

SECRET CODE: HIDDEN MESSAGES

The Greeks were very interested in sending important information safely in times of war. They invented two basic types of secret messages.

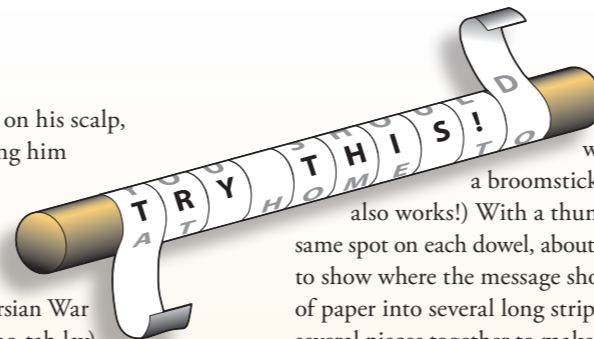
Steganography is the science of hiding a message by covering it. The Greek historian Herodotus describes two examples of steganography:

- Writing the message on a wooden tablet and then covering it up with wax. (This is not as odd as it sounds at first. Since paper used to be more expensive than it is today, the Greeks did not use it for everyday writing. They wrote shopping lists and other daily notes with a pointed tool on wooden tablets that had been coated with wax. To erase, they rubbed the wax flat again.)

- Shaving a slave's head, tattooing the message on his scalp, waiting for his hair to grow, and then sending him to deliver the message!

Cryptography is the art of hiding messages using codes.

One method used by the Greeks during the Persian War in the fifth century BCE was called scytale (skoo-tah-lay). A person who wanted to send a secret message wrapped a narrow strip of leather around a smooth wooden stick and wrote the message down the length of the stick in columns. Then he unwound the strip, which was now covered with what looked like random letters. The messenger carried the strip (or wore it as a belt) to another person with a stick of exactly the same length and diameter. That person simply rewound the strip around his own scytale, presumably anchoring it at a similar beginning point, and then easily read the message in columns!



At the hardware store, buy two 18-inch-long dowels with a diameter a little bigger than a broomstick. (A cardboard paper towel tube also works!) With a thumbtack, make a small hole at the same spot on each dowel, about a quarter inch down from one end, to show where the message should be anchored. Now cut a piece of paper into several long strips about an inch in width and tape several pieces together to make two strips about 3 feet long. With a tack, make a hole at the same spot at the end of each strip. Give one dowel and one long strip to a friend. With a tack, attach your strip to your dowel at the marked spots and wind it carefully down the shaft, pulling it taut so it will not unravel. You can write from the top down, in columns, or you can hold the dowel horizontally and write your message from left to right along the shaft in rows (at the end of a row twist the dowel away from you and start a new row from the top/left). Carefully unwind the finished message and send it to your friend to read. Ask your friend to write back!

SANTORINI'S ERUPTION

Possibly in 1646 BCE, a massive volcanic eruption—perhaps the largest ever witnessed by humankind—took place at Santorini. The explosion, estimated to be about the equivalent of 80 atomic bombs, blew out the interior of the island and measured 6 on the Volcanic Explosivity Index (VEI 6). About 7 cubic miles of magma erupted in a column over 20 miles high! A VEI 6 eruption like Santorini's is called "colossal." The most recent colossal volcanic eruption occurred on the Indonesian island of Krakatoa in 1883. Krakatoa's eruption made the loudest sound ever recorded; the explosion could be heard as far away as Australia!

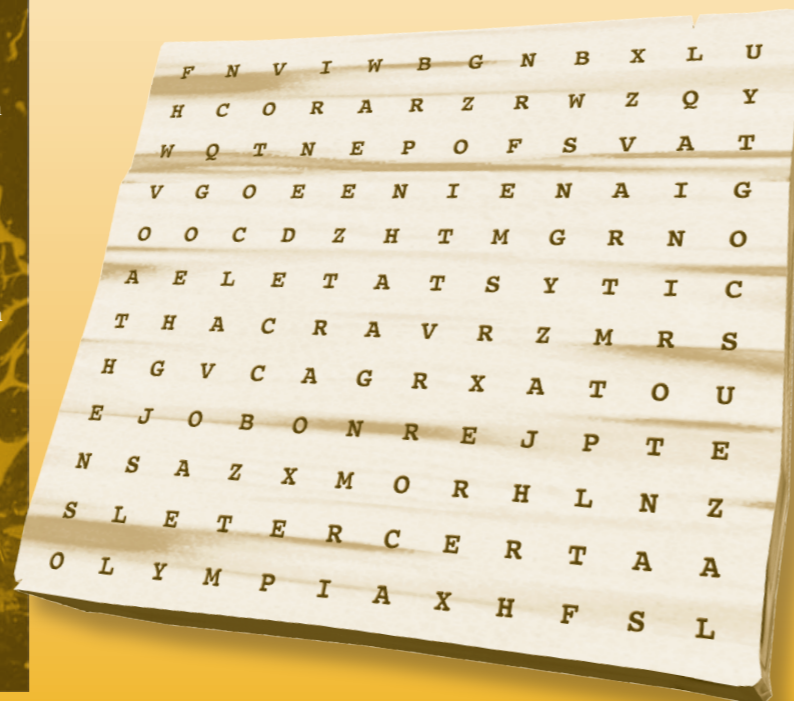
The Mount St. Helen's volcano, which erupted in Washington state in 1980, is an example of a lesser, paroxysmal volcano with a VEI of 5. Mt. St. Helen's eruption was nevertheless the deadliest in the history of the United States.

