

## Find Miss Columbia!

*She's lost! Can your students find Miss Columbia, using century-old communication techniques?*

**Objective:** Students learn about communication technologies and world geography while trying to pinpoint Miss Columbia's location, somewhere in the world in the year 1901.

### Background

It's true: Miss Columbia, for a time during her first voyage, *was* believed to have been lost in the Philippines. Her owner, Mrs. Elizabeth Richards Horton, of Boston, Massachusetts heard nothing from her travel companion there, Miss Cora Fay, for close to nine months. It's a small miracle that, considering how many different forms of travel she used, and how many traveling companions provided her escort, Miss Columbia wasn't "lost" a few more times — or even lost permanently.

Part of the problem, of course, was that communicating around the world in the year 1900 was nowhere near as instant, inexpensive, or easy as it is today. The telegraph had come into fairly common use during the latter half of the 19<sup>th</sup> century, but the telephone (invented by Alexander Graham Bell in 1876) was still a technology in its infancy. When Miss Columbia was in the Philippines in 1901, her traveling companions heard about the assassination of President William McKinley a day later, presumably by telegraph. Nowadays, of course, news of such impact would be flashed around the world in a single instant.

The key to the development of the communications industry was the use of *codes* to represent meaning. Samuel Morse is best known for his development of Morse Code, the system of "dots" and "dashes" that became widely used on national and international telegraph systems. In the 20<sup>th</sup> century, of course, the most important communications development has been the development of the binary code (simply 1 and 0, or "on" and "off") as the basis for all digital technology.

### Materials



#### ◆ Level 1 (grades 2-4):

- Copies of (or access to, on a blackboard) the Morse Code alphabet.

#### ◆ Level 2 (grades 4-6):

- Copies of (or access to, on a blackboard) the secret coded message provided below.

#### ◆ Level 3 (grades 5-6):

- Copies of the "Two Bits, Four Bits" activity developed by and reprinted with permission from the National Science Foundation. (Note: see this activity on pages 82-84 for other required materials.)

**FIND  
MISS COLUMBIA****Getting Started**

This activity provides three different levels of complexity as follows:

- ◆ Level 1 asks students to use Morse Code to determine where in the world Miss Columbia can be found.
- ◆ Level 2 sets a somewhat more challenging course, asking students to crack a number code in order to find her (and then create their own number/letter code, if they like).
- ◆ Level 3 offers a challenging activity that will acquaint students with the fundamentals of digital technology — not inappropriately timed, considering the digital nature of the “Y2K” challenge facing the world as it turns the corner towards the 21<sup>st</sup> century.

**Procedures: Level 1**

1. Divide the class into teams of three to four students each. Tell students that they are communications experts, brought in by Mrs. Horton, Miss Columbia’s owner, to help find the doll, which has been lost for several months.
2. Create a Morse Code display either on a blackboard or easel pad in the classroom, or copy and distribute copies of the Morse Code alphabet provided here (see Box for Level 1). Ask the class whether they’ve heard of the Morse Code and discuss with them its importance in history and the way it was used to communicate messages via the telegraph. (They may be familiar with the international distress signal, SOS: dot-dot-dot, dash-dash-dash, dot-dot-dot.)
3. Tell them that a mysterious Morse Code message has been received at the Boston Western Union station, and that they are to try to decode the message using the Morse Code alphabet. Write the mysterious message on the board and let them go!
4. When the message has been decoded and Miss Columbia found, extend the activity by asking each team to pick a place anywhere in the world, encode it using Morse Code, and ask all of the other teams to try to decode their message. For a real challenge, have students pick out a clue to a real place to which Miss Columbia traveled (using her journal), and have the student teams encode that clue. Then, other teams will not only have to decode the message, but search through the journal to find the place it represents.
5. When they are being transmitted, dots represent short beeps, clicks, dings, or signals, and dashes represent long ones. Consider making the activities even more realistic by using a soundmaker of some sort to transmit the signals.

*Answer to Mystery Message, next page: She is at the Rock of Gibraltar.*





## FIND MISS COLUMBIA

### Procedures: Level 2

1. This activity has the same “set-up” as the Level 1 activity, but instead of using Morse Code, students will have to crack a code matching numbers with individual letters of the alphabet. You may want to do the Morse Code activity first, to acquaint students with this kind of signal coding and decoding, before moving to this one.
2. Divide the class (if you haven’t already done so) into teams of three to four students each. Ask the teams to draw up lists of codes that we use today. Some examples include zip codes, telephone numbers, social security numbers, area codes, sign language, state abbreviations — even stoplights are a form of coded signal. Can students figure out what they all have in common? (Answer: each uses a coded language in which symbols represent a message or piece of information.)
3. Tell students that Mrs. Horton has once again brought them in to help her solve a new clue as to the whereabouts of Miss Columbia, lost somewhere in the world. The clue has come in the form of a *cipher* — a coded message. Their job is to crack the code and help her understand the message.
4. The coded message (which appears in the box on page 81) appears to be in the form of a number code, where each number stands for a certain letter in the alphabet. For practice with this form of code, students might use the simplest one (A = 1, B = 2, etc.) to code and send a short message to each other. To crack the coded message, they will have to try out different possibilities. If children are stumped, offer these suggestions. Some number/letter codes:
  - ◆ Simply reverse the alphabet (Z = 1, Y = 2, etc.)
  - ◆ Use a simple arithmetic formula, for example adding a value of 1 to the simplest number/letter code (A = 2, B = 3, etc.)
  - ◆ Use the simplest code (A = 1), but play tricks with the position of the letters in each word (for example, reversing them).
5. Give them the coded message and set the teams on their way. Once a team has cracked the code, make sure it doesn’t divulge the secret to other teams; the fun (and learning) comes in cracking the code yourself! (*Hint for the teacher:* the code involves a simple doubling of a straight number/letter code, so A = 2, B = 4, etc.) If students find this code too easy, encourage them to create their own number/letter codes and try to stump their classmates.

*Answer to Secret Coded Message, next page: The code is a straight number-letter code with the number doubled (i.e., A=2, B=4, C=6, etc.). The answer is: ON A SHIP IN THE NORTH ATLANTIC.*



## Where is Miss Columbia?

### The Secret Coded Message

30 28 2 38 10 18 32 18 28 40 16 10

28 30 36 40 16 2 40 24 2 28 40 18 6

**3.3.1**

IN THE NEWS

THEN AND NOW

**TWO BITS,  
FOUR BITS****Procedures: Level 3**

This activity is presented in its entirety as a reprint of the National Science Foundation activity, “Two Bits, Four Bits,” from NSF’s National Science & Technology Week materials for 1997. The Wenham Museum would like to acknowledge the contribution of NSF to this Interdisciplinary Guide and express its appreciation.

Teachers can relate the activity to the *Around the World with Miss Columbia* project by using the same “Find Miss Columbia!” strategy. See the “Extensions” section in the reprint, and ask students to create a number/letter code using the binary system, and then challenge each other to code and decode messages relaying the location of Miss Columbia using that system.



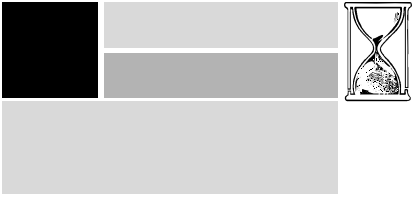
IN THE NEWS

THEN AND NOW

**3.3.1**

**TWO BITS,  
FOUR BITS**

(first nsf page)



(second nsf page)