Comparative Analysis of Design Model

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