engineer and safety assessor for advanced computer control systems used on subways and railroads
    • I make sure all the control software and hardware is reliable and safe before it goes into revenue service carrying passengers
    • If nothing bad happened to you on your last train or subway ride, you may have me to thank
    • I’ve worked on systems all over the world, but NYCT is my favorite!
    • You’ll find out more about my job if you take Engineering with me

Mr. Eric, For Life™
Meet Mr. Eric - Your Crazy Merit Badge Counselor – 3/5

• Mr. Eric’s job #3 – Fantasy book series author / illustrator
  – Archaeology-themed Cartouche Chronicles series for middle schoolers / young adults
  – Best described as a mix of Indiana Jones, Harry Potter, Stranger Things, and the Goonies – see www.cartouchechronicles.com
  – CC1 and CC2 are out on Amazon, CC3 releasing in late-2022
  – I have two “magical” Egyptian hieroglyphic arm tattoos that I designed myself from the books

Left: LOST (the bad guys)  
Right: ASIM (the good guys)
Meet Mr. Eric - Your Crazy Merit Badge Counselor – 4/5

**CARTOUCHE CHRONICLES 1: THE CURSE OF THE MUMMY**

**CARTOUCHE CHRONICLES 2: PURSUIT IN POMPEII**
Meet Mr. Eric - Your Crazy Merit Badge Counselor – 5/5

• I’m a registered MBC for 57 Merit Badges, here are my top ten very most favorites (it was very hard to choose!)

  1. Archaeology – I teach this at Moose and various MBUs
  2. Engineering – right up my alley!
  3. Model Design and Building - neckerchief slides are fun!
  4. Woodwork – I make furniture, our gateway sign, cool Scout stuff
  5. Home Repairs – save money and fix things yourself!
  6. Kayaking – my favorite water sport – have 3 kayaks & a SUP
  7. Railroading (I taught it at the National Jambo 2013!)
  8. Reptile and Amphibian Study – Lenny the leopard gecko rules!
  9. Wilderness Survival – most of my Scouts usually survive!
 10. Reading & Scholarship (tied) – I blame it on my books!
Part One - Introduction

Overview of Merit Badge Requirements
What is Archaeology?
Some of Mr. Eric’s Favorite Archaeological Sites
The Archaeological Process
  Site Location
  Site Excavation
  Artifact Identification and Examination
  Preservation
  Information Sharing
Site Excavation: Sampling Techniques
Archaeology Mock Dig – Patrol Competition
Can you dig it?
Overview of Archaeology Merit Badge Requirements
Archaeology MB Reqts – See Handout

Troop 1029
Archaeology Merit Badge with Mr. Eric

Requirements

1. Tell what archaeology is and explain to your counselor how it differs or relates to other fields of study such as anthropology, geology, paleontology, and history. Explain how archaeology is different than artifact collecting or treasure hunting.

2. Describe each of the following steps of the archaeological process: site location, development of background research and a research design, site survey and fieldwork, artifact identification and examination, interpretation, preservation, and information sharing.

3. Describe at least two ways in which archaeologists determine the age of sites, structures, or artifacts. Explain what absolute dating and relative dating are.

4. Learn about a combined total of five archaeological sites located both within and outside the United States.
   a. For EACH site you research, point it out on a map and explain how it became known to archaeologists. Describe some of the information about the past that has been found at each site. Explain how the information gained from the study of these sites answers questions that archaeologists are asking and how the information may be important to modern people. Compare the relative ages of the sites you research.

5. Do the following:
   a. Learn about the federal laws and international conventions that protect archaeological sites. Find out if your state, county, or local government has regulations that apply to archaeological or historic sites.
   b. Identify a national, international, or local organization that helps to protect archaeological sites.

6. Do the following:
   a. Explain why it is important to protect archaeological sites.
   b. Explain what people should do if they think they have found an artifact.
   c. Describe the ways in which you can be a protector of the past.

7. Do ONE of the following and discuss your findings with your counselor:
   a. Visit a museum to observe how artifacts aid in conveying history.
   b. Present to your counselor a significant family artifact/heirloom and discuss its history.
   c. Make a list of the trash your family throws out during one week. Discuss with your counselor what archaeologists might learn about you and your family if they found your trash a thousand years from now.

8. Research a group of people who lived in your area more than 100 years ago. Find out about their ways of life, including housing, clothing, arts and crafts, tools, trade and markets, rituals and religions, and diets, and their relationships with other groups of people in the area. Describe what you would expect to find at an archaeological site where these people lived. Explain how these people influenced your current community.

