PHYSICAL SCIENCE

2005 – 2008

Benchmarks

A. Describe that matter is made of minute particles called atoms and atoms are comprised of even smaller components. Explain the structure and properties of atoms.

B. Explain how atoms react with each other to form other substances and how molecules react with each other or other atoms to form even different substances.

C. Describe the identifiable physical properties of substances (e.g., color, hardness, conductivity, density, concentration and ductility). Explain how changes in these properties can occur without changing the chemical nature of the substance.

D. Explain the movement of objects by applying Newton's three laws of motion.

E. Demonstrate that energy can be considered to be either kinetic (motion) or potential (stored).

F. Explain how energy may change form or be redistributed but the total quantity of energy is conserved.

G. Demonstrate that waves (e.g., sound, seismic, water and light) have energy and waves can transfer energy when they interact with matter.

H. Trace the historical development of scientific theories and ideas, and describe emerging issues in the study of physical sciences.

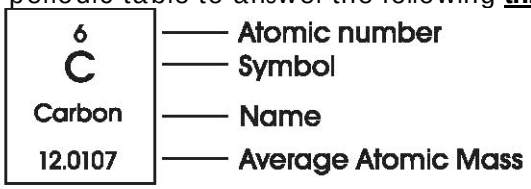
Multiple Choice

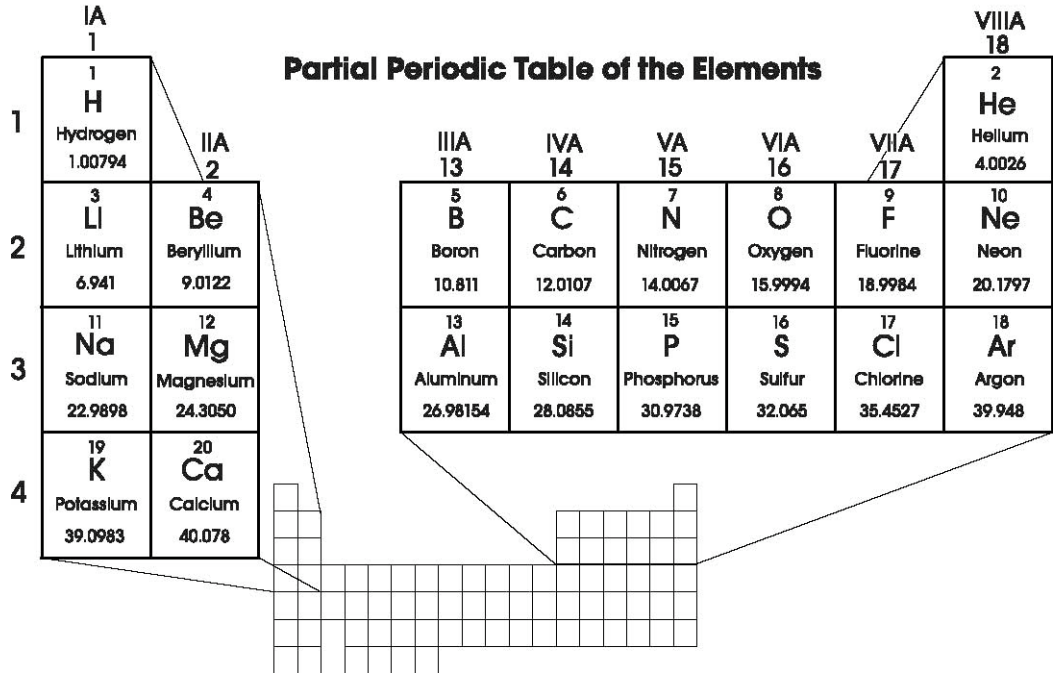
Identify the choice that best completes the statement or answers the question.

Physical Science Benchmark A

Describe that matter is made of minute particles called atoms and atoms are comprised of even smaller components. Explain the structure and properties of atoms.

Use the partial periodic table to answer the following **three** questions.





1. Suppose scientists discovered four new elements (W, X, Y, Z) while studying rock and soil samples brought back from a Mars mission. Which Lewis dot structure represents an element that should be placed in column VIIA (17) of the periodic table?

A) 

B) 

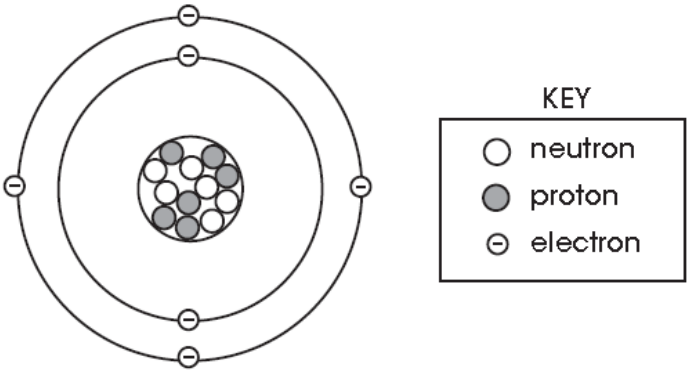
C) 

D) 

2. A neutral atom of silicon has
   A) 12 electrons.
   B) 13 electrons.
   C) 14 electrons.
   D) 15 electrons.

3. Use the graphic below to answer the question:

Shell Model



A)

6
C
Carbon
12.0107

B)

9
F
Fluorine
18.9984

C)

12
Mg
Magnesium
24.3050

D)

11
Na
Sodium
22.9898

Physical Science Benchmark B

Explain how atoms react with each other to form other substances and how molecules react with each other or other atoms to form even different substances.

