



DIGITAL LITTERACY

Computational Thinking Exploring Pattern Recognition

These unplugged activity ideas are meant to show examples of each key concept of computational thinking, in order to demonstrate its importance. You may find overlaps in the concepts presented in the activities; this is to be expected, since they are a part of a whole process that happens simultaneously.

Everyday life scenarios

1. Most classification systems are a form of pattern recognition, such as the classification of elements in the periodic table, or the classification of living organisms into plant or animal kingdoms.
 - Ask participants to create a classification system for random objects, according to a unifying concept. At the Canada Science and Technology Museum, the **Artifact Alley** exhibition presents this idea by having displays based on a theme, a material, or their provenance.
2. Play the board game *Code Breakers*, in which participants have to create patterns by tying together disparate words using a one-word clue.
 - Escape rooms also follow patterns to uncover the solution. Online games are available.
3. Any type of diagnosis, made by a doctor or even a repair person, is a type of pattern recognition.
 - Ask participants to associate a solution to a series of problems.

Discussion

- Did everyone agree on the same patterns?
- Did some peers see patterns that others did not? Remember classification of patterns can be a very controversial and sensitive topic, such as Darwin's *On the Origin of Species*.
- What was the unifying concept that led you to establish a pattern?



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15-30 minutes



Grade 5 and up



Solo and Team



Intermediate

Binary art: Pattern sequencing in computer programming

Pattern recognition is extremely important in computer programming. For instance, most machine learning software, the base for creating artificial intelligence, start by training the program to recognize patterns. Even more importantly, the motherboard of the computer — its brain — detects patterns in the binary digit (bit), made only of “0s” and “1s.” It then groups them into a pattern of eight bits called a “byte.” They are then translated by the program and rendered into an interface for the user.

Preparation

- Print out or share the *Exploring Pattern Sequencing: Binary art activity* document.

Tasks

1. Page 1: Ask the participants to create new bit patterns.
2. Page 2: Fill in the squares associated to the correct bit pattern.
3. Page 3: Find the byte pattern associated with each filled square.
4. Page 4: Create a byte pattern that represents your design, and share it with a peer.

Lesson goal

Participants will be able to recognize and use the patterns created by bits.

Go further

Music is the sequencing of sound patterns into harmonies and melodies. Have participants create a musical excerpt using free browser-based music creation software such as Soundation or Soundtrap or by downloading a tablet app such as GarageBand or Bravoura.