

CHAPTER

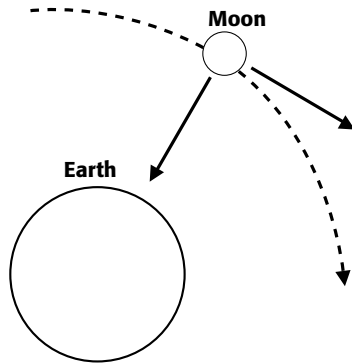
23

TEKS/TAKS TEST PREPARATION FOR SCIENCE

Practice Test A 

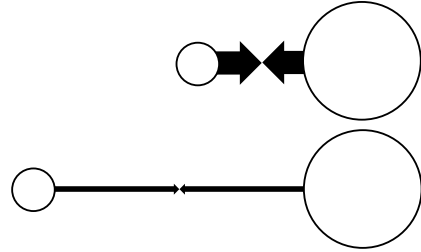
- 1** In a stable nebula, which two opposing forces are balanced?
- A** Gravity and pressure
 - B** Gravity and magnetism
 - C** Magnetism and pressure
 - D** Velocity and inertia

- 2** The diagram below was drawn during a study of the moon’s orbit. Which statement best describes the diagram?



- F** Orbits are straight lines.
- G** The force of gravity does not affect orbits.
- H** Orbits result from a combination of gravitational attraction and inertia.
- J** If the moon were not moving forward, it would fly off into space.

- 3** The diagram below was drawn during a study of the relationship between gravitational attraction and distance. Which statement best describes the diagram?



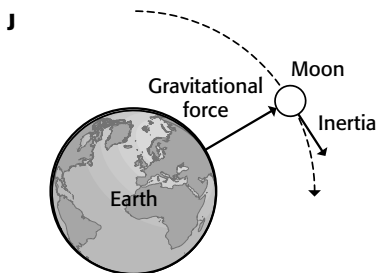
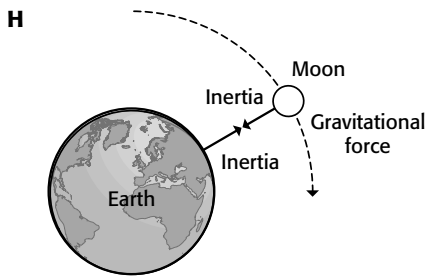
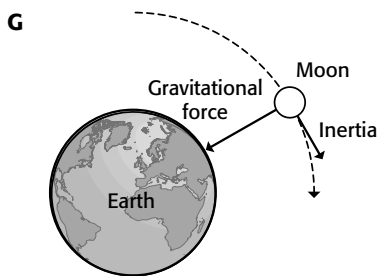
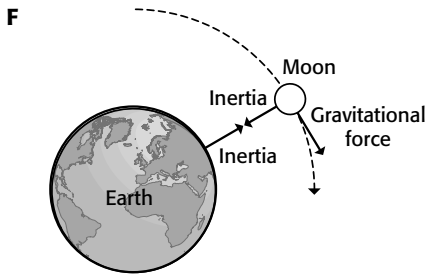
- A** As objects are moved closer together, gravitational attraction increases.
 - B** As objects are moved closer together, gravitational attraction decreases.
 - C** The distance between objects does not affect gravitational attraction.
 - D** Gravitational attraction causes objects to move farther apart.
- 4** Organisms such as plants make their food using photosynthesis. What is the source of energy in this process?
- F** Oxygen
 - G** Sunlight
 - H** Earth’s core
 - J** Nitrogen

CHAPTER

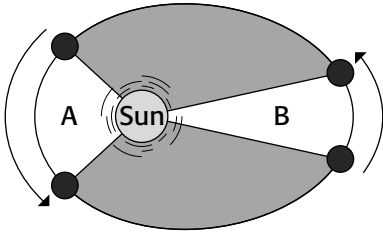
23 TEKS/TAKS TEST PREPARATION FOR SCIENCE

Practice Test B 

- 1** In a stable nebula, which of the following best describes the opposing forces involved?
- A** Gravity pulls particles together; pressure pulls particles together.
 - B** Pressure pulls particles together; gravity pushes particles apart.
 - C** Gravity pulls particles together; pressure pushes particles apart.
 - D** Gravity pulls particles together; inertia forces particles apart.
- 2** As part of a field investigation, student groups produced the following illustrations depicting the moon's inertia and the gravitational forces acting on the moon and Earth. Which illustration is correct?



Chapter 23 Practice Test B, continued



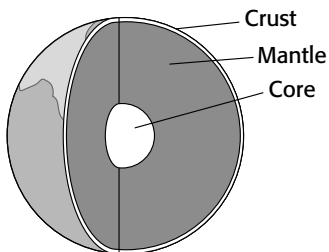
- 3** In the illustration above, area A is equal to area B because the planet moves with a greater speed around area A than it does around area B. Which of the following scientists developed this law of motion that describes planetary orbits?
- A** Tycho Brahe
 - B** Johannes Kepler
 - C** Galileo Galilei
 - D** Isaac Newton
- 4** A student swings a ball attached to a string in a circle to model the moon's orbit around Earth. What force does the string represent?
- F** Inertia
 - G** Pressure
 - H** Gravity
 - J** Momentum
- 5** One of Newton's laws states that an object traveling at a constant speed in a specific direction will continue to do so unless an unbalanced force acts on it. The moon orbits Earth because
- A** no unbalanced force acts on it.
 - B** an unbalanced gravitational force constantly pulls the moon toward Earth.
 - C** circular forces act on it.
 - D** inertia pulls the moon toward Earth.
- 6** If there were absolutely no gravitational force acting on the moon,
- F** the moon would quickly crash into Earth.
 - G** it would continue at a constant speed in a straight line through space.
 - H** the moon would still orbit Earth as it does now.
 - J** the moon would have no inertia and thus would remain stationary, at a fixed distance from Earth.

Chapter 23 Practice Test B, continued

Data for the Inner Planets			
Planet	Period of rotation (Earth days)	Average distance from sun (km)	Period of revolution (Earth years)
Mercury	59	58,000,000	0.24
Venus	243	108,000,000	0.62
Earth	1	150,000,000	1
Mars	1.03	228,000,000	1.9

7 Neil made the table above to summarize data on the inner planets for a field investigation report he was preparing. Based on the data in Neil's table, which of the following is a valid conclusion?

- A** In general, as average distance from the sun increases, period of rotation increases.
- B** In general, as average distance from the sun increases, period of revolution increases.
- C** In general, as average distance from the sun increases, period of rotation decreases.
- D** Period of rotation is directly related to the average distance from the sun.



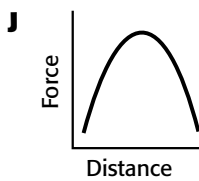
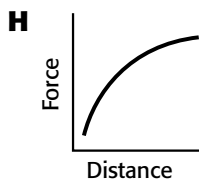
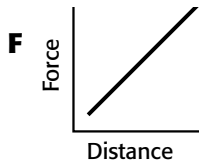
8 Pam made the sketch of Earth's layers shown above as part of a field investigation on the formation of Earth. What is the most likely location of the densest elements?

- F** Dense elements are equally abundant in all layers.
 - G** Crust
 - H** Mantle
 - J** Core
- 9** Based on Pam's sketch, which of the following is NOT a valid conclusion?
- A** The crust is Earth's thickest layer.
 - B** Earth is composed of three distinct layers.
 - C** The mantle is between the crust and the core.
 - D** The crust is the outermost layer.

Chapter 23 Practice Test B, continued

Gravitational Force Versus Distance Data	
Distance (meters)	Force (Newtons)
1.0	4.00
2.0	1.00
4.0	0.250
8.0	0.0625

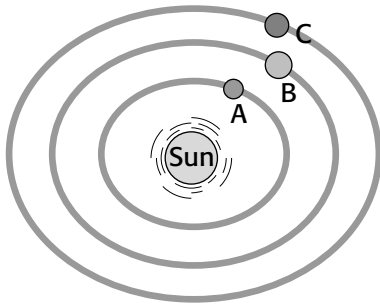
10 A scientist made the table above to summarize the results of careful measurements made during a laboratory experiment. The table shows the force of gravitational attraction between two masses at varying distances. Which of the following graphs best fits the data given in the table above?



11 Based on the data given in the table above, which of the following is a valid conclusion?

- A** As the distance doubles, the gravitational attraction increases by a factor of four.
- B** As the distance increases, the gravitational attraction increases.
- C** Gravitational attraction decreases with decreasing distance.
- D** As the distance doubles, the gravitational attraction decreases by a factor of four.

Chapter 23 Practice Test B, continued



- 12** Claire made the model above of a theoretical solar system. Which planet in the solar system would take the longest time to complete a revolution around the sun?
- F** Planet A
 - G** Planet B
 - H** Planet C
 - J** Planets B and C
- 13** Which of the following scientists proposed that the moon orbits Earth because of the combined effects of gravity and inertia?
- A** Tycho Brahe
 - B** Johannes Kepler
 - C** Galileo Galilei
 - D** Isaac Newton
- 14** How has photosynthesis changed Earth's atmosphere?
- F** Plants take oxygen from the atmosphere to use during photosynthesis. The chemical reaction that occurs during photosynthesis produces carbon dioxide, which plants then release into the atmosphere.
 - G** Plants take carbon dioxide from the atmosphere to use during photosynthesis. The chemical reaction that occurs during photosynthesis produces oxygen, which plants then release into the atmosphere.
 - H** Plants take nitrogen from the atmosphere to use during photosynthesis. The chemical reaction that occurs during photosynthesis produces oxygen, which plants then release into the atmosphere.
 - J** Plants take carbon dioxide from the atmosphere to use during photosynthesis. The chemical reaction that occurs during photosynthesis produces nitrogen, which plants then release into the atmosphere.

Answer Key and TAKS Doctor for Practice Test A

Answers	TEKS Correlation	TAKS Objectives
1 A	7.5A	
2 H	7.2C	1
3 A	7.2C	1
4 G	7.8B	3



The following TAKS questions have been diagnosed by the TAKS Doctor. Find out what might be causing your “ailing” answers. The TAKS Doctor will see you now!

Item 3 asks students to choose which statement best describes the diagram.

- A Correct.** Gravitational attraction increases as distance decreases.
- B Incorrect.** Gravitational attraction does not decrease as distance decreases.
- C Incorrect.** Gravitational attraction is affected by distance.
- D Incorrect.** Gravitational attraction does not cause objects to move farther apart.

Item 4 asks students to identify the source of energy in photosynthesis.

- F Incorrect.** Oxygen is produced by plants during photosynthesis.
- G Correct.** Sunlight is the source of energy in photosynthesis.
- H Incorrect.** The Earth’s core is not a source of energy for photosynthesis.
- J Incorrect.** Nitrogen is not a source of energy for photosynthesis.

Answer Key and TAKS Doctor for Practice Test B

Answers	TEKS Correlation	TAKS Objectives	Answers	TEKS Correlation	TAKS Objectives
1 C	7.5A		11 D	7.2D	1
2 G	7.2E		12 H	7.3C	1
3 B	7.3E	1	13 D	7.3E	1
4 H	7.3C	1	14 G	7.8B	3
5 B	7.6B	5			
6 G	7.6B	5			
7 B	7.2D	1			
8 J	7.2C	1			
9 A	7.2D	1			
10 G	7.2E				



The following TAKS questions have been diagnosed by the TAKS Doctor. Find out what might be causing your “ailing” answers. The TAKS Doctor will see you now!

Item 1 asks students to describe the opposing forces acting on a stable nebula.

- A Incorrect.** Gravity is a force that pulls particles together. The pressure in a nebula, which is caused by the kinetic energy of the particles, pushes the particles apart.
- B Incorrect.** The pressure of the particles in a nebula pushes the particles apart, and gravity pulls the particles together.
- C Correct.** Gravity is a force that acts to pull particles together. The pressure in a nebula, which is caused by the kinetic energy of the particles, pushes the particles apart.
- D Incorrect.** Inertia is the tendency for an object to resist change in motion unless acted on by force; inertia does not force the particles in a nebula apart.

Item 2 asks students to analyze four sketches depicting the inertial and gravitational forces acting on the moon and Earth and identify which of the sketches is correct.