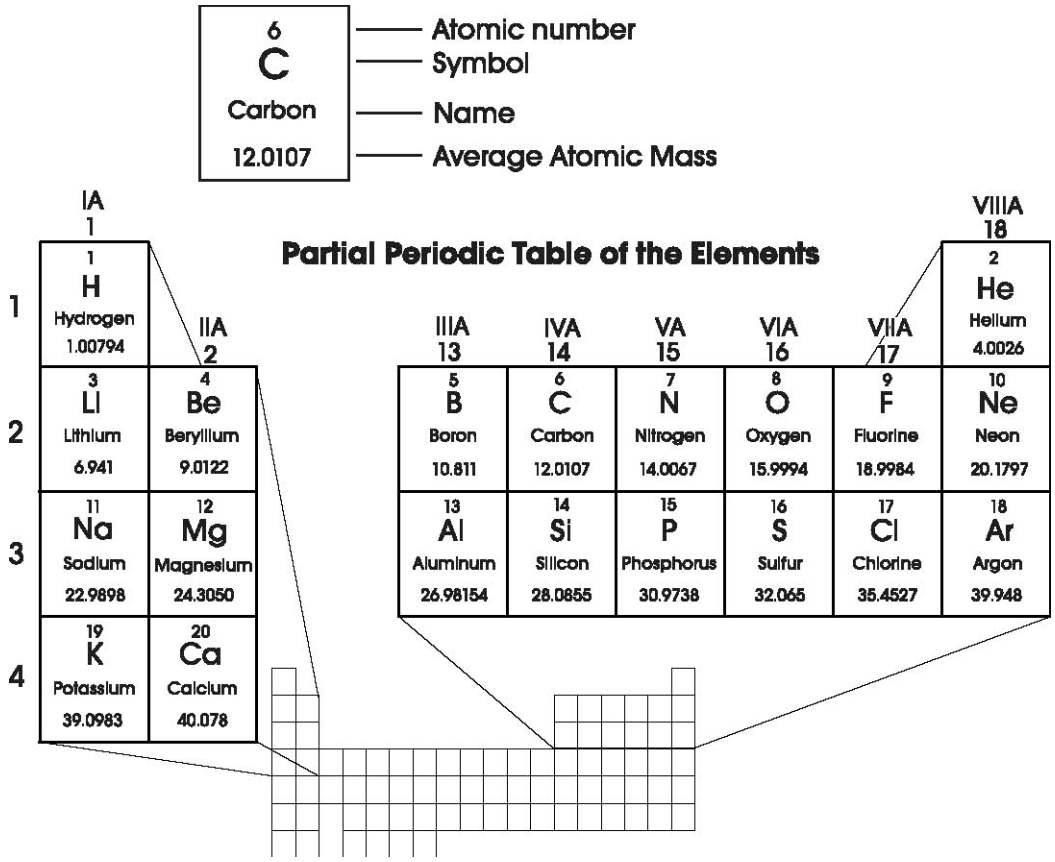
4. When methane (CH_4) is burned in the presence of oxygen (O_2), the two chemicals react together in a process called combustion.
Which of these compounds could be a possible product of this combustion reaction?
A) NH_3
B) SO_2
C) H_2O
D) CS_2

5. W reacts with X in the equation below.

$W + X \rightarrow Y + Z$

According to the law of conservation of mass, how many grams of W must react completely with 225 grams of X to result in 375 grams of product?
A) 150 grams
B) 225 grams
C) 375 grams
D) 600 grams

6. Use the partial periodic table to answer the question below.



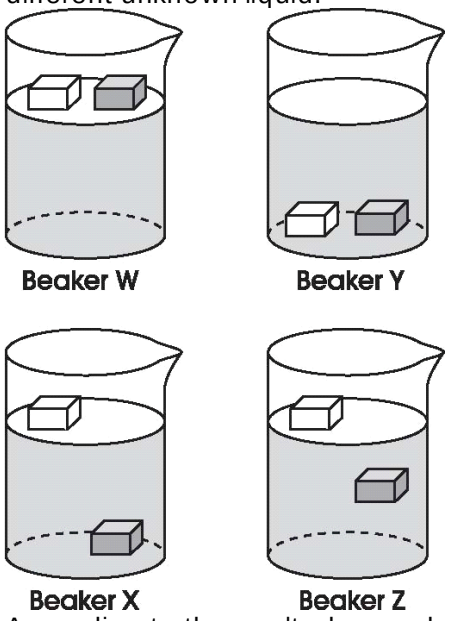
Would you normally expect neon (Ne) to form compounds?

A) Yes, but neon is a rare gas and difficult to obtain.
B) No, neon needs six electrons to fill its outermost level.
C) Yes, neon needs six electrons to fill its outermost level.
D) No, neon has eight electrons in its outermost level and is stable.

Physical Science Benchmark C

Describe the identifiable physical properties of substances (e.g., color, hardness, conductivity, density, concentration and ductility). Explain how changes in these properties can occur without changing the chemical nature of the substance.

7. Gertrude cut two bars of different types of soap into four pieces each. She put one piece from each bar into each of four beakers, labeled Beaker W, Beaker X, Beaker Y and Beaker Z. Each beaker contained a different unknown liquid.



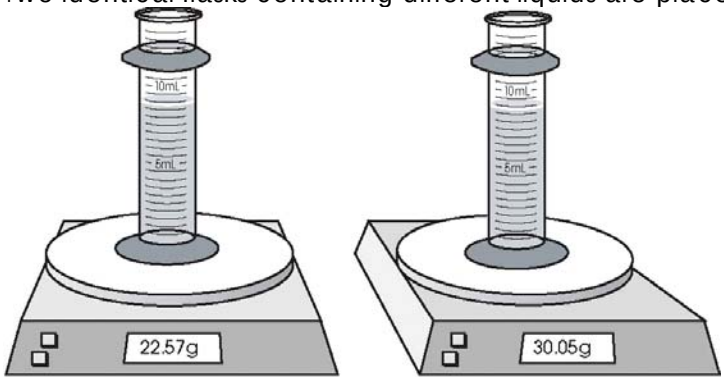
According to the results shown above, which beaker contained the liquid that was densest?

A) Beaker W
B) Beaker X
C) Beaker Y
D) Beaker Z

8. At 25°C, water has a density of 1.0 g/mL and vegetable oil has a density of 0.90 g/mL.
How would a substance with a density of 0.95 g/mL behave when placed in both oil and water?

A) sink in both oil and water
B) sink in oil and float on water
C) float on oil and sink in water
D) float on both oil and water

9. Two identical flasks containing different liquids are placed on identical balances.



Based only on what you can observe from the picture, what property differs between the two liquids?

A) density
B) volume
C) alkalinity
D) conductivity

10. Antoine Lavoisier developed a model of an acid from which he concluded that acids were oxygen-containing binary compounds. Later, Davy and Gay-Lussac demonstrated that hydrogen was the essential element in acids. This example from history shows that Lavoisier's model
    A) did not take into account the correct charge on hydrogen ions.
    B) was a failure, since bases, not acids, are able to contain oxygen.
    C) was rejected as more information was collected.
    D) was a mere hypothesis with no data to support it.

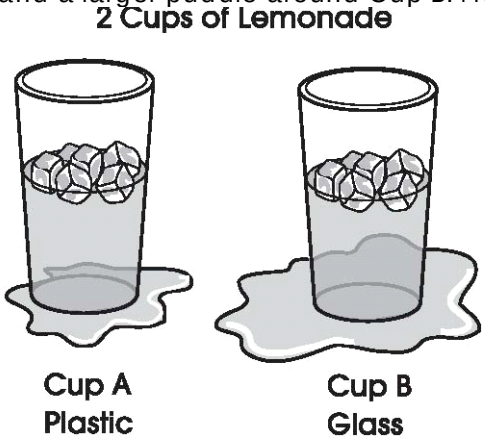
11. A student is testing the conductivity of two solid substances.
    Substance A has high conductivity and **substance B** has low conductivity.
    Based on this information, what must be true regarding these two substances?
    A) Electrons in substance A are able to move more easily than electrons in substance B.
    B) There is more energy stored in chemical bonds in substance A than there is in substance B.
    C) The atomic nuclei in substance A have more mass than the atomic nuclei in substance B.
    D) Substance A contains a higher percentage of radioactive atoms than does substance B.

