# Introduction to Pressure (SwiftStudy Printable)

### Definition of Pressure

$$P = \frac{F}{A}$$

| | | |
|---|---|---|
| $P$ | pressure | pascals (Pa) |
| $F$ | force | newtons (N) |
| $A$ | area | $m^2$ |

### Pressure from a Column of Fluid

$$P = \rho g h$$

| | | |
|---|---|---|
| $P$ | pressure | pascals (Pa) |
| $\rho$ | density of fluid | $kg/m^3$ |
| $g$ | acceleration due to gravity | $m/s^2$ |
| $h$ | height of column | m |

### Tips to Remember

- The force in the definition of pressure is often, but not always, an object's weight. For example, if you are calculating the pressure on the feet of a standing elephant, $F$ would be the elephant's weight (using $W = mg$ if you are given the mass), and $A$ would be the combined area of the elephant's four feet.
- A pascal is a pretty small unit of pressure, so don't be surprised if your answers seem large. One atmosphere of pressure—i.e., the pressure you are under right now from the weight of the atmosphere—is about a hundred thousand pascals.
- If you're calculating the pressure from a column of fluid, you may have to look up the density of the fluid in a table. Be sure that the density has the SI units of $kg/m^3$, not the $g/cm^3$ that you will see in some contexts. For example, the density of water needs to be 1000 $kg/m^3$.