

BINARY BRACELETS

Binary Code

We are often used to representing numbers using ten digits: 0, 1, 2, 3, 4, 5, 6, 7, 8, and 9. This is called a base-10, or decimal system. Binary code, however, uses only zeros and ones in a sequence of eight spots. We often refer to these binary, or base-2, digits as "bits." Binary code is used to communicate information between computers, communication devices, and many more modern technologies. It's useful to build into electronic devices because it is a simple system that requires something turn on or off (where 1 is the on state and 0 is the off state).

This activity will allow you to embed your own name or nickname in this secret code on a bracelet. The binary code for capital letters is found on the back of this page.

Make a Binary Bracelet

1. Spell out your name on paper.
2. Use the key (on back) to write out each letter in binary code.
3. Transform each letter to a colored bead. Choose one color bead to represent the white squares (signifying "1") and another color to represent the black squares (signifying "0"). Between each letter you can add an extra bead in a color of your choice as a divider. In computer science, separating markers like this are called "delimiters." Many encodings use delimiters, especially if the size of each unit varies. You don't actually need a delimiter to know when one character ends and another begins in binary code, however, as each character requires exactly 8 bits.
4. Cut a length of cording, sized to your wrist, with a few extra inches added on. For example, if you have an approximate 6" wrist, add 4" of string for 10" total, or for an 8" wrist, add 4" of string for 12" total. Make a triple knot to start the bracelet. Then string each of your bits and delimiter beads on the string towards the knotted end.
5. Holding the open end carefully, try wrapping it around your wrist to see how it fits and looks. Note how much of the extra string you'll need to slip the bracelet over your hand. Once you're satisfied, carefully knot the open end of string and then tie the two ends together, leaving enough of that extra string to slip it over your hand.
6. Cut off any remaining string, far enough away from the knots so they don't loosen.



GET CREATIVE!
Other colors besides blue and purple can be used, so choose your favorite colors!

VOCABULARY

Binary

A notation that utilizes only two options for each selection.

Bit

Short for "Binary Digit." It is one digit's location in a binary number.

Code/Coding

Transformation from one representation to another.

Decode

Convert a coded message into something familiar.

Delimiter

A delimiter is one or more characters that separates text strings.

Encode

Convert a familiar message into code.

BINARY BRACELETS

A	■ □ ■ ■ ■ ■ ■ □
B	■ □ ■ ■ ■ ■ □ ■
C	■ □ ■ ■ ■ ■ □ □
D	■ □ ■ ■ ■ □ ■ ■
E	■ □ ■ ■ ■ □ ■ □
F	■ □ ■ ■ ■ □ □ ■
G	■ □ ■ ■ ■ □ □ □
H	■ □ ■ ■ □ ■ ■ ■
I	■ □ ■ ■ □ ■ ■ □
J	■ □ ■ ■ □ ■ □ ■
K	■ □ ■ ■ □ ■ □ □
L	■ □ ■ ■ □ □ ■ ■
M	■ □ ■ ■ □ □ ■ □
N	■ □ ■ ■ □ □ □ ■
O	■ □ ■ ■ □ □ □ □
P	■ □ ■ □ ■ ■ ■ ■

Q	■ □ ■ □ ■ ■ ■ □
R	■ □ ■ □ ■ ■ □ ■
S	■ □ ■ □ ■ ■ □ □
T	■ □ ■ □ ■ □ ■ ■
U	■ □ ■ □ ■ □ ■ □
V	■ □ ■ □ ■ □ □ ■
W	■ □ ■ □ ■ □ □ □
X	■ □ ■ □ □ ■ ■ ■
Y	■ □ ■ □ □ ■ ■ □
Z	■ □ ■ □ □ ■ □ ■

■ purple
□ blue