12. A metal that can be hammered out or rolled into thin sheets is best described as
    A) brittle.
    B) ductile.
    C) reactive.
    D) malleable.

Use the information to answer the next **two** questions.

Lemonade

On a humid summer day, Franklin put six ice cubes into each of two cups and then poured the same amount of lemonade into each cup. Cup A was made of plastic, and Cup B was made of glass. He left the cups for about 20 minutes and then came back. He found a small puddle of water around Cup A and a larger puddle around Cup B. Franklin determined that the cups were not leaking.



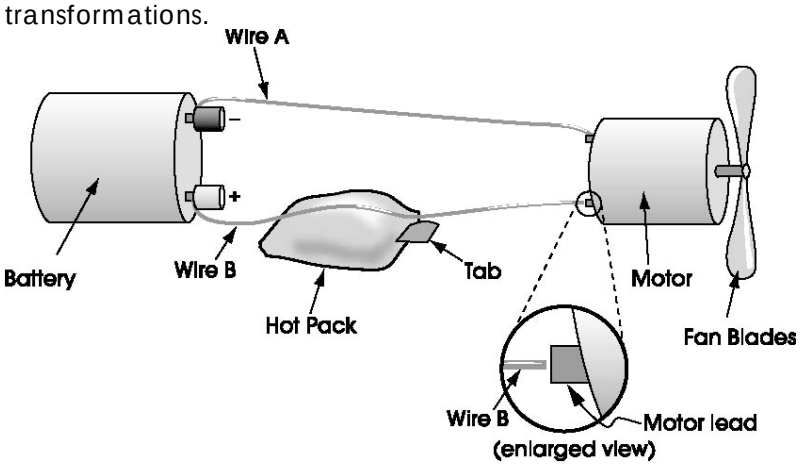
13. Which is the best explanation for the small puddle around Cup A and the larger puddle around Cup B?
    A) Cup A contained more ice than Cup B.
    B) Cup A was a better insulator than Cup B.
    C) Cup A had a greater volume of lemonade than Cup B.
    D) The contents of Cup A were initially colder than the contents of Cup B.

14. Suppose Franklin had a third cup, made of Styrofoam, to which he added the same number of ice cubes and the same amount of lemonade. What would Franklin expect to observe after 20 minutes?
    A) The Styrofoam cup would have a smaller puddle than either the glass or plastic cup.
    B) The Styrofoam cup would have a larger puddle than either the glass or plastic cup.
    C) The Styrofoam cup would have a puddle exactly the same size as the plastic cup.
    D) The Styrofoam cup would have a larger puddle than the plastic cup but a smaller puddle than the glass cup.

Physical Science Benchmark B, C, D and F

Use the information to answer the next **two** questions that follow.

For a science fair project, a student has built the following apparatus to demonstrate energy transformations.



The battery is made from a zinc-containing paste which releases electrons and a mercury compound which accepts electrons. Because these substances are separated, electron flow occurs only when the battery is part of a complete circuit.

The hot pack is a sealed plastic bag. Water and calcium chloride ($CaCl_2$) are stored separately inside the bag. When the tab is pulled, the $CaCl_2$ mixes with the water and dissolves. This dissolving process is highly exothermic.

Wire B is in physical contact with the outside of the hot pack. Wire B is very close to the motor lead, but does not quite touch it (open gap seen in enlarged view).

Before the student pulls the hot pack tab, the motor is inactive. Once the tab is pulled, the temperature of the hot pack increases and thermal energy is transferred to wire B. The wire expands, making contact with the motor lead (closes the gap seen in enlarged view). The motor becomes active and the fan begins to rotate, creating a breeze.

15. (Benchmark B)
    What changes in the hot pack over the course of the demonstration?
    A) total mass
    B) number of protons
    C) number of atomic nuclei
    D) amount of thermal energy

16. (Benchmark C)
    Electrons in the wire cannot flow into the hot pack because
    A) only positive charges flow through wire B.
    B) hot pack atoms have higher kinetic energies.
    C) the plastic bag has low electrical conductivity.
    D) the hot pack does not contain an electrolyte solution.

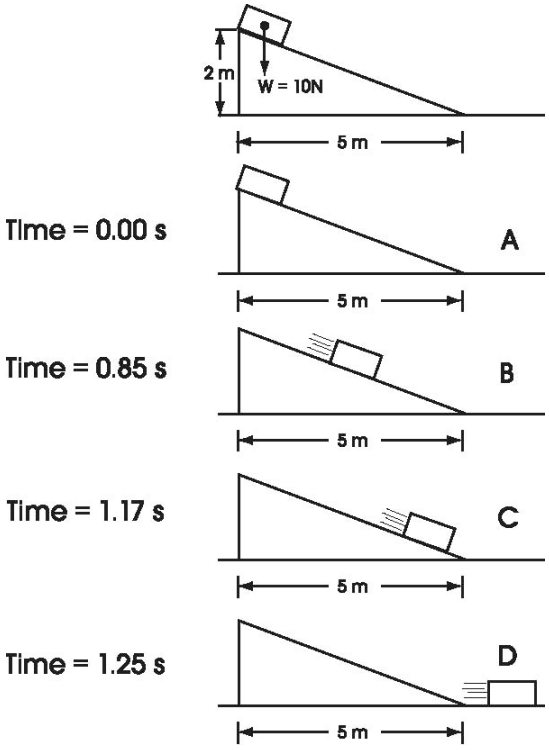
17. (Benchmark D)
Assume that the electric circuit remains complete. Which change in the system would cause a slower rotation within the motor?
A) reducing friction in the motor
B) decreasing the length of wire B
C) increasing the size of the fan blades
D) reversing the direction of current flow in the circuit

18. (Benchmark F)
The energy conducted through the circuit will cease at some time after the
A) hot pack stops conducting electricity.
B) chemical reaction in the hot pack ends.
C) fan blades are disconnected from the motor.
D) mercury in the battery begins releasing electrons.

Physical Science Benchmarks D, E, and F
Use the following information to answer the next **three** questions.

Inclined Plane Experiment

In doing the following inclined plane experiment in "ideal conditions," students assume that friction from the air, incline or floor is negligible. A stationary box at the top of a frictionless incline is released and is allowed to slide to the bottom. The figure below illustrates the box in four positions labeled A through D as it is sliding from the incline onto the level floor. As the box moves from the bottom of the incline to the floor, students assume that the box experiences no change in speed, only a change in direction.



19. (Benchmark D)
The weight of the box used in the experiment is 10 Newtons (N) as illustrated in the figure. The weight of the box is a measure of the
A) velocity of the box while sliding.
B) friction between the air and the box.
C) kinetic energy at the top of the incline.
D) force acting on the box due to gravity.

20. (Benchmark E)
At what time does the box have the greatest kinetic energy?
A) 0.00 s
B) 0.85 s
C) 1.17 s
D) 1.25 s

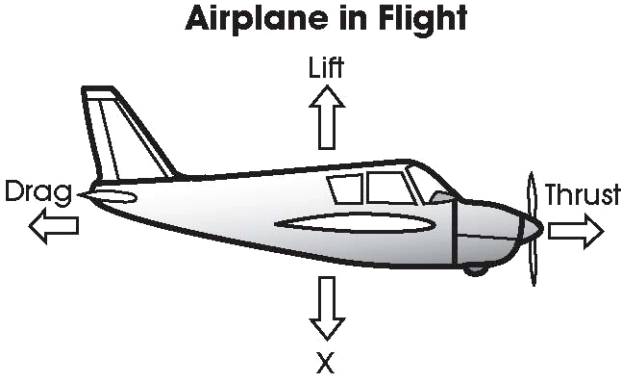
21. (Benchmark E)
Where is the potential energy of the box greatest?
A) The potential energy is constant throughout the motion.
B) The potential energy is greatest at the top of the incline.
C) The potential energy is greatest midway along the incline.
D) The potential energy is greatest at the bottom of the incline.

22. (Benchmark F)
The total energy of the box is
A) always the same.
B) negative at point D.
C) increasing with time.
D) zero before the box is released.

Physical Science Benchmark D
Explain the movement of objects by applying Newton's three laws of motion.

23. When dropped from the same height, why does a flat sheet of paper fall more slowly than the same sheet when it is tightly crumpled into a ball?
A) The sheet of paper has less mass when it is flat than it does when it is crumpled.
B) The sheet of paper weighs less when it is flat than it does when it is crumpled.
C) The force of gravity has a greater effect on the crumpled paper than it does on the flat paper.
D) The flat sheet of paper has greater surface area and encounters more air resistance than when it is crumpled.

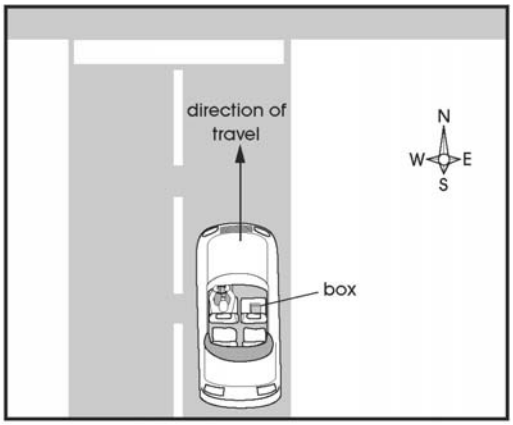
24. The picture below shows the four major forces acting on an airplane in flight.



What causes the force indicated by the X?
A) gravity
B) air friction
C) magnetic force
D) force exerted by the engine

25. A teacher dropped one light ball and one heavy ball simultaneously from the roof of a school building. Both balls struck the ground at the same time.
The students correctly concluded from this experiment that falling objects
A) lose mass as they fall.
B) are influenced by the height of the building.
C) do not accelerate under the influence of gravitational force.
D) accelerate at the same rate, regardless of mass, due to the force of gravity.

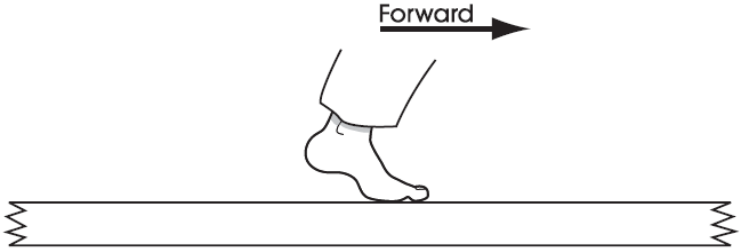
26. A driver is headed north at 50 km/hr. A box is sitting on the seat next to him.



What action by the driver would most likely cause him to observe the box appear to slide to the west?

A) applying the brakes
B) speeding up to 60 km/hr
C) making a turn to the east
D) making a turn to the west

27. Use the picture to answer the question below.



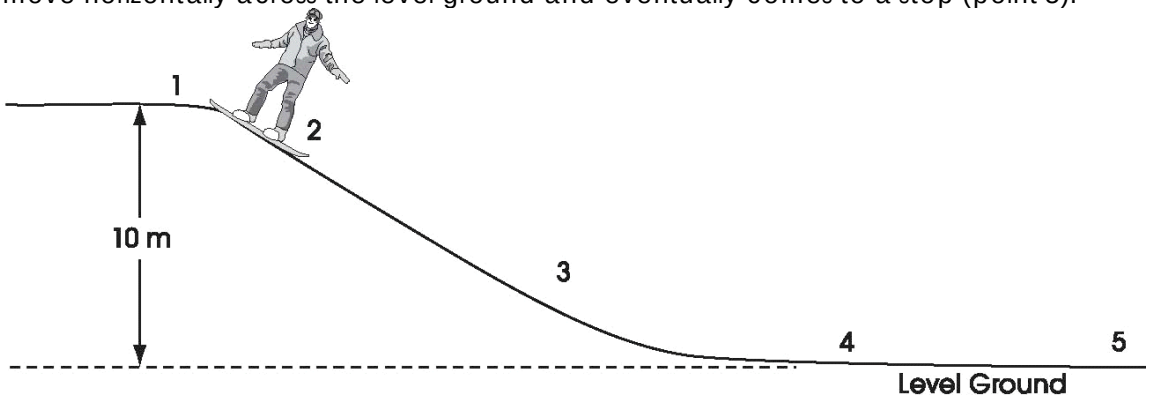
Which statement accurately describes the interaction between the foot and sidewalk as a person moves forward along the sidewalk in the direction of the arrow?

A) The foot pushes forward on the sidewalk; the sidewalk does not push forward on the foot.
B) The foot pushes forward on the sidewalk; the sidewalk pushes forward on the foot.
C) The foot pushes backward on the sidewalk; the sidewalk pushes forward on the foot.
D) The foot pushes backward on the sidewalk; the sidewalk pushes backward on the foot.

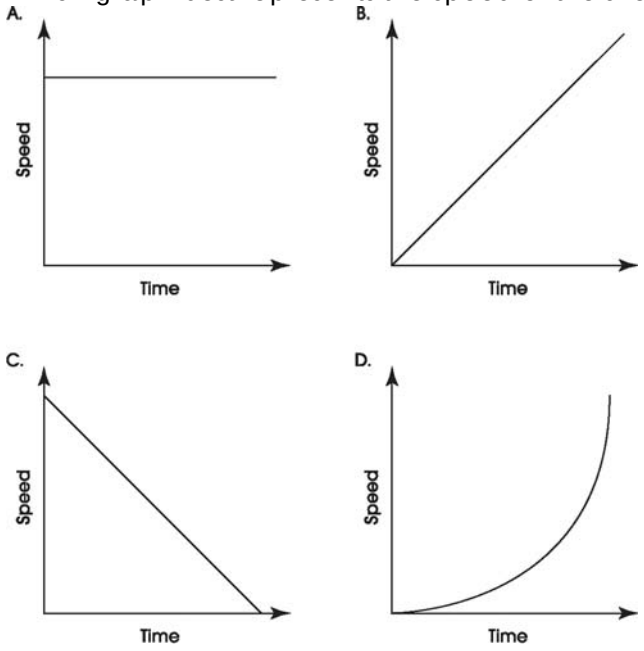
Use the information and illustration to answer the question that follows.

