

## UNDERSTANDING STRESS & LOAD

When engineers design an object or a structure, they must understand and consider the types of stress the object or structure will be under. They also consider the kind of load, or force that is going to cause the stress.

Three types of stress are **tensile** (pulling apart), **compression** (pushing together) and **shearing** (applying a sliding force). Three kinds of loads cause stress. A **static load** exerts a constant force. A **repetitive load** is applied again and again. An **impact load** is a suddenly applied load.

A material's ability to withstand various stresses and loads is a mechanical property of the material. A material's properties depend on the arrangement of the atoms of which the material is made.

Welding engineers are especially concerned about stresses and loads along joints. Welding engineers apply their knowledge of materials, types of stress, and kinds of load to determine the sizes of the pieces to be welded and the size of the weld needed to join them.

### APPLYING WHAT YOU KNOW

Study the diagrams of the bicycle, canoe and basketball backboard. Label the type of stress (tensile, compression, shearing) and the kind of load (static, repetitive, impact) causing the stress at each point.

Fig. 1

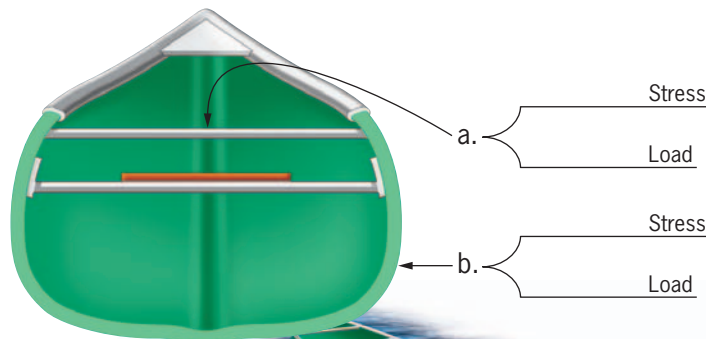
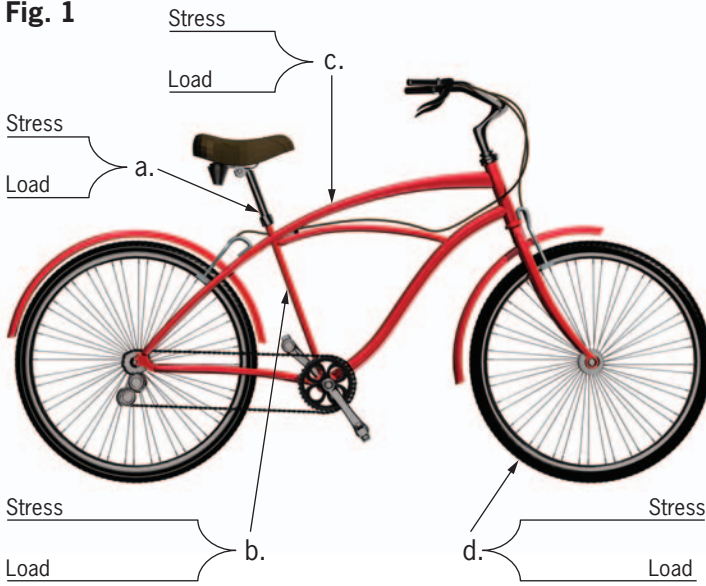


Fig. 3

### CONCLUSIONS & INFERENCE

Mary is building a bookcase using only wood and glue. What kind(s) of load(s) will be applied to the bookcase when it is in use? Will she be better off relying on the bookcase's ability to

Fig. 2



withstand shearing stress, tensile stress or compression stress at the joints between the shelves and sides? Why?