What languages can you speak?

People all around the world speak hundreds of different languages. English, Spanish, Mandarin, Russian, Japanese, sign language... Over 100 languages are spoken by students in the Anchorage School district!

Humans aren't the only ones with their own languages.

Computers use computer languages, or **code**. **Code** was invented by humans to communicate with computerized devices.

Your Challenge:

Your challenge is to create a bracelet by **encoding** your initials into **binary code**.

What is Binary code?

A **binary code** is any code that uses only two symbols to represent information. Some examples of binary codes include Braille, which uses raised and non-raised bumps, and Morse code, which uses long and short signals to relay information.

Binary code for computers uses two numbers: 0 and 1. Computers **encode** different letters into 0s and 1s. For example, the letter A would be translated into 01000001. If we tried to read a binary code message, we would have to **decode** it from 0s and 1s to letters.

Notice how the single letter A was translated into 8 digits? Each set of binary code can hold 8 **bits**, or binary digits. The sets are separated by a **delimiter**.

Vocabulary

Binary: (noun) A language that uses only two symbols to communicate.

Bit: (noun) Short for "binary digit." The smallest unit of information communicated by a computer.

Code: (noun)

Decode: (verb) To change symbols or computer language into words or letters.

Delimiter: (noun) Separates each letter in the binary code.

Encode: (verb) To change a message from words or letters into computer language or symbols.

<u>STEP 1: Encode your initials into binary code</u>

Write the first letter of your first, middle, and last names in the boxes below.

Find each of your initials in the binary code alphabet below. Write the 8 bit translation of each letter in the boxes of this template.

Pick two colors for your bracelet. Mark those colors on the key below. Color the boxes of template the correct color.
Once you have finished coloring your template, show this paper to an adult. They will give you the materials for your bracelet.

<u>STEP 2: Make your bracelet</u>

Bend one end of your pipe cleaner into a U shape. Thread your beads on the unbent end of the pipe cleaner. Thread the beads in the same color order as your template from left to right.

YOUR KEY

Number	Color
0	
1	
delimiter	

BINARY CODE ALPHABET

A - 01000001	B – 01000010	C – 01000011	D – 01000100
E - 01000101	F – 01000110	G - 01000111	H – 01001000
I - 01001001	J - 01001010	K – 01001011	L – 01001100
M - 01001101	N - 01001110	O - 01001111	P – 01010000
Q – 01010001	R – 01010010	S – 01010011	T - 01010100
U - 01010101	V - 01010110	W - 01011000	X – 01011000
Y - 01011001	Z - 01011010		