**Ball Bounce**

**Observations:** Almost any material, when in the shape of a sphere, will bounce when dropped onto a firm surface. Some materials seem to bounce higher than others do. Many different questions can be asked about the height of the bounce of different materials. Some questions that might be asked: How high will a wooden sphere bounce? Will a steel ball bounce? Would it make any difference in the height a ball would bounce if one ball was solid and another was hollow?

**Question:** How high will a rubber-ball bounce when dropped from various heights?

**Hypothesis:** Make a prediction as to what you think will happen to the height of a bounce if a rubber-ball is dropped from different heights.

Dropped from 50 cm, I predict the bounce will \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Dropped from 100 cm, the bounce will \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Materials**- a meter stick, a rubber-ball, and a hard surface.

**Procedure:**

1. One person should drop the ball, and another person should observe how high the ball bounces.
2. Record your observations in the chart below. To be consistent always place the bottom of the ball at the level from which it is going to be dropped from. Then observe the height at which the bottom of the ball bounces. Be sure to drop the ball from the same place three times, and record the height of the bounce each time. Get an average bounce height by adding up each of these sets of numbers and dividing by three to get the average height of the bounce. (False data could show up if the ball was dropped only once from each level. This is because a person could make errors in the way the ball is released or the way the person observed the height. A set of three drops should reduce the effect of errors.)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Drop Height (cm) | Bounce Height (cm) | | | Average Bounce Height (cm) |
| 1 | 2 | 3 |
| 10 |  |  |  |  |
| 20 |  |  |  |  |
| 30 |  |  |  |  |
| 40 |  |  |  |  |
| 50 |  |  |  |  |
| 60 |  |  |  |  |
| 70 |  |  |  |  |
| 80 |  |  |  |  |
| 90 |  |  |  |  |
| 100 |  |  |  |  |

**Analysis:**

1. What was the independent variable?
2. What was the dependent variable?
3. What were your constants (controlled variables)?
4. Graph the average bounce height for the different drops.
5. Conclusion: How did your hypothesis compare to the pattern of different bounces? Can you determine a mathematical expression for the pattern?

The Effect of Ball Height on Bounce

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