

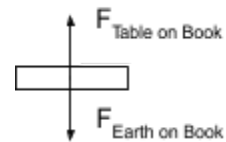
## Drawing *Free Body Diagrams*

Free Body Diagrams (FBD's) are a tool that we use to identify the forces that are acting on an object. Forces are the pushes or pulls that exist between objects. There are two types of forces, contact and long-range. **Contact** forces are the forces that exist due to the objects touching one another. The only **Long Range** forces that we are going to work with are gravitational attraction and electrostatic interactions. This means that there are two questions to ask when identifying forces.

(1) What is touching the object?

(2) What long-range forces are there?

All of the forces are to be named in subscripts by identifying both of the objects involved in the force. The outside object is the first one in the name and the object of the FBD is second in the name. The FBD for a book that is sitting on a table is:



Draw the Free Body Diagrams for each of the following situations.

1. Joy sitting on a chair.
2. Andrew standing on the ground.
3. Kyla pushing off the ground to jump up in the air.
4. A baseball:
  - a. as Jack hits the ball
  - b. after the ball has left Jack's bat.
5. A car as it is being towed by a truck.
6. A desk as Teresa and Emma are pushing on it in opposite directions.