Short Activity
Ages 9–12
20-30 minutes

Jet-Setter Binary Bracelets

Description

Children will use an 8-bit binary coding system and different beads to create bracelets with their local airport code.

The activity worksheets can be used for passive programming.

Number of participants

For any number of participants, depending on the supplies available.

Space considerations

An indoor space is best, with tables and chairs for participants.

Competencies

- Computer coding
- Observation and recording
- Critical thinking
- Fine motor skills

Materials

- Crayons, markers or coloured pencils
- Binary code worksheet for each participant
- Binary alphabet chart
- Canadian airport code chart
- Beads (at least two different colours or shapes)
- Pipe cleaners or string/twine to thread beads onto

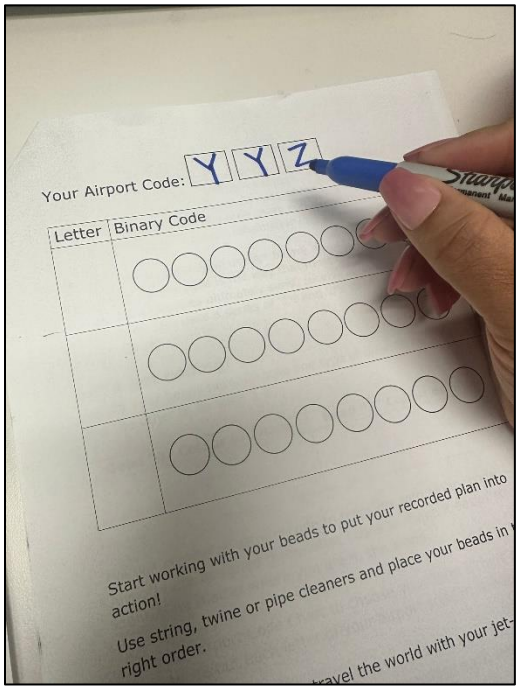
Preparation

- Prepare tables and chairs for participants with enough space to move around in between

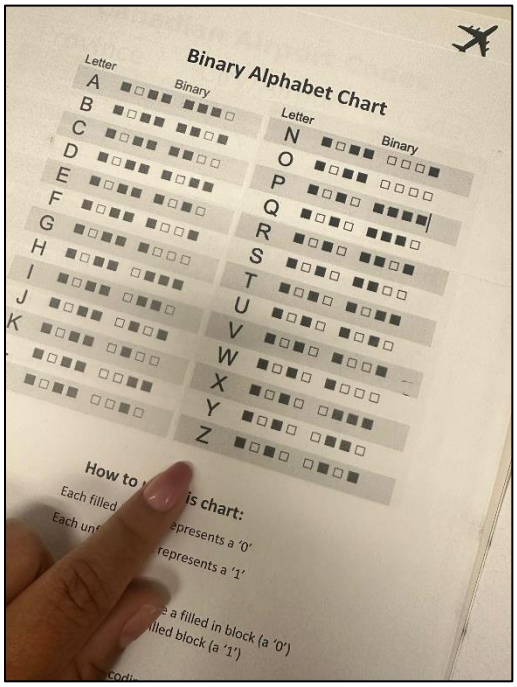
- On the tables, place small bowls of beads divided by bead style (e.g., all green beads together or all star-shaped beads together)
- Place crayons/markers/coloured pencils throughout for planning
- Have a **Binary Code Worksheet** for each participant. The **Alphabet Binary Chart** and **Airport Code Chart** can be printed for each participant or shared in small groups.

Implementation

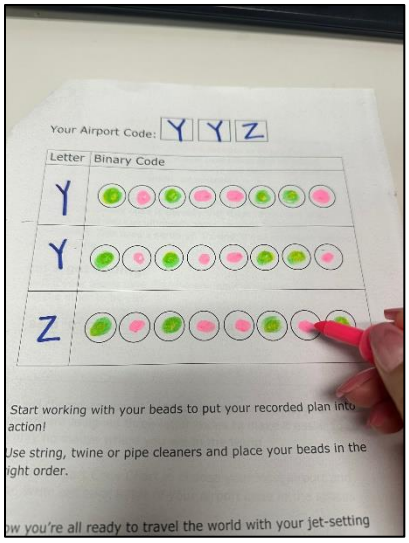
1. Begin with an overview of what a binary system is, using the **Binary Code Worksheet**'s introduction.
2. You can use the **Binary Alphabet Chart** to help code any word into binary. The more letters a word contains, the more sets of 8 beads will be required. To avoid having too many beads on a bracelet, for this activity we will use two different coloured beads to spell out a three-letter airport code in 8-bit binary.

