

2.3 Sprites, rooms, objects and collisions.

Games display elements in a screen in a changing and dynamic way. What the player sees is simply "things" moving around inside an area or "world", and often things crash, bump or collide with other things. Game Maker, and also developers and players, give specific names for different visual elements. The area or "world" where the game happens is called room in GameMaker. Animated images are named "sprites". Static or unanimated images are just decorative and can be called background. Elements of a game that have some behaviour or influence the game in any way are assigned the "object" name. And finally, "collision" is the most common event happening between two objects when they meet physically. These elements are at the basis of GameMaker main features.

Most games show an image made up from different objects, items or elements. Often, there is also a background image that mostly decorates the screen and creates an immersive atmosphere. It is important to see the greater importance of images that are relevant or meaningful in the game. For example a car race game may display stands of people watching the race, this image will be only decorative but of a noticeable meaning. However the collectable extra fuel points that randomly appear on the road are not decorative but a part of the game. These images are special and Game maker treats them so. They begin as what is called as "sprites". Every non background image, even animated ones, starts as a sprite.

Consider another example, like a "shoot them up" game. Every enemy or projectile, among others items, will be drawn over and over during the game. To build the game, the developer will link sprites (images) to those elements of the game. The first step for the developer is to define the sprites of those objects.

But sprites by themselves are simply images, they are not interactive, they do not have behaviour or properties useful to build the logic of a game (only the properties we expect from an image). Sprites can't collide, react, move, take the input from the mouse or keyboard in any way. To build the game logic we use what Game Maker calls "Objects"

Objects are the game elements that have some behaviour or mechanics in them and between them and the game. Examples of objects are "the player", an obstacle, a projectile, a gold coin that can be taken, a door, and so on. Objects can react to other objects or events (or a combination of both) and perform actions that yield some consequences to the game or to other objects. For example, pressing a "right" key will change the position of the "player" object to a position further in the right of the screen. Here we have an object that has been affected by an event. But when the player object is moving and collides with a "wall" object next to it, the collision will stop the movement. Here we have two objects that interact between them.

Developing a game is basically giving a specific behaviour to every object,
programming the action or change



to every relevant event and other objects.

Many games are based on a simplified representation of reality. They can either a simulation, an action game, shoot'em up, etc. In all this games real or science fiction objects have some kind of physical interaction. The game engine makes complex calculations to reproduce the physics laws set by the game designer, which often coincides real physics. As the computers become more powerful, the games can handle more objects and keep a realistic interaction between them.

Of the different type of physical interaction between objects, collisions are the most important. Almost every game requires objects to be visibly separated or maybe to react to hits (like a projectile meeting the target). Very succinctly, collisions are base on objects dimensions and positions in the simulated world. If, taking into account the dimensions of two objects, they have nearby positions, they are colliding. When this occurs, the game can take a special action like stopping or destroying one or both of the objects, for example.

Rooms are the area where the game takes place. Players can use to call whatever word comes to their mind with a related meaning, either "worlds", "levels", "area", "round", etc. Game Maker's name for it is "room". Basically by creating rooms and placing elements of the game on it, the developer is expanding and adding more content to the game. Many games have very large number of "rooms" each one with slight changes and few new elements. One known example is the popular "Candy Crush"

Rooms are also useful to set some global properties which affect all objects on it. For example, the player can pilot a spaceship through different rooms or levels. At some point, a room can be configured to apply a different gravity than the others. The spaceship is the same for every room, but in some particular room the behaviour and physics are different.

Rooms are defined by these elements:

- Dimensions
- Physics
- Viewports and cameras, which play a special role in how objects are seen in 3D games
- Objects placed on it

Game Maker is best suited for 2D games, and with this type of games, Rooms are easy to quickly setup and get content added.

