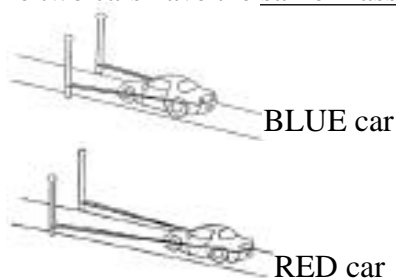




## Content Items about FORCES

The drawing shows two toy cars that will be set in motion with the same type of rubber band.  
The two cars have the same mass but the rubber band is pulled back much farther for the RED car.



15. If we measured the speed of both cars, which would go faster?

- a) the BLUE car
- b) the RED car
- c) both cars will go the same speed

The drawing shows Jamie and Steve sitting in identical chairs. Jamie pushes Steve's chair with her feet, causing both chairs to move in opposite directions.



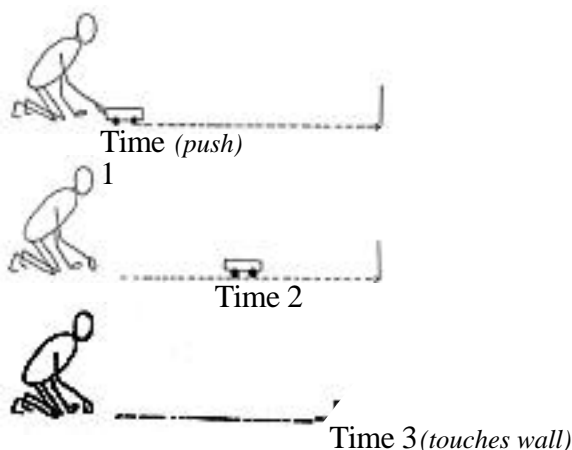
17. If Jamie and Steve both have the same mass, who will go farther?

- a) Jamie
- b) Steve
- c) They will both go the same distance

18. If Steve's mass was much larger than Jamie's, who would go farther?

- a) Jamie
- b) Steve
- c) They will both go the same distance

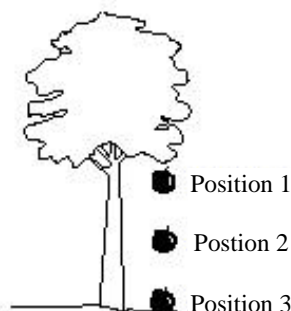
A cart is pushed into motion by a person. The drawing shows that cart at three different times in its motion.



19. At which of the three times is there a force in the same direction as the cart's motion?

- a) 1 only
- b) 3 only
- c) 1 and 3 only
- d) 1, 2, and 3

The drawing shows an apple falling to the ground.

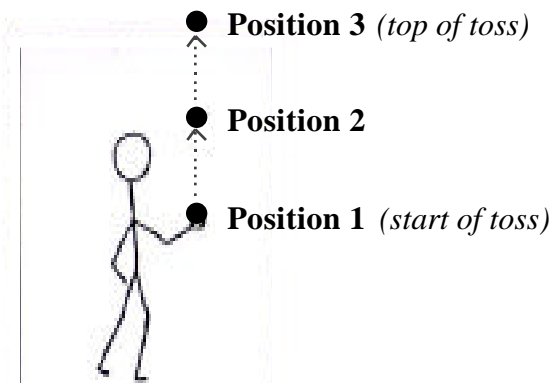


20. In which of the three positions does the force of gravity act on the apple?

- a) 1 only
- b) 3 only
- c) 2 and 3 only
- d) 1, 2, and 3

## Content Items about FORCES (cont.)

The drawing shows a person tossing a ball.



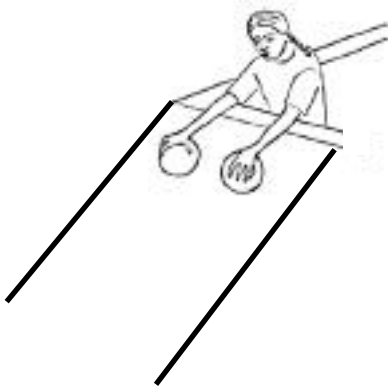
21. In which of the three positions is there an upward force acting on the ball?

- a) 1 only
- b) 3 only
- c) 2 and 3 only
- d) 1, 2, and 3

22. In which of the three positions is there a downward force acting on the ball?

- a) 1 only
- b) 3 only
- c) 2 and 3 only
- d) 1, 2, and 3

The drawing shows a person holding two balls of exactly the same size at the top of a short ramp. One ball is much heavier than the other.



23. If these balls are let go at exactly the same time, what do you think will happen?

- a) The *heavier* ball will get to the end of the ramp much *faster*.
- b) The *lighter* ball will get to the end of the ramp much *faster*.

c) *Both balls* will get to the end of the ramp *at about the same time*.

