LESSON:
Robot Picasso

GRADE(S): 4-12   **TIME:** 1 45 minute class

LESSON SUMMARY:

In this unplugged activity, students will practice and experience computational thinking by drawing a simple sketch and writing out instructions for it.

LESSON OBJECTIVES:

Students will be able to:

- Experience the computational thinking problem solving approach.

TOPIC(S):

Technology & Engineering

Technology & Innovation

Coding

KEYWORDS:

Computational Thinking

Computer Programming

LESSON MATERIALS:

- Paper
- Pencil/Pen

COMPETENCIES:

- Managing Information
- Critical Thinking
- Creativity and Innovation
- Communication

- Collaboration
- Problem Solving
- Cultural growth & citizenship
- Personal Growth & Well-Being

LEARNING OUTCOMES

This activity can be applied to any curriculum concept. You can utilize this concept understanding by applying it as a method for discovering any learning outcome of choice.

Coding concepts: Computational Thinking

5 E's	Lesson Instructions & Times	Special Teacher Notes
ENGAGE Hook	**DAY 1** **Hook (5-10 mins)** 1. Draw a smiley face on the board 2. Ask the class, who thinks they can recreate this drawing? 3. Ask one student to provide instructions to you, to recreate the smiley face on the board 4. Repeat #3 one or two more times with different student volunteers	Almost all students will raise their hand to #2. For #3, Listen for a lack of specificity in the students instructions to demonstrate the point that computers need exact instructions, and cannot interpret things the way humans do. For example, If they say draw a circle, draw a tiny circle, or a very large circle

5 E's	Lesson Instructions & Times	Special Teacher Notes
EXPLORE Hands-on activities Group work	**Activity (20 mins)** 5. Have students pair up with a partner 6. Provide exactly 1 minute for each student to create a drawing of their choosing on a blank sheet of paper, ensuring their partner does not see it 7. Provide 5-10 minutes for each student to write out a set of instructions to recreate their drawings. 8. Have one student in the partner pair be a "robot", and attempt to redraw their partners sketch by only following the instructions. Then swap so the other student is the robot.	Some students may share that they noticed repetition in their instructions. This can provide the opportunity to discuss the use of loops - repeating a sequence to increase efficiency when writing code.

5 E's	Lesson Instructions & Times	Special Teacher Notes
EXPLAIN & ELABORATE Class discussion	**Discussion (15 mins)** Invite the students to share the difference between the artist's drawing, and the "robot"'s drawing, and their experiences of the activity. Discuss the difference between humans and computers by drawing or projecting the following chart on the board: **Human:** 　　- Has prior knowledge 　　- Uses intuition 　　- Can "read between the lines" when given instructions **Robot:** 　　- No prior knowledge 　　- No intuition 　　- Executes commands exactly as they're given	

POSSIBLE EXTENSION:

How could this lesson be extended to deepen understanding of the coding concept(s) or modified for other grade levels?

- For lower grades or for students who experience challenges with writing, allow them to provide their directions orally
- For homework, assign students to write down the step by step instructions of carrying out a common task (eg making a sandwich, brushing your teeth, etc). Select one or more of the submissions, and bring in required materials to carry out in front of the class as a fun demonstration of computational thinking and for some laughs
- As a next step, use an online coding platform like www.codingville.ca for students to practice block based sequential programming.