9. Identify three career opportunities in archaeology. Pick one and explain how to prepare for such a career. Discuss with your counselor what education and training are required, and explain why this profession might interest you.

10. Do either A or B of the following:
   a. With your parent’s and counselor’s permission, assist a qualified archaeologist for at least eight hours with a project being worked on. Projects may include surveying, site monitoring, site stabilization, excavation, laboratory analysis, use of digital archaeological technology, or public outreach. Describe your involvement in the project, what you learned about archaeology, and the steps of archaeological inquiry.
   Note: Visiting an archaeological site will require advance planning. An archaeological site during study can be a dangerous place. While there, you will need to closely follow the archaeologist’s directions and comply with all the safety procedures. Be aware of the changing conditions at the site.

   b. With your counselor’s approval, take part in a simulated archaeological project designed by a qualified archaeologist. The project must include the use of a simulated archaeological site including artifacts and features for the site. Using the steps of archaeological inquiry, analyze the “artifacts and features” and document the spatial relationships of the “artifacts and features” at the simulated site.

   Explain how the environment and time can affect the interpretation of an artifact and the overall archaeological site. Tell how you would share the results of your analysis with other researchers and the public.

   Note: To find out how to make a simulated archaeological site, talk with a professional archaeologist, trained avocational archaeologist, museum school instructor, junior high or high school science teacher, advisor from a local archaeology society, or other qualified instructor.

Patrol-based activities during class

Mr. Eric’s Pre-requisites

b. Choose ONE of the sites you picked and give a short presentation about your findings to a Cub Scout pack, your Scout troop, your school class, or another group.
1. Tell what archaeology is and explain to your counselor how it differs or relates to other fields of study such as anthropology, geology, paleontology, and history. Explain how archaeology is different than artifact collecting or treasure hunting.

2. Describe each of the following steps of the archaeological process: site location, development of background research and a research design, site survey and fieldwork, artifact identification and examination, interpretation, preservation, and information sharing.

3. Describe at least two ways in which archaeologists determine the age of sites, structures, or artifacts. Explain what absolute dating and relative dating are.
4. Learn about a combined total of five archaeological sites located both within and outside the United States.

a. For EACH site you research, point it out on a map and explain how it became known to archaeologists. Describe some of the information about the past that has been found at each site. Explain how the information gained from the study of these sites answers questions that archaeologists are asking and how the information may be important to modern people. Compare the relative ages of the sites you research.

b. (will do in Mr. Eric’s class) Choose ONE of the sites you picked and give a short presentation about your findings to a Cub Scout pack, your Scout troop, your school class, or another group.
5. Do the following:
   a. Learn about the federal laws and international conventions that protect archaeological sites. Find out if your state, county, or local government has regulations that apply to archaeological or historic sites.
   b. Identify a national, international, or local organization that helps to protect archaeological sites.

6. Do the following:
   a. Explain why it is important to protect archaeological sites.
   b. Explain what people should do if they think they have found an artifact.
   c. Describe the ways in which you can be a protector of the past.
7. (Mr. Eric’s pre-req homework) Do ONE of the following and discuss your findings with your counselor:

a. Visit a museum to observe how artifacts aid in conveying history.

b. Present to your counselor a significant family artifact/heirloom and discuss its history.

c. Make a list of the trash your family throws out during one week. Discuss with your counselor what archaeologists might learn about you and your family if they found your trash a 1000 years from now.
8. (Mr. Eric’s pre-req homework) Research a group of people who lived in your area more than 100 years ago. Find out about their ways of life, including housing, clothing, arts and crafts, tools, trade and markets, rituals and religions, and diets, and their relationships with other groups of people in the area. Describe what you would expect to find at an archaeological site where these people lived. Explain how these people influenced your current community.
9. Identify three career opportunities in archaeology. Pick one and explain how to prepare for such a career. Discuss with your counselor what education and training are required, and explain why this profession might interest you.

10. Do either A or B of the following:
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10. Do either A or B of the following (continued):

b. (will do in Mr. Eric’s class) With your counselor’s approval, take part in a simulated archaeological project designed by a qualified archaeologist. The project must include the use of a simulated archaeological site including artifacts and features for the site. Using the steps of archaeological inquiry, analyze the “artifacts and features” and document the spatial relationships of the “artifacts and features” at the simulated site. Explain how the environment and time can affect the interpretation of an artifact and the overall archaeological site. Tell how you would share the results of your analysis with other researchers and the public.
11. Under the supervision of a qualified archaeologist or instructor, do ONE of the following:

a. Help prepare an archaeological exhibit for display in a museum, visitor center, school, or other public area.

b. (will do in Mr. Eric’s class) Use the methods of experimental archaeology to re-create an item or to practice a skill from the past. Write a brief report explaining the experiment and its results.
Introduction to Archaeology
Lesson 1: How do you spell Archaeology?

