Overview
Building a larger piece of software like a game can quickly get complex. Starting with a plan can help you stay organized and identify issues ahead of time. A lot of the work you do here will make it much easier to keep track of what you need to do once you begin writing your actual code.

Gameplay and Visuals
Start by thinking about what your game actually does. What does it look like? How do you actually play it? What will make it fun, interesting, or relevant to the player?

Describe Your Game
In a couple of sentences describe the game you are going to build and how it will work.

I'm going to make a monkey jumper game. The monkey will jump and try to catch an apple. When the monkey catches the apple, the apple will move to a different place and the monkey has to get it again. You will jump with space and move left and right with arrows.

Draw Your Game
Draw a quick sketch of how your game will work. Who are the characters. What does the background look like? How do things move? Label things to make them more clear.

Note: The tree ONLY shows up when you have enough apples.
**Sprites and Variables**

Using the description of your game above, figure out what information and characters you’ll need to keep track of through your game. Fill in a description for each in the space below.

**Sprites**

In the table below list information about the different sprites in your game. Where are they located? How do they move? How do they interact with other sprites?

<table>
<thead>
<tr>
<th>Name (Label) and Appearance</th>
<th>At Start of Game (Animation, position, rotation, velocity, rotation speed)</th>
<th>User and Sprite and Interactions (Does the user control this sprite? How does it move? Does it ever need to reset its position? Does it interact with other sprites? How?)</th>
</tr>
</thead>
</table>
| monkey                      | Image: Monkey circle
x: 200
y: 100
space: jump (negative velocity)
left arrow: left velocity
right arrow: right velocity |                                                                                                                                                                                                 |
| apple                       | Image: apple
x: 100
y: 300
When it touches the monkey, it moves to a different random place.     |                                                                                                                                                                                                 |
**Variables**
Think about the information your game needs to keep track of. Is there a score? A number of lives? Describe each variable in the space below.

<table>
<thead>
<tr>
<th>Name (Label)</th>
<th>What It Keeps Track Of</th>
<th>How It Changes During the Game</th>
</tr>
</thead>
<tbody>
<tr>
<td>apples</td>
<td>number of apples the monkey has touched</td>
<td>It starts at zero and goes up every time the monkey touches an apple</td>
</tr>
</tbody>
</table>

**Functions**
Your draw loop shouldn’t have a lot of complex code. Instead, break your program up into the major steps you’ll need for your game to work. The different behaviors you described for your sprites and variables should help you decide what these steps should be. Then describe what the code for that function should do.

<table>
<thead>
<tr>
<th>Function Name</th>
<th>What Happens In This Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>moveMonkey</td>
<td>moves the monkey when the user presses space or the left arrow or the right arrow.</td>
</tr>
<tr>
<td>gravity</td>
<td>makes the monkey fall</td>
</tr>
<tr>
<td>drawTree</td>
<td>draws the tree</td>
</tr>
<tr>
<td>resetApple</td>
<td>moves the apple to a random place if the monkey touches it.</td>
</tr>
</tbody>
</table>
**Program your Game**

Once your teacher has approved your design, go to Code Studio to create your game.

**Check Your Program**

Check your program to make sure it has everything it needs.

**Reflect**

What part of your project are you most proud of? ___________ The way the monkey moves ___________

Why? ___________ It is really hard to make it move at the right speed, because too fast and too slow are both frustrating. ___________

If you had more time, what improvement would you make to your game? ___________ I would make the backgrounds more interesting. ___________