- F Incorrect.** All of the inertial and gravitational forces shown in this sketch are incorrect. The arrows labeled “Inertia” should be labeled “Gravitational force,” and the arrow labeled “Gravitational force” should be labeled “Inertia.”
- G Correct.** The moon’s inertia and the gravitational force acting from the moon toward Earth are correct.
- H Incorrect.** The arrows labeled “Inertia” should be labeled “Gravitational force,” and the arrow labeled “Gravitational force” is actually the moon’s resulting orbit. Inertia is not represented in this diagram
- J Incorrect.** The arrow that indicates the gravitational force between the moon and Earth is pointing in the wrong direction. The moon is pulled toward Earth.



Item 4 asks students to analyze a simple model of orbital motion in which a ball attached to a string is swung in a circle and determine what force is represented by the string.

- F Incorrect.** The string does not represent the inertia of the ball. The inertia of the ball acts tangentially to the string and acts to maintain the ball's motion along a straight path.
- G Incorrect.** An orbital system is not affected by pressure. The string does not represent pressure.
- H Correct.** Gravitational force from Earth pulls the moon into orbit around Earth. In this model, the string represents this gravitational force.
- J Incorrect.** The orbiting moon does have momentum, but the momentum acts tangentially to the string. The string does not represent the moon's momentum.

Item 6 asks students to demonstrate that an object will move at a constant speed and in a straight line if it is not subjected to an unbalanced force.

- F Incorrect.** Gravitational forces pull objects together. If there were no gravitational force acting on the moon, it would not be pulled toward Earth, and thus, the moon would not collide with Earth.
- G Correct.** The gravitational force acting on the moon pulls the moon into an orbit around Earth. Without this force acting on the moon, the moon would simply continue along a straight path through space.
- H Incorrect.** The gravitational force acting on the moon pulls the moon into an orbit around Earth. Without this force acting on the moon, the moon would not continue to orbit Earth.
- J Incorrect.** Because the moon is moving, it has inertia. The moon would still have inertia even if there were no gravitational force acting on the moon. The moon's inertia would cause the moon to travel at a constant speed in a straight line through space until it is acted upon by an unbalanced force. The moon would not become a stationary object at a fixed distance from Earth.

Item 7 asks students to analyze and determine which of a series of statements is a valid conclusion.

- A Incorrect.** As the average distance from the sun increases, the period of rotation does not, in general, increase. In fact, there is no general pattern in the period of rotation as a function of distance from the sun.
- B Correct.** As the average distance from the sun increases, the period of revolution increases. For example, Mercury, at a distance of 58 million miles has a period of revolution of one-quarter of an Earth year, while Venus, at a distance of 108 million miles has a period of revolution of three-fifths of an Earth year.
- C Incorrect.** As the average distance from the sun increases, the period of rotation does not, in general, decrease. In fact, there is no general pattern in the period of rotation as a function of distance from the sun.
- D Incorrect.** There is no general pattern in the period of rotation as a function of the average distance from the sun.

Item 9 asks students to analyze a sketch depicting Earth's layers and determine which of a series of statements is not a valid conclusion.

- A Correct.** The crust is Earth's thinnest layer, not the thickest.
- B Incorrect.** According to the sketch, Earth is comprised of three distinct layers: the crust, the mantle, and the core.
- C Incorrect.** The crust is the outermost layer, and the core is the centermost layer. The mantle is between these two layers.
- D Incorrect.** The crust, which is Earth's thinnest layer, is also the outermost layer.

Item 11 asks students to analyze data from an experiment and determine which of a series of statements is a valid conclusion.

- A Incorrect.** As the distance doubles, the gravitational force does not increase by a factor of four. The data shows that at 1.0 m the force is 4.00 N, but at 2.0 m the force is 1.00 N, not 16.0 N.
- B Incorrect.** As the distance increases the gravitational force decreases, it does not increase.
- C Incorrect.** As the distance decreases, the gravitational force increases, it does not decrease.
- D Correct.** As the distance doubles, the gravitational force decreases by a factor of four. The data shows that at 1.0 m the force is 4.00 N, and at 2.0 m the force is only one-fourth as much, or 1.00 N.