1. The Steamboat Geyser in Yellowstone National Park, Wyoming is capable of shooting its hot water up from the ground with a speed of 48.0 m/s. How high can this geyser shoot?

2. A giraffe, who stands 6.00 m tall, bites a branch off a tree to chew on the leaves, and he lets the branch fall to the ground. How long does it take the branch to hit the ground?

3. Billy, a mountain goat, is rock climbing on his favorite slope one sunny spring morning when a rock comes hurtling toward him from a ledge 40.0 m above. Billy ducks and avoids injury. A) How fast is the rock traveling when it passes Billy? B) How does this speed compare to that of a car traveling down the highway at the speed of 25 m/s (equivalent to 55 mi/h)?

4. Reverend Northwick climbs to the church belfry one morning to determine the height of the church. From an outside balcony he drops a book and observes that it takes 2.00 s to strike the ground below. A) How high is the balcony of the church belfry? B) Why would it be difficult to determine the height of the belfry balcony if the Reverend dropped only one page out of the book?

5. How long is Tiny, a ballerina, in the air when she leaps straight up with a speed of 1.8 m/s?

6. In order to open the clam it catches, a seagull will drop the clam repeatedly only a hard surface from high in the air until the shell cracks. If a seagull flies to a height of 25 m, how long will the clam take to fall?

7. While repairing a defective radio transmitter atop the 410-m-tall World Trade Center, Lyly drops his hammer that falls all the way to the ground below. A) How long will it take for Lyle's hammer to fall? B) With what speed will the hammer hit the pavement? C) How far will the hammer have fallen after 1.50 s when a janitor watches it pass outside an office window?

8. A unique type of basketball is played on the planet Zarth. During the game, a player flies above the basket and drops the ball in from a height of 10 m. If the ball takes 5.0 s to fall, find the acceleration due to gravity on Zarth.

Examples:

1. King Kong carries Fay Wray up the 321-m-tall Empire State Building. At the top of the skyscraper, Fay Wray's shoe falls from her foot. How fast will the shoe be moving when it hits the ground?

2. A baby blue jay sits in a tall tree awaiting the arrival of its dinner. As the mother lands on the nest, she drops a worm toward the hungry chick's mouth, but the worm misses and falls from the nest to the ground in 1.50 s. How high up is the nest?