

Physics: Newton's Laws of Motion

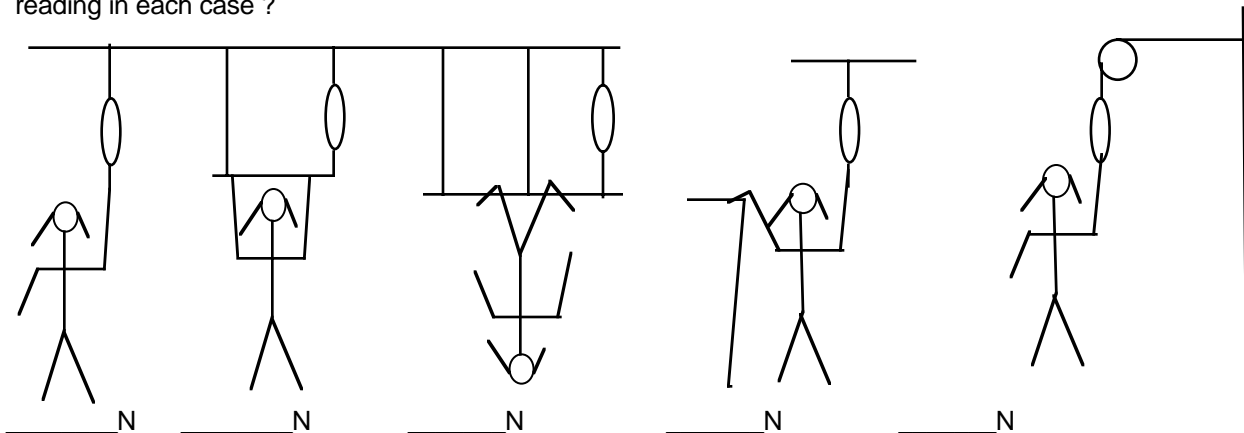
Name: _____
Date: _____ Period: _____

- (Circle the correct answer) An astronaut throws a rock in outer space away from gravitational or frictional forces. The rock will _____ gradually slow to a stop _____ continue moving in a straight line at constant speed
- Use the words mass, weight & volume to fill in the blank:
The force due to gravity on an object = _____.
The quantity of matter in an object = _____.
The amount of space an object occupies = _____.

3. Complete the table

Object	Mass	Weight
Melon	1 kg	
Apple		1N
Physics Book		
Uncle Harry	90 kg	

- Different masses are hung on a spring scale calibrated in Newtons.
The force exerted on 1 kg = 9.8 N. The force exerted on 5 kg = _____ N.
The force exerted by gravity on _____ kg = 98 N.
Record your own mass and show the weight _____ kg = _____ N.
- In each case below, the girl hands at rest. Since she is not accelerating, the net force on her is zero. This means that the upward force of the rope equals the downward pull of gravity. She weighs 300N. What is the scale reading in each case ?



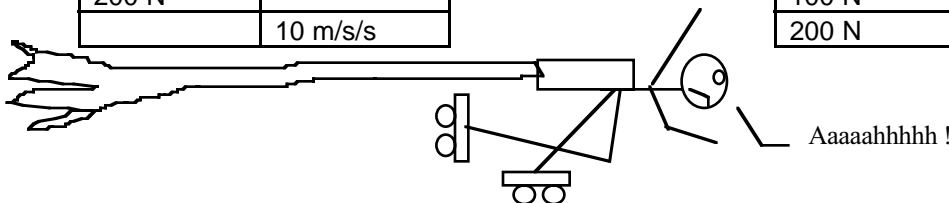
- Skelly the skater has a total mass of 25 kg and propels himself by rocket power. Fill in table 1 where resistance effects are ignored and table 2 where resistance is a constant 50 N. Remember $f = ma$.

Table 1

Force	Acceleration
100 N	
200 N	
	10 m/s/s

Table 2

Force	Acceleration
50 N	0 m/s/s
100 N	
200 N	



If the resistance force is zero or constant, and the thrust force is constant, when will his acceleration be the greatest, at the start or end of his run (when he runs out of gas) ? why ?

8. A ball rolls down a constant slope ramp.

The acceleration is (decreasing) (constant) (increasing)

If the ramp is steeper, the acceleration is (more) (less) (same)

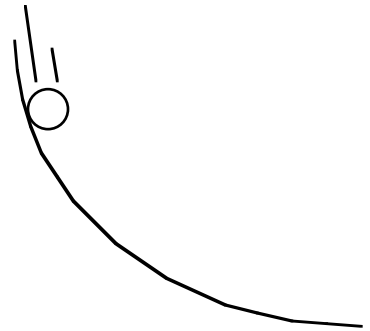
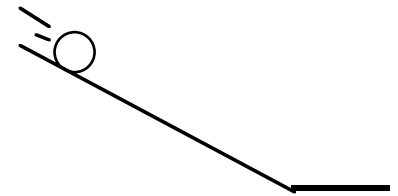
When the ball reaches the bottom and rolls along the smooth, level surface it (continues to accelerate) (does not accelerate)

When a ball rolls down a varying slope, the acceleration is greater (at the top) (in the middle) (at the bottom) (same everywhere)

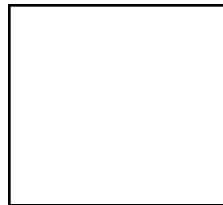
The speed of the ball is greater (at the top) (in the middle) (at the bottom) (same everywhere)

In this special case, the speed is the greatest when the acceleration is (most) (least)

(Remember this when some tells you that acceleration and speed are both the same because they are not!)



In the box at right, sketch a ramp on which the acceleration of a ball would be very little at the top and get progressively greater as it moves down the ramp.



9. For each example, there is an action/reaction force pair. State the reaction to the given action.

Ex. A fist hits a wallwall hits fist.

Soccer player knocks a ball with her head ... _____

Your windshield smashes a bug ... _____

Baseball bat hits a ball _____

You tap someones shoulder... _____

Your hand pulls a flower out of the ground ... _____

An athlete pushes a dumb bell up ... _____

Compressed air pushes a balloon's surface outward ... _____

10. There is an interaction between the earth and the moon that we call gravity. Part of the interaction is the earth pulling on the moon and the other part is the moon pulling on the earth. Which, if any part, is greater: the earth pulling on the moon or the moon pulling on the earth ? _____

11. Circle at least 6 action/reaction pairs:

