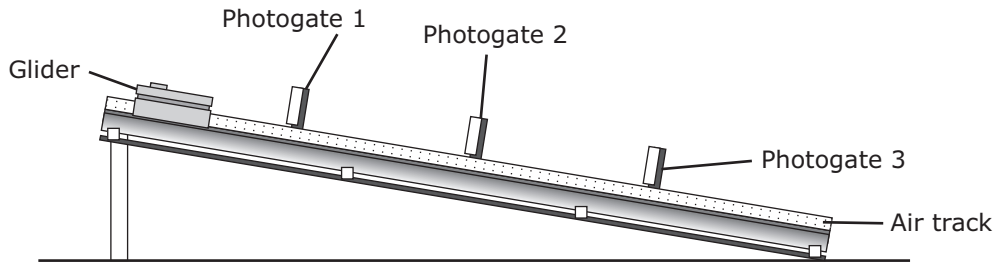


# Physics

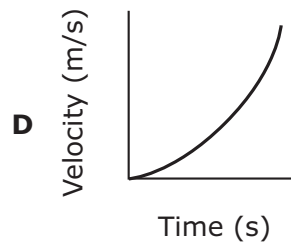
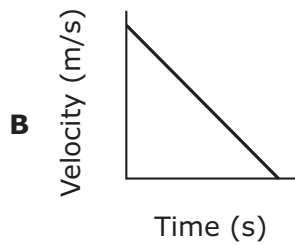
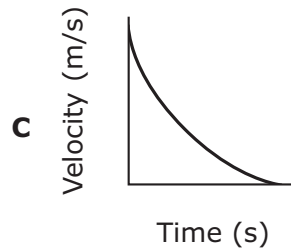
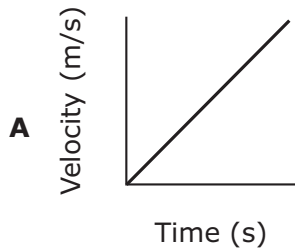
**2011 Released Test Questions**

These released questions represent selected TEKS student expectations for each reporting category. These questions are samples only and do not represent all the student expectations eligible for assessment.

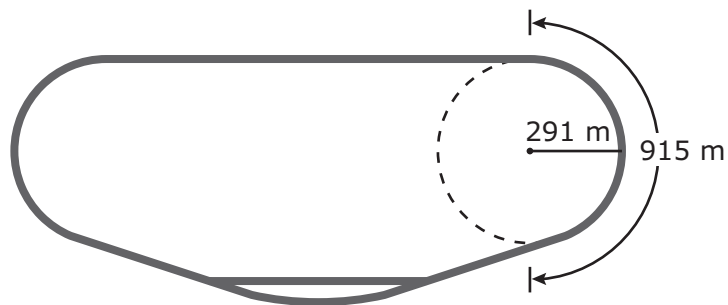
- 1 The diagram below shows a glider on an air track with three photogates. Each photogate determines the velocity of the glider as it moves down the air track.



Which graph best represents the glider’s velocity as it moves down the air track?



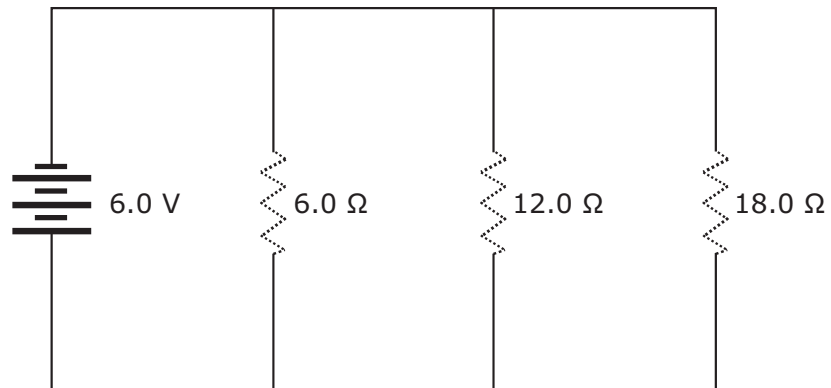
- 2 A turn on a racetrack is 915 meters long and can be considered a semicircle with a radius of 291 meters, as shown in the diagram below.



