Virginia 4-H MAKING the Future

*18 U.S.C. 707

The Science of Writing

The Science Behind it . . .

How is paper made?

The earliest messages were written on wooden tablets, tree bark, leaves, or even the skins of animals. Before paper was invented a common writing material around 3,000 BC in Egypt, Greece, and Rome was papyrus, made from the inside of the papyrus plant. Paper, coming from the Latin word papyrus, is reported to have been invented in China in AD 105. The first mill to make paper in the United States was established in Pennsylvania in 1690.

All paper is made of connected fibers, usually from processed trees but it can also be made from a variety of other materials like recycled paper or cotton clothing. The papermaking process:

- Remove the bark
- Cut the tree into small wood chips
- Mix the wood chips (or recycled paper/cotton) with water]
- Heat to form a paste;
- Add **calcium carbonate** to give the paper more strength and a brighter white color;
- Flatten the paste, squeezing out the water;
- Dry and cut the paper to size.

Calcium carbonate (CaCO3): is an odorless, tasteless mineral. It is also called limestone and has many uses, most commonly as chalk, and as an antacid or calcium supplement.

How are stamps made?

Did you know that the U.S. Postal Service issues limited edition stamps to commemorate people, places, and things on a wide variety of topics, ranging from Star Trek or Elvis Presley to the Civil War?
Stamps are made up of four layers: 1) ink for the image; 2) a layer of phosphor coating; 3) paper; and 4) glue. The layer of phosphor glows under special lights, helping the mail sorting machine find the stamp to automatically cancel it.

Materials

⇒ Blank paper (1 per youth)
⇒ Lined paper (for younger children/youth)
⇒ Pencils and pens (to share)
⇒ Crayons, colored pencils, markers (to share)

Making and Exploring Further

Make activities encourage problem solving through trial and error, allowing for individual creativity and experimentation. Youth will ignite their curiosity and expand their critical thinking skills as they move from the planned and guided activity to an open exploration of different materials and methods.

⇒ Encourage youth to design a stamp that conveys a message.
⇒ Encourage youth to create a personalized note card.

Sources

⇒ Georgia Tech University – The Invention of Paper: www.ipst.gatech.edu/amp/collection/museum_invention_paper.htm
⇒ The Metropolitan Museum of Art: www.metmuseum.org/toah/hd/papy/hd_papy.htm
⇒ Smithsonian National Postal Museum: http://postalmuseum.si.edu/education/curriculum/
⇒ U.S. National Library of Medicine: https://pubchem.ncbi.nlm.nih.gov/compound/calcium_carbonate#section=Top

www.ext.vt.edu/topics/4h-youth/makers