CHAPTER 3 Transparency 3-1

Velocity v. Time

Table A

Velocity v. Time

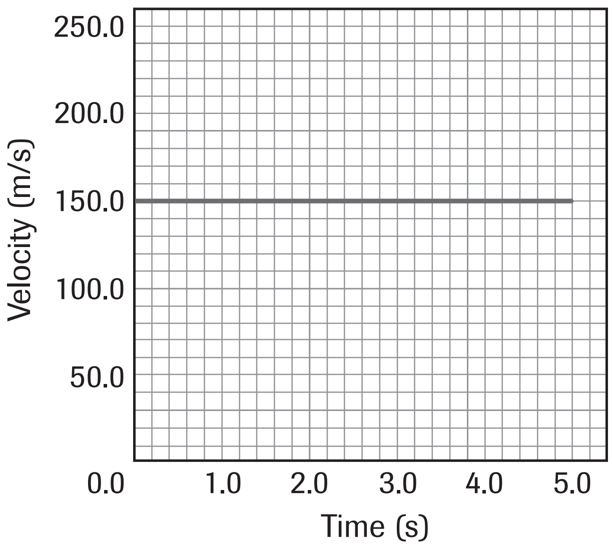
Time (s)	Velocity (m/s)
0.0	150.0
1.0	150.0
2.0	150.0
3.0	150.0
4.0	150.0
5.0	150.0

Table B

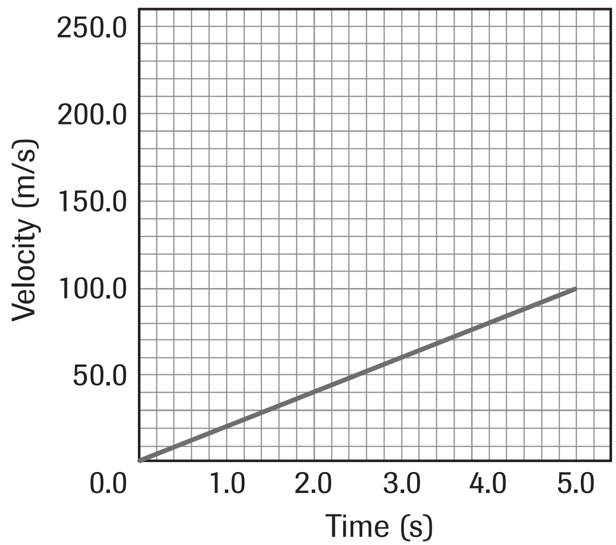
Velocity v. Time

Time (s)	Velocity (m/s)
0.0	+0.0
1.0	+20.0
2.0	+40.0
3.0	+60.0
4.0	+80.0
5.0	+100.0

Graph A
Velocity v. Time



Graph B
Velocity v. Time



Date _____ Period _____ Name _____

3 Transparency 3-1 Worksheet

Velocity v. Time

1. In which graph is the object moving at a constant velocity? What is the velocity?

_____

_____

2. What is the slope of the line in Graph B? What value does the slope represent?

_____

_____

3. Write the equation that represents Graph A.

_____

4. For Graph B, state the relationship between the variables as an equation.

_____

5. In Graph A, what is the object's displacement at 4.5 s?

6. In Graph B, what is the object's displacement between 2.0 s and 5.0 s?

7. Compare the velocities of the objects in the two graphs at 3.0 s.

_____

_____

_____

8. How long will it take the object in Graph B to reach the velocity of the object in Graph A?

_____

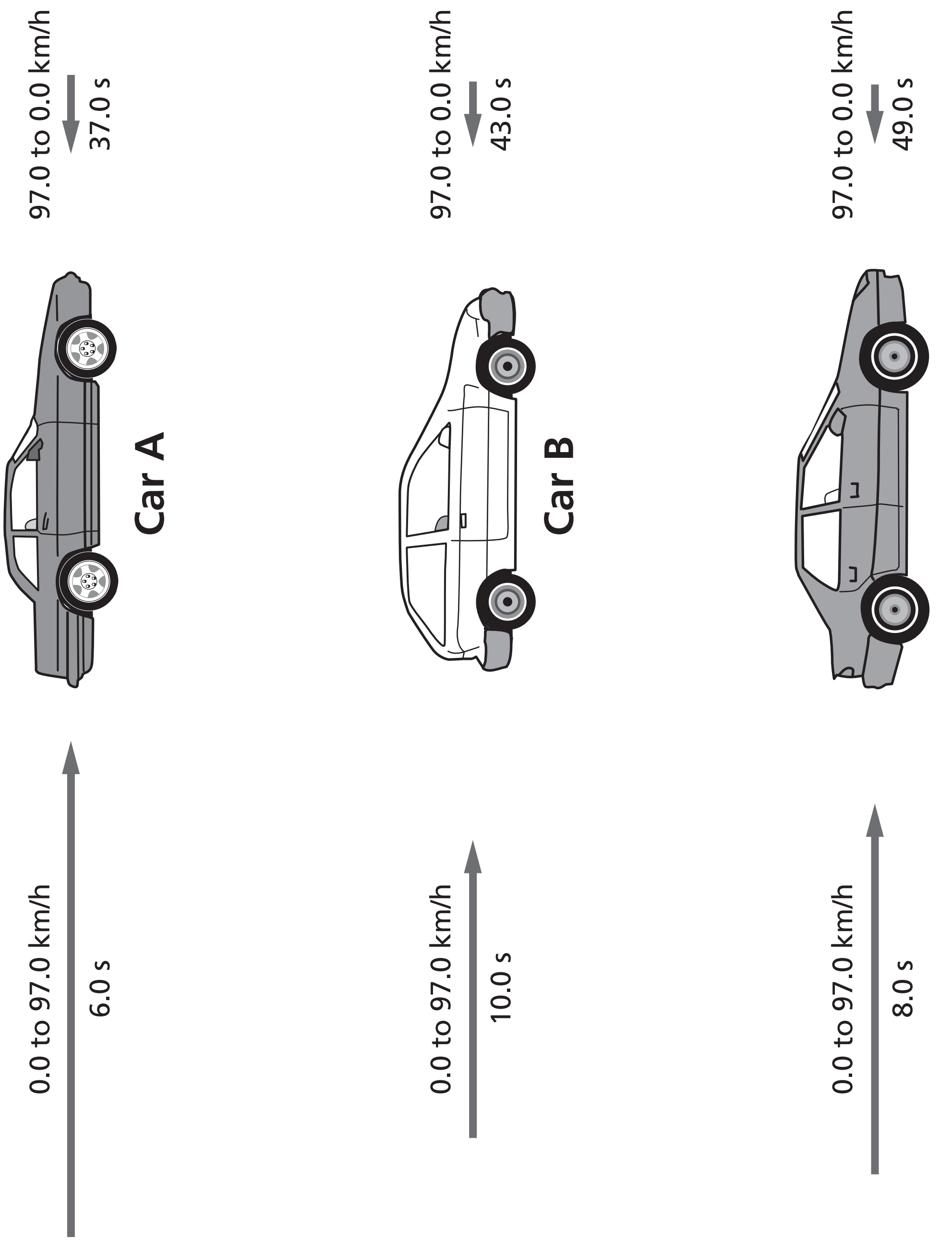
9. What is the difference in velocity between the two objects at 2.0 s?

_____

CHAPTER 3

Transparency 3-2

Positive and Negative Acceleration



Date _____ Period _____ Name _____

Transparency 3-2 Worksheet

Positive and Negative Acceleration

1. Acceleration figures for cars usually are given as the number of seconds needed to go from 0.0 to 97 km/h. Convert 97 km/h into m/s.