What is the centripetal acceleration of a car that completes the semicircular turn at a constant speed in 15.0 seconds?

- A 0 m/s<sup>2</sup>
- B 3.14 m/s<sup>2</sup>
- C 12.8 m/s<sup>2</sup>
- D 61.0 m/s<sup>2</sup>
- 
- 3 A car is traveling at 21.0 m/s. It slows to a stop at a constant rate over 5.00 s. How far does the car travel during those 5.00 seconds before it stops?
- A 4.20 m
- B 52.5 m
- C 105 m
- D 158 m

- 4 The diagram below shows a 6.0 V battery connected to three resistors.



How much current is the circuit drawing from the battery?

- A 0.17 A
- B 0.55 A
- C 1.8 A
- D 3.3 A

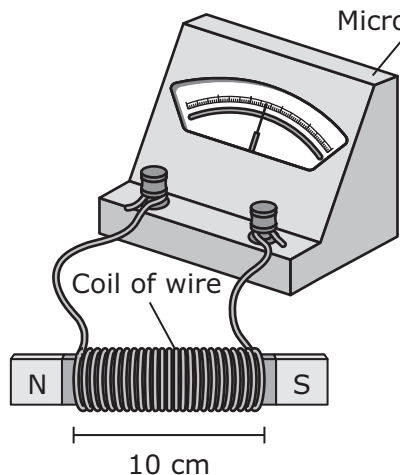
5 The table below shows data about five satellites orbiting Earth.

Satellite	Distance from Earth's Center (thousands of kilometers)	Mass of Satellite (kg)
<b>X</b>	<b>8</b>	<b>100</b>
1	16	400
2	16	200
3	32	800
4	32	400

Which satellite will experience the same magnitude of gravitational force as Satellite X does in its orbit?

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

6 A student wants to generate an electric current using a bar magnet and a coil of wire.



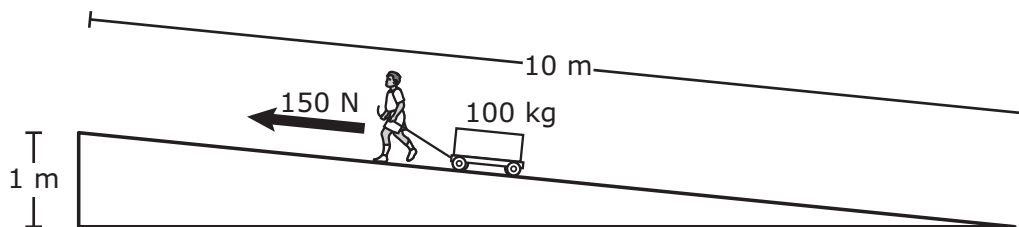
Possible Laboratory Setups

Lab Setup	Wire Diameter	Number of Loops
K	Thin	200
L	Thin	100
M	Thick	200
N	Thick	100

Which experimental setup will generate the greatest electric current?