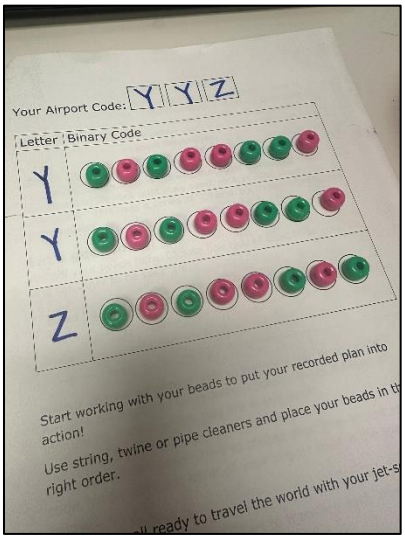


3. Using the **Airport Code Chart**, choose a three-letter airport code and decide which style or colour of bead will be the "0" and which will be the "1". Write out your chosen airport code on your sheet.



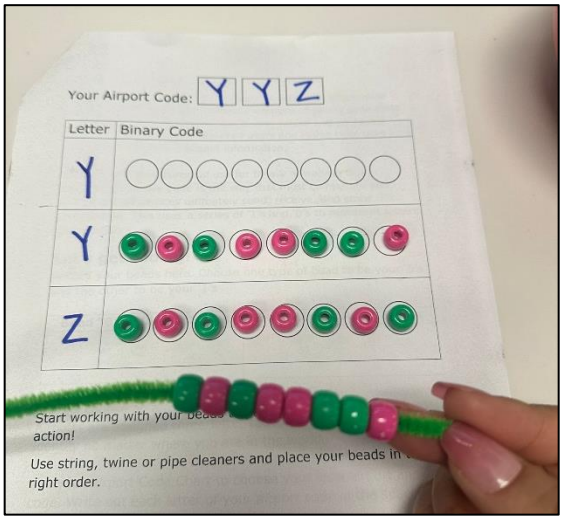
4. Refer to the **Binary Alphabet Chart** to find the codes for your letters.

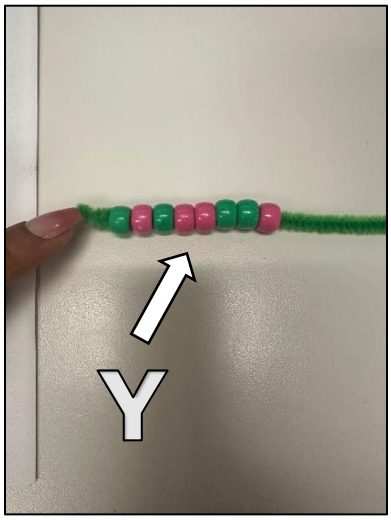




5. Using the **Binary Code Worksheet**, start to plan out your bracelet using coloured markers to plot the bead arrangement.

Optionally, this step can be skipped and beads placed directly on the sheet in the correct arrangement.





6. Once the beads are in the correct order, begin carefully threading them onto a pipe cleaner or string/twine, making sure to knot one end so the beads don't slide off.

Make sure you are threading them in the right direction.

7. When all beads are threaded, twist the pipe cleaner ends together or tie your string/twine. Enjoy your finished product, jet-setter!

Accessibility considerations

- Consider alternate styles of beads. For example, instead of having two varying colours, the actual shape of the bead can differ: e.g., a round pony bead and a heart- or star-shaped bead.

- Similarly, beads can vary in size: a smaller bead and a larger bead. Any set of two distinct items will work.
- Have participants work in pairs or small groups.