2. What is the average acceleration of Car A? Car B? Car C?

3. Which car can go from 0.0 to 97 km/h in the shortest time? Does this car have the highest acceleration or the lowest?

_____

4. For acceleration from 0.0 to 97 km/h, which direction is the acceleration vector pointing? Explain your answer.

_____

5. When a car is braking from 97 km/h to 0.0 km/h, is it positive or negative acceleration? Explain your answer.

_____

_____

_____

6. Based on the information shown in the figure, which car would you consider to be the safest? Why?

_____

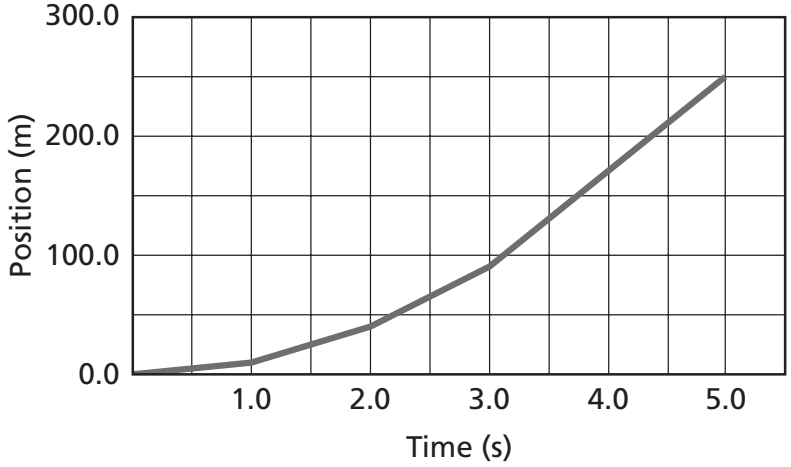
_____

CHAPTER 3

Transparency 3-3

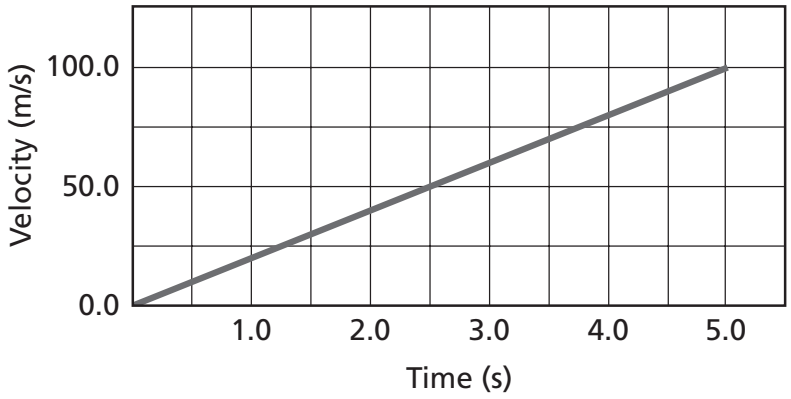
Position, Velocity, and Acceleration

Time v. Position



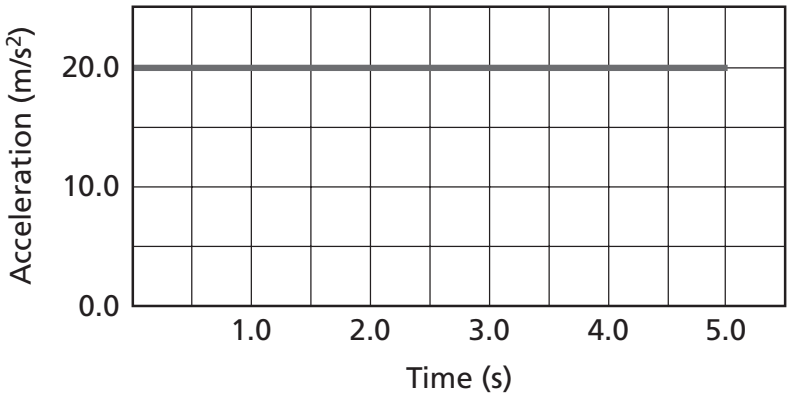
Time (s)	Position (m)
0.0	0.0
1.0	10.0
2.0	40.0
3.0	90.0
4.0	160.0
5.0	250.0

