5.7B Science STAAR Release Questions

Effects of Forces on Objects

Students design an investigation to test the strength of different magnets. They use three magnets and steel paper clips. Each magnet is placed at a different distance from the steel paper clips. The table they will use to record their data is shown.

Magnet	Distance from Steel Paper Clips (centimeters)	Number of Steel Paper Clips Attracted
1	15	
2	30	
3	45	

What should the students do to improve the investigation?

Ⓐ Use different steel objects for each magnet

Ⓑ Place the paper clips farther away from each magnet

Ⓒ Place each magnet at the same distance from the paper clips

Ⓓ Repeat the investigation using plastic paper clips

Answer C

A student wants to investigate how the force with which a ball is thrown affects how high of a splash it makes in a pool.

Which table **BEST** represents how the investigation should be set up?

Ⓐ

Independent variable	Type of ball
Dependent variable	Weight of the ball
Controlled variables	Height of the splash Force the ball is thrown with Height the ball is thrown from

Ⓑ

Independent variable	Height of the splash
Dependent variable	Force the ball is thrown with
Controlled variables	Weight of the ball Type of ball Height the ball is thrown from

Ⓒ

Independent variable	Weight of the ball
Dependent variable	Type of ball
Controlled variables	Height of the splash Force the ball is thrown with Height the ball is thrown from

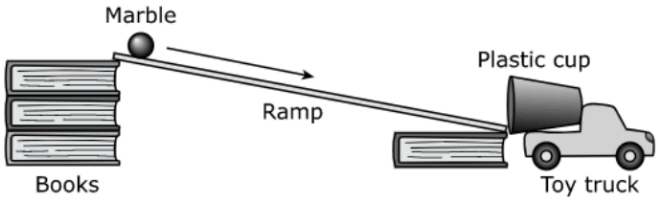
Ⓓ

Independent variable	Force the ball is thrown with
Dependent variable	Height of the splash
Controlled variables	Weight of the ball Type of ball Height the ball is thrown from

Answer D

A class is using the setup shown to test this hypothesis.

The shorter the stack of books becomes, the shorter the distance the toy truck will roll.



What is **ONE** more piece of equipment needed to test the hypothesis **AND** how can the hypothesis be tested?

Look at the diagram carefully. Then enter your answer and explanation in the box provided.

Chars 0/475

***Correct Answer (The student needs to identify at least one more piece of equipment such as a ruler, measuring tape, or meter stick AND include at least one idea for how the hypothesis can be tested: varying the size of the book stack, measuring distance traveled, repeated trials.)**

Students conduct experiments to investigate friction. Which experiment will best test the effect of friction on objects?

F Drop two balls from the same height at the same time

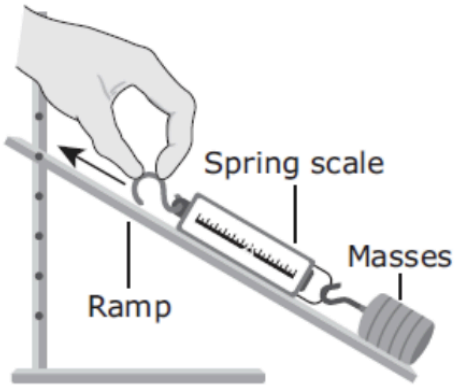
G Roll two marbles on the carpet from the same starting point at the same time and with the same amount of force

H Roll three marbles across three different surfaces from the same starting point at the same time and with the same amount of force

J Release two balls from the top of a ramp at the same time

Answer H

Students investigate force. The masses they use begin at rest on the ramp. The setup the students use is shown.



Which change will reduce the amount of force needed to move the masses?

A Decrease the height of the ramp

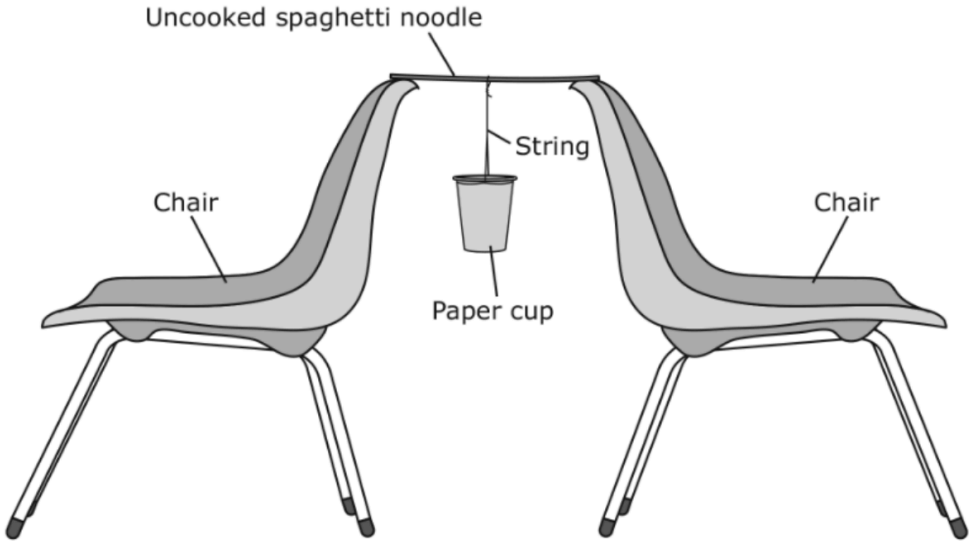
B Increase the height of the ramp

C Add an additional mass

D Pull the spring scale with two hands

Answer A

A student conducts the investigation shown in the diagram. In this experiment a paper cup hangs from a string tied to a single uncooked spaghetti noodle. The student measures and records the mass of a penny. The student then adds pennies to the paper cup one at a time.



Which question is the student most likely trying to answer with this investigation?

A How many spaghetti noodles will it take to hold up the mass of a penny?

B How much force will it take to break the spaghetti noodle?

C How long should the string that holds the paper cup be in order to support the greatest mass of pennies?

D How does the distance between the two chairs affect the amount of force it takes for the spaghetti noodle to break?

Answer B