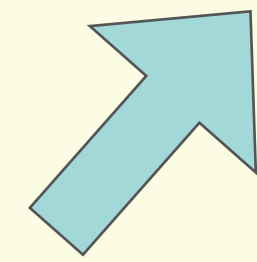


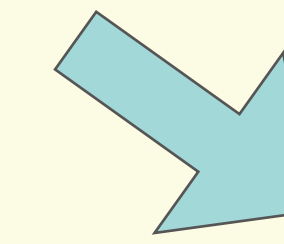
Four possible outcomes:

- Expected and desired
- Expected and undesired
- Unexpected and desired
- Unexpected and undesired

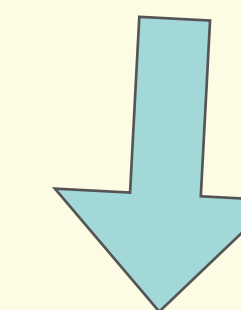


# 1. Define a problem or need

Identify criteria (specifications) and constraints  
Identify deliverables

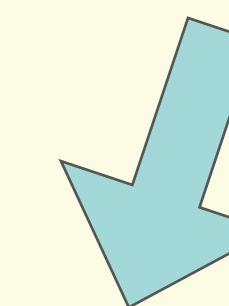


# 2. Investigate related engineering/science



# 3. Create possible solutions Select one to test

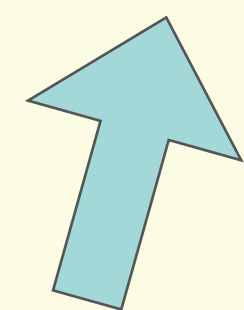
Brainstorming, sketches, mockups, models (scale)  
simulations, consider systems & trade-offs



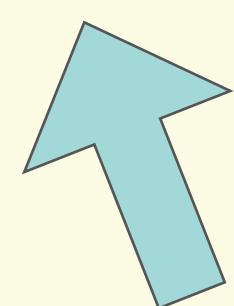
# 4. Test and evaluate a prototype

Anticipate failures

# 7. Develop production and analyze consumer use



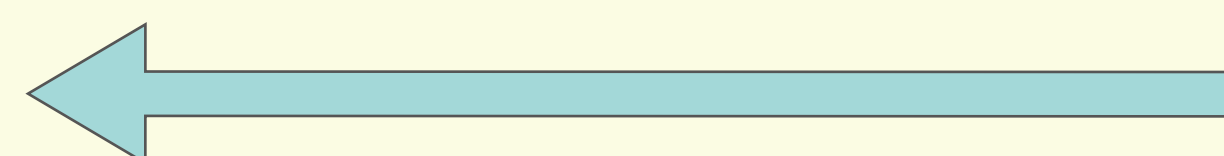
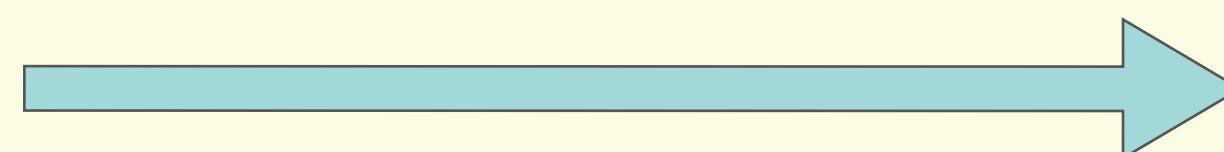
# 6. Communicate the solution



# 5. Redesign to optimize a solution

Do failure analysis, re-consider trade-offs with respect to criteria and constraints.

Cycle through 4 and 5 until the desired results are reached



# Engineering Design Process