• For some reason, lots of folks always mess up the spelling of this amazing and wonderful word

• Archaeology is spelled like this:

Archaeology

Arch because sometimes Archaeologists dig up arches

First letter of the alphabet since Archaeology is the best, duh!

Geology without the G

Prepared. For Life.”
What is Archaeology?
(MB Book pages 9-11, Requirement 1)

• The word *Archaeology* is derived from Greek word *archaios* meaning “ancient” and Latin *logia* meaning “to talk or write about.”

• Archaeologists are detectives who study how people lived in the past.

• Archaeologists study the material remains of past *cultures* – the *things* people left behind – to learn how people lived and how cultures have changed through time.

• By studying the past, we can learn where we came from, how we got to where we are today, and where the future may take us.
What is a Culture?
(MB Book page 9)

• A culture is the way of life shared by a group of people and passed down from one generation to the next.

• The people of a given culture have the same language and similar customs, beliefs, ceremonies, habits, food preferences, and so on.

• Examples:
  – Native American Indian tribes
  – Ancient Egyptians
  – Ancient Romans
  – Vikings
  – Amazonian Indian tribes
Fields Related To Archaeology
(MB Book pages 15-16, Requirement 1)

- Anthropology – the study of humans in the widest sense
- Geology – the study of rocks, soil, and terrain
- Paleontology – the study of fossils of ancient animals and plants
- History – the study of the past through written records
- Archaeology is officially classified as a sub-field of Anthropology
- Archaeologists may call on other specialists for help
Some of Eric’s Favorite Archaeological Sites
(Intro to Requirement 4a)
World Archaeology Overview

The Arctic
North America
Mesoamerica
South America
Europe and Western Asia
The Near East
Egypt
Africa
The East

WORLD ARCHAEOLOGY
Egyptian Archaeology
Ancient Egypt – Pyramids of Giza (2500 BC)
Ancient Egypt – Pyramids of Giza (2500 BC)

• **Great Pyramid of Khufu**
  – Western name is sometimes “Great Pyramid of Cheops”
  – 481 feet tall, 756 feet per side, volume of over 90 million cubic feet, and an estimated mass of 6 million tons
  – Was tallest building in world until Lincoln Cathedral was built in 1300AD
  – Has large ancient cemeteries on west and east, with a row of mastabas on south where key princes, princesses, and nobles had been buried
  – Khufu’s funerary boat was found on south and rebuilt, housed on site

• **Pyramid of Khafre**
  – 450 feet tall, only one with smooth white limestone casing still left at top, the others were “raided” over the years for other projects 😞
  – Only one with bottom layer of pink granite casing stones

• **Pyramid of Menkaure**
  – Youngest and smallest at just over 200 feet tall
  – Has three small Pyramids of Queens on south side
Ancient Egypt – Pyramids of Giza (2500 BC)
Ancient Egypt – The Great Sphinx (2500 BC)
Ancient Egypt – The Great Sphinx (2500 BC)

• 240 feet long, with the body of a mighty lion and the head of a man, thought to be the pharaoh Khafre
• Face of the sphinx looks eastward toward the Nile, must have been an impressive sight to visitors
• It was carved directly out of the limestone bedrock on the Giza plateau
  – The rock quarried away during construction was used to build the adjacent valley temple and other nearby monuments
• The different hard and soft layers of rock in the sphinx eroded differently over time, giving it the look of “tiger stripes”
Ancient Egypt – Tomb of King Tut (1350 BC)

Section of Tutankhamen’s tomb
1 Corridor
2 Antechamber
3 Annex
4 Treasure Chamber
5 Burial Chamber
Ancient Egypt – Tomb of King Tut (1350 BC)

- Tutankhamun often called the “boy king,” he became pharaoh at age 10 and ruled until age 19
- His early death is still very mysterious with lots of different conspiracy theories
- His father was the pharaoh Akhenaten, mom was Nefertiti
  - Old pops had radically shaken up Egypt by declaring that the old gods should be abandoned and everyone must worship the one sun god Aten
  - When Tut became pharaoh, he quickly restored all the old gods
  - After the death of Akhenaten and Tut, future rulers were still furious and erased all records of both of them from all public temples
- His intact tomb found by Howard Carter in 1922, held over 5,400 magnificent artifacts
  - Tut had been forgotten, and his tomb was in a perfect location where it was buried by grave robber chippings and overlooked in antiquity
Ancient Egypt – Tomb of King Tut (1350 BC)

