

Invention Convention- Widget Wall

Exhibit Content Focus:

This exhibit component focuses on inventing a series of passageways through which a ball may travel as it falls due to gravity. As visitors create, experiment with, and redesign these paths, they explore basics in energy and motion. The most prominent force on Widget Wall is gravity, which is the force pulling the ball down toward the center of the earth. Experimenters give the ball potential energy by placing it at the top-most height of their roller coaster pathway. Gravity pulls on the ball, and once released, the ball's potential energy is converted into kinetic energy, or the energy of motion. Friction acts upon the ball to slow its travels, and visitors often manipulate sections of the channels to provide directional forces to turn, stop, or drop the ball. In the levers box, the energy of the moving ball is used to tip levers. Two apps relate to Widget Wall, and incorporate the energy of the falling ball into other ways that energy can be used.

Related Apps:

- **Name: BallFallDown**



- Icon:
- Description: This app is a great virtual representation of the Widget Wall. There are no points and no levels, and visitors are able to interact with the game however they like, making their own goals. Pieces can be moved wherever you like, and components added or moved at will.
- Relation to Exhibit Content: This app is a vivid model of the tinkering spirit represented in Widget Wall. There is freedom to explore pathways and components and how they influence the balls as they fall with gravity.
- Helpful Hints: Use the tab at the top of the screen to add more components. Drag components to the trash can to remove. All pieces can be moved, including the shooter. Tubes may be stretched or shortened using a two-finger pinching gesture. Gravity depends on the orientation of the iPad- turn the screen sideways, and gravity will pull all the balls to the side. If there are no more balls coming out of the shooter, then it should be refilled by having balls enter the recycling bin. The blue objects are fun- balls entering one opening will come out the other, and if the exit is oriented above the entrance, a dizzying repetition occurs.

- **Name: Gravity HD**



- Icon:
- Description: Seven different levels of difficulty are available on this app, as users try to refine a passageway or construct a chain reaction that allows a falling ball on one side to activate a red push-button on the other side.
- Relation to Exhibit Content: This app takes Widget Wall to the next level, affording visitors ways of incorporating chain reactions into their falling-ball experimentation.
- Helpful Hints: Always press play (green triangle in the top right) to see how the ball falls regularly, first, and what is needed to modify its path. Use the items in the top left to change where the ball goes, or to set up a chain reaction. When an object is dragged down, a perimeter gear appears around it, which allows you to rotate that object. It isn't always the ball that has to touch the red stop button- sometimes it is a lever that is tipped. Level 5 offers a twist with a motorized car replacing the ball.

- **Name: Giant Timer**

- Icon:



- Description: The Giant Timer is just what it sounds like, a giant timer. The timer has two settings, stopwatch and countdown. The stopwatch counts up in seconds to measure how much time has elapsed. For the countdown, you put in a specific amount of time, 30 seconds, 1 minute, etc. and it will countdown that amount of time.
 - Relation to Exhibit Content: At Widget Wall, the Giant Timer can be used to encourage visitors to spend more time tinkering on their paths. The Giant Timer can be used to measure how long a ball travels on the current path. From that information you can pose challenges to the visitor: Your path was X seconds, can you make it Y seconds or Z seconds? Can you alter your path to reach this box on the wall? I'm going to give you 1 minute to create a brand new path that stretches from A to B.
 - Helpful Hints: Be sure you are using the correct mode for the challenge you are posing!