Snowboarding in Science

A snowboarder begins his run from rest (point 1) on top of a hill. He moves straight down the slope until he reaches the bottom of the hill (point 4) and the ground levels off. The snowboarder continues to move horizontally across the level ground and eventually comes to a stop (point 5).



28. Which graph best represents the speed of the snowboarder as he moves from point 2 to point 3?

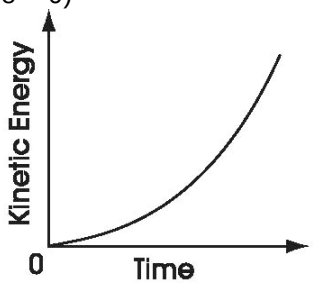


A) A
B) B
C) C
D) D

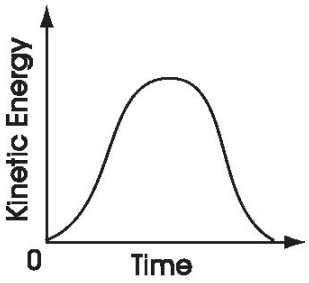
Physical Science Benchmak E
Demonstrate that energy can be considered to be either kinetic (motion) or potential (stored).

29. When a space shuttle is launched, it continues to accelerate for several minutes.
Which graph shows the kinetic energy of the space shuttle during the first few minutes of flight? (Launch time = 0)

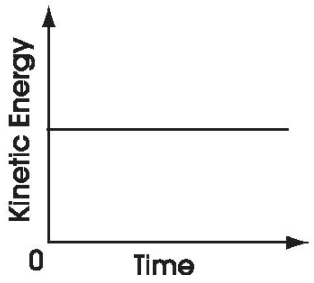
A.



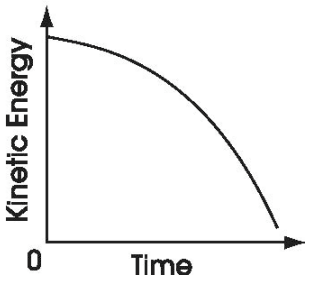
B.



C.



D.



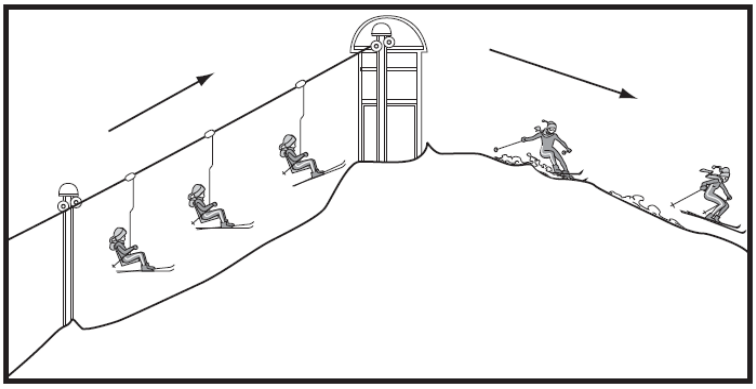
A) A
B) B
C) C
D) D

30. A student plans to collect data needed to calculate the kinetic energy of a thrown baseball. She plans to measure the distance from pitcher to catcher, the time it takes for the baseball to arrive in the catcher's glove, the mass of the baseball, and the circumference of the baseball.
Which of these measurements is not needed to calculate the kinetic energy?

A) measuring the mass of the ball
B) measuring the flight time of the ball
C) measuring the circumference of the ball
D) measuring the distance from pitcher to catcher

31. The picture below shows the different positions of a skier as she is lifted to the top of a slope and then skis down the other side.

Ski Lift



Which statement best explains the change in the skier's potential energy?

A) The skier loses potential energy as she is lifted up the slope and loses potential energy as she skis down the slope.
B) The skier gains potential energy as she is lifted up the slope and maintains the same potential energy as she skis down the slope.
C) The skier gains potential energy as she is lifted up the slope and loses potential energy as she skis down the slope.
D) The skier loses potential energy as she is lifted up the slope and gains potential energy as she skis down the slope.

Physical Science Benchmark F

Explain how energy may change form or be redistributed but the total quantity of energy is conserved.

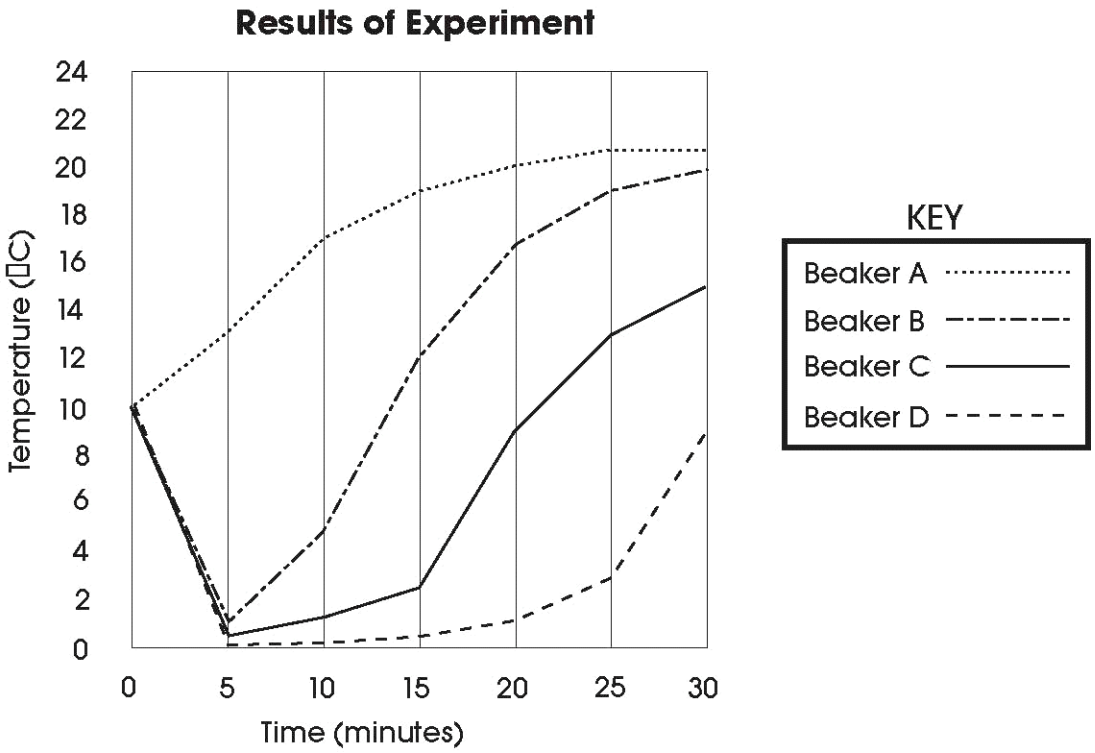
32. Use the information to answer the question that follows.

