Springs and Restoring Forces

Passage

When a spring is stretched, it will exert a force that will take it back to its non-stretched state. Similarly, when a spring is compressed, it will exert a force that will take it back to its non-compressed state. This force is referred to as a restoring force, as it attempts to place the spring in its relaxed state, being neither compressed nor stretched.

The formula $\boldsymbol{F = -kd}$ expresses the restoring force (***F***) as its relationship to both ***k*** (the spring constant) and ***d*** (the spring displacement). The spring constant (***k***) is constant for each given spring. The displacement (***d***) is a measure of the distance the spring is either stretched or compressed. The restoring force is always opposite the exerted force (stretching or compressing) as indicated by the negative sign in the formula.