To extend this activity:

- Encourage participants to research other airport codes from around the world and include it in their bracelets.
- Include all kinds of words (and phrases) by using crayons or markers to colour code on an extra sheet of paper. Encourage participants to challenge each other by sending messages in code!

Book suggestions

- **I Can Do That! 1000 Ways to Become Independent** by DK Publishing
- **What's in a Bead?** by Kelsey Borgford and Tessa Pizzale
- **Métis Like Me** by Tasha Hilderman and Risa Hugo

Download links

- Jet-Setter Binary Bracelets—Activity PDF
- Binary Code Worksheet
- Binary Alphabet Chart
- Airport Code Chart

What is binary code?

Any code that uses just two symbols to represent information is considered **binary code**. Different versions of binary code exist all around us. For example, braille uses raised and unraised bumps to assist visually impaired users, and Morse code uses long and short signals to transmit information.

Perhaps the most common use for binary nowadays is in computers: binary code is the way that most computers and computerized devices ultimately send, receive and store information. This code uses a series of "1"s and "0"s to represent letters and numbers.

Let's get coding!

Record your beads here. Choose one type of bead to be your "0"s and the other to be your "1"s.

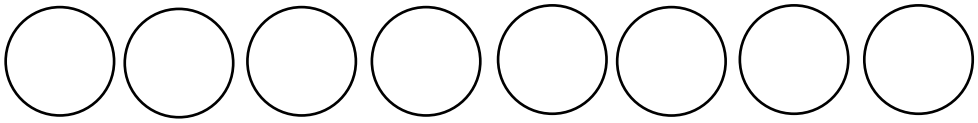
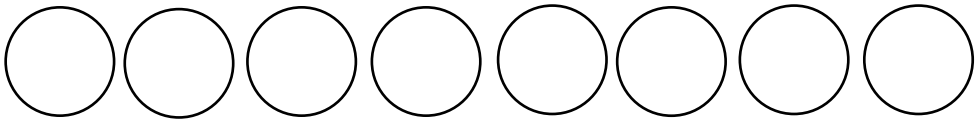
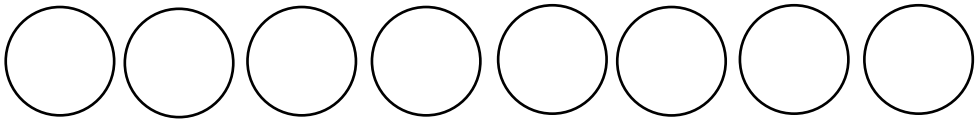
Bead "0" colour or shape	Bead "1" colour or shape

You will choose an airport code to translate into binary code. Airports are assigned three-letter codes to make them easy to identify no matter where you are in the world.

Use your Airport Code Chart to choose your airport and code. Write out each letter of your airport code in the spaces below.

Use your Alphabet Binary Chart to translate each letter into binary and record it.

