

## 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

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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.