BOOK M CHAPTER 2

Math skills for Science

FINDING VELOCITY

Velocity =   SPEED +   DIRECTION

North, South, East, West

How fast?   meters/second   Vertically, Horizontally
Which   Kilometers/hour
way?   Forward, Backward

Up, Down

GRAVITY

- Gravity pulls objects toward the center of the Earth with a force of 9.8 m/s^2

- which is 9.8 meters per second, per second as an object falls.

CHAPTER REVIEW # 14

- A 12 kg rock falls from being at rest on the top of a cliff, and hits the ground in 1.5 seconds.
  - a.) Without air resistance, what's the rock's velocity just before it hits the ground? Show your work!

- $V = G \times T$ Velocity = gravity x time
- **9.8 m/s² x 1.5 seconds = 14.7 m/s**

b.) What is the rock's momentum just before it hits the ground? Show your work!

$P = M \times V$ Momentum = mass x velocity, so

12 kg x 14.7 m/s = 176.4 kg• m/s

CHAPTER REVIEW # 16

- During a space shuttle launch, about 830,000 kg of fuel is burned in 8 minutes. The fuel provides the shuttle with a constant thrust, or forward force. How does Newton's second law of motion explain why the shuttle's acceleration increases as the fuel is burned??

- Acceleration = force ÷ mass   The shuttle will have LESS mass after each minute that the fuel is being burned, so it will need less FORCE to move the shuttle forward. You increase acceleration when you decrease the mass.

- Can I accelerate faster with ¼ tank of gas, or with a full tank of gas???

HOTS REVIEW

A driver starts her car and steps on the gas pedal. The car gradually accelerates to 50 km/hr. A few minutes later, the driver suddenly slams on the brakes to avoid hitting a box in the road. As the car comes to a stop, the driver's body appears to lurch forward in the seat until it is restrained by the seatbelt.

Total Distance — Time — A
Acceleration — Time — B
Velocity — Time — C
Acceleration — Time — D
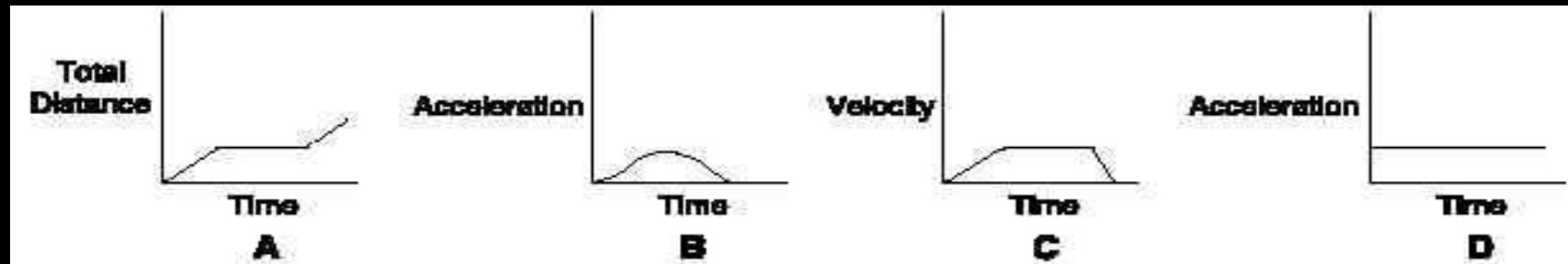
A driver
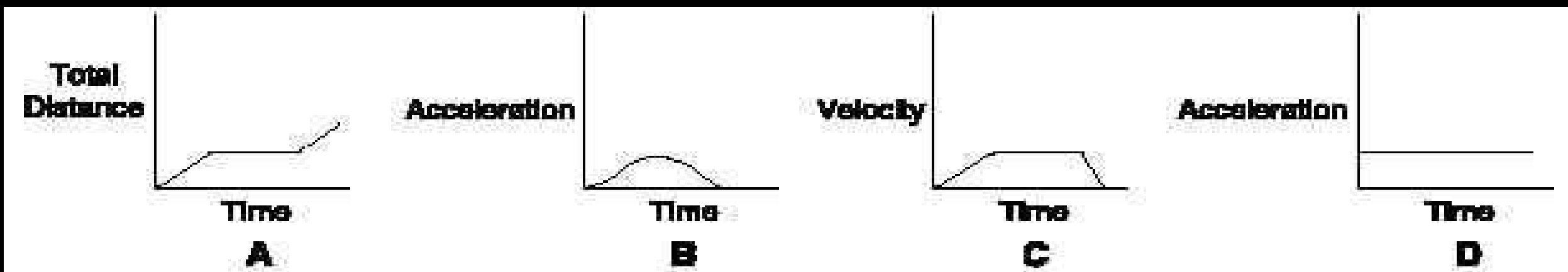
What story might you tell for graph A, C, or D?