Balls & Ramps Storyline

Big idea: Balls have identifiable characteristics. The behavior of balls is affected by a variety of factors.

1. Introducing Balls 1-4
   (Students explore, observe, discover, and describe characteristics and properties of balls)
   - Balls have properties that can be observed and described such as size, composition, weight, roundness, bounciness. (L.E. 1,2)
   - Different balls may have similar or different properties. (L.E. 1,2)
   - There is a cause and effect relationship for balls and their motion. (L.E. 1)
   - Balls move in a variety of ways. (L.E. 1)
   - Ball motion can be initiated in a variety of ways. (L.E. 1,3,4)
   - There is a relationship between the physical properties of balls and their motion. (L.E. 3,4)

2. Characteristics of Bouncing Balls 5-7
   (Students explore what characteristics make balls bounce the best)
   - Ball composition affects bounciness. (L.E. 5)
   - The force applied affects bounciness. (L.E. 5)
   - Good bouncers bounce higher and longer. (L.E. 6)
   - Certain properties affect the bounciness of a ball. (L.E. 7)

3. Applying Characteristics to make balls 8-9
   (Students make their own balls, using their previous experiences to think about some of the characteristics and properties of the balls they create)
   - Ball shape affects movement. (L.E. 8,9)
   - Ball composition affects bounciness.

4. Explorations of Ball Behaviors 10-14
   (Students build roadways and explore the different behavior of balls as they roll down inclines)
   - An inclined plane affects the motion of a ball. (L.E. 10)
   - The height of an inclined plane affects the energy of a ball. (L.E. 11)
   - The height of an inclined plane and the mass of a ball affect momentum, and the ball's ability to knock over or move objects. (L.E. 11)
   - The height of an inclined plane and the nature of the surface affects the motion of the ball. (L.E. 11)
   - Ball mass does not affect the speed at which a ball reaches the end of an inclined plane. (L.E. 12)
   - Ball mass does not affect the distance a ball rolls. (L.E. 12)
   - Ball size does not affect the speed at which a ball reaches the end of an inclined plane. (L.E. 13)
   - Ball size does not affect the distance a ball rolls. (L.E. 13)
   - Ball properties affect the motion of balls as they roll down inclines, through tunnels, up hills, and around bends.