

LESSON 10

Enemies, lives and debugging, Part 2

40 minutes

Strand 1: Introducing computer science

Built in MakeCode Arcade

Outcome 1.7

Outcome 1.8

WHAT THIS LESSON DOES

Students continue their MakeCode Arcade Space Shooter, adding lives, spawning asteroids, overlap events, scoring and a lose condition while running, testing and debugging as they build.

CURRICULUM OUTCOMES

Outcome	What the specification asks for
1.7	Discuss and implement core features of a structured programming language: variables, operators, loops, decisions, assignment and modules.
1.8	Test code to find and manage errors.

WHAT STUDENTS SHOULD BE ABLE TO DO

- Add score and lives variables, spawning loops and a win or lose condition (LO 1.7)
- Run, test and debug the game as you build, managing errors (LO 1.8)

BEFORE THE BELL

- Students logged in at devices with MakeCode Arcade open in the browser (arcade.makecode.com).
- Each student or pair opens the Space Shooter project saved from the earlier part of this build.
- Projector or board ready so you can model the first blocks before students continue independently.

WHAT YOU NEED

Item	Qty	Per	If you do not have it
tablet or laptop with MakeCode Arcade	1	pair	run the lesson on the IWB with students taking turns

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HOW THE LESSON RUNS

4 min	introduction	Start: what we're building
2 min	content	The plan: five parts to build
2 min	content	Create a new Arcade project
3 min	content	Create your spaceship sprite
3 min	content	Control the spaceship
3 min	content	Set the number of lives
3 min	content	Create the asteroids
5 min	content	Program the asteroids
3 min	content	Fire rockets
2 min	content	Destroy asteroids
2 min	content	Lose a life
2 min	content	Game On!
3 min	content	Make sense: what worked, what broke
2 min	content	Reflect
1 min	summary	What you covered

TEACHING MOVES

- Model the first one or two blocks on the board, then let pairs drive the rest while you circulate.
- Stress testing after each new block: run, watch what happens, then add the next piece.
- When overlaps are added, pause the class and check that students have chosen the correct sprite kinds and are destroying otherSprite, not the player.
- Name debugging out loud when a pair hits a bug: symptom, where they looked, what fixed it.

WHAT TO WATCH FOR

- Overlap kinds left on the wrong sprite kinds, so hits do nothing. Fix: reselect Player/Enemy or Projectile/Enemy in the overlap block and run again.
- Destroying the wrong sprite in an overlap (player vanishes instead of the asteroid). Fix: put otherSprite into the destroy block.
- Asteroids not appearing or piling up because the interval spawn or off-screen destroy is missing. Fix: check the on-update-interval block and the destroy-when-off-screen setting, then run.

DIFFERENTIATION

- Support: Keep pairs on the shared project; provide a quick visual checklist of the blocks still to add (lives, spawn, overlaps).
- Extension: Once the lose condition works, invite students to tweak spawn rate, starting lives or score per hit and retest.
- Extension: Ask a confident pair to find and fix one deliberate bug you introduce, then explain the symptom and the fix to the class.