Scratch 2D Shooter — Project Guide & Scripts

A complete, copy-and-paste friendly guide to build a simple but polished 2D top-down shooter in **Scratch** (MIT Scratch). It uses: player movement, shooting with clones, enemy spawning with clones, score, lives, sound effects and game over.

Project overview

- Genre: 2D top-down shooter
- View: Stage is a space / arena backdrop
- Sprites: Player, Bullet, Enemy, Explosion (optional), UI (score/lives) as variables
- Core mechanics: move player, shoot bullets, spawn enemies that move toward player or straight down, collide with bullets or player, score and lives system

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Variables (create these)

- `Score` (for all sprites)
- `Lives` (for all sprites)
- `enemySpeed` (for enemies)
- `spawnRate` (for stage or enemy spawner)
- `canShoot` (optional cooldown boolean)

Backdrop

- Add a space or plain dark backdrop.
- Optionally add stars (animate a parallax).

Sprites & Scripts

Below each sprite contains a concise script written in Scratch block style so you can recreate directly in the editor.

Player sprite

Costumes: a ship facing up (or right); add a small flame costume for movement if you want.

Scripts:

```
when green flag clicked
set Score to 0
set Lives to 3
go to x: 0 y: -120
point in direction 90  // right-facing by default; adjust to your art
show

forever
  // Movement
  if <key (left arrow) pressed?> then change x by -6 end
  if <key (right arrow) pressed?> then change x by 6 end
  if <key (up arrow) pressed?> then change y by 6 end
  if <key (down arrow) pressed?> then change y by -6 end
  // keep inside stage
  if x position > 230 set x to 230 end
  if x position < -230 set x to -230 end
  if y position > 170 set y to 170 end
  if y position < -170 set y to -170 end
end
```

Shooting script (use clones for bullets):

```
when [space v] key pressed
create clone of [Bullet v]
```

Optional cooldown version:

```
when green flag clicked
set canShoot to 1

when [space v] key pressed
if <(canShoot) = 1> then
  set canShoot to 0
  create clone of [Bullet v]
  wait 0.2 seconds
  set canShoot to 1
end
```

Player hit detection:

```
when I receive [player-hit v]  // optional message
change Lives by -1
if <(Lives) = 0> then broadcast [GameOver v] end
```

Bullet sprite

Costumes: small rectangle or circle

Scripts:

```
when I start as a clone
go to [Player v]
point in direction 0   // up; adjust to your player's facing
show
repeat until <touching [edge v]?>
  change y by 12
  // collision with enemy
  if <touching [Enemy v]?> then
    broadcast [enemy-hit v]
    change Score by 10
    delete this clone
  end
  wait 0.02 seconds
end
delete this clone
```

Notes: If enemies have many clones, prefer `if <touching [Enemy]?>` then use `ask enemy to handle damage` via broadcast or use `touching color` on enemy's color.

Enemy sprite

Costumes: enemy ship or alien. Use multiple costumes for variety.

Scripts (spawner / clones):

```
when green flag clicked
hide
wait 1 second
forever
  wait (spawnRate) seconds
```

```
  create clone of [Enemy v]
end
```

Clone behavior:

```
when I start as a clone
go to x: (pick random -220 to 220) y: 180  // spawn at top
show
set size to (100%)
repeat until <(y position) < -200>
  change y by (-1 * (enemySpeed))
  // optional: move toward player
  // point towards [Player v]
  // move (enemySpeed) steps
  if <touching [Player v]?> then
    broadcast [player-hit v]
    delete this clone
  end
  wait 0.02 seconds
end
delete this clone
```

On enemy-hit (from bullet):

```
when I receive [enemy-hit v]
if <touching [Bullet v]?> then
  // play explosion costume or sound
  delete this clone
end
```

Alternative: have bullet broadcast `enemy-hit` and include the x,y in a variable to only kill the actual touched clone. Simpler: bullets use `if touching (Enemy)? delete this clone` which removes both bullet clone and the touching enemy clone.

Explosion (optional)

Use a sprite or costumed animation: when enemy dies, create clone of Explosion at enemy position, play animation then delete.

Stage (spawner controller)

You can control `spawnRate` and `enemySpeed` here if you want progressive difficulty.

```
when green flag clicked
set spawnRate to 1.5
set enemySpeed to 2
forever
  wait 15 seconds
  change enemySpeed by 0.5
  change spawnRate by -0.1
end
```

Game Over

```
when I receive [GameOver v]
broadcast [stop-all v] // or use stop [all v]
show a Game Over backdrop or message
```

Sounds

- Add a shooting sound to the Bullet clone creation.
- Add an explosion or hit sound when an enemy is destroyed or player hit.

Attach `play sound [shoot v] until done` in the bullet creation script or when clone starts.

Polish & Tips

- Use `glide` or `move steps` for smoother movement.
- Add cooldown for shooting so the player can't spam too fast.
- Use `timer` or difficulty scaling for waves.
- Add powerups as new sprite clones (e.g., `Health`, `RapidFire`) that check collision with Player.
- Keep sprites small and test on the stage edges.

Simple scoring & UI

- Display `Score` and `Lives` on stage using Scratch variable monitors (large font recommended).
- For a nicer UI, create a sprite that shows text using costumes for digits, but variables are easier.

Quick checklist to build

1. Create sprites: Player, Bullet (hide initial), Enemy (hide initial), Explosion (hide initial).
2. Make `Score`, `Lives`, `enemySpeed`, `spawnRate` variables.
3. Implement Player movement + shooting.
4. Implement Bullet clone behavior and collision with Enemy.
5. Implement Enemy spawner and clone behavior and collision with Player.
6. Add sounds, polish and difficulty scaling.
7. Test and tweak speeds and spawn rates.

Troubleshooting

- Bullets not hitting enemies? Make sure both clones show and that `touching` checks are accurate — collision depends on costume shape/transparent edges.
- Too slow/fast? Tweak `change y by` for bullets and `enemySpeed` for enemies.
- Clones not deleting? Ensure `delete this clone` is inside the clone's script and only runs in clones.

Want an example project file?

I can help you create pixel-art sprites or export step-by-step screenshots of the Scratch editor. Tell me which part you'd like next: art, sounds, exact spawn values, or a downloadable `.sb3` sample (I can give instructions to assemble it).

Have fun — build it and tell me which feature you want next (boss, powerups, two-player?)