Animating Objects

Introduction: For each part you will need to create programs on your own Glowscript account that are copies of the programs below. You will be editing and revising these programs that I have shared with you and then submitting your workvia email.

*As always, you are encouraged to click on the “HELP” link where you can access all of the VPython Resources.

Part 1: Concept Check -- Annotating the Code for a “Bouncing Sphere”

A. Navigate to this program titled: ConstantVelocitySphereBounce.
B. Make a copy of this program on your own Glowscript account.
C. Go through the code line by line and add annotations using the “#” symbol. Be as explicit as you can.

Part 2: Concept Check -- Constant Acceleration Sphere

Repeat the process you did for part 1, but now add annotations to this program:
ConstantAccelerationSphere

Part 3.0: Creating Your Own Code -- Animating a Ball Bouncing on The Floor

Make a copy of this program titled: ConstantVelocitySphereBounceTemplate in your own Glowscript account. The reason the word “template” is in the title is because this program is incomplete. Running it in its current form will render a stationary sphere above a horizontal plane.

Your Objective: *Edit the program so that the ball smoothly bounces up and down on the floor. The ball should descend with constant downward acceleration and bounce elastically when it hits the floor.*

Part 3.1: Creating Your Own Code --Animating a Ball Bouncing Back and Forth in a Room

Take the code you wrote in part 3 and modify to do the following:

- Add walls at -x and +x locations at the edges of the current floor
- Give the sphere initial velocity in the horizontal (x) direction.
- Allow the sphere to bounce elastically off of the walls horizontally so that now it behaves like a projectile bouncing back and forth in a closed room
- *Note: Its motion should be restricted to the xy plane.

Part 3.2: Creating Your Own Code -- Allowing the Ball to Move in 3 Dimensions

So far we have restricted the ball to motion in the xy plane. The new goal is to allow the ball to move in 3 dimensions. Try modifying your code to do the following:

- Add walls at -z and +z locations so that they touch the edges of the floor.
- Give the sphere initial velocity with both x and z components.
- Add conditions to your code so that it will bounce elastically off of all walls at the correct angle.

When your work is completed, copy links to each part in a clearly organized email addressed to me. Put your name in the subject line of the email.