# Description of the Entity in PyGameFramework

An entity is anything that can move in the game, interact with other entities, or be interacted with by entities. This will include all PC’s, and NPCs. It will also encompass physical objects that can be interacted with – switches, doors, pushable objects, etc.

Scene components differ from entities. They can be animated, but cannot move. Scenery can impact an entity as a barrier (wall, tree, statue), can affect the movement of an entity (ice, mud, sand), trigger game events by touch, even damage an entity (hot lava, spikes) but does not get affected by actions the entity takes. Anything in the environment that should react to an entity should be another entity. A door that can swing open when the PC interacts with it should be an entity embedded in the wall’s scenery.

# Entity ID

There is no entity class. Each entity is tracked as an unique ID in the game (eg a 32bit int). The ID in RAM is generated on load, whereas the resource ID on disk is fixed. We can load multiple instances of the same resource ID and each will get its own unique entity id

# Components

The entity is described in discrete component classes. Each tracks the entity id that it describes, and contains the needed function pointers to send and receive data from the other Components of the same entity. Entities are not required to contain all components, only what is needed to handle its function.

# Subcomponents

An entity may need to have each of its constituent parts described independently. A character sprite may need to have its torso and legs animated independently. Each portion may need its own physics and hit detection as well. Components contain a list of their sub components.

The subcomponents are indexed in the same order for all of the related components. This means that if the Torso is the 2nd indexed component in the Graphics subcomponent list, its particle physics is calculated in the 2nd indexed subcomponent of the Physics Components.

# List of Components and Subcomponents

## Graphics Component

Subcomponent: SpriteInstance

## Physics Component

Subcomponent: Particle

## Bounding Component

Subcomponent: BoundingPortion

## Behavior Component

Subcomponent: BehaviorState

# Data Structure Relationships

See data\_structs/Entity\_Data\_Relationships.xlsx