Time v. Velocity



Time (s)	Velocity (m/s)
0.0	0.0
1.0	20.0
2.0	40.0
3.0	60.0
4.0	80.0
5.0	100.0

Time v. Acceleration



Time (s)	Acceleration (m/s^2)
0.0	20.0
1.0	20.0
2.0	20.0
3.0	20.0
4.0	20.0
5.0	20.0

Date _____ Period _____ Name _____

3 Transparency 3-3 Worksheet

Position, Velocity, and Acceleration

1. How can you determine velocity using the position-time graph?

2. What is the relationship between the position-time graph and the velocity-time graph in terms of velocity?

3. What is the area under the velocity-time graph between $t = 2.0$ s and $t = 4.0$ s?

4. What is the change in position on the position-time graph between $t = 2.0$ s and $t = 4.0$ s?

5. How are your answers to problems 3 and 4 related?

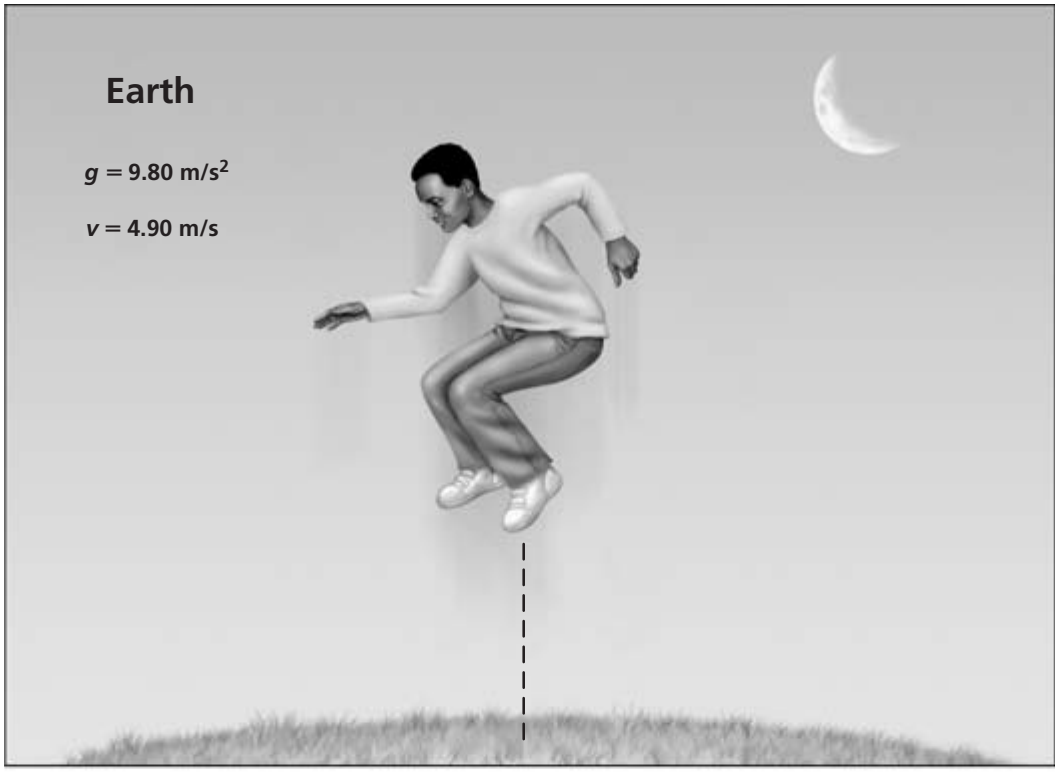
6. How can you determine acceleration using the velocity-time graph?

