

Ph 150 – Free-Body Diagram Exercises

The following symbols are commonly used for forces on free-body diagrams:

F_g – force of gravity – force pulling object toward centre of earth

F_N – normal force – force pushing two surfaces apart, which is perpendicular to the surfaces

F_f – frictional force – always parallel to surfaces, and opposing relative movement of surfaces

F_T – tension force due to a string, rope, elastic, etc.

F – external force

Draw a free-body diagram for the following situations:

1. A block is sitting on a flat surface.
2. A block is hanging from a string.
3. A block is being pulled along a horizontal, frictionless surface by a horizontal string.
4. A block is being pushed along a rough surface (not frictionless) by a horizontal, external force.
5. A block is being pushed down onto a table by a vertical force.
6. A block is sitting at rest on an incline.
7. A block is held stationary on a frictionless incline by a string parallel to the incline's surface.
8. A block has just fallen off the table, and hasn't hit the floor yet.