

The Illustrated Limit

Read “The limit of $f(x)$ as x approaches a is L .”
that is, $f(x)$ heads to L as x goes to a

↓

$$\lim_{x \rightarrow a} f(x) = L \text{ if and only if}$$

for all $\varepsilon > 0$
there exists a $\delta > 0$
such that

no matter how small a number you pick
you can find another number

$$|x - a| < \delta \text{ implies } |f(x) - L| < \varepsilon.$$

the distance between x and a is less than a number that is, x is really close to a

the distance between $f(x)$ and L is less than any small number you pick that is $f(x)$ is really close to L