

## ***InterActions* Unit 3 Chapter 2 Sample Quiz KEY**

**REMEMBER** exams are given for the last chapter in a unit. They are comprehensive. So practice taking the Unit 3 Chapter 1 quiz again along with this practice exam. This practice exam only asks questions about Unit 3 Chapter 2.

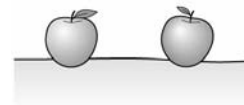
**Use your Scientists' Consensus Ideas sheets for assistance.**

1. The gravitational interaction is caused by

- a. Earth's magnetic field.
- b. Earth's rotation
- c. Earth's atmosphere.
- d. The interaction between two masses.

Gravitational interactions occur between any pair of masses. To answer this question you need to know what causes the gravitational interaction.

2. Two apples are sitting near each other on the ground. There is a gravitational interaction



- a. between the two apples that keeps them apart.
- b. between the two apples that causes them to move toward each other.
- c. between the two apples, but you don't notice it because it is so small.
- d. only between the earth and each apple. The apples do not have a gravitational interaction between them.

Every pair of masses interacts gravitationally. The interaction is so weak that at least one of the masses must be very, very large for the interaction to be noticeable unless you are doing a carefully designed experiment. To answer this question you need to know what causes the gravitational interaction.

3. Earth orbits the Sun because there is a

- a. gravitational pull from the Sun on the Earth. The Earth is pulled toward the Sun, rather than going off in a straight line.
- b. gravitational pull from the Sun on the Earth. The Sun pulls the Earth in the direction of the Earth's orbital path.
- c. gravitational push from the Sun on the Earth. The Sun pushes the Earth away so it does not crash into the Sun.
- d. strong magnetic interaction between the Sun and the Earth. The gravitational interaction between the Sun and the Earth is small.

Planetary orbits are caused by the gravitational interaction between the Sun and the planet. The Sun pulls the planet inward. To answer this question you need to know about orbits and the gravitational interaction.

4. Weight is another word for

- a. the force exerted by a planet on an object
- b. the mass of an object
- c. the density of an object
- d. the interaction between an object and the a planet's rotation.

This question asks you for a definition. See the Glossary for assistance

5. Imagine you throw a ball up in the air. Assume there is no drag interaction. As the ball moves upward there

- a. is a downward force exerted on the ball by the Earth.
- b. is an upward force exerted on the ball by the Earth.
- c. is the upward force from the hand even though are no longer touching.
- d. are no forces acting on the ball.



The gravitational force exerted by the Earth on an object is always toward the Earth's center. To answer this question you need to know the direction of a gravitational force.

6. Imagine you throw a ball up in the air. Assume there is no drag interaction. As the ball moves upward

- a. it speeds up.
- b. it slows down.
- c. it moves with a constant speed.
- d. its speed cannot be described without more information.

As the ball moves upward the only force on it is the downward force exerted by the Earth on the ball. To answer this question you need to know the direction of the gravitational force.

7. The variables that affect the gravitational interaction between two objects are:

- a. masses and directions of motions of the objects
- b. masses and speeds of the objects
- c. masses and distance between the objects
- d. distance between and directions of motions of the objects
- e. distance between and speeds of the objects

To answer this question you need to know the variables that affect the gravitational interaction.

8. As a space ship of constant mass moves farther away from Earth, the strength of the gravitational interaction between the Earth and the space craft

- a. increases.
- b. decreases
- c. stays the same.
- d. there is not enough information to answer.

The longer the distance between two objects the smaller the strength of the gravitational interaction between the objects. To answer this question you need to know how gravitational strength depends on distance.

9. A flat sheet of paper is dropped from the top of a building. Assume the force exerted on the paper by the Earth is the same strength as the force from the drag interaction. The paper
- a. slows down.
  - b. speeds up.
  - c. starts slowing to a stop.
  - d. moves at a constant speed.

Because the downward gravitational force and the upward drag force exerted on the paper are balanced, the paper moves at a constant speed. To answer this question you need to know the directions of the gravitational force and the drag force exerted on the paper.

10. You throw a ball up in the air. Neglect the drag interaction. As the ball is coming down it
- a. slows down.
  - b. speeds up.
  - c. starts slowing to a stop.
  - d. moves at a constant speed.

The only force on the ball is the downward gravitational force exerted by the Earth on the ball. Since this unbalanced force is in the direction of motion, the ball speeds up. To answer this question you need to know the direction of the gravitational force.

11. A light year is

- a. the amount of light that strikes Earth in a year .
- b. the amount of light the sun gives off in a year.
- c. the distance light travels in a year.

To answer this question you need to know the definition of a light year. See the Glossary for assistance.

12. You put a block in a tank of water. The density of the block is greater than the density of water. The block will

- a. float .
- b. sink.
- c. Remain where you put it.

When the density of an object is greater than the density of the liquid it is placed in, the object sinks because the upward buoyant force is less than the downward gravitational force exerted on the object. To answer this question you need to know how about the buoyant force.

13. During class, the teacher stood up on the table and began to sing. What force balances the teacher's weight and prevents the teacher from crashing through the table?

- a. Gravitational force.
- b. Compression force.
- c. Buoyant force.
- d. Friction force.

A compression force exerted by the table onto the teacher balances the gravitational force exerted by the Earth on the teacher (the teacher's weight). To answer this test question you need to know how to identify a compression force.

14. Consider three cubes made of ironwood (a reddish hardwood with density =  $1.22 \text{ g/cm}^3$ ), coal (density =  $1.35 \text{ g/cm}^3$ ), and ebony (a black hardwood with density =  $1.10 \text{ g/cm}^3$ ). In which liquid would all three cubes sink to the bottom?

- a. Corn syrup (density =  $1.38 \text{ g/cm}^3$ ).
- b. Milk (density =  $1.03 \text{ g/cm}^3$ ).
- c. Salt water (density =  $1.20 \text{ g/cm}^3$ ).
- d. Ethyl alcohol (density =  $0.79 \text{ g/cm}^3$ ).

Objects denser than the liquid you place them in sink. To answer this question you need to know about buoyancy.

15. Bob places a box of his favorite coins on the middle shelf of his book shelf. How could Bob increase the potential energy of his box of coins?

- a. By putting more coins in the box or moving it to a higher shelf.
- b. By taking coins out of the box or moving it to a higher shelf.
- c. By putting coins in the box or moving it to a lower shelf.
- d. By taking coins out of the box or moving it to a lower shelf

The gravitational potential energy is increased when the object is higher up or has more mass. To answer this question you need to know about potential energy.

16. What type of object can be described as an icy rocky body found mainly beyond the orbit of Neptune?

- a. Satellite
- b. Meteor
- c. Kuiper Belt Object
- d. Asteroid

To answer this question you need to know about objects in our solar system.