

Handed Out: _____
Due Date: _____

Name: _____
Date: _____

Free-Body Diagrams

Physical Science and Technology

Use your own paper to draw a free-body diagram for **Annette Force** in problems 1-5 below. Remember the rules for drawing free-body diagrams:

- 1) Draw all the forces that are specifically described in the problem.
- 2) Draw a pulling force for gravity (unless the problem says there is no gravity).
- 3) If the object is on a surface, and that surface is either slowing the object down or preventing the object from sliding along the surface, draw a pushing force for friction (opposite the direction of motion).
- 4) If the object is on a surface, and that surface is preventing the object from falling straight down, draw a pushing force for the surface force that is perpendicular (90 degree angle) to the surface.

Also remember that

- a) Free-body diagrams only show ONE object at a time (so in these problems, you should only draw Mr. Bregar).
 - b) Pushing forces can be shown by arrows pointing towards the object and pulling forces can be shown by arrows pointing away from the object.
 - c) All arrows should be clearly labeled.
 - d) Only show forces that are acting ON the object (not forces that the object is exerting).
-
1. Annette Force is being stepped upon by an elephant.
 2. Annette is in outer space, where there is no gravity, and a Martian is pushing her.
 3. Annette is being squished by a vise.
 4. Annette is being pulled in one direction by Ty Delwave and in the opposite direction by Collin D. Hogs. Collin is pulling twice as hard as Ty is, so Annette is sliding along the floor towards Collin.
 5. Annette is floating in outer space, where there is no gravity, and she is pushing on a rocket.
 6. In problems 1, 3, and 4, gravity is pulling on Annette. Newton's 3rd law says that if gravity is pulling on Annette, then Annette must be pulling on gravity. Does this make sense? Can you explain what the "equal and opposite reaction" force is to the force of gravity pulling on Annette? (Hint - it's the same for each problem, and it's not a force that you would draw on the free-body diagram because it's NOT acting on Annette.)