LESSON PLAN

VELOCITY BALL (WONDER PARK)

Objectives:

The students will understand:

- How to collect data and determine varying outcomes reliant upon the input of information
- That models can be representatives of something else
- Anyone can be a scientist and test hypothesis
- How to calculate central measures of tendency
- The varying speeds at which objects travel and the affect gravity has on objects
- That objects that weigh more typically cannot travel as far as objects that are lighter
- If muscles are used more then they typically can perform better

Standards Assessed:

- Scientific Method
- Collecting Data
- Scientific Inquiry
- Testing Hypothesis
- Models for Representation
- Central Measures of Tendency
- Effects of gravity
- Understanding a push/pull can move an object
- Measuring with non-standard units
- Force and motion
- Muscular system
- Safety procedures

New York Standards:

K: S1.1a, S1.2.3, S1.3, S1.3.2, PS3.1d, PS5.1b, PS5.1c, PE1a, PE1b
1st: S1.1a, S1.2.3, S1.3, S1.3.2, PS3.1d, PS5.1b, PS5.1c, PE1a, PE1b
2nd: S1.1a, S1.2.3, S1.3, S1.3.2, PS3.1d, PS5.1b, PS5.1c, PE1a, PE1b
3rd: S1.1a, S1.2.3, S1.3, S1.3.2, PS3.1d, PS5.1b, PS5.1c, PE1a, PE1b
4th: S1.1a, S1.2.3, S1.3, S1.3.2, PS3.1d, PS5.1b, PS5.1c, PE1a, PE1b
5th: S1.1.2, S1.2a, S1.2b, S2.2b, PS5.1d, PS5.2a, PE1a, PE1b
6th: S1.1.2, S1.2a, S1.2b, S2.2b, PS5.1d, PS5.2a, PE1a, PE1b
7th: S1.1.2, S1.2a, S1.2b, S2.2b, PS5.1d, PS5.2a, PE1a, PE1b
8th: S1.1.2, S1.2a, S1.2b, S2.2b, PS5.1d, PS5.2a, PE1a, PE1b

Materials:

- Velocity Ball Exhibit
- Data Collection Card

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Procedures: The student will throw the ball at least once, at the most three times. The exhibit will at first offer them a selection of 7 famous batters to choose from. Once they select one, then they will have to press 'start.' The batter will appear on the screen and then the student will attempt to throw the ball where the batter would hit it. The screen will tell the student the success of their pitch and the

speed. If the student only throws the ball once, then they need to write the score on their data collection card, if the student throws it more than once, then they need to write the highest score on their card. Once back in the classroom the discussion needs to include graphing the students speed and then using the graph to determine the central measures of tendency. Measuring the speed of a ball with Miles Per Hour (MPH) is not a standard form of measurement such as feet and inches. MPH is a non-standard form of measurement. The class also needs to discuss why some students can throw faster than others based on their size or athletic ability and what would happen if students practiced throwing balls everyday, would it increase their speed. There are also certain safety procedures that need to be followed when participating in this exhibit. Balls can only be thrown in one direction in a certain space. Throwing the balls carelessly could result in injury. If we lived on a planet without any gravitational pull, what would be the result if a ball was thrown? In addition, how much force has to be exerted to make the ball travel a certain distance. How accurate is this exhibit as a model for representing how it would be to throw an actual baseball in a baseball game and what other factors would come into play.

Independent Practice: The exhibit is completely independent.

Assessment:

- The student will write their outcome on their post-teaching card
- Teacher observation of participation in classroom discussion
- Score on WonderWorks Data Collection Card

Modifications (Special Education Students):

Special education students may need assistance in collecting and throwing the balls. They may also need assistance with choosing a batter and starting the exhibit. They may also need help with writing the speed down on their data collection card.

Extensions (Gifted Students): If gifted students are successful in throwing pitches, then they can write down all the speeds and use the central measures of tendency to write down the mean on their data collection card, and then find the median and the mode.

Generalization to other Subjects:

Collecting empirical data and measurement can be generalized to math.