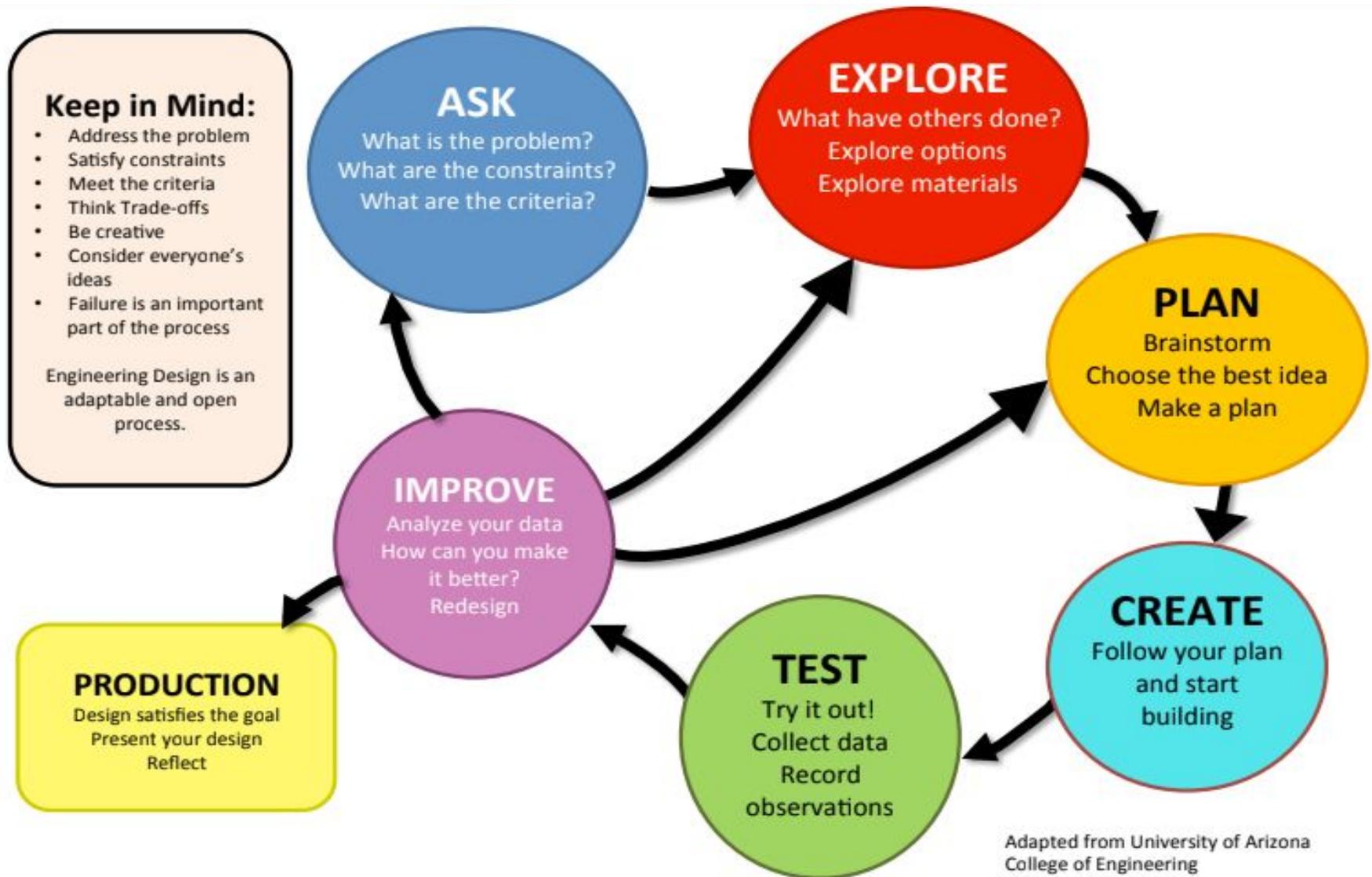# Burns Comparative Analysis of Design Process

Foundationally all the same: Well <u>defined process</u> for finding <u>multiple solutions</u> for a problem while having the ability to <u>repeat different steps</u> until desired outcome or goal is achieved

NASA- Circular in design.	**Ask:** Identify problems, clarify for understanding, consider requirements	**Imagine:** Research ideas, brainstorm solutions. NO BAD IDEAS	**Plan:** Sketch 2 or 3 different ideas, select one idea to design	**Create:** Build a model within requirements	**Test:** Collect data, record results in table analyze pro/cons: How can I improve this?	**Improve:** Based on recorded notes, improve designs.	
University of Arizona Design Process	**Ask**	**Explore** What have others done	**Plan** Brainstorm Choose best idea	**Create**	**Test**	**Improve** go back to any step	**Production** When goal is met- solution is presented
Project Lead the Way- In between each step there is a justification matrix,before moving on	**Define** Is the problem valid and justifiable?	**Generate Concepts** Compare designs Do technologies exist to generate solution? No? Research.	**Develop Solutions** Are solutions valid?	**Construct and Test Prototype** Is the protype valid?		**Evaluate Solution** Solution solves the problem?	**Present Solution**

Keep in Mind:
- Address the problem
- Satisfy constraints
- Meet the criteria
- Think Trade-offs
- Be creative
- Consider everyone's ideas
- Failure is an important part of the process

Engineering Design is an adaptable and open process.

ASK
What is the problem?
What are the constraints?
What are the criteria?

EXPLORE
What have others done?
Explore options
Explore materials

PLAN
Brainstorm
Choose the best idea
Make a plan

IMPROVE
Analyze your data
How can you make it better?
Redesign

PRODUCTION
Design satisfies the goal
Present your design
Reflect

TEST
Try it out!
Collect data
Record observations

CREATE
Follow your plan and start building

Adapted from University of Arizona College of Engineering

https://stemazing.org/engineering-design-process-university-of-arizona/

1. Define the Problem

2. Generate Concepts

3. Develop a Solution

4. Construct and Test a Prototype

5. Evaluate the Solution

6. Present the Solution

This design process was developed based on the University of Maryland - College Park - IRB Research Project

PLTW Engineering

https://westcampus.scusd.edu/sites/main/files/file-attachments/designprocess.pdf