Newton’s First Law and Interpreting Graphs

A great video to watch over Newton’s First Law of Motion - [https://www.youtube.com/watch?v=08BFCZJDn9w](https://www.youtube.com/watch?v=08BFCZJDn9w)

**Background**

Sir Isaac Newton (1643-1727) an English scientist and mathematician famous for his discovery of the law of gravity also discovered the three laws of motion. He published them in his book *Philosophiae Naturalis Principia Mathematica* (Mathematic Principles of Natural Philosophy) in 1687. Today these laws are known as *Newton’s Laws of Motion* and describe the motion of all objects on the scale we experience in our everyday lives.

Newton’s First Law

*An object at rest tends to stay at rest and an object in motion tends to stay in motion unless acted upon by an unbalanced force.*

What does this mean?

Basically, an object will “keep doing what it was doing” unless acted on by an unbalanced force.

If the object was sitting still, it will remain stationary. If it was moving at a constant velocity, it will keep moving.

It takes force to change the motion of an object.

Newton’s First Law is also called *The Law of Inertia*

*Inertia*: the tendency of an object to resist changes in its state of motion.

The First Law states that all objects have inertia. The more mass an object has, the more inertia it has (and the harder it is to change its motion).

If objects in motion tend to stay in motion, why don’t moving objects keep moving forever?

*Things don’t keep moving forever because there’s almost always an unbalanced force acting upon it.*

A book sliding across a table slows down and stops because of the force of what? **Friction**

If you throw a ball upwards it will eventually slow down and fall back down because of the force of what? **Gravity**

**Interpreting the Graph**

These graphs are common in science. The question tells us that each lap is 3 km and the student ran two laps. It then asks us what the runner took a 5 minute between the two laps. Answer is H.

Remember the more mass an object has the more force it will take to move that object. The more mass an object has the more inertia that object has as well. If we could remove friction from in between two objects, then an object that is set in motion would just go forever at a constant speed according to Newton’s First Law.