

## Checkout Questions

### Lab 7. Mass and Free Fall

#### How Does Mass Affect the Amount of Time It Takes for an Object to Fall to the Ground?

1. A group of students is investigating the relationship between mass and the time it takes for an object to reach the ground. They have six different cubes. Each cube is the same size but a different mass. They label the cubes in order of their relative mass. Cube A is the heaviest and cube F is the lightest. They then drop each cube from a height of 5 meters and time how long it takes for each cube to hit the ground. Use Tables 1–3 to answer the question below.

Table 1	
Cube	Time (seconds)
A	1.3
B	1.2
C	1.1
D	1.0
E	0.9
F	0.8

Table 2	
Cube	Time (seconds)
A	1.0
B	1.1
C	1.0
D	0.9
E	1.0
F	1.0

Table 3	
Cube	Time (seconds)
A	0.8
B	0.9
C	1.0
D	1.1
E	1.2
F	1.3

Which table do you think best represents the data that the students would have collected?

- a. Table 1
- b. Table 2
- c. Table 3
- d. Unsure

How do you know?

2. "The force of gravitational attraction is directly dependent on the masses of both objects and inversely proportional to the square of the distance that separates their centers" is an example of a scientific theory.

- a. I agree with this statement.
- b. I disagree with this statement.

Explain your answer, using an example from your investigation about mass and free fall.

3. "It took the cube 1.1 seconds to reach the ground" is an example of evidence.

- a. I agree with this statement.
- b. I disagree with this statement.

Explain your answer, using an example from your investigation about mass and free fall.

4. Scientists often need to look for and understand the underlying cause of patterns in data. Explain why it is important to be able to identify and understand patterns in data in science, using an example from your investigation about mass and free fall.

5. Scientists often look for proportional relationships between quantities in science. Explain what proportional relationships are and why they are important in science, using an example from your investigation about mass and free fall.