A Production Game

- Draw the process flow map.

- Set up SimQuick to simulate the production game.

A Production Game

- What is the overall mean throughput?

- What is the overall mean cycle time of the process?

- What is the utilization of a work station?

How to improve the throughput of the process?

Concepts involved in manufacturing processes

- Throughput of a process:
  - Number of good units produced during some time period
- Cycle time of a process
  - The mean amount of time it takes one unit to go from the start to the finish of a process.
- Work-in-process (WIP) Inventory
- Utilization of a work station
- Causes of variability in a manufacturing process:
  - Processing times of machines/workers
  - Quality of output of machines/workers
  - Demand of customers (at end of process; i.e., the last "machine")
  - Reliability of suppliers (at beginning of process; i.e., the first "machine")

Principles from the production game
(relationships between the concepts)

- As work-in-process inventory increases (from near zero):
  - Inventory costs _____.
  - Throughput of process _____ (to a point, after which it remains the same).
  - Cycle time of process _____.

- As variability decreases, throughput of process _____.

Demo of graphical simulation packages

- AnyLogic
  - www.anylogic.com
- Simulation Visualization
  - https://www.runthemodel.com