



TIME TEAM AMERICA

FIND THE STEM IN ARCHAEOLOGY!

STEM: Ages 11-17 – adapt as needed depending upon age



Time Team America Field School

MATERIALS

The materials needed for this activity are:

- STEM activity sheet

How Does Archaeology Connect to STEM?

Archaeology is the study of human activity in the past, by recovering and analyzing the material culture and environmental data that humans have left behind. For example, archaeologists find artifacts, architecture, and biofacts/ecofacts, such as plant seeds. Interestingly, because archaeology employs a wide range of different procedures, it is considered both a science and a humanity. And even when the focus is more humanity-based, archaeology still utilizes the four disciplines of Science, Technology, Engineering, and Mathematics (in shorthand called STEM).

What?

Engage youth in a STEM scavenger hunt to help them make connections between everyday objects that humans use and the STEM disciplines that played a role in their creation.

Why?

Youth will learn to better recognize the different STEM disciplines and understand how they are used by archaeologists—and that some archaeologists *are* STEM professionals! As they participate in the scavenger hunt, they also will be using similar scientific practices that archaeologists use as they recover and analyze material culture from the past.

How?

Part 1

Lead a discussion with youth about each of the STEM disciplines, seeing what youth already know and whether they can share examples of each. Be prepared to fill in any gaps.

Science: A systematic enterprise and set of practices that gathers and organizes knowledge in the form of testable explanations and predictions about the the natural and physical world. Scientific practices include asking questions and defining problems, developing and using models, planning and carrying out investigations and analyzing and interpreting data. Science also refers to bodies of knowledge that have been gathered, organized, can be rationally explained and reliably applied. This includes laws of nature associated with disciplines such as physics, chemistry, and biology, for example, along with the facts, principles, concepts, or conventions associated with these disciplines. (National Research Council, 2012, 2001)

Technology: An innovation, change, or modification of the natural and physical environment in order to solve a problem, improve a preexisting solution to a problem, achieve a goal, or perform a specific function. Technology also can refer to the collection of tools used including machinery, modifications, arrangements and procedures. Technologies significantly affect humans, as well as other animal species' ability to control and adapt to their natural environments (chimpanzees use technology in the form of tools too!) Broadly it includes the making, modification, use, and knowledge of tools, machines, techniques, crafts, systems, and methods of organization.

Engineering: The application of scientific, economic, social, and practical knowledge in order to design, build, and maintain structures, machines, devices, systems, materials and processes. Engineering has existed since ancient times as humans devised inventions such as the pulley, lever, and wheel; each of these inventions is consistent with the modern definition of engineering, exploiting basic mechanical principles to develop useful tools and objects.

Mathematics (“math” for short): A discipline that involves the specialized abstract study of quantity, structure, space, and change (i.e., arithmetic, algebra, geometry, and analysis), as well as computational thinking, the science of numbers and their operations, interrelations, combinations, generalizations, and abstractions. Specialties within mathematics explore links to other fields: logic, set theory, the mathematics of the various sciences (applied mathematics and statistics), and the study of probability, uncertainty and decision theory.

Part 2

The Scavenger Hunt:

Give youth approximately 30 minutes to work in small groups. Give each of them the activity sheet, which has four columns. Each column has a header dedicated to each of the four disciplines. Their goal is to walk around and locate objects that apply to each discipline (or perhaps more than one) and write it under each column. This activity can be scaled to your needs as a facilitator and can be led in a classroom, outside a school, in community center, or on a field trip.

What did you discover?

Once each group has completed the task ask them to explain a few of the objects they wrote down in each column and how it applies to the discipline. Lead a discussion around these discoveries.

Engineering Examples: The discipline of engineering is extremely broad, and includes four main specialties, each with a specific emphasis on particular areas of technology and types of applications. These include:

- Civil engineering – The design and construction of public and private works, such as infrastructure (airports, roads, railways, water supply and treatment etc.), bridges, dams, and buildings.
- Electrical engineering – The design and study of various electrical and electronic systems, such as electrical circuits, generators, motors, electronic devices, electronic circuits, optical fibers, computer systems, and telecommunications.
- Mechanical engineering – The design of physical or mechanical systems, such as power and energy systems, aerospace/aircraft products, and transportation products.
- Chemical engineering – The application of physics, chemistry, biology, and engineering principles in order to carry out chemical processes that convert raw materials or chemicals into more useful or valuable forms.

Science	Technology	Engineering	Math