CHAPTER 13 Chapter Review

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Chapter 13 Review Chart

Time

45–60 min

Skills and Processes

The Chapter Review provides an opportunity for students to demonstrate their understanding of and their ability to apply the key ideas, vocabulary, and skills and processes.

Program Resources

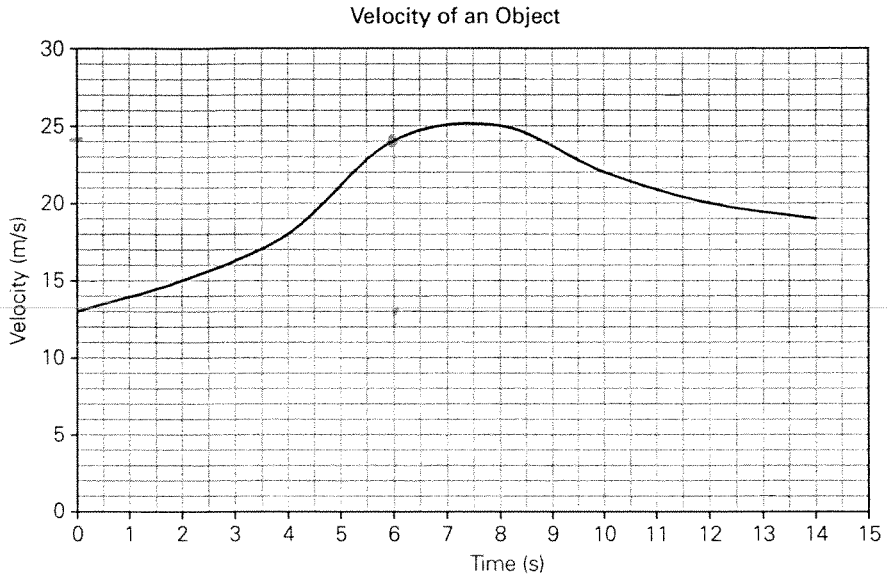
BLM 0.0-10 Chapter Key Ideas
WS 13.0-1 Chapter Checklist
WS 13.0-2 Chapter 13 Quiz
Nelson Science Probe 10 website
www.science.nelson.com

- Divide the class into small groups. Have each group discuss the meanings of each vocabulary term. If time permits, have each group of students act out, or demonstrate to the extent possible, each of the terms and the Key Ideas. For example, in order to explain acceleration, a student might walk across the room at increasing speed and drop a pencil at regular times. The student could place a pencil on the floor each second. The distance between the pencils would show that the student's velocity was increasing. This would show that the student was accelerating. Alternatively, have groups act out or demonstrate a vocabulary term or Key Idea and have other groups guess what term or concept is being demonstrated.
- Next, have each group discuss the Key Ideas and the bulleted list of statements below each idea. Students in the group should work together to give an example of the meaning of each idea.
- Lead the class in a discussion of the photographs on page 396 and the graphs on page 397 of the Student Book.
  - Ask, *Why were these photographs chosen for the review page? What points about motion do they make?* Students should notice that the bicyclists in the first photograph are moving around a curve, which means they are accelerating. Their speed is likely not changing significantly. The bungee jumper in the second photograph was almost in free fall before the cord was stretched. Ask, *What would a velocity–time graph of the bungee jumper's motion look like?* A velocity–time graph would show a steady (downward) increase in velocity followed by a sudden decrease in velocity. As the jumper bounced upward, the graph would show a reversal in the direction of velocity.
  - Have students describe the motion represented by each of the graphs. Ask, *What information can you get from the graphs?* From a velocity–time graph, students can determine an object's average velocity, instantaneous acceleration, and displacement. Ask, *What is the purpose of the triangle drawn on the first graph?* The triangle is drawn in order to determine the slope of the line, or the acceleration, during that time period.
- Have students use their Study Guides from the Student Workbook to review what they have learned in this chapter. They should use these guides and their notes to review the key ideas given in the Chapter Review.
- Have students use *BLM 0.0-10 Chapter Key Ideas* to review the key ideas in the chapter.
- Students can complete *WS 13.0-1 Chapter Checklist* to self-check their knowledge of the prescribed learning outcomes and achievement indicators presented in the chapter.
- Have students complete *WS 13.0-2 Chapter 13 Quiz* to review the vocabulary and concepts in this chapter.

Review Key Ideas and Vocabulary—Suggested Answers

1. C **2.** 1.2 m/s^2 [E] **3.** A

4. (a)



(b) 1.8 m/s^2; **(c)** 0.43 m/s^2; **(d)** 1.3 m/s^2

5. (a) 10 m/s up; 0 m/s; 10 m/s down

(b) In each case, $\vec{v}_f = \vec{v}_i + \vec{a}_{av}\Delta t$. Up is defined to be positive.

For 1 s, $\vec{v}_f$ = 20 m/s + (−9.8 m/s^2)(1.0 s) = +10 m/s or 10 m/s up.

For 2 s, $\vec{v}_f$ = 20 m/s + (−9.8 m/s^2)(2.0 s) = 0 m/s.

For 3 s, $\vec{v}_f$ = 20 m/s + (−9.8 m/s^2)(3.0 s) = −10 m/s or 10 m/s down.

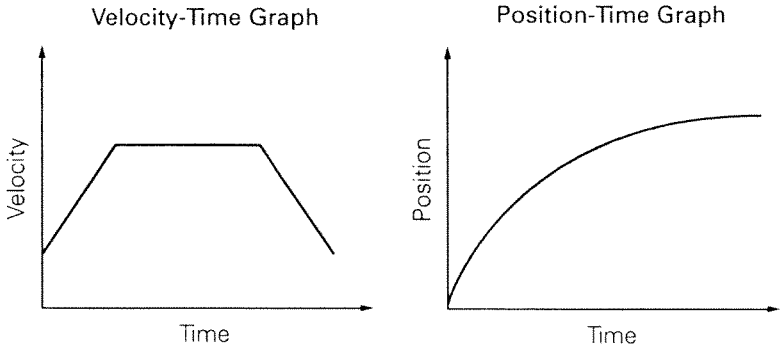
(c) The ball is at its highest point at 2.0 s. The acceleration of the ball at this point is –9.8 m/s^2.

(d) No.

Use What You've Learned—Suggested Answers

6. B **7.** B **8.** B **9.** D

10.



11. Average velocity is the velocity over a time interval. Instantaneous velocity is the velocity at a specific moment in time.

12. displacement, average acceleration, and instantaneous acceleration

Think Critically—Suggested Answers

13. The mass of a moving object and the object's cross-section, or shape, affect its terminal velocity. The medium through which the object falls also affects its terminal velocity. An experiment might include using a sonar ranger to measure the falling velocity over time for two objects that have the same mass but different cross-sections.

Ch 13 - Review Solutions

#1 c ← not 0 because v is 0 at highest point but $\vec{a}$ due to gravity is constant

#2) $\vec{a} = \frac{\Delta \vec{v}}{\Delta t} = \frac{28\,m/s - 22\,m/s}{5.0 - 0\,s} = 1.2\,m/s^2\,[E]$

↑ check your units + direction! ↗

#3) no slope ∴ no $\vec{a}$

#4) b) $\vec{a}_{ave} = \frac{\Delta v}{\Delta t} = \frac{24-13}{6} = 1.8\,m/s^2$ c) $\vec{a}_{ave} = \frac{\Delta v}{\Delta t} = \frac{19-13}{14\,s} = 0.43\,m/s^2$

d) approx slope at 10s

#5 a) read v off the graph! b) v is constant c) gravity always $-9.8\,m/s^2$ $9.8\,m/s^2$ down

d) No

#6) $\frac{\Delta \vec{v}}{\Delta t} = \frac{2.25 - 0.43}{0.68} = 2.68\,m/s^2\,[W]$

#7) $\vec{a} = \frac{v}{t}$ ∴ $\Delta v = a \times t$
$= 9.8\,m/s^2 \times 2.50\,s = 24.5\,m/s$
∴ $14.0\,m/s - 24.5\,m/s = 10.5\,m/s$ down

#8) $\Delta v = 7.5 - 2.5$
$= 5\,m/s = a \times t$
$4.2 = 1.2\,s$