Write.Read.Repeat.
Unplugged



Students continue to solve pixel bot problems by playing Coders & Bots to read and write code.



#### **OBJECTIVES**

- Students will perform the Coder & Bots roles of Writer, Navigator, Reader, and Stepper
- Students will collaborate in small groups to write and read code
- Students will become more proficient at writing code



#### **AGENDA**

#### Length: 45 minutes

1. Pixel Bots: Write Code Warm-up

2. Pixel Bots: Coders and Bots

3. Pixel Bots: Write Code Exit Ticket



#### VOCAB

- Programming Element A command the computer understands.
- Action An observable event that the code produces
- Error The program fails to run because the computer cannot execute the code



# **MATERIALS**

- 1. Lesson 3 | Warm-up Worksheet
- 2. Lesson 3 | Worksheet 1
- 3. Lesson 3 | Worksheet 2
- 4. Lesson 3 | Worksheet 3
- 5. Lesson 3 | Worksheet 4
- 6. Lesson 3 | Exit Ticket Worksheet
- 7. Scratch paper grids
- 8. Small pixel bot cutout for each student
- 9. Magnetic pixel bot
- 10. Scratch paper grids
- 11. Pencils
- 12. Whiteboard



### **CLASSROOM SETUP**

Pods of four.



# PIXEL BOTS: WRITE CODE WARM-UP



Length: 15 minutes

Students write code for a simple pixel bot image.

Prep: Hand out Lesson 3 | Warm-up.

Teacher Actions		Student Actions	
1	Individual Work: Ask students to solve the problem on [Lesson 3   Warm-up Worksheet][warm- up].	1	Students individually solve the problem on the worksheet.
2	As students attempt the problem, draw the problem on the whiteboard.		
3	Code the solution to the problem as a whole class. Call on students at random to provide each next line of code. Each student should walk up to the board and write the	3	If called on, students walk up to the board to write in (or read) the next line of code.

next line of code.
With each new line
of code, you should
play the role of
Navigator, moving
the turtle. Call out
the roles of Writer
and Navigator to
make them explicit.
On occasion, pick a
Reader and Stepper
to walk up to the
board to test the
code starting from
line one.



## PIXEL BOTS: CODERS AND BOTS



Length: 30 minutes

Students work in groups to write and read code to produce two pixel bot images.

Prep: Consider having paper bags for each group. Each paper bags contains the four roles (Writer, Navigator, Reader, Stepper).

#### Teacher Actions Student Actions Students enact their Teacher breaks Coders and Bots students into groups of four and roles. They write randomly assigns code to create the roles for the pixel bot image. **Programming Team** and the Computer Team. (Consider handing each group a paper bag with the four roles inside - students reach into the bag and grab a role.) In this first round, groups either get [Lesson 3] | Worksheet 1] [worksheet1] or [Lesson 3 | Worksheet 2] [worksheet2] (alternate between groups). Bots should always help the Coders during

the code writing phase of the activity.

Pollow the Coders and Bots Protocol by having the Bot Team switch to a new group when it comes time to check

new group when it comes time to check the code. Make sure that the Coders fold back their paper to hide the provided pixel bot image before the Bots arrive (ensuring that the Bots are not biased in their reading).

The Bots should test

the code on an empty scratch paper grid. Ask

students, "What do you think the computer does when it cannot understand the code or the code forces the turtle to

Answer: An error! If the Bots notice this happening, they should report the error to the

break the rules (go outside the grid)?"

programming team and tell them what line the error happened on. 2

The Bots switch to a new group to assess code. If the Bots find an error, report it to the Coders and tell them what happened and the line number the error happened on.

- After one round,
  pass out [Lesson 3 |
  Worksheet 3]
  [worksheet3] or
  [Lesson 3 |
  Worksheet 4]
  [worksheet 4]
  [worksheet4] to the
  groups (alternate
  again) and repeat
  the Coders and Bots
  Protocol.
- 3 Students repeat the above process with new coding challenges.

- In whole class mode, ask students to share out any disagreements they had in the write and read process. Use this as an occasion to firm up any misconceptions.

  Also use this time to introduce and define Elements and Actions (see vocabulary section above).
- 4 Students summarize and describe the disagreements they could not resolve.



# PIXEL BOTS: WRITE CODE EXIT TICKET



Length: 5 minutes

Time permitting, students individually fill out an exit ticket to check for understanding.

Prep: Hand out Lesson 3 | Exit Ticket Worksheet

Teacher Actions	Student Actions	
Ask students to individually work on completing the [Lesson 3   Exit Ticket Worksheet] [wrap-up].	Students work individually on the [Lesson 3   Exit Ticket Worksheet] [wrap-up].	