

AP Physics: Short Lab 4-A
Virtual Free Body Diagrams

Name _____

Hour _____

Purpose:

To practice creating free body diagrams for various situations.

Equipment:

Computer with Internet access and Shockwave program installed.

Preparation:

1. Open the Virtual Free Body Diagram web page located at <http://www.physicsclassroom.com/shwave/fbd.cfm> and click “*Begin*” and then “*Start*.” (You do not need to enter your name.)

2. The program will present you with several Free Body Diagram situations in a random order. Click “*Try New Problem*” until you are given one of the 6 situations listed below.

Book

Car

Elevator – moving down, constant speed

Elevator – moving down, slowing down

Football – at the peak

Ice Skater

3. Create a virtual free body diagram by adjusting the type of force and relative size of force acting on the object in each direction. Use the “*Large*,” “*Medium*,” and “*Small*” commands to describe the size of the force, relative to the force acting in the opposite direction.

4. When you have adjusted the forces acting on the object, click the “*Check Answer*” command at the bottom of the screen. The program will tell you whether or not your diagram is correct. If your diagram is incorrect, you may adjust the forces and try again. When you have created the correct diagram for each situation, sketch your answer in the spaces below. Draw each vector of the appropriate length to show whether it is a large, medium, or small force. Also label each vector with the type of force used. You do *not* need to submit your answers to the computer. (*NOTE: For extra practice, you may create free body diagrams for other situations that are given. However, you only need to record your answers for the 6 situations listed below and on the back page.*)

Answers:

Book:



Car:



Elevator - Moving Down
at Constant Speed:



Elevator - Moving Down
and Slowing Down:



Football - At the Peak:



Ice Skater:

