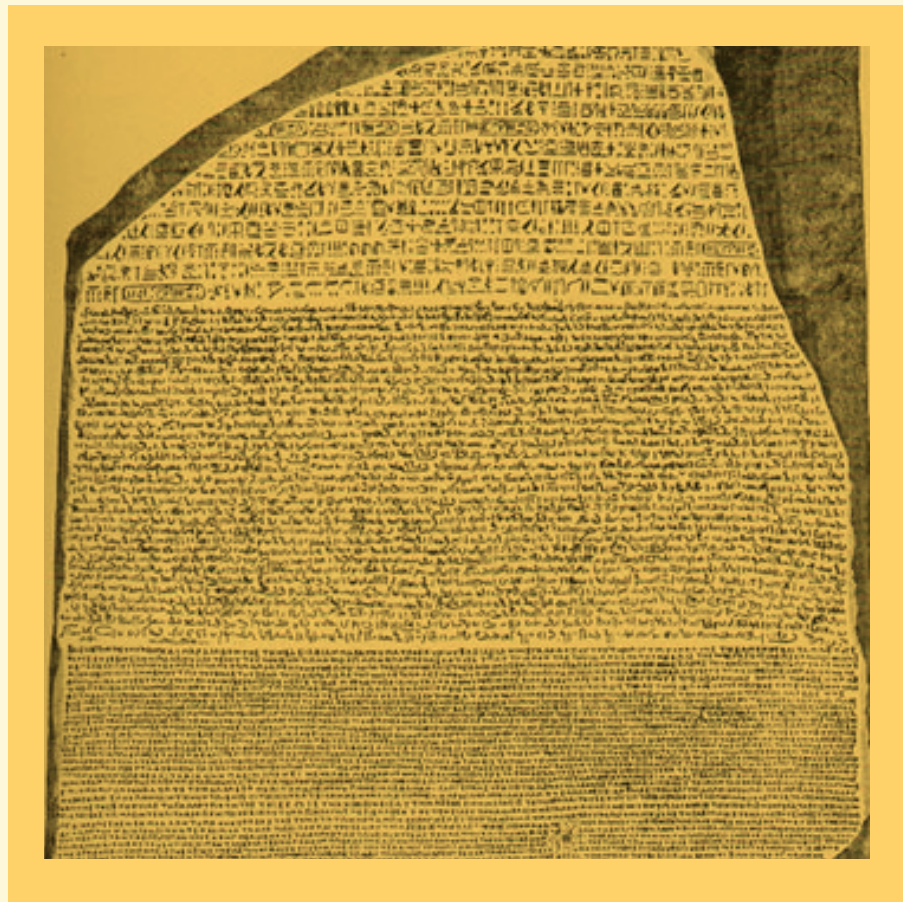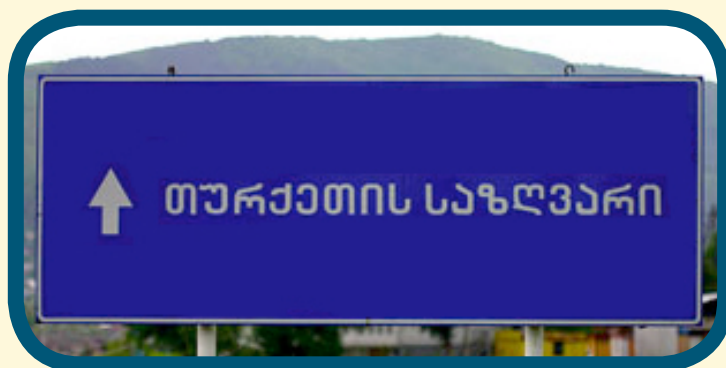# STEM Sims™

Rosetta Phone

RosettaPhone

Do you need an idea for a scientific study?
Try out one of our ideas or make one of your own.

Start right now learning about optical character recognition and language translation. Take the following brief quiz to see how much you already know about how images of text are converted and translated to a format people can understand. See the bottom of page 4 to check your answers.

1. The English language has 26 letters in its alphabet. How many letters are in the modern Armenian alphabet?
   a. 16
   b. 26
   c. 38
   d. 132

2. The French phrase "le temps" when translated to English means:
   a. top.
   b. time.
   c. temporary.
   d. temperature.

3. What does the Greek term "Αθηνά" mean when translated to English?
   a. After
   b. Attention
   c. Away
   d. Athena

4. The French phrase "les pommes de terre" when translated to English means:
   a. island of beauty.
   b. land of plenty.
   c. smooth surface.
   d. potatoes.

5. The sign to the right comes from an Armenian roadway. What do you think the sign says in English?
   a. Border of Turkey
   b. Watch for Falling Rocks
   c. Arch Waterfall
   d. New City

What Does It Say?

Digital imaging is a technique in which a picture is represented as a sequence of numbers. To do this, the picture must be overlaid with a grid of uniformly sized cells. Each cell now represents one element of the picture, called a pixel. The term "pixel" combines the words picture and element and can be thought of as the smallest part of the picture. A tile mosaic provides an excellent analogy of a pixel. An individual tile that makes up the mosaic can be thought of as a pixel. Each tile is the smallest part of the mosaic, just as a pixel is the smallest part of any digital image.

A computer must also be able to translate from binary numbers back to an image. In this case, "0" will represent a blank space and "1" will represent a filled-in space. Use the sequence of binary numbers below each grid to fill in the grid and determine the hidden message. Each sequence of five numbers represents one row on the grid. Look at the bottom of page 4 to check your answer.

10001
10001
11111
10001
10001 _____

11111
00100
00100
00100
11111 _____

Now it's your turn to go digital. But this time, you'll do the reverse process. Instead of turning a set of binary numbers into an image, you'll convert from an image of letters that you make to the binary number code. Use the grid below to help code a five-letter word to one of your friends. Remember that each letter must consist of a 25 number sequence using only the numbers "0" and "1."

__ __

__ __

__ __

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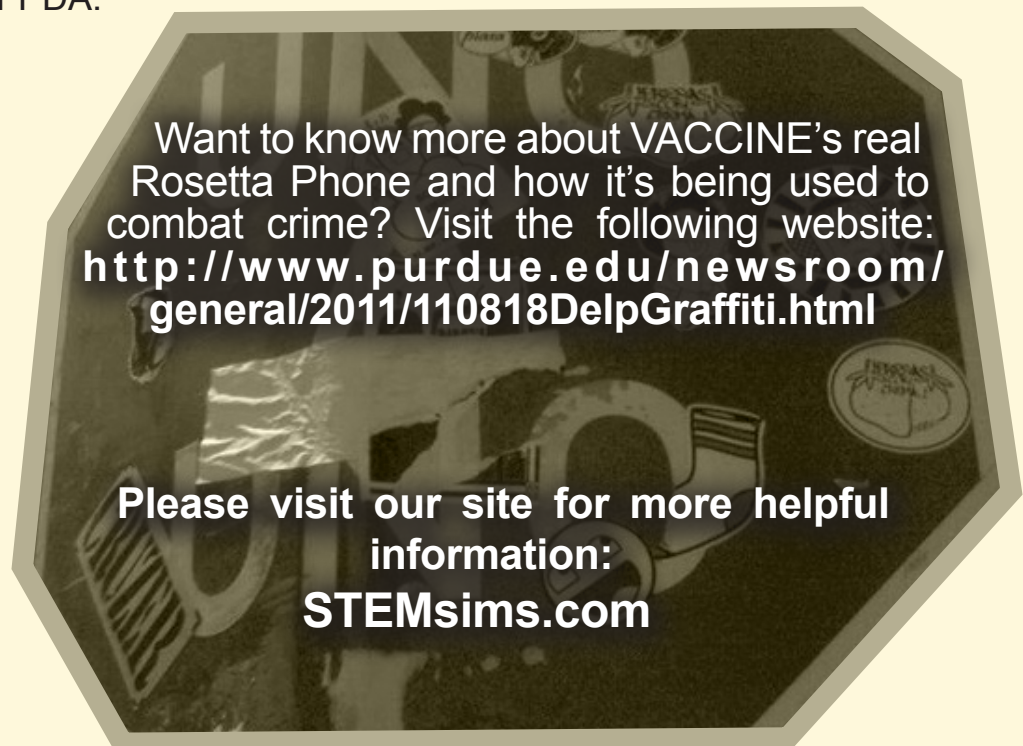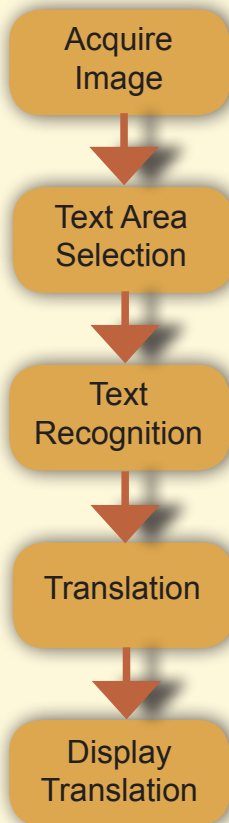__ __

RosettaPhone

The Real Rosetta Phone

One of the Department of Homeland Security's Centers for Excellence is called the Visual Analytics for Command, Control, and Interoperability Environments (VACCINE for short) and is located at Purdue University. The center is developing a real device that mirrors the one in the simulation in this module.

CAUTION! MINE FIELD

The Rosetta Phone is a self-contained handheld mobile device capable of real-time translation of text from multiple languages into English. The device then uses speech technology to speak the original language word and English translation to the user. Their project is focused on bringing the full power and capabilities of the Original Rosetta Stone to a portable easy to use device such as a cell phone or PDA.

- Acquire Image
- Text Area Selection
- Text Recognition
- Translation
- Display Translation

Want to know more about VACCINE's real Rosetta Phone and how it's being used to combat crime? Visit the following website:
http://www.purdue.edu/newsroom/general/2011/110818DelpGraffiti.html

Please visit our site for more helpful information:
STEMsims.com

Answers: Page 2 Answers: 1) c. 2) b. 3) d. 4) d. 5) a. **Page 3 What Does it Say Answer:** Hi.