Name _____ Date _____

Motion

Section 1 Describing Motion

CHAPTER 2
DRW

Skim *Section 1 of the chapter. Read the headings and illustration captions. Write three questions that come to mind.*

1. _____
2. _____
3. _____

Review Vocabulary **Define** *meter to reflect its scientific meaning.*

meter _____

New Vocabulary *Use your book to define the words below.*

motion _____

distance _____

displacement _____

_____

speed _____

Contrast the average speed *and the* instantaneous speed *of a runner in a race.*

average speed _____

instantaneous speed _____

_____

_____

_____

Academic Vocabulary *Use a dictionary to define* position *with its scientific meaning.*

position _____

Name _____ Date _____

Section 1 Describing Motion (continued)

Main Idea	Details
Motion and Position *I found this information on page* _____.	**Draw** *a winding path that covers a distance of 70 miles and finishes with a displacement 20 miles southwest of the starting point. Label your diagram with the distance and direction traveled.*
Speed *I found this information on page* _____.	**Analyze** *the formula for speed by looking at the diagram and filling in the prompts.* Put your finger over the *s* on the diagram. Now write the formula for speed. _____  Put your finger over the *d* on the diagram. Write the calculation to find distance when you know speed and time. _____ Prove to yourself that these formulas are correct by checking the units. speed (units of ___ or ___) = $\frac{\text{distance (units of ___ or ___)}}{\text{time (units of ___ or ___)}}$ distance (units of ___) = speed (units of ___) × time (units of ___) Note that the units always turn out the same on both sides of the equation.

Name _____ Date _____

Section 1 Describing Motion (continued)

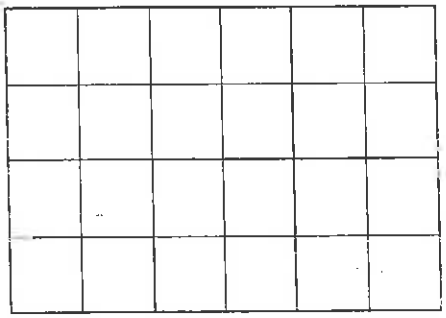
Main Idea

Graphing Motion

I found this information on page _____.

Details

Create *a graph to show the progress of a runner who runs a 1-kilometer race in 3 minutes. The runner gets off to a fast start, runs the middle of the race at a more moderate pace, and then sprints to the finish.*



Graphing Checklist:
- title
- scale on *x*-axis
- units on *x*-axis
- label on *x*-axis
- scale on *y*-axis
- units on *y*-axis
- label on *y*-axis

ANALYZE IT

Analyze the following statement. "A boat traveled at 10 km/h for one hour, then at 13 km/h for two hours, and finally at 11 km/h for another hour. The average speed over the whole trip was 15 km/h." Support your analysis with a calculation.

Name _____ Date _____

Motion

Section 2 Velocity and Momentum

Scan *Use the checklist below to preview Section 2 of your book.*

- Read all section titles.
- Read all boldfaced words.
- Read all graphs and equations.
- Look at all the pictures and read their captions.

Review Vocabulary

Define speed *in a sentence to show its scientific meaning.*

speed _____

New Vocabulary

Use your book to define the words below.

velocity _____

momentum _____

Academic Vocabulary

The words positive *and* negative *are a natural pair. Explain how no number can be both positive and negative. Can any number be neither positive nor negative?*

negative _____

positive _____

_____

Name _____ Date _____

Section 2 Velocity and Momentum (continued)

Main Idea | **Details**

Velocity

I found this information on page _____.

Critique *the phrase "airspeed velocity of a swallow."*

_____

_____

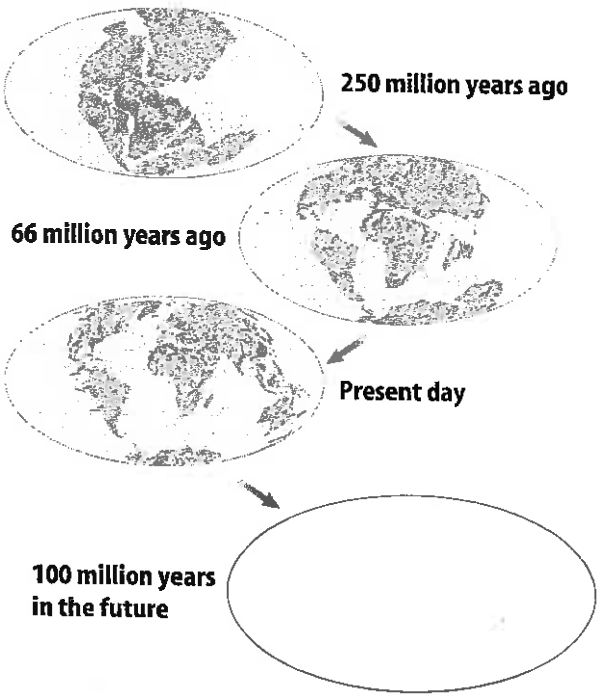
Model *a swallow in flight.*

- Use an arrow to show the swallow's velocity.
- Label the arrow to indicate the swallow's speed.

Motion of Earth's Crust

I found this information on page _____.

Draw *the shape of the continents as they may appear at 100 million years from the present day.*



Name _____ Date _____

Section 2 Velocity and Momentum (continued)

Main Idea

Details

Relative Motion

I found this information on page _____.