Water Temperature Experiment

Students studied the effect of ice on the temperature of a sample of water. First, they put 500 mL of cold water (at 10°C) into each of four beakers. Next, they measured and recorded the initial temperature of the water in each beaker. Then, they added various amounts of ice as shown in the table below. They continued to measure the temperature over a period of 30 minutes. Their results are shown in the graph below. The temperature of the room during the experiment was 22°C.

Data Table

Beaker	Amount of Ice (scoops)	Volume of Water (mL)
A	0	500
B	1	500
C	2	500
D	3	500



During the first five minutes of the experiment,

A) the total energy of the system decreased by half.

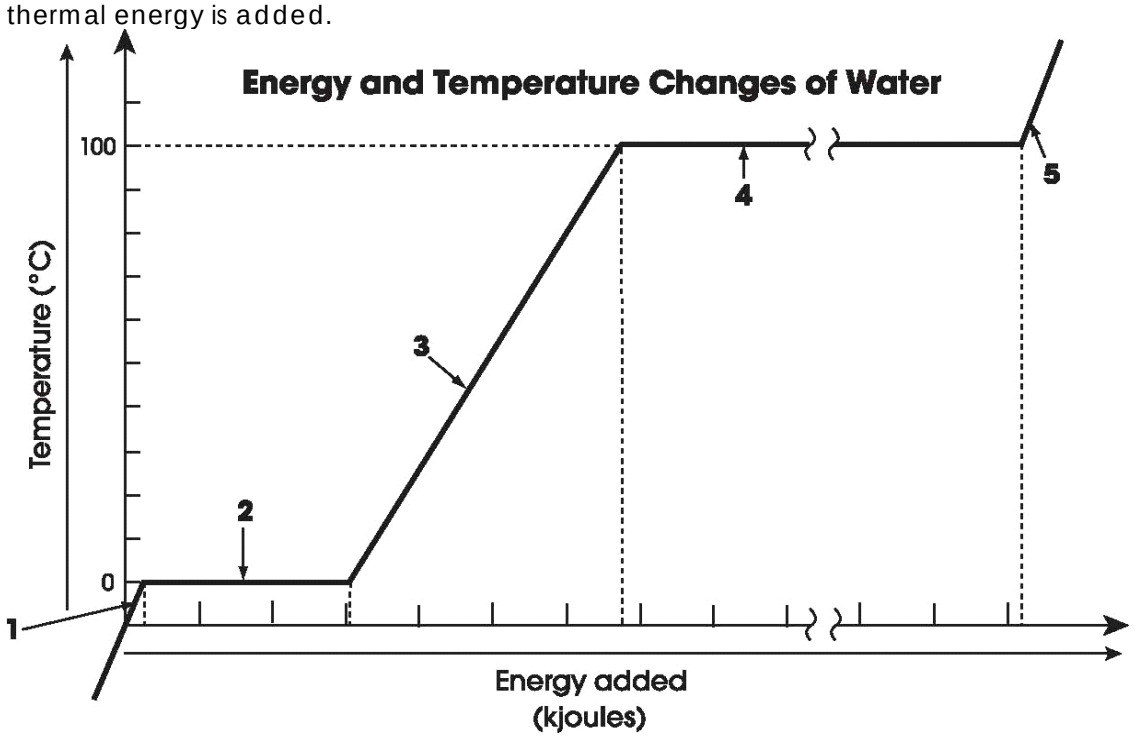
B) kinetic energy is transferred from the ice to the water.

C) thermal energy is transferred from the water to the ice.

D) thermal energy is transferred from the water to the surrounding air.

33. Use the information to answer the question that follows.

The following graph shows the change in temperature of a sample of H_2O, which begins as ice, as thermal energy is added.



22. Which region of the graph represents water (H_2O) in the liquid form only?

A) 1
B) 2
C) 3
D) 4

34. Which energy transformation below describes the conversion involved when the carbon compounds in wood are burned?

A) Chemical energy is converted to thermal energy.
B) Thermal energy is converted to chemical energy.
C) Potential energy is converted into chemical energy.
D) Chemical energy is converted into potential energy.

Physical Science Benchmark G

Demonstrate that waves (e.g., sound, seismic, water and light) have energy and waves can transfer energy when they interact with matter.

35. Use the table to answer the question that follows.

Speed of Sound in Solids

Solids	Density (g/cm3)	Speed (m/s)
cork	0.25	500
brick	1.80	3650
glass	2.24	4540
stainless steel	7.90	5000

For the solids listed in the data table, which seems to be true about the relationship between the speed of sound and density?

A) The speed of sound decreases as density increases.
B) The speed of sound increases as density increases.
C) The speed of sound increases as density decreases.
D) There is no apparent relationship between density and the speed of sound.

36. Use the table to answer the question that follows.

Speed of Sound

Substance	Temperature (°C)	Speed (m/s)
dry air	0	331
	25	346
	100	366

Could the speed of sound be used to estimate dry air temperature, based on the data above?

A) No, because the speed of sound in dry air is the same regardless of temperature.
B) No, because as temperature increases, the speed of sound in dry air increases.
C) Yes, because as temperature increases, the speed of sound in dry air increases.
D) Yes, because as temperature decreases, the speed of sound in dry air increases.

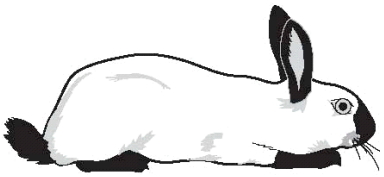
37. Use the information to answer the question that follows.

Himalayan Rabbits

Himalayan rabbits are native to the Himalayan Mountains, where a great deal of snow falls annually. These rabbits have white fur over most of their bodies, with black fur on the ears, noses, feet and tails. This color pattern results from temperature differences in different parts of the rabbits' bodies. Areas where the body temperature is below 33°C the fur grows in black.

To demonstrate this color change, a scientist shaved a small area of fur on the backs of adult Himalayan rabbits. Ice packs were kept on the shaved areas long enough for the rabbits' fur to begin growing back. When the ice packs were removed, the fur growing beneath them was black.

Before Experiment



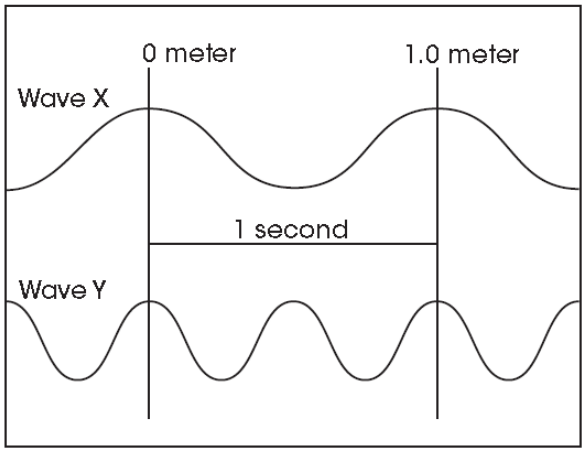
After Experiment

The black fur on Himalayan rabbits helps provide additional warmth for the ears, noses, feet and tails. Why does the fur color affect warmth for these areas?

