

Binary Bracelet Activity

Source : Girls Who Code

Materials

- **Binary Decoder**
 - **Printable Binary Bracelet**
 - **Printable Binary Poster**
 - **Markers or Colored Pencils**
- OR**
- **Two Different Colors of Beads**
 - **Colorful String of Embroidery Floss**

Activity Overview

It's important to remain positive and keep our spirits lifted during times of stress and uncertainty. Through this unplugged activity you will be able to create bracelets that share positive and uplifting messages by using binary code! If you have colorful beads and string, then you can use that for this activity. If not, don't worry because you can make a printable bracelet or opt to make your uplifting message on a poster. Before you start designing your bracelets and posters, check out the featured Women in Tech Spotlight, Yasmin Mustafa. Yasmin is the founder of ROAR for Good, which is focused on diminishing attacks against women and addressing the causes of violence. Learn more about how Yasmin responded to challenges in her community and uses wearable technology to ensure safety for many women by exploring her spotlight on the next page.

Students can use the Printable Binary Poster to write longer messages and the Printable Binary Bracelets if there are no beads or string available.

Women in Tech Spotlight: Yasmin Mustafa

Yasmin Mustafa lived in Kuwait until she was 8 years old, when she evacuated with her family at the start of the Gulf War. After a long journey to become an American citizen and graduate from college, she embarked on a six-month solo trek across South America. This trip inspired Yasmin to found her latest venture, ROAR for Good. ROAR for Good is a wearable safety technology company aimed at diminishing attacks against women and addressing the underlying causes of violence.

Watch a portion (roughly from the start of the video until minute 6:14) of Yasmin's interview with The Cube at the Grace Hopper Conference to learn about her inspiration for starting ROAR for Good and how she evolved her product over time. After watching the interview, read more about ROAR for Good and their flagship product Athena. If you still have time, you can read more about Yasmin's journey to becoming an entrepreneur in this Tech Republic article.

The YouTube video is called “Yasmine Mustafa, ROAR for Good | Grace Hopper 2017”

The Tech Republic article can be found at:

<https://www.techrepublic.com/article/yasmine-mustafa-roar-for-good-ceo-wearable-creator-stargazer/>

Reflection

Being a computer scientist is more than just being great at coding. Take some time to reflect on how Yasmin and her work relates to the strengths that great computer scientists focus on building - bravery, resilience, creativity, and purpose.

Purpose

Yasmin's purpose was to create a wearable technology to help end violence against women. She didn't have to invent new technology to build her product and instead put together technology that was readily available to make an effective and user-friendly device.

Think of a cause that you care about. How could you get involved in solving that problem? How might you be able to utilize technology to solve it?

Step One: Understand Binary Code

Binary code is a way that information can be represented using only two options like: (yes/no, true/false, on/off, or 1/0). A line of binary code is made up of 8 units called a byte. Each unit that makes up a byte is called a bit. A bit is binary because it can only contain one of the two options described earlier. Here is an example of a binary code using the 1/0 option:

0 1 0 0 0 0 0 1

Computers send and store all information using binary and that's what you see and interact with on a computer screen. Binary code can represent numbers, symbols, sounds, colors, and images on a computer screen. Today you will focus on how to represent capital letters using binary code. For this activity we will use a binary decoder to show what the code is for each capital letter. We will use the on and off or 1 and 0 method to represent each letter.

This is a representation of the letter A:



Step Two: Practice with Your Initials

Now let's practice using this method to convert our initials into binary code.

1. Use the binary decoder to find the letters for your initials.
2. Color your initials below before making your bracelet.

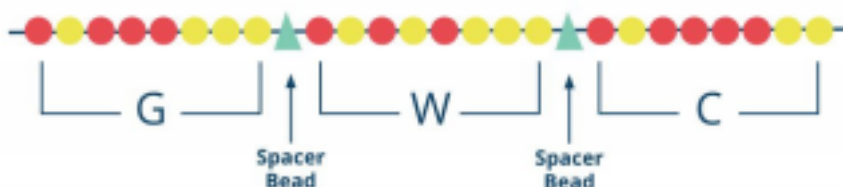
Here's an example using GWC initials:



Step Three: Select and Build Your Message

1. Decide what positive or uplifting message you want to write out in binary. You can come up with your own or use some of the examples below.
 - a. Even in darkness there is light
 - b. If you can be one thing, be kind
 - c. Just breath
 - d. This too shall pass
2. Use the binary decoder to find the letters that make your message.
3. Build your binary bracelet or binary poster!
4. If you have materials to make a bracelet with beads and string, follow these steps
Below:
 - a. Select one colored bead to represent the “1” bit.
 - b. Select another colored bead to represent the “0” bit.
 - c. Pick a different color bead to act as the spacer.
 - d. Make your bracelet! Don’t forget to tie off the ends.

Here is an example of a bracelet with GWC initials:



BINARY DECODER

A	■ □ ■ ■ ■ ■ ■ □	N	■ □ ■ ■ ■ □ □ □ □ ■
B	■ □ ■ ■ ■ ■ ■ □	O	■ □ ■ ■ ■ □ □ □ □ □
C	■ □ ■ ■ ■ ■ ■ □	P	■ □ ■ □ ■ ■ ■ ■ ■
D	■ □ ■ ■ ■ ■ □ ■ ■ ■	Q	■ □ ■ □ ■ ■ ■ ■ ■ □
E	■ □ ■ ■ ■ ■ □ □ ■ ■	R	■ □ ■ □ ■ ■ ■ □ ■ ■
F	■ □ ■ ■ ■ ■ □ □ □ ■	S	■ □ ■ □ ■ ■ ■ □ □ □
G	■ □ ■ ■ ■ ■ □ □ □ □	T	■ □ ■ □ ■ □ ■ □ ■ ■
H	■ □ ■ ■ ■ □ ■ ■ ■ ■	U	■ □ ■ □ ■ ■ □ □ ■ □
I	■ □ ■ ■ ■ □ ■ ■ ■ □	V	■ □ ■ □ ■ □ ■ □ □ ■
J	■ □ ■ ■ ■ □ ■ ■ □ □	W	■ □ ■ □ ■ □ ■ □ □ □
K	■ □ ■ ■ ■ □ ■ ■ □ □	X	■ □ ■ □ ■ □ □ ■ ■ ■
L	■ □ ■ ■ ■ □ □ □ ■ ■	Y	■ □ ■ □ ■ □ □ ■ ■ ■
M	■ □ ■ ■ ■ □ □ □ ■ □	Z	■ □ ■ □ ■ □ □ ■ □ ■

Printable Binary Poster

The image displays a template for a binary poster. It features four identical vertical grids, each consisting of 20 rows and 4 columns of squares. The background is divided into three horizontal color bands: a yellow band at the top (rows 1-5), a light green band in the middle (rows 6-15), and a light blue band at the bottom (rows 16-20). The grid lines are black, and the squares are currently empty, intended for binary code input.

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