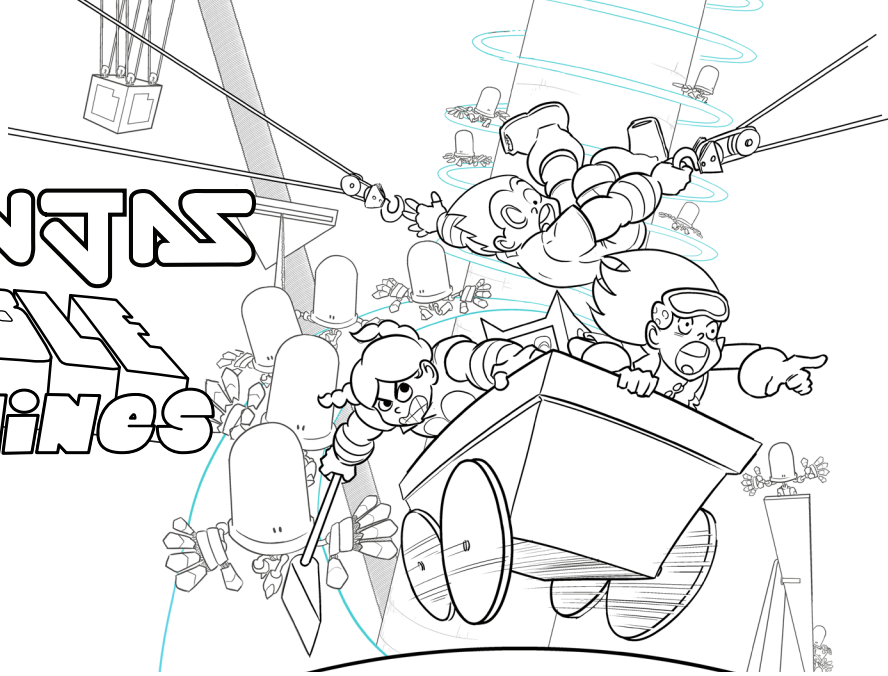


# SCIENCE NINJAS

## BIG TROUBLE WITH SIMPLE MACHINES

### Physics Quiz!

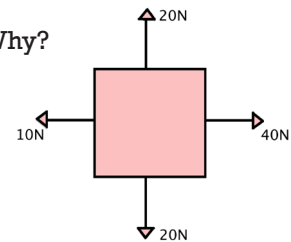


1. Force is...

- A. How strong an object is
- B. A push or a pull on an object
- C. An object's mass multiplied by acceleration
- D. b and c

2. Look at the Free Body Diagram below. Is this a balanced or unbalanced force? Why?

- A. It's a balanced force, because the vertical force is balanced
- B. It's a balanced force, because there's not enough force to move it
- C. It's an unbalanced force, because there is a greater force pushing to the right than pushing to the left
- D. It's an unbalanced force, because it's being pulled instead of pushed



3. In science, what is work?

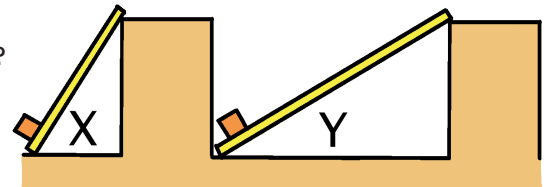
- A. The amount of time it takes to move an object
- B. A net force on an object multiplied by the distance that object travels
- C. A net force on an object multiplied by the object's mass
- D. A net force on an object divided by the distance that object travels

4. Why do simple machines make work easier? Check all that apply

- A. They output more force than they input
- B. They decrease the amount of materials needed for work
- C. They make the input force travel a shorter distance
- D. They can redirect force in a useful way

5. Looking at these two inclined planes, moving the block up either will accomplish the same amount of work. Which will be easier work? Why?

- A. X, because it's a shorter distance
- B. X, because it will take less time
- C. Y, because it is less work
- D. Y, because it requires less input force



6. What is true about wedges?

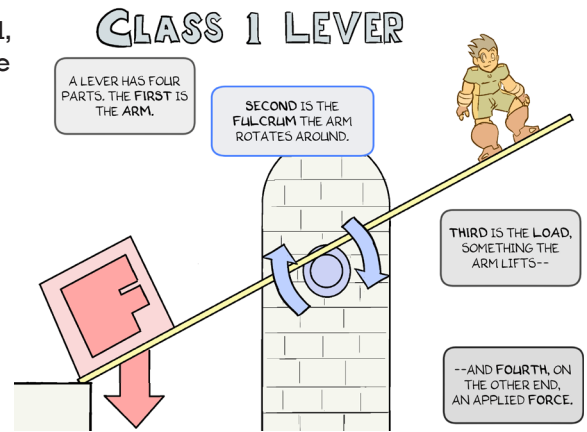
- A. The sharper the wedge, the less applied force it takes to accomplish work
- B. A lever is really just a wedge
- C. Inclined planes are really just wedges
- D. The wider the wedge, the more work it can do

7. A lever consists of an arm, an applied force, a load, and a

- A. claw
- B. plank
- C. weight
- D. fulcrum

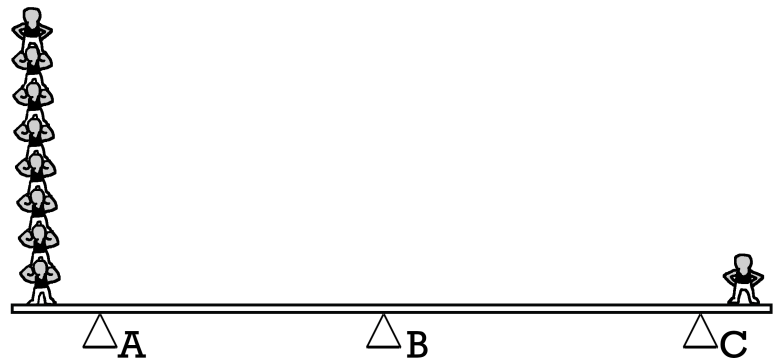
9. A class 1 lever has a fulcrum between the applied force and the load, so pushing down redirects the force to push the load up. Which of the following is a class 1 lever?

- A. A fishing pole
- B. A bottle opener
- C. A see-saw
- D. A nut cracker



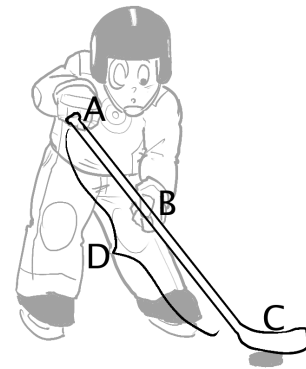
10. You are building a seesaw. You want it so 9 acrobats can use it - one person can stand on one end and hold the other 8 people up, who are stacked on top of each other. Where should the fulcrum be?

- A. Point A
- B. Point B
- C. Point C



11. Look at this hockey stick, which is a class 3 lever. If D is the Arm, what is C?

- 1. The load
- 2. The applied force
- 3. the fulcrum



12. How are screws related to inclined planes?

- A. Screws are wedges, which are two inclined planes
- B. Screws and inclined planes are both wedges
- C. Screws are inclined planes wrapped around an axis
- D. Screws are not related to inclined planes, they are related to levers

13. Which of the following is NOT true about wheels?

- A. Wheels are closely related to levers
- B. It's easier to turn a wheel the closer you get to its axis, or center
- C. The inside of a wheel turns with less speed than the outside
- D. The outside of a wheel requires less force to turn than the inside

14. Why would adding more pulleys make lifting a heavy block easier?

- A. The weight of the block is more evenly distributed among the pulleys
- B. It requires a longer rope or cord to pull
- C. You can pull the rope or cord faster
- D. You can pull the rope or cord farther