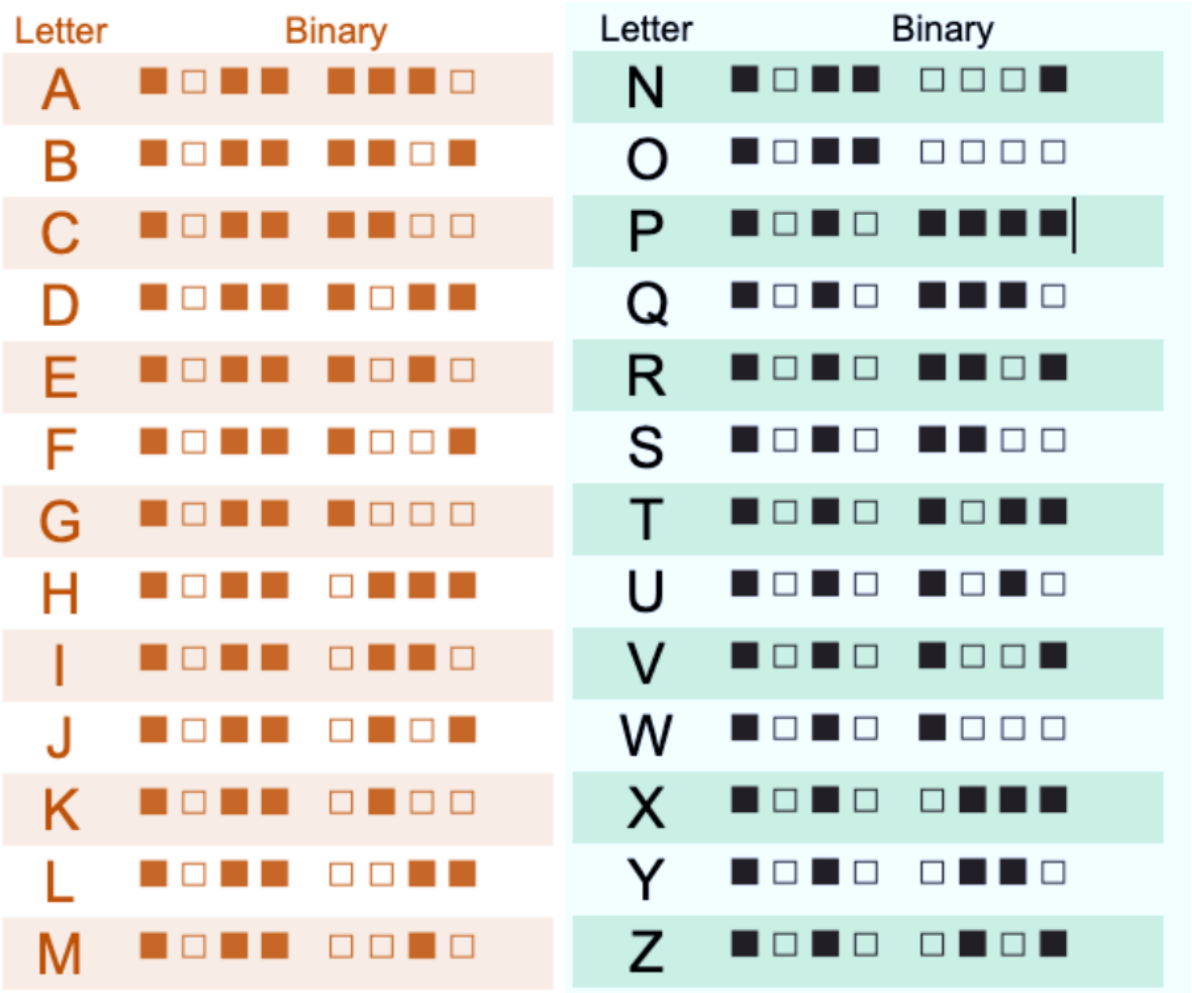
Your airport code: ☐ ☐ ☐

Letter	Binary Code
	
	
	

Use beads to put your code into action! Place your beads in the right order on string, twine or a pipe cleaner.

Now you're all ready to travel the world with your jet-setting binary bracelet!

Binary Alphabet Chart



How to use this chart:

Each filled-in block represents a “0”

Each unfilled block represents a “1”

Decide which of your beads will be a filled-in block (a “0”)
and which will be an unfilled block (a “1”)

Happy coding!

Canadian Airport Codes

Province	City/Airport	Code
Alberta	Calgary	YYC
	Edmonton	YEG
British Columbia	Vancouver	YVR
	Victoria	YYJ
Manitoba	Winnipeg—James Armstrong Richardson	YWG
New Brunswick	Fredericton	YFC
	Greater Moncton	YQM
	Saint John	YSJ
Newfoundland	Gander	YQX
	St. John's	YYT
Nova Scotia	Halifax—Stanfield	YHZ
Ontario	Toronto—Pearson	YYZ
	Ottawa—Macdonald-Cartier	YOW
	Thunder Bay	YQT
Prince Edward Island	Charlottetown	YYG
Quebec	Montréal—Pierre Elliott Trudeau	YUL
	Québec—Jean Lesage	YQB
Saskatchewan	Saskatoon	YXE
	Regina	YQR

Information taken from Transport Canada.
Please note that this is not a complete list of all Canadian airports, international or otherwise.