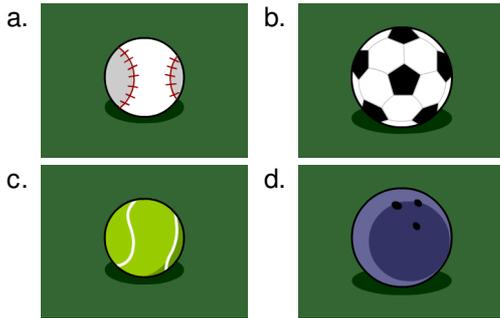


1. Which of the following requires the most energy to be thrown into the air?



2. When you throw an object straight up, why doesn't it fly off into space?

- a. There's too much thrust acting on the object
- b. Earth's atmosphere prevents the object from going into space
- c. The object travels too fast to reach Earth orbit
- d. The force of gravity pulls the object back down to Earth

3. Which two opposing forces are at work when a rocket flies into space?

- a. Drag and torque
- b. Gravity and thrust
- c. Thrust and torque
- d. Drag and gravity

4.  A jet pack is a type of rocket system that can allow a human to "fly" for short distances. What can you infer about how jet packs work?

- a. The thrust created by a jet pack must be greater than the force of gravity acting on the user and the pack.
- b. The user must weigh less than the jet pack to lift off the ground.
- c. The weight of the fuel in the jet pack must be greater than the weight of the user in order to achieve liftoff.
- d. The force of gravity on the user must decrease as he is lifted off the ground.

5.  In this illustration of a liquid-fuel rocket, which letter represents the payload?

- a. A
- b. B
- c. C
- d. D

6. What is one main difference between solid-fuel rockets and liquid-fuel rockets?

- a. Solid-fuel rockets don't require an oxidizer to work; liquid-fuel rockets do
- b. Liquid-fuel rockets can't lift heavy payloads; solid-fuel rockets can
- c. Solid fuel-rockets launch with pre-mixed fuel and oxidizer; liquid-fuel rockets combine the fuel and oxidizer at launch
- d. Liquid-fuel rockets contain a higher proportion of oxidizer to fuel than solid-fuel rockets do

7. The combination of fuel and oxidizer in the presence of a spark or flame results in a combustion reaction. Which is another example of a combustion reaction?

- a. Mixing honey into a cup of tea
- b. Setting a piece of wood on fire
- c. Heating water until it boils
- d. Combining flour and sugar to make dough

8. Put the following into the correct order for a rocket launch: A) Heated gas is expelled; B) Oxidizer and fuel mix; C) Force of thrust exceeds force of gravity on the rocket.

- a. A, B, C
- b. B, C, A
- c. B, A, C
- d. C, B, A

9. Which part(s) of the U.S. space shuttle is/are not reusable?

- a. The orbiter
- b. The external fuel tank
- c. The solid rocket boosters
- d. The main engine nozzles

10. The farther apart two objects are, the weaker the force of gravity is between them. What can you infer from this?

- a. A body orbiting Saturn feels a weaker gravitational pull from Earth than a body orbiting Mars
- b. The Earth's gravity exerts a stronger pull on spacecraft orbiting the moon than spacecraft in low-earth orbit
- c. A spacecraft that has left the solar system feels no gravitational pull whatsoever from Earth
- d. Any spacecraft launched from Earth will, given enough time, eventually fall into the sun