Welcome to SolidWorks
Computer Aided Design (CAD)
Design Analyses

Finite Element Analysis (FEA)

Topology Optimization
Production Preparation

Computer Aided Manufacturing (CAM) Simulation

CAD to XR (AR/VR/MR/Web)
Solid Modeling

- Defined by:
  - Boundary representation (B-rep)
    - connected surfaces create an inside and outside of the part

- Have these properties:
  - Mass
  - Volume
  - Moment of inertia
Constraints

๏ Defined as a limitation or restriction

๏ Apply constraints to any geometry drawn in Solidworks (under the discretion of the user)

*Constraints in Solidworks look like this.
Implicit Constraints

- Geometric relationships implied by the way the profile is drawn and interpreted by SolidWorks
- Note: SolidWorks only makes closed profiles, so your profiles must have closure.
More Implicit Constraints

- Same Size
- Coincident
- Concentric
Explicit Constraints

- Defined by the operator
  - Dimensional constraints: assigning a specific length to a line, radius to a circle, etc.
  - Geometric constraints: specifying the ways in which lines/shapes/features relate to one another
Levels of Constraint

- Fully constrained
  - Every element has been completely dimensioned/specified

- Underconstrained
  - Not all elements are dimensioned/specified (leaves interpretation up to Solidworks)

- Overconstrained
  - Adding a new constraint would conflict with existing constraints (Solidworks won’t let another dimension be added)
Driven Dimension: is driven by the model *Changing the model changes this driven dimension value

Driving Dimension: drives the model *Changing this driving dimension changes the model
Take a Break Buddy!
One of the basic steps... Extrusion

- Linear Extrusion: starts with closed polygon (profile) drawn on a plane, and then swept along a defined path for a defined length.
Extruding a primitive shape allows you to make some of these 3D objects...
Path-based Extrusion

- Sweep: create a profile and define its path to be extruded along
Revolute Extrusions

- Start with a drawn profile and define an axis of rotation about which the profile is rotated for a defined angle.
Path-based and Revolute Extrusions allow you to make some of these 3D objects....
Activity

๏ Complete the Lesson 1: Parts tutorial
  - How to get there: Tutorials>Getting Started>Lesson 1: Parts

๏ Complete Revolves and Sweeps tutorial
  - How to get there: Tutorials>Basic Techniques>Revolves and Sweeps
  - ***Let me know if you have any questions!