

INNOVATE-IT



Game Design Real Time Challenge #1

Physics!

100 Points

Due: 11:00AM (part 1), 3:00 PM (part 2)

Innovate-IT Showcase, Spring 2023

Overview

For your first real time challenge, you will be tasked with creating a game focusing on the Unity physics engine. Specifically, you will only be allowed to use Unity primitives for your models (Cubes, Spheres, Cylinders, etc.). The goal is open-ended, giving you room to explore any ideas you might come up with.

Your real time challenge will be split into two parts, the first centered around planning, and the second around your prototype (remember, this is a real time challenge with very limited time – a prototype is all you need!).

Restrictions and Expectations

- Your game's gameplay should focus on using the physics engine. Throw objects around, break stuff, change gravity, and slam stuff into each other.
- You may not use any non-primitive meshes for your game. Primitive meshes are any meshes you can generate in Unity or Blender. The full list of approved shapes is:
 - Cubes
 - Spheres
 - Capsules
 - Cylinders
 - Planes
 - Quads
 - Icospheres
 - Cones
 - Tori
- You may change the scale of the primitive shapes and compose them together however you'd like.
- The final game should be a short prototype (playable game, <5min gameplay, show off mechanics, show off style).
- Your game should be appropriate for both your age group (high school) and venue (a public event containing people of many backgrounds and beliefs). Your game is required to be appropriate for both categories. You will be penalized or potentially disqualified if your game is considered to be inappropriate by the judgment of a judge, the venue leader, or Innovate-IT management. If you are concerned or questioning whether a mechanic, element, or effect in your game is appropriate, please reach out to Innovate-IT staff.

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Tasks

Part 1 – Design Document (Due at 11:00 AM, worth 20 points)

Your first task with this project will be to create a short design document for your project. You should work with your team to brainstorm some ideas for games which fit the theme and expectations for this challenge. You should then create a one to two page design document containing the following sections (at minimum):

- Game Name
- Game Overview (summary of your game idea)
- Game Mechanics (summary of the major mechanics in your game)
- Art (summary of what you want your game to look like)

While making the design document, you should also try to outline some tasks your group needs to complete to finish a prototype before 3:00 PM. These tasks do not need to be included in the design document but will be useful for your team to have.

Part 2 – Prototype (Due at 3:00 PM, worth 80 points)

Your second, and main challenge for this real time challenge is the actual implementation of a prototype for the game you design. You should attempt to remain as faithful as possible to your original design document, though changing ideas during the competition is completely acceptable (but may set you behind timewise).

Your prototype should be created using the Unity engine (speak with competition staff if you believe your idea warrants the use of another engine). You may use free plugins and code files, but you may not use any resources (code, models, sounds, logos, etc.) which are not free. You must also document any external resources you use (crediting outside sources is mandatory).

You may also submit a short “user” document with your game if you need to explain any part of your game, talk about incomplete features, describe controls, or anything else.

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Scoring and Rubric

Design Document (20 points)

Game Overview (8 points)

- An accurate summary of the game is provided.
- The overview is detailed enough to prove the group is prepared to implement a game.

Game Mechanics (8 points)

- At least two mechanics are described in detail.
- Game mechanics are novel and try something different.

Art (4 points)

- The game has a clearly defined art style (with one or two concrete ideas).

Prototype (80 points)

Playability (10 points)

- The prototype is cohesive (you can sit down and play it from start to finish without many hiccups).
- The prototype doesn't exhibit many (frustrating) bugs (fun bugs become features 😊)
- Control scheme and mechanics are easy to learn.

Game Mechanics (40 points)

- At least two large mechanics were implemented and are fun to play with.
- Mechanics contribute to the overall theme/story/feel of the game.
- Mechanics are novel (they are creative and exciting).
- The game's focus is on using the Unity physics system.

Art/Visual Appeal (10 points)

- The game's theme is clear.
- No illegal shapes were used.
- Color, shape, and sound all contribute to the game meaningfully.

Code Quality and Documentation (20 points)

- Any written code is commented and well documented.
- Any external resources are cited and credited.
- Code makes efficient use of control structures (conditionals, loops) and variables.

Tips and Suggestions

- Since you'll be focusing on using the physics system to do something fun, you'll likely be using the following Unity components/functions a lot:
 - Rigidbodies (<https://docs.unity3d.com/ScriptReference/Rigidbody.html>)
 - Rigidbody.AddForce and Rigidbody.AddTorque (same link as above)
- There are lots of physics-based games out there. Google around for physics-based games and you'll find some inspiration.