Newton's 1st Law Force Diagrams

A "Free-Body Diagram" is just a sketch showing all the forces acting on an object, but taking care to label the forces correctly and show the correct directions.

Common forces that may be present:

- $\begin{array}{l} F_g Force \ of \ gravity \ (weight) \\ F_T Tension \ (force \ in \ a \ string \ or \ a \ cable) \\ F_N Normal \ force \ (support \ force \ of \ the \ ground \ on \ an \ object) \\ F_f \ or \ F_{drag} Force \ of \ friction \ or \ force \ of \ air \ drag \\ F_{lift} Lift \ force \ of \ the \ propellers \ or \ wings \ of \ an \ airplane \\ F_a Force \ applied \ to \ an \ object. \end{array}$
- 1. Which of the following would best represent a person standing still in the hallway?



2. Which of the following would best represent a person being pulled to the right at constant speed?



3. Which of the following would best represent a person standing still in an elevator?



NAME:

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4. Which of the following would show forces completely cancelling out? (Circle all that apply.)



For each of the following, sketch a "Free Body Diagram," which is a labeled diagram of all the forces acting on the object.

- 1. A car traveling to the right at a constant speed.
- 2. An airplane flying to the right at constant velocity.
- 3. A helicopter hovering above the ground.
- 4. A person riding in an elevator moving up with constant speed.
- 5. A helicopter coming down at constant speed.
- 6. A student pushing a fellow student on a skateboard to the left at a constant speed.
- 7. What do all of those examples have in common? How does this relate to Newton's 1st Law?