A) Black fur generates more heat energy than white fur.
B) Black fur insulates the rabbit from cold better than white fur.
C) Black fur reflects more heat energy from sunlight than white fur.
D) Black fur absorbs more heat energy from sunlight than white fur.

38. In the diagram below, similar types of waves with the same amplitude travel in the same medium.

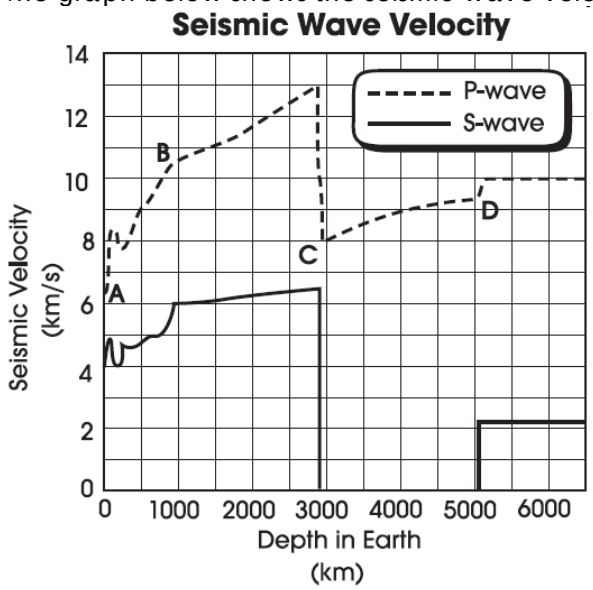
Wave Propagation



Compared to wave X, which statement is correct?

A) Wave Y has greater speed.
B) Wave Y has less energy.
C) Wave Y has a lower frequency.
D) Wave Y has a shorter wavelength.

39. The graph below shows the seismic wave velocities at various depths within Earth.



Based on the graph, which point marks the beginning of Earth's liquid outer core?

A) A
B) B
C) C
D) D

Physical Science Benchmark H

Trace the historical development of scientific theories and ideas, and describe emerging issues in the study of physical sciences.

40. In his investigations of air, Henry Cavendish discovered a small bubble of leftover gas that would not combine with nitrogen. His observations went unnoticed until William Ramsay performed experiments in which he obtained similar results. Ramsay recalled and repeated Cavendish's experiments exactly to verify the results. Then, using Gustav Kirchhoff's spectroscopy technique, Ramsay was able to identify the leftover gas as the element he called argon. Upon further investigation, he found the elements neon, krypton and xenon.

Based on this information, it can be said that

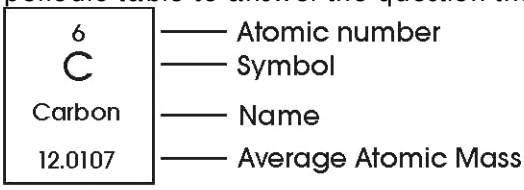
A) the combined work of Cavendish, Kirchhoff and Ramsay led to the discovery of the noble gases.
B) Kirchhoff's work was insignificant in the investigations leading to the discovery of argon.
C) Ramsay violated ethical practice in science by repeating Cavendish's experiments.
D) Cavendish is directly responsible for the discovery of argon, but not neon, krypton or xenon.

Short Answer

Physical Science Benchmark B

Explain how atoms react with each other to form other substances and how molecules react with each other or other atoms to form even different substances.

41. Use the partial periodic table to answer the question that follows.



Partial Periodic Table of the Elements

	IA 1	IIA 2A	IIIA 13	IVA 14	VA 15	VIA 16	VIIA 17	VIIIA 18
1	1 H Hydrogen 1.00794							2 He Helium 4.0026
2	3 Li Lithium 6.941	4 Be Beryllium 9.0122	5 B Boron 10.811	6 C Carbon 12.0107	7 N Nitrogen 14.0067	8 O Oxygen 15.9994	9 F Fluorine 18.9984	10 Ne Neon 20.1797
3	11 Na Sodium 22.9898	12 Mg Magnesium 24.3050	13 Al Aluminum 26.98154	14 Si Silicon 28.0855	15 P Phosphorus 30.9738	16 S Sulfur 32.065	17 Cl Chlorine 35.4527	18 Ar Argon 39.948
4	19 K Potassium 39.0983	20 Ca Calcium 40.078						

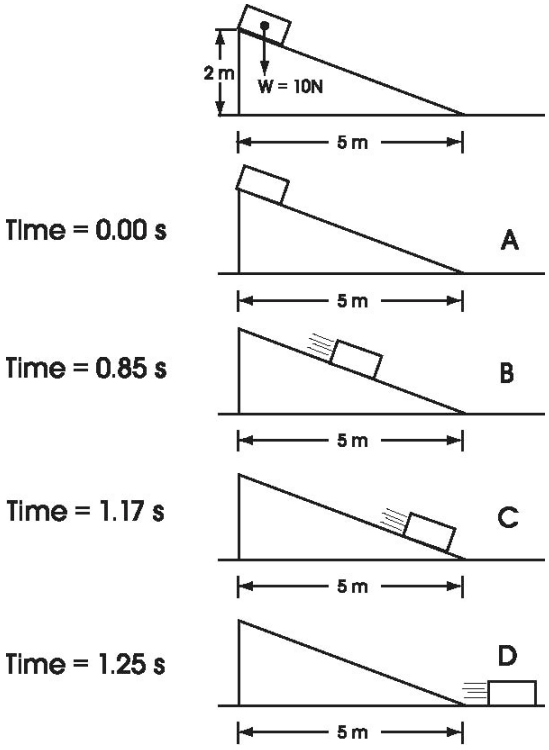
In terms of electrons, describe the difference between the formation of the covalent bond in Cl_2 and the ionic bond in NaCl. Respond in the space provided in your Answer Document. (2 points)

Physical Science Benchmarks D, E, and F

Use the following information to answer the next **three** questions.

Inclined Plane Experiment

In doing the following inclined plane experiment in "ideal conditions," students assume that friction from the air, incline or floor is negligible. A stationary box at the top of a frictionless incline is released and is allowed to slide to the bottom. The figure below illustrates the box in four positions labeled A through D as it is sliding from the incline onto the level floor. As the box moves from the bottom of the incline to the floor, students assume that the box experiences no change in speed, only a change in direction.

