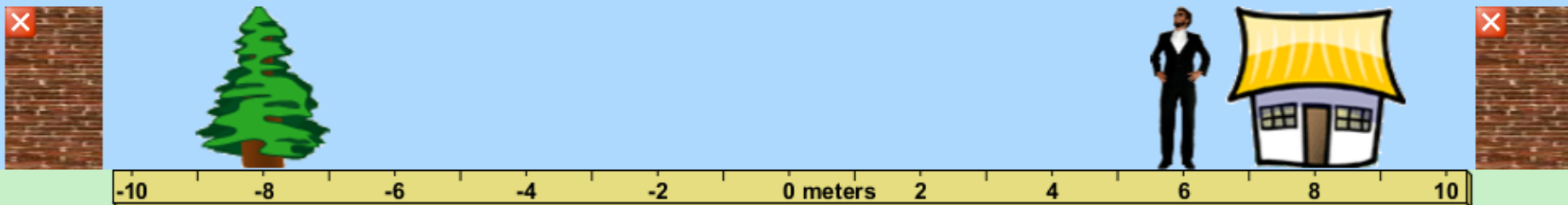


**Speed, acceleration, friction,
inertia, force, gravity**

10/1/14

59.5 seconds



Position

6.00 m



Velocity

0.00 m/s



Velocity Vector

Acceleration

0.00 m/s²



Acceleration Vector

Speed and Acceleration

- Which car has a higher speed?

A



B



C. Not enough information

Speed and Acceleration

- Which car has a higher speed?

A



B



C. Not enough information

Speed and Acceleration

- Which car has a greater acceleration?

A



B



C. Not enough information

Speed and Acceleration

- Which car has a greater acceleration?

A



B



C. Not enough information

Acceleration

Rate of change of speed

If a car accelerates at 20 miles/hour/second it means that every second the car speeds up by 20 miles/hour

Starts at 20 miles per hour.

1 second later it is going

A. 40 miles/hour

B. 30 miles/hour

C. 22 miles/hour

D. 60 miles/hour

Acceleration

Rate of change of speed

If a car accelerates at 20 miles/hour/second it means that every second the car speeds up by 20 miles/hour

Starts at 20 miles per hour.

1 second later it is going

A. 40 miles/hour

B. 30 miles/hour

C. 22 miles/hour

D. 60 miles/hour

Acceleration

Rate of change of speed

If a car accelerates at 20 miles/hour/second it means that every second the car speeds up by 20 miles/hour

Starts at 20 miles per hour.

2 seconds later it is going

A. 40 miles/hour

B. 30 miles/hour

C. 24 miles/hour

D. 60 miles/hour

Acceleration

Rate of change of speed

If a car accelerates at 20 miles/hour/second it means that every second the car speeds up by 20 miles/hour

Starts at 20 miles per hour.

2 seconds later it is going

A. 40 miles/hour

B. 30 miles/hour

C. 24 miles/hour

D. 60 miles/hour

Acceleration

Rate of change of speed

Often you'll see m/s^2

Just means meters/second/second

1 m/s^2 is equal to

- A. traveling 1 meter every second
- B. A speed of 1 meter/second
- C. Speeding up 1 meter/second every second

Acceleration

Rate of change of speed

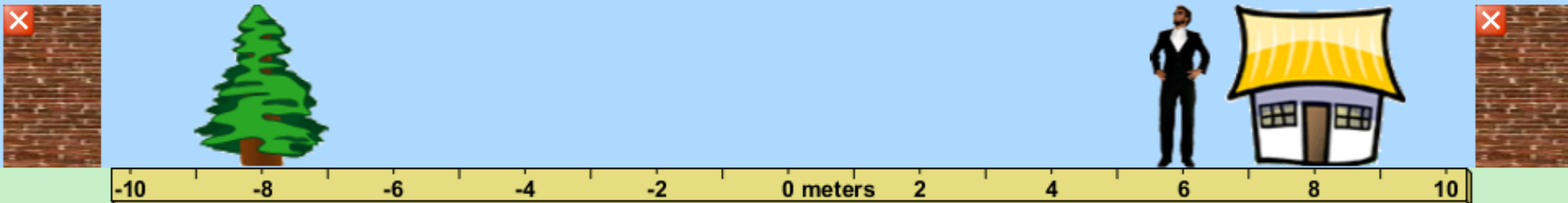
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59.5 seconds



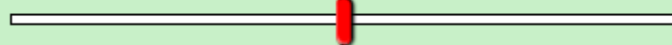
Position

6.00 m



Velocity

0.00 m/s



Velocity Vector

Acceleration

0.00 m/s²



Acceleration Vector

Natural Motion

- Sitting still
- Constant speed

Natural Motion = No acceleration,
no change in speed

Newton's First Law

If an object has no force acting on it,

If it is at rest, it will remain at rest;

If it is moving, it will continue to move in a straight line at a constant speed.

The natural state of an object - its behavior if free of external influences - is *uniform motion* with constant speed!

If it is moving, it will continue to move in a straight line at a constant speed.

Then, why do things slow down?

- A. Natural motion
- B. Friction
- C. Newton was wrong!

If it is moving, it will continue to move in a straight line at a constant speed.

Why do things slow down?

A. Natural motion

B. Friction

C. Newton was wrong!



0:02 / 1:58



Inertia

- Harder to get heavier objects going.
 - Takes more force



At rest stays at rest



Inertia

- Harder to stop heavier objects.
 - Takes more force.



In motion stays in motion!

Natural Motion

- Sitting still
- Constant speed

Natural Motion = No acceleration,
no change in speed