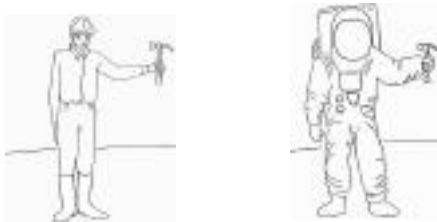
24. If the balls are let go in the same way but on a ramp 100 times longer, what do you think will happen?

a) The *heavier* ball will get to the end of the ramp much *faster*.

b) The *lighter* ball will get to the end of the ramp much *faster*.

c) *Both balls* will get to the end of the ramp *at about the same time*.

The drawing shows a worker on the Earth and an astronaut on the Moon each holding a hammer. The force of gravity on the *Moon* is much less than the force of gravity on the *Earth*.



25. If they let go of their hammers at the same time, which person's hammer will hit the ground first?

a) the worker's

b) the astronaut's

c) both hammers will hit the ground at the same time

26. What is the reason for your answer in Question 25?

a) *mass* DOES make a difference in how fast something falls

b) *mass* does NOT make a difference in how fast something falls

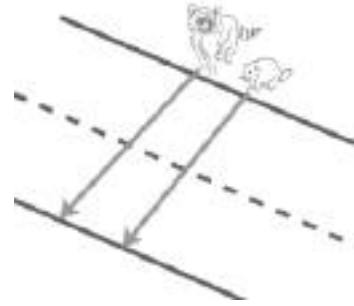
c) the *amount of force* DOES make a difference in how fast something falls

d) the *amount of force* does NOT make a difference in how fast something falls

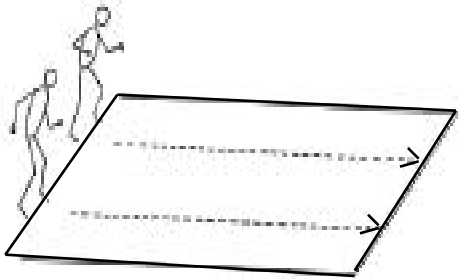
# Content Items about MOTION

The drawing shows a raccoon and a groundhog walking across a road on a straight path. It took the **raccoon** 30 seconds to cross the road. It took the **groundhog** 20 seconds to cross the same road.

- Which animal moved *faster* when crossing the road?
  - the raccoon
  - the groundhog
  - both animals moved at the same speed



The drawing shows Jon and Sam about to run across a field



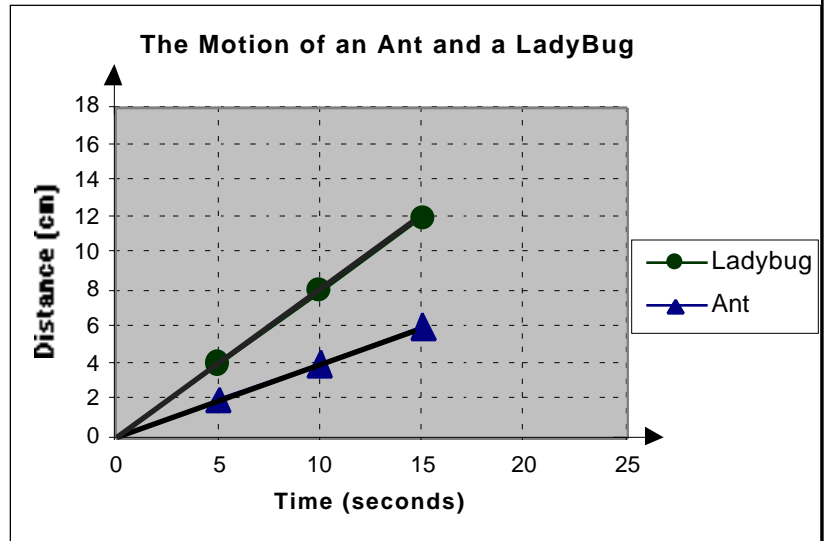
- If **Jon** got to the end of the field in 5 seconds, and **Sam** got to the end of the field in 3 seconds, who went faster?
  - Jon
  - Sam
  - They both went the same speed.

The graph shows the motion of an **ant** and a **ladybug** walking on the sidewalk in a straight line. The **ant** and **ladybug** are about the same size and weight.

- Which line shows the ant's motion?
  - 
  -

- How far did the **ant** travel in 15 seconds?
  - 2 cm
  - 4 cm
  - 6 cm
  - 12 cm

- How far did the **ladybug** travel in 15 seconds?
  - 4 cm
  - 6 cm
  - 8 cm
  - 12 cm



- Which animal moved faster?
  - the ant
  - the ladybug
  - They went the same speed.