Fortunately, human beings have rarely seen VEI 7 (super-colossal) eruptions. In the last 10,000 years, only four volcanoes have measured VEI 7. Humans have never seen a VEI 8 mega-colossal volcano; however, in North America a VEI 8 volcano erupted 2.1 million years ago in Yellowstone, Montana. It created a cloud of ash 10 miles high and sent 1,000 cubic miles of ash into the air!

SECRET CODE: HIDDEN WORDS

Word searches are examples of everyday cryptography.

ATHENS ■ BRONZE AGE ■ CITY STATE ■ CRETE
GREECE ■ OLYMPIA ■ PARTHENON ■ SANTORINI
SOCRATES ■ THERA ■ VOLCANO ■ ZEUS



ARCHAEOLOGICAL TREASURE IN YOUR TRASH

Digging through ancient trash can provide valuable clues about how people live. Consider a trash can as a mini archaeological site. The layers could be important and show events that happened earlier in the week. The trash itself may explain aspects of our culture. For example, gnawed turkey bones from Thanksgiving dinner suggest what we eat for ritual feasts.

A piece of clothing found in a landfill in Chicago, but made from cotton grown in India, reveals trade between faraway places as well as the styles of clothing popular today. Trash can show the gender, age, and number of people in a place, reveal what they like to do and to eat, and much more.

Think of three items you threw away yesterday. An old math test? A candy wrapper? The envelope from the letter your uncle in Mexico City wrote you? What clues might each item give future archaeologists about our culture?

MORE RESOURCES

CHILDREN'S BOOKS ON ARCHAEOLOGY

Duke, K. 1997. *Archaeologists Dig for Clues*. Let's-Read-and-Find-Out-Science Series. New York: HarperCollins. Grade 2.
McIntosh, J. 2000. *Archeology*. London: Dorling Kindersley Ltd.
Moloney, N. 1995. *The Young Oxford Book of Archeology*. Oxford: Oxford University Press.

CHILDREN'S BOOKS ON ANCIENT GREECE

Coloring books are terrific sources of images and information.

Santa Barbara, Bellerophon Books:

The Trojan War, A Coloring Book of the Odyssey from the Art of Ancient Greece, A Coloring Book of Ancient Greeks, A Coloring Book of Greek Goddesses, Gorgons, Ancient Greece.

Dersin, Denise, ed. 1997. *What Life Was Like at the Dawn of Democracy: Classical Athens, 525–322 BC*. Alexandria, VA: Time-Life Books.

Hart, A., and P. Mantell. *Ancient Greece: 40 Hands-On Activities to Experience This Wondrous Age*. Charlotte, VT: Williamson Publishing.

MacDonald, F., and M. Bergin. 1992. *A Greek Temple*. New York: Peter Bedrick Books.

Malam, J. 1998. *Ancient Greeks at a Glance*. New York: Peter Bedrick Books.

WEBSITES: GENERAL

Greece: Secrets of the Past
www.greecefilm.com

WEBSITES: ARCHAEOLOGY

Archaeological Institute of America
www.archaeological.org

Archaeology magazine, published by the Archaeological Institute of America
www.archaeology.org

Dig magazine, published in cooperation with the Archaeological Institute of America
www.digonsite.com/links.html

Bureau of Land Management
www.blm.gov/nhp/index.htm

IARC (Illicit Antiquities Research Centre)
www.mcdonald.cam.ac.uk/IARC/home.htm

WEBSITES: VOLCANOES

U.S. Geological Survey, Volcano Hazards Program
volcanoes.usgs.gov/

National Park Service, Hawaii Volcanoes National Park
www.nps.gov/havo/

FEMA (Federal Emergency Management Agency) for Kids: Volcanoes

www.fema.gov/kids/volcano.htm

Volcano World (includes kids' and teachers' information, lessons)
volcano.und.edu/

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