Lesson Title: Falling Balls Activity
Course: Grade 7 Math
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Learning Outcomes/Intentions

Formal Unit Outcome(s):
SP7.1

Demonstrate an understanding of the measures of central tendency and range for sets of data.

[C, CN, PS, R, T]

Indicators for this outcome

(b) Determine mean, median, and mode for a set of data, and explain why these values may be the same or different.

(c) Determine the range of a set of data.

Objectives:
$d = \frac{1}{2} at^2$ a = g = 9.81

Students will demonstrate the ability to find mean, median, mode and range from a set of data.

Mathematical Process:
[C]: Communication: Students will communicate within their groups to find measures of central tendencies.

Essential Question:
What is the mean?
What is the mode?
What is the median?
What is the range?

First Nations Content

N/A

Assessment Evidence

Formative Assessments (Assessment for Learning):

Summative Assessments (Assessment of Learning):
Exit Slip

Materials

-tennis balls x5 (one for each group)
-golf balls x5 (one for each group)
-basketballs x5 (one for each group)
-Shot Put x5 (one for each group)
-wiffle balls x5 (one for each group)
-step stool
-gym stage
-table
-pen
-exit slip
-timers

Learning Plan

Learning Experiences & Instruction:

Engage:

Show students falling rock videos (The first one not timed, the second timed).
https://mrmeyer.com/threeacts/fallingrocks/
After showing the non-timed video, ask the students:
How far do you think the rock dropped? (This will be your hook)
How much time do you think it took for the rock to drop to the bottom of the chasm?
After receiving a few answers/predictions, show the students the timed video, then ask:
Were your predictions correct?
Now that the students know how long it took, give them the formula for solving distance and explain what each variable means as well as what g stands for.

d=1/2at^2, a = g =9.81

Allow students to work through and solve the question.
How did you find the answer?
Did everyone achieve the same answer?
Allow students to express their process of calculating the answer using the formula.

Explore/Explain:

Assign students in groups of 3-4. Students will conduct three trials of dropping each different type of ball (approximately 2 meters high) and record their findings on their individual chart chart.
Did any of the balls drop at the same time?
Did each group achieve the same time stamp when dropping the balls?
Did each group drop the balls at the same time?
Students will be asked to construct a data set using the different times that the balls drop.
Students will be asked to measure the time it takes for each different ball to drop in a set of three trials.
Using the fake data set (2,4,7,8,9) the teacher will explain how to find mean, median, and mode.
Students will then be asked to find the median, mean, mode, and range.
Students will explain how they found the mean, median, mode, and range with the use of their information on their tables from the trials.

Elaborate/Extend- Students will be asked to justify their reasoning for choosing certain numbers for the mean, median, and mode. (Bonus: Are there any outliers? What happens if you take them out?)

Evaluate- The class will have a group discussion based on the results of their charts along with calculating the mean, median, and mode.
Did each group achieve the same answer?
If not, why do the students think this is possible?
Does this mean some groups achieved a wrong answer?
Why can students achieve different answers yet still be correct?

Time (seconds)	Tennis Ball	Golf Ball	Basketball	Shot Put	Wiffle Ball
Height 1					
Height 2					
Height 3					

Exit Slip
Given the following data set:
3, 4, 7, 9, 13, 16, 23, 25, 27

1. a) Find the mean from this set of data.

   b) Find the median.

   c) Find the mode.

   d) Find the range.