

## Accelerated Car Pre-Activity Discussion Questions (Teacher)

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### Prior Knowledge Questions and Discussion

1. **What will be the motion of the device? Sketch the position vs. time graph you expect for this motion.**

The device should speed up when it is first released and then slow down until it comes to a stop. The position-time curve should have an increasing slope upward and then a decreasing slope, but continue upward to the 5 m mark.

2. **Will the velocity of the device ever be negative? Sketch the velocity vs. time graph you expect for this motion.**

No, the velocity will not be negative as the car will continue to move in the positive direction and the slope of the position-time graph continues to be positive. The velocity-time graph will start off at zero and quickly rise to a higher number and then decrease to zero as the object comes to a stop.

3. **Will the acceleration of the device be constant? What about the force acting on the device?**

The acceleration will not be constant since the device will speed up then slow down. Since the rubber band will not maintain the same "stretch," the force on the object will not be constant and, since the mass of the object stays the same then, according to Newton's second law of motion, the acceleration must change. This means that the acceleration will change over time. Since the device will both speed up and slow down, it will have both positive and negative acceleration.