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# Forces, Loads, and Stresses

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## Topic 4

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# Forces

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- Forces are a push or a pull
  - External forces act on the outside of a structure
  - Internal forces, or stresses, are within the materials of a structure
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# External Force

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- Forces can cause deformation
- A dead load is a permanent force on a structure - the weight of a structure
- A live load is a changing force on a structure



# Internal Forces

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- Tension force - pulling ends apart
  - Compression force - squeezing together
  - Shear forces - Bend or tear a material by pull different parts in opposite directions
  - Torsion forces - twisting a material
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# Resisting stress

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- Steel has high tensile strength
  - Graphite has low shear strength - used in pencils
  - Rubber has high torsion strength
  - Even glass can be bullet proof!
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# Questions

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