You are walking toward the back of a train that is moving forward with a constant velocity. The train's velocity relative to the ground is 30 m/s forward. Your velocity relative to the train is 1.5 m/s backward. How fast are you moving relative to the ground?

_____

_____

Momentum

I found this information on page _____.

Analyze the property of momentum *in words and with an equation. Include units and identify all variables.*

Words	Equation

Predict *why* momentum *is a property of moving objects, but not of stationary objects.*

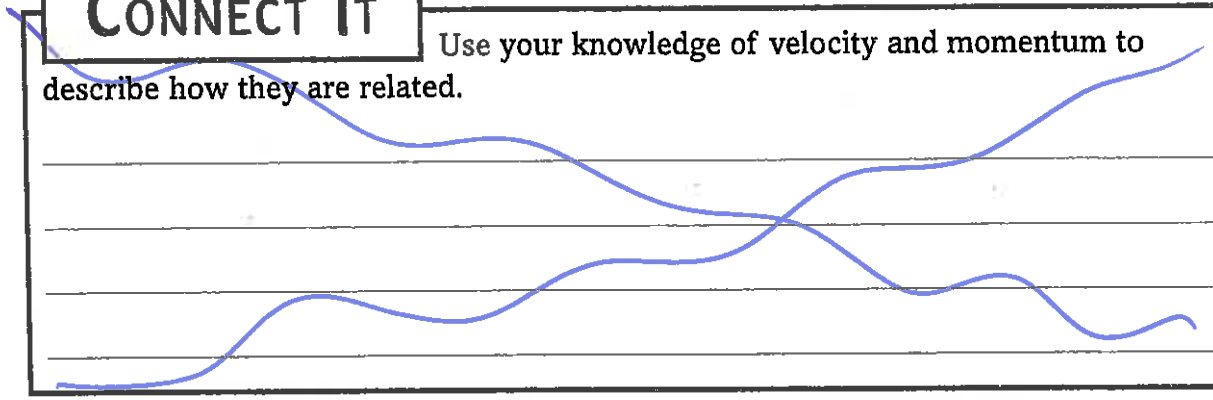
_____

_____

_____

CONNECT IT

Use your knowledge of velocity and momentum to describe how they are related.



_____

_____

_____

_____

Name _____ Date _____

Motion

Section 3 Acceleration

Scan *Use the checklist below to preview Section 3 of your book.*

- Read all section titles.
- Read all boldfaced words.
- Read all graphs and equations.
- Look at all the pictures and read their captions.

Review Vocabulary

Define velocity *in a sentence to show its scientific meaning.*

velocity _____

_____

New Vocabulary

Use your book to define the terms below.

acceleration _____

centripetal acceleration _____

_____

Analyze why we say an object is accelerating, when we usually mean that it is speeding up. An object that is slowing down also is accelerating.

_____

_____

_____

_____

Academic Vocabulary

Use a dictionary to define constant *to its scientific meaning.*

constant _____

_____

Name _____ Date _____

Section 3 Acceleration (continued)

Main Idea | **Details**

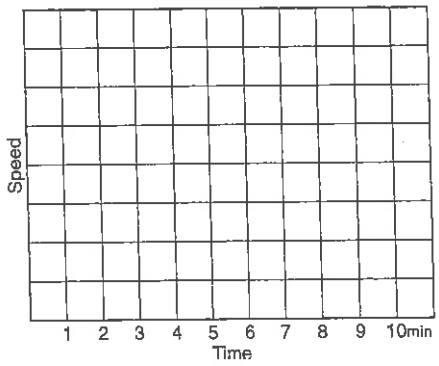
Velocity and Acceleration

I found this information on page _____.

Synthesize *Create a graph titled "Speed Changing Over Time" to show the acceleration of the car traveling around your course (above). Place the labels* A, B, C, *and* D *along the horizontal axis to represent the time when the car travels each part of the course.*

- Draw a line on the graph to show how the speed of the car changes with time.
- Label each of the four parts of the graph with either a plus sign, a minus sign, or a zero to indicate where the car's acceleration is positive, negative, or zero.

Speed Changing Over Time



- Describe the relationship between speed and acceleration as shown in your graph.

_____

_____

Motion in Two Dimensions

I found this information on page _____.

Compare *the results of applying the acceleration equation in the following two cases: (1) an object that goes from 0 to 10 m/s in 4 s, and (2) then goes from 10 m/s to 30 m/s in 8 s.*

(1) $a = (v_f - v_i)/t$

$= \_\_\_\_\_ = \_\_\_\_\_$

(2) $a = (v_f - v_i)/t$

$= \_\_\_\_\_ = \_\_\_\_\_$

_____

_____

_____

Name _____ Date _____

Section 3 Acceleration (continued)

Main Idea	Details
	Analyze *why the SI unit of acceleration is* m/s^2.
Projectile Motion *I found this information on page* _____.	**Model** *a ball thrown horizontally. Sketch the path of the ball and draw arrows showing its horizontal and vertical velocity at three points along the path. Vary the length of your arrows to show the magnitude of the velocities.*
Circular Motion *I found this information on page* _____.	**Create** *a top view of an object moving in a circle at constant speed, such as a ball on a string. Show at least two positions of the object. At each position, draw an arrow for the object's velocity and another arrow for the centripetal acceleration of the object.*

SYNTHESIZE IT

Distinguish between average acceleration and instantaneous acceleration. Be sure to explain how the acceleration equation calculates average acceleration, instantaneous acceleration, or both.