Mass and Weight

Activity 1: Two Truths and a Lie

Question Group 1

Question 1

Consider the following three statements. Two are true and one is false. Identify the false statement.

The weight of an object is equal to its mass multiplied by the acceleration of gravity.
More massive objects experience a greater force of gravity than less massive objects.
The weight of an object on Earth is identical to the weight of the same object on the moon.

Question 2

Consider the following three statements. Two are true and one is false. Identify the false statement.

The weight of an object on Earth is identical to the weight of the same object on the moon.
The weight of an object is equal to its mass multiplied by the acceleration of gravity.
More massive objects experience a greater force of gravity than less massive objects.

Question 3

Consider the following three statements. Two are true and one is false. Identify the false statement.

More massive objects experience a greater force of gravity than less massive objects.
An object weighs differently on the moon as it does on Earth because its mass varies with location.
The weight of an object is equal to its mass multiplied by the acceleration of gravity.

Question Group 2

Question 4

Consider the following three statements. Two are true and one is false. Identify the false statement.

An object weighs differently on the moon as it does on Earth because its mass varies with location.
The kilogram is a unit of mass and the Newton is a unit of weight.
An object's weight is the force of gravity that acts upon it.

Question 5
Consider the following three statements. Two are true and one is false. Identify the false statement.

An object's weight is the force of gravity that acts upon it.
An object's mass is greater on the Earth than it is on the moon.
The kilogram is a unit of mass and the Newton is a unit of weight.

Question 6
Consider the following three statements. Two are true and one is false. Identify the false statement.

The kilogram is a unit of mass and the Newton is a unit of weight.
An object's weight is the force of gravity that acts upon it.
An object's mass is greater on the Earth than it is on the moon.

Question Group 3
Question 7
Consider the following three statements. Two are true and one is false. Identify the false statement.

The mass of an object on Earth is identical to the mass of the same object on the moon.
The weight of an object is equal to its mass multiplied by the force of gravity.
The weight of an object is equal to the force with which gravity pulls upon the object.

Question 8
Consider the following three statements. Two are true and one is false. Identify the false statement.

The weight of an object is equal to the force with which gravity pulls upon the object.
The mass of an object on Earth is identical to the mass of the same object on the moon.
The weight of an object is equal to its mass multiplied by the force of gravity.

Question 9
Consider the following three statements. Two are true and one is false. Identify the false statement.

The weight of an object is equal to its mass multiplied by the force of gravity.
The weight of an object is equal to the force with which gravity pulls upon the object.
The mass of an object on Earth is identical to the mass of the same object on the moon.

Question Group 4
Question 10
Consider the following three statements. Two are true and one is false. Identify the false statement.

An object's mass is the force of gravity that acts upon it.
An object would have the same mass on the moon as on Earth but would weight less on the moon.
An object would have a different weight on a different planet.

Question 11
Consider the following three statements. Two are true and one is false. Identify the false statement.

The same object would have a different weight on a different planet.
An object's mass is the force of gravity that acts upon it.
An object would have the same mass on the moon as on Earth but would weight less on the moon.

Question 12
Consider the following three statements. Two are true and one is false. Identify the false statement.

An object would have the same mass on the moon as on Earth but would weight less on the moon.
The same object would have a different weight on a different planet.
An object's mass is the force of gravity that acts upon it.

Activity 2: Calculate It!
Question Group 5
Question 13
What is the weight of a 32-kg child?

Question 14
What is the weight of a 38-kg child?

Question 15
What is the weight of a 44-kg child?

Question Group 6
Question 16
What is the weight of a 82-kg linebacker?

Question 17
What is the weight of a 98-kg lineman?

Question 18
What is the weight of a 76-kg halfback?

Question Group 7
Question 19
What is the mass of a student who weighs 524 Newton?

Question 20
What is the mass of a student who weighs 618 Newton?

Question 21
What is the mass of a student who weighs 582 Newton?

Question Group 8
Question 22
What is the mass of a table that weighs 441 Newton?

Question 23
What is the mass of a chair that weighs 118 Newton?

Question 24

What is the mass of a lab bench that weighs 825 Newton?

Activity 3: Out of This World
Question Group 9
Question 25
Complete the following table.

	Object	Mass (kg)	Location	Grav. Field Strength (N/kg)	Weight (N)
A	Astronaut	65	Earth	9.8	
B	Astronaut	65	Earth Orbit	9.5	
C	Melon	8.4	Earth	9.8	
D	Melon		Moon	1.7	
E	Hammer	5.2	Moon		
F	Hammer		Venus	8.8	
G	Astronaut	65	Venus		

Question 26
Complete the following table.

	Object	Mass (kg)	Location	Grav. Field Strength (N/kg)	Weight (N)
A	Astronaut	72	Earth	9.8	
B	Astronaut	72	Earth Orbit	9.5	
C	Melon	9.2	Earth	9.8	
D	Melon		Moon	1.7	
E	Hammer	4.8	Moon		
F	Hammer		Mars	3.8	
G	Astronaut	72	Mars		

Question 27
Complete the following table.

	Object	Mass (kg)	Location	Grav. Field Strength (N/kg)	Weight (N)
A	Astronaut	78	Earth	9.8	
B	Astronaut	78	Earth Orbit	9.5	
C	Melon	8.8	Earth	9.8	
D	Melon		Moon	1.7	
E	Hammer	3.9	Moon		
F	Hammer		Saturn	11.2	
G	Astronaut	78	Saturn		

Question 28
Complete the following table.

	Object	Mass (kg)	Location	Grav. Field Strength (N/kg)	Weight (N)
A	Astronaut	84	Earth	9.8	
B	Astronaut	84	Earth Orbit	9.5	
C	Melon	6.8	Earth	9.8	
D	Melon		Moon	1.7	
E	Hammer	5.9	Moon		
F	Hammer		Uranus	9.1	
G	Astronaut	84	Uranus		