Barrelbots ½ Day Summer Camp Outline

Jeff Ginger – last updated July 2025

Overview

A one week (3 hr/day) informal learning STEM / CS concepts camp.
6-16 junior high or high school students – ages 10-13 or 14-18, basic WASD and Minecraft familiarity strongly suggested
1-3 staff – one or two main instructors, one with CS knowledge, one technical support, one TA (optional)

Anticipated Learning and Research Outcomes

By the end of a camp a participant should be able to…

1. Understand how to employ algorithmic **(computational) thinking** to develop a sequence of steps to create and test automated solutions to puzzles
2. **Break puzzles into component parts**, identify key information, and develop descriptive (mental) models to understand complex systems or facilitate problem-solving
3. **Compare and refine** multiple algorithms (approaches) for the same task and determine which is the best
4. Create programs (instructions) that involve **sequences, loops, conditionals, timing, placement** and **functions**
5. **Test and debug** (identify and fix errors in) a program to ensure it work as intended
6. **Think** of STEM careers or roles that can relate to computational thinking, programming or robots
7. **Know** how to work with a partner to build, test and solve programming problems
8. **Collaborate** with a team to imagine, build and present realistic mars habitats that include applied (justified) robotic automation

Junior high group: evaluation with validated cCTt metric by El-Hamamsy, L., Zapata-Cáceres, M., Barroso, E. M., Mondada, F., Zufferey, J. D., & Bruno, B. (2022). The Competent Computational Thinking Test: Development and Validation of an Unplugged Computational Thinking Test for Upper Primary School. Journal of Educational Computing Research, 60(7), 1818-1866. https://doi.org/10.1177/07356331221081753

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Prior Preparation

People tasks

- Research consent and photo use permissions (if required)
- Set staffing roles by day, share contact information
- Who will provide domain knowledge support? Technical support? Who teachers what? Recess?

Space to host

- Power for all tables/laptops
- Internet – including access for Microsoft account login and Minecraft ports (25565)
- Large screens/boards, space for physical demonstrations

Computer for each participant

- Loaner Java Edition accounts – staff need access to emails for these
- OSX or Windows computers (only) - need admin access to install software
- Number computers (animal stickers), connect to internet, ensure server connection works
- Set home page to LinkTree (surveys, skin creator, etc)
- Install Multi-MC (or Prism on OSX) add your own instance/accounts, launch each to make sure it works
- Launch OBS for silent screen capture

Instructional aides for activities by-day

- Nametags, computer labels, print appropriate handouts

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Day-by-Day Overview – Mornings, High School

Monday	9:20	5x (introductions, preview video, puzzles 1-4, map resets)
	11:45	Sort out student class assignments, cleanup and reflection
Tuesday	9:15	Introductions, ground rules, what is this grant, cCTt/survey
	9:45	Puzzle set 1+2 – move at your own pace
	10:30	Think, pair, share, Recess / snack break
	10:45	Puzzle set 3 – move at your own pace OR continue previous build
	11:30	Skins and play time
Wednesday	9:15	Puzzle set 4 – move at your own pace OR continue previous build
	10:45	Recess / snack break
	11:00	Vibe Coding Challenge
	11:50	Think, pair, share reflection
Thursday	9:15	Habitation challenge introduction, team/role formation, automation brainstorm
	9:45	Begin habitation challenge
	10:30	Recess / snack break
	10:45	Continue habitation challenge, cCTt/survey
Friday	9:00	Habitat checklist and presentation prep, prepare habitats
	10:00	Showcase rotations

In-game, experiment, out of classroom, evaluation/research

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Day-by-Day Overview – Afternoon, Middle School

Monday	1:20	5x (introductions, preview video, puzzles 1-4, map resets)
	3:45	Sort out student class assignments, cleanup and reflection
Tuesday	1:15	Introductions, ground rules, what is this grant, cCTt/survey
	1:45	Puzzle set 1 – move at your own pace
	2:30	Think, pair, share, Recess / snack break
	2:45	Puzzle set 2 – move at your own pace OR continue previous build
	3:30	Skins and play time
Wednesday	1:15	Puzzle set 3 – move at your own pace OR continue previous build
	2:30	Recess / snack break
	2:45	VexCodeVR activity
	3:50	Think, pair, share reflection
Thursday	2:15	Habitation challenge introduction, team/role formation, automation brainstorm
	2:45	Begin habitation challenge
	3:30	Recess / snack break
	3:45	Continue habitation challenge, cCTt/survey
Friday	1:00	Habitat checklist and presentation prep, prepare habitats
	2:00	Showcase rotations

Backup activities:
WorldEdit, Worldpainter, Datapacks, BinVox
Learnable programming principles in coding environments
More time spent on Vibe Coding

In-game, experiment, out of classroom, evaluation/research

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