- A Setup K
- B Setup L
- C Setup M
- D Setup N

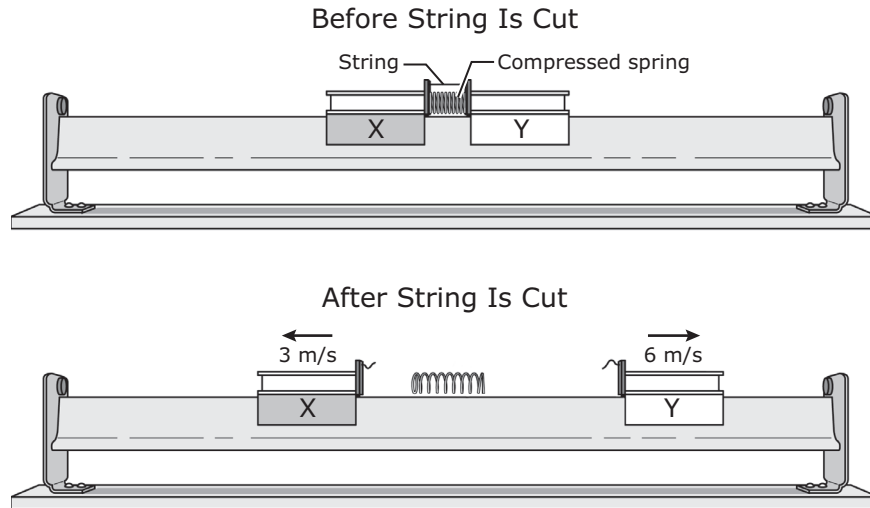
7



A student pulled a 100 kg cart up a ramp using a force of 150 N. By the time the cart reached the top of the ramp, it had gained 980 joules of potential energy. What happened to the work the student did by pulling the cart?

- A** Some of the work done on the cart became the cart's potential energy, and some of the work was converted into heat by friction.
- B** The work done on the cart was equally divided between the cart's potential and kinetic energy.
- C** All the work done on the cart was transformed into the cart's potential energy.
- D** The cart had no kinetic energy at the top of the ramp because all the work done on the cart was converted into heat by friction.

- 8 The first diagram shows two gliders, X and Y, on a nearly frictionless air track. A spring is compressed between the two gliders. The gliders are tied together tightly by a piece of string. The second diagram shows what happens to the gliders when the string is cut.



Which of the following quantities is the same for both gliders while the spring is pushing them apart?

- |                                    |                                |
|------------------------------------|--------------------------------|
| <b>A</b> Magnitude of acceleration | <b>C</b> Mass                  |
| <b>B</b> Kinetic energy            | <b>D</b> Magnitude of momentum |
- 
- 9 A 5.000 kg crate is accelerated from 5.000 m/s to 10.00 m/s. What is the amount of work needed to accelerate the crate, to the nearest tenth of a joule?

Record your answer and fill in the bubbles on your answer document.



- 10** Radar works by sending out radio signals. The reflected signals are measured and analyzed to determine some of the characteristics of the object that reflected the signals. One type of radar emits radio signals having a wavelength of 1.5 meters. What is the frequency of these signals?
- A**  $1.5 \times 10^8$  Hz
  - B**  $2.0 \times 10^8$  Hz
  - C**  $2.5 \times 10^8$  Hz
  - D**  $3.0 \times 10^8$  Hz
- 
- 11** Using a diffraction grating, a student looks at an incandescent lightbulb and a hydrogen-gas-discharge tube. Why does the student see fewer colors from the hydrogen-gas-discharge tube than from the incandescent lightbulb?
- A** Hydrogen gas is invisible and does not reflect light.
  - B** Hydrogen atoms contain only one electron.
  - C** Only certain electron transitions are possible in a hydrogen atom.
  - D** Hydrogen gas changes in the presence of light.
- 
- 12** Which of the following statements best describes the motion of air molecules that transmit sound waves?
- A** The air molecules oscillate parallel to the direction of propagation and move along with the wave.
  - B** The air molecules oscillate parallel to the direction of propagation and remain in the same general position.
  - C** The air molecules oscillate perpendicular to the direction of propagation while moving along with the wave.
  - D** The air molecules oscillate perpendicular to the direction of propagation while remaining in the same general position.

Item Number	Reporting Category	Readiness or Supporting	Content Student Expectation	Process Student Expectation	Correct Answer
1	1	Readiness	P.4(A)	P.2(G)	A
2	1	Supporting	P.4(C)	P.2(L)	C
3	1	Readiness	P.4(B)	P.2(L)	B
4	2	Readiness	P.5(F)	P.2(L)	C
5	2	Readiness	P.5(B)	P.2(J)	A
6	2	Supporting	P.5(G)	P.2(J)	C
7	3	Supporting	P.6(G)		A
8	3	Readiness	P.6(D)		D
9	3	Readiness	P.6(A)	P.2(L)	187.5
10	4	Readiness	P.7(B)	P.2(L)	B
11	4	Supporting	P.8(B)		C
12	4	Supporting	P.7(C)		B

For more information about the new STAAR assessments, go to [www.tea.state.tx.us/student.assessment/staar/](http://www.tea.state.tx.us/student.assessment/staar/).