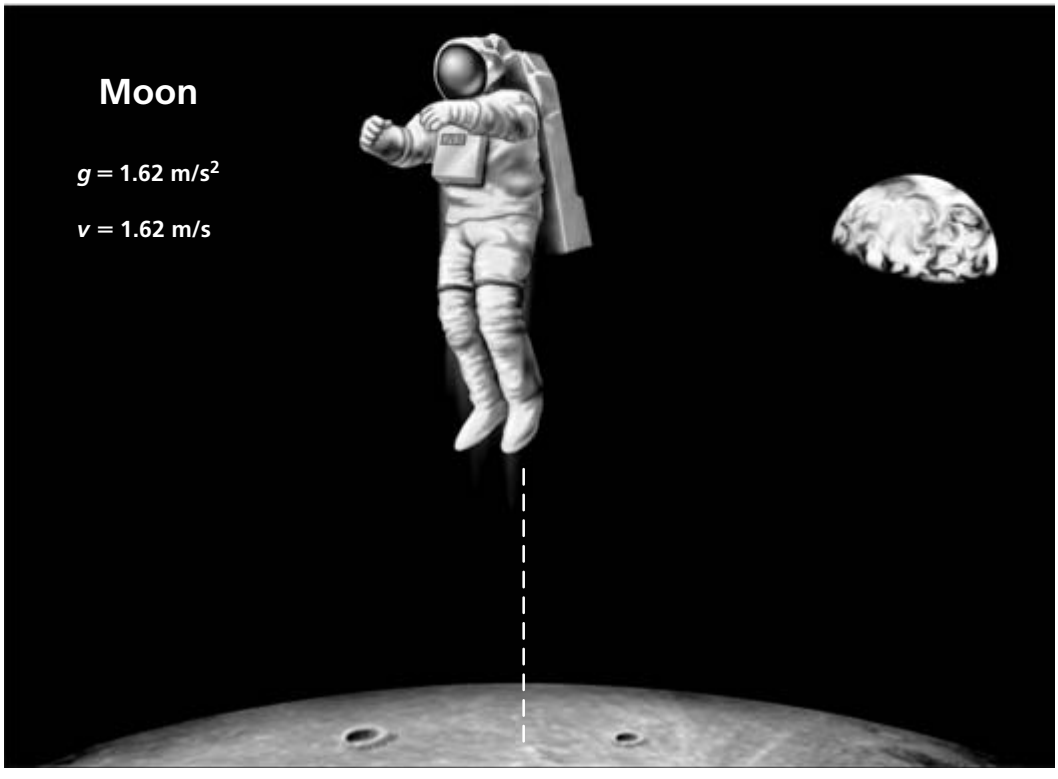
7. How is the relationship between the velocity-time graph and the acceleration-time graph in terms of acceleration?

8. If the velocity were constant, what would the position-time graph look like? What would the acceleration-time graph look like?

Transparency 3-4

Free Fall on the Moon





Date _____ Period _____ Name _____

3 Transparency 3-4 Worksheet

Free Fall on the Moon

1. A boy on Earth jumps straight upward with an initial velocity of 4.9 m/s.

a. How long does it take for him to reach maximum height?

b. At maximum height, what is his velocity?

c. At maximum height, what is his acceleration? Explain your answer.

_____

_____

_____

2. An astronaut wearing a 20-kg spacesuit jumps on the Moon with an initial velocity of 16 m/s. On the Moon, the acceleration due to gravity is 1.62 m/s^2. (Assume that downward is the positive direction.)

a. How long does it take him to reach maximum height?

b. What is the maximum height he reaches?

c. If you drew a velocity-time graph for the motion of the astronaut, what would be the slope of the line?

d. Are the vectors for acceleration and initial velocity pointed in the same or different directions? Explain your answer.

_____

_____