

## Answer on Question #47352-Physics-Mechanics-Kinematics-Dynamics

What is the difference between a concentrated load and a uniformly distributed load?

### Answer

A concentrated load is a force applied at a single point on a beam or structure. Beams are commonly used for structural support in homes, commercial buildings, and bridges. A beam must be designed to withstand forces and stress, while minimizing weight, space requirements, and material cost. Incorrectly designed beams can fail prematurely and have catastrophic effects.

A load or force can be either concentrated or distributed. A distributed load is spread out over a large area. It can be uniformly distributed, wherein the amount of force is the same throughout the area to which it is applied; or non-uniform, meaning it is not evenly spread out. A distributed load will influence the design of a beam differently than a concentrated load. A concentrated one can be applied at more than one location on a beam, and multiple loading points may exist on a single beam.

The two most important characteristics of a concentrated load in beam design are the magnitude of the force and the location where it is applied. How a beam or structure is supported plays an important role in its ability to support this type of load. A concentrated load applied at the center of a long beam, which is supported at both ends, will behave very differently than the same load applied to the end of a cantilevered beam.