Functions describe relationships between data. Their is input data and output data.

$$x, y, z, t \longrightarrow f \longrightarrow f(x, y, z, t)$$

Function Notation can be confusing:

| Leibniz | Lagrange | Newton | Euler |
|---|---|---|---|
| $\frac{dy}{dx}$ | $\equiv$ $y'(x)$ | $\equiv$ $\dot{y}$ | $\equiv$ $Dy$ |

- sometimes this is due to historical & concurrent discovery
- sometimes particular notation is more useful for certain applications.