

Lesson 9 Worksheet

1. A sky diver falls at a constant speed in the spread-eagle position. After he opens his parachute, is the sky diver accelerating? If so, in which direction? Explain your answer using Newton's 1st and 3rd laws.

2. Meredith is walking to school when she checks her cell phone for the time. She's late! Panicked because she has a physics test in her first block, she starts to run. Realizing that Newton's Second Law will be on the test, she decides to practice for the test by calculating in her head how much horizontal force her feet are exerting against the ground as she starts to run. She knows that her mass is 55kg and she guesses that she accelerates at 0.30m/s^2 . How much horizontal force are her feet exerting against the ground as she starts to run?

3. William, with a mass of 65.0 kg, is standing by the boards at the side of an ice skating rink. He pushes off the boards with a force of 9.0 N. What is his resulting acceleration?

4. William, being the sly dog that he is, decides to ask his girl friend Kate to do the same experiment so he can determine her mass. He notes that Kate pushes off the boards with a force of 8.0N and accelerates at a rate of 0.15m/s^2 . What is Kate's mass?

5. A basket ball is dropped exactly vertically (no horizontal motion) from a height of 1.00m and bounces back up to 0.80m above the ground. Using Newton's 3rd Law, explain what happens when the ball hits the ground.

Also, any ideas as to why the ball doesn't bounce back up to the same height as it was dropped? Note that we haven't studied this part of the question in the course yet, so don't worry if you're not sure. It won't be on the test.