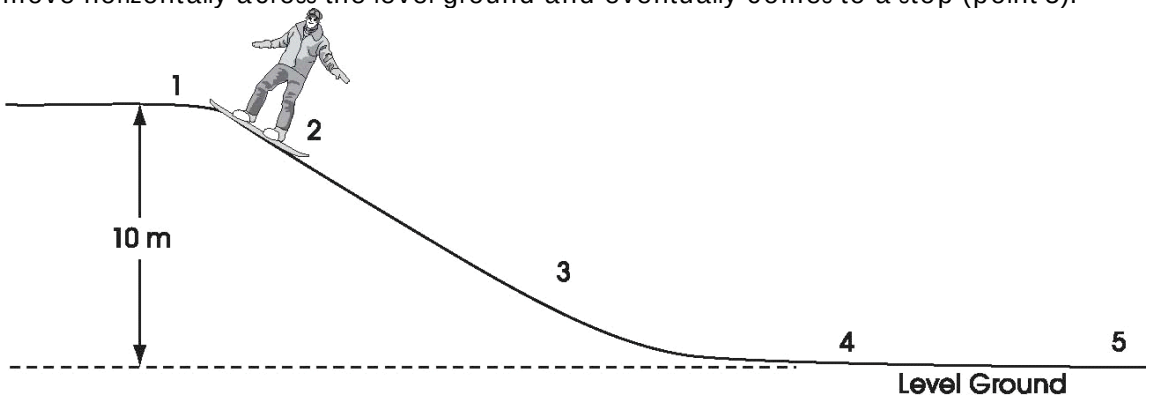


42. Assume that the experiment will be repeated in less "ideal" conditions where the effects of friction on the motion of the box cannot be ignored. Predict the effect that significant friction would have on the acceleration of the box as it slides down the incline. Explain the cause of the predicted effect. Respond in the space provided in your Answer Document. (2 points)

Use the information and illustration to answer the question that follows.

Snowboarding in Science

A snowboarder begins his run from rest (point 1) on top of a hill. He moves straight down the slope until he reaches the bottom of the hill (point 4) and the ground levels off. The snowboarder continues to move horizontally across the level ground and eventually comes to a stop (point 5).

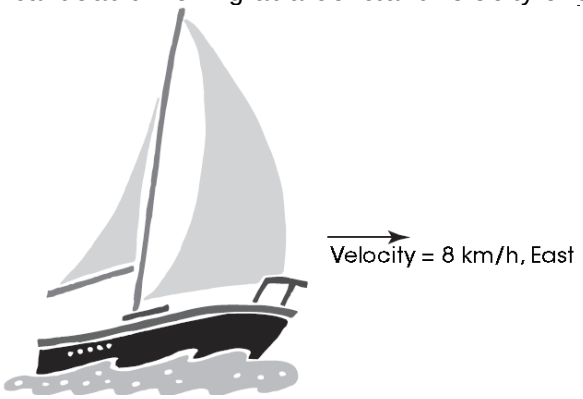


43. Using the same board, the snowboarder decides to make another run down the hill to see if he can increase his speed. Describe one thing the snowboarder could do to increase his speed on the slope. Explain why this would cause his speed to increase. Respond in the space provided in your Answer Document. (2 points)

Physical Science Benchmark D

Explain the movement of objects by applying Newton's three laws of motion.

44. A sailboat is moving at a constant velocity of 8 km/h eastward as shown in the picture below.



Describe two opposing forces acting on the boat and explain how each force affects the boat. Respond in the space provided in your Answer Document. (2 points)

OGT Physical Science Benchmarks
Answer Section

MULTIPLE CHOICE

1.	ANS:	A	REF:	2005 - No.35		STA:	PS Benchmark - A
2.	ANS:	C	REF:	2006 - No.27		STA:	PS Benchmark - A
3.	ANS:	A	REF:	2008 - No.31		STA:	PS Benchmark - A
4.	ANS:	C	REF:	2005 - No.27		STA:	PS Benchmark - B
5.	ANS:	A	REF:	2008 - No.1	STA:	PS Benchmark - B	
6.	ANS:	D	REF:	2008 - No.16		STA:	PS Benchmark - B
7.	ANS:	A	REF:	2005 - No.28		STA:	PS Benchmark - C
8.	ANS:	B	REF:	2006 - No.26		STA:	PS Benchmark - C
9.	ANS:	A	REF:	2007 - No.1	STA:	PS Benchmark - C	
10.	ANS:	C	REF:	2007 - No.10		STA:	PS Benchmark - C
11.	ANS:	A	REF:	2008 - No.17		STA:	PS Benchmark - C
12.	ANS:	D	REF:	2008 - No.36		STA:	PS Benchmark - C
13.	ANS:	B	REF:	2007 - No.8	STA:	PS Benchmark - C	
14.	ANS:	A	STA:	PS Benchmark - C			
15.	ANS:	D	REF:	2007 - No.20		STA:	PS Benchmark - B
16.	ANS:	C	REF:	2007 - No.22		STA:	PS Benchmark - C
17.	ANS:	C	REF:	2007 - No.23		STA:	PS Benchmark - D
18.	ANS:	B	REF:	2007 - No.21		STA:	PS Benchmark - F
19.	ANS:	D	REF:	2005 - No.5	STA:	PS Benchmark - D	
20.	ANS:	D	REF:	2005 - No.2	STA:	PS Benchmark - E	
21.	ANS:	B	REF:	2005 - No.4	STA:	PS Benchmark - E	
22.	ANS:	A	REF:	2005 - No.3	STA:	PS Benchmark - F	
23.	ANS:	D	REF:	2005 - No.21		STA:	PS Benchmark - D
24.	ANS:	A	REF:	2006 - No.5	STA:	PS Benchmark - D	
25.	ANS:	D	REF:	2006 - No.41		STA:	PS Benchmark - D
26.	ANS:	C	REF:	2007 - No.36		STA:	PS Benchmark - D
27.	ANS:	C	REF:	2008 - No.7	STA:	PS Benchmark - D	
28.	ANS:	B	REF:	2006 - No.44		STA:	PS Benchmark - D
29.	ANS:	A	REF:	2005 - No.25		STA:	PS Benchmark - D
30.	ANS:	C	REF:	2006 - No. 32		STA:	PS Benchmark - E
31.	ANS:	C	REF:	2008 - No.42		STA:	PS Benchmark - E
32.	ANS:	C	REF:	2006 - No.12		STA:	PS Benchmark - F
33.	ANS:	C	REF:	2006 - No.22		STA:	PS Benchmark - F
34.	ANS:	A	REF:	2008 - No.44		STA:	PS Benchmark - F
35.	ANS:	B	REF:	2005 - No.7	STA:	PS Benchmark - G	
36.	ANS:	C	REF:	2006 - No.33		STA:	PS Benchmark - G
37.	ANS:	D	REF:	2007 - No.41		STA:	PS Benchmark - G
38.	ANS:	D	REF:	2008 - No.14		STA:	PS Benchmark - G
39.	ANS:	C	REF:	2008 - No.21		STA:	PS Benchmark - G
40.	ANS:	A	REF:	2006 - No.42		STA:	PS Benchmark - H

SHORT ANSWER (see extended response rubric)