Glossary

deformation
change in shape due to the application of force

drag force
F_D , found to be proportional to the square of the speed of the object; mathematically

$$F_D \propto v^2$$

$$F_D = \frac{1}{2} C \rho A v^2,$$

where C is the drag coefficient, A is the area of the object facing the fluid, and ρ is the density of the fluid

friction
a force that opposes relative motion or attempts at motion between systems in contact

Hooke's law
proportional relationship between the force F on a material and the deformation ΔL it causes, $F = k\Delta L$

kinetic friction
a force that opposes the motion of two systems that are in contact and moving relative to one another

magnitude of kinetic friction
$f_k = \mu_k N$, where μ_k is the coefficient of kinetic friction

magnitude of static friction
$f_s \leq \mu_s N$, where μ_s is the coefficient of static friction and N is the magnitude of the normal force

shear deformation
deformation perpendicular to the original length of an object

static friction
a force that opposes the motion of two systems that are in contact and are not moving relative to one another

Stokes' law
$F_s = 6\pi r \eta v$, where r is the radius of the object, η is the viscosity of the fluid, and v is the object's velocity

strain
ratio of change in length to original length

stress
ratio of force to area

tensile strength
the breaking stress that will cause permanent deformation or fraction of a material