2018: Hidden chambers detected

2022: Hidden chambers now not believed to exist, but in Mr. Eric’s book they do 😊
Grand Egyptian Museum

- Constructed on the Giza plateau in sight of the pyramids, same height as Great Pyramid
- Over 700,000 square foot footprint
- State of the art Conservation Center
- Set to house over 100,000 artifacts from all pharaonic periods including all of King Tut’s 5,400 artifacts housed together for the first time
- Replaces the old Egyptian Antiquities Museum in Tahrir Square in Cairo, built in 1900 and way too small
Greek Archaeology
The Minoans – Palace of Knossos, Crete (1800 BC)
The Minoans – Palace of Knossos, Crete (1800 BC)

• **Greece culture at this time was divided into:**
  – The Mycenaeans on mainland Greece with their capital in Athens and grand palaces/citadels at Mycenae and Pylos
  – The Minoans on the island of Crete with their palace at Knossos

• **Legends of Knossos and King Minos**
  – Knossos was the origin of the Minotaur and maze legend
  – King Minos asked Poseidon for a worthy sacrifice animal, and Poseidon gave him a mighty bull
  – Minos decided to keep it which angered Poseidon, so he tricked Minos’ wife Pasiphae into falling in love with it, resulting in the Minotaur
  – Minos asked his engineer Daedalus to create a maze to hold the beast
  – Later, Minos’ son Androgeus was killed by the Marathonian Bull in Athens, so Minos suspected treachery and declared war and Athens surrendered
  – Every 9 years, Athens sent 7 boys and 7 girls to the Minotaur’s maze as sacrifice
  – Later Prince Theseus of Athens volunteered, and with the help of Minos’ daughter Ariadne, he killed the Minotaur and freed Athens from their sacrifice
Ancient Greece – The Parthenon, Athens (432 BC)

Statue of Athena →
Gold and Ivory
European Archaeology
The Bog People, Denmark (300 BC – Iron Age)
Anglo-Saxons: Sutton Hoo Ship Burial, UK (700 AD)
Vikings – Denmark, Norway, Sweden (800 – 1100 AD)
Italian Archaeology
Pompeii and Mount Vesuvius, Naples, Italy (AD 79)

Over 2,000 bodies found
Pompeii and Mount Vesuvius, Naples, Italy (AD 79)
Pompeii and Mount Vesuvius, Naples, Italy (AD 79)

2019: Inscribed charcoal date in House of the Gardens was 10/17/79, we always thought eruption was 8/24!
South American Archaeology
Inca City of Machu Picchu, Cusco, Peru (AD 1450)
Shipwrecks

- **Atocha – Spanish Galleon**
  - 40 tons of gold and silver,
  - 71 pounds of emeralds
  - Most valuable shipwreck ever recovered

- **RMS Titanic**
Wreck of the Spanish Galleon Atocha (AD 1622)
Wreck of the RMS Titanic (April 15, AD 1912)
The Archaeological Process
(MB Book pages 33-70, Requirement 2)

• To be covered in this session:
  – Site Location
  – Site Excavation

• To be covered at next session:
  – Artifact Identification and Examination
  – Preservation
  – Information Sharing
Site Location- Where to Dig?
Site Location
(MB Book page 33 - 36, Requirement 2)

• Sites are selected (or discovered) for archaeological investigation through a variety of methods
  – Historical references like old newspapers, letters, and maps
    • Example: Wreck of the RMS Titanic
  – Sites are often found “by accident” during modern construction
    • Example: Rail project finds Byzantine merchant ships from AD 700, Istanbul, Turkey
  – Ask the locals !!
    • Example: Minoan city of Gournia, Crete
  – Farmers digging wells or tilling fields
    • Example: Emperor’s tomb with 6,000 terra-cotta soldiers, China
    • Example: Viking treasure and weapons hoard, UK
  – Scouts on hikes !!
Recent Accidental Discoveries

Popular cave in Spain – a badger digs a nest and kicks out 209 Roman coins from 200 to 400 AD. Archaeologists suspect that the hoard had been hidden by locals from barbarian invaders.

Metal detectorist finds one of England’s first gold coins dated 1257 in a field, only 7 others known to exist! Minted by King Henry III and going up for auction for half a million dollars (he gets to keep the money)!
Site Location: Technology
(MB Book page 34, Requirement 2)

- Often aided by modern non-destructive technology
  - Aerial surveys
  - Satellite images
  - Ground penetrating radar
  - LIDAR – Laser Imaging, Detection And Ranging

- Destructive techniques may also be applied but are not encouraged for obvious reasons
  - Core sampling
  - Dynamite
  - Bulldozers and heavy machinery
Satellite image of Great Pyramids, Egypt
Zoom-in Satellite Image
Behind Great Pyramid, Egypt
Ground Penetrating Radar

GPR overlay on top of satellite image
LIDAR (Laser Imaging, Detection And Ranging)

- LIDAR image penetrates tree cover to show old stone walls, foundations, and roads
LIDAR (Laser Imaging, Detection And Ranging)

- Marching Bear Mound Group
- Effigy Mounds National Monument, Iowa
LIDAR (Laser Imaging, Detection And Ranging)

- Mayan ruins under dense Guatemalan jungle
Site Excavation: Sampling Techniques
Site Excavation: Sampling
(MB Book page 41 - 43, Requirement 2)

- Archaeologists rarely have enough time, money and resources to fully excavate a new site
  - May also want to preserve some areas for future archaeologists who will have better technology
- A grid system is established to divide the site into blocks for study
- Sampling is used to select grid blocks to excavate
  - Want to select some areas from across the site to not miss anything
  - Can also concentrate sampling in areas with promising points of interest
Site Excavation: Planning

Point of interest

Point of interest

Point of interest

Point of interest

Point of interest

Point of interest

Point of interest
Site Excavation: Sampling
Site Excavation: Sampling from Grid

- F8, F9, G8, G9:
- D9, D10, E9, E10:
Site Excavation: Artifacts

• When archaeologists find an artifact, they dig carefully with special tools and brushes to avoid damaging the artifact

• An artifact is never immediately moved unless it is in danger of damage or theft
  – The artifact’s position can provide valuable clues to how it was used, its relationship to nearby artifacts, and for site dating
  – The artifact’s location must be carefully recorded on the dig grid
  – Pictures are taken (with a reference stick) to record the position, and detailed drawings or digital/laser scans are also made
  – Each artifact is assigned an identification number and marked
  – The artifact is moved **only** after all the above steps are done
Site Excavation: Artifact Drawing – King Tut’s Tomb
Archaeology Mock Dig Patrol Competition – Can You Dig It ?!
Mock-Dig Process
(MB Book page 73 - 75, Requirement 8b)

- Each patrol will be given a dig site, map, tools, and artifact log
- You will apply sampling to excavate part of the site
  - The site looks suspiciously like a cake – do not eat the soil, and keep oily fingers away from your uniform / clothes
  - During excavation, record what you find on your site map and artifact log. Don’t move artifacts until they have been recorded.
- Goal is to determine what culture(s)/site(s) you have found and give an approximate date
  - Then sketch out the entire site map based on your findings
- At the end of the dig, present your site identification, map and key findings to the group
Mock-Dig Steps and Rules:

• **Step 1:** Create a grid system using poles and strings
  – 13 x 8 = 104 grid blocks (Mr. Eric did this for you already)

• **Step 2:** Look for points of interest and decide on a sampling approach. Explain your approach.
  – Use stakes to mark 30 grid blocks to initially excavate.

• **Step 3:** **After approval,** start excavating as a team using provided tools
  – Stay within the grid block, go slowly and carefully
  – Do not move any artifacts until they have been recorded on your dig map. Sift your excavated soil in case you missed something.

• **Step 4:** Based on findings, choose an additional 20 blocks to excavate. Explain your approach.
Mock-Dig Steps and Rules:

- **Step 5:** Draw your site map based on your findings and try to guess at unexcavated areas
- **Step 6:** Fill in your artifact log recording location and description of every artifact
- **Step 7:** Determine what culture/site you have found and give an approximate date
  - At the end of the meeting, present your site identification, map and key findings to the Troop
  - Bonus: Each site has FOUR artifacts that do not belong – did you find them?
- **After you give your report, you are welcome to excavate the rest of your site**
Mock-Dig Rule Reminders

- Stay within the grid block, go slowly and carefully
- Don’t move any artifacts until they have been recorded on your dig map and artifact log
  - Paperwork is BORING but it is a critical part of archaeology!
- Don’t try to pull up artifacts that go beyond the square – you must excavate adjacent square
- Don’t try to pull up walls – can’t do that in real life!
- Sift your excavated soil in case you missed something - don’t throw anything in trash!
- Don’t eat the soil (always a good life rule), and keep oily fingers away from your uniform / clothes
Mock-Dig Patrols

- We will split into four Patrols, you can either pick a team or we can draw randomly.

Mummies  Scarab Beetles  Jackals  Falcons

Crazy Patrols. For Life.™