

GRADE 8 | 2024

Technology: Structures and Mechanisms

Technology

CAPS ALIGNED

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1. Structures

A structure is any object that has to support a load. Structures must be strong, stable, and rigid.

Types of Structures

- Frame structures: made of parts joined together (Eiffel Tower, skeleton)
- Shell structures: hollow with a thin outer covering (egg, helmet, car body)
- Solid structures: completely solid, heavy and strong (dam wall, mountains)

Forces on Structures

- Compression: pushing or squeezing force
- Tension: pulling or stretching force
- Torsion: twisting force
- Shear: forces acting in opposite directions, like scissors

2. Mechanisms

A mechanism changes the size or direction of a force. Simple machines make work easier.

- Lever: a rigid bar that pivots around a point (fulcrum)
- Pulley: a wheel with a rope to change direction of force
- Wheel and axle: rotation transfers force
- Gear: toothed wheels that transfer motion and change speed
- Inclined plane: a slope that reduces the force needed to lift objects

FORMULA: Mechanical Advantage (MA) = Load / Effort

If MA > 1, the mechanism reduces the effort needed.

3. Design Process

- Identify the problem
- Research and gather information
- Generate design ideas (brainstorm)
- Choose the best design
- Plan and draw (technical drawings)
- Build/Make the product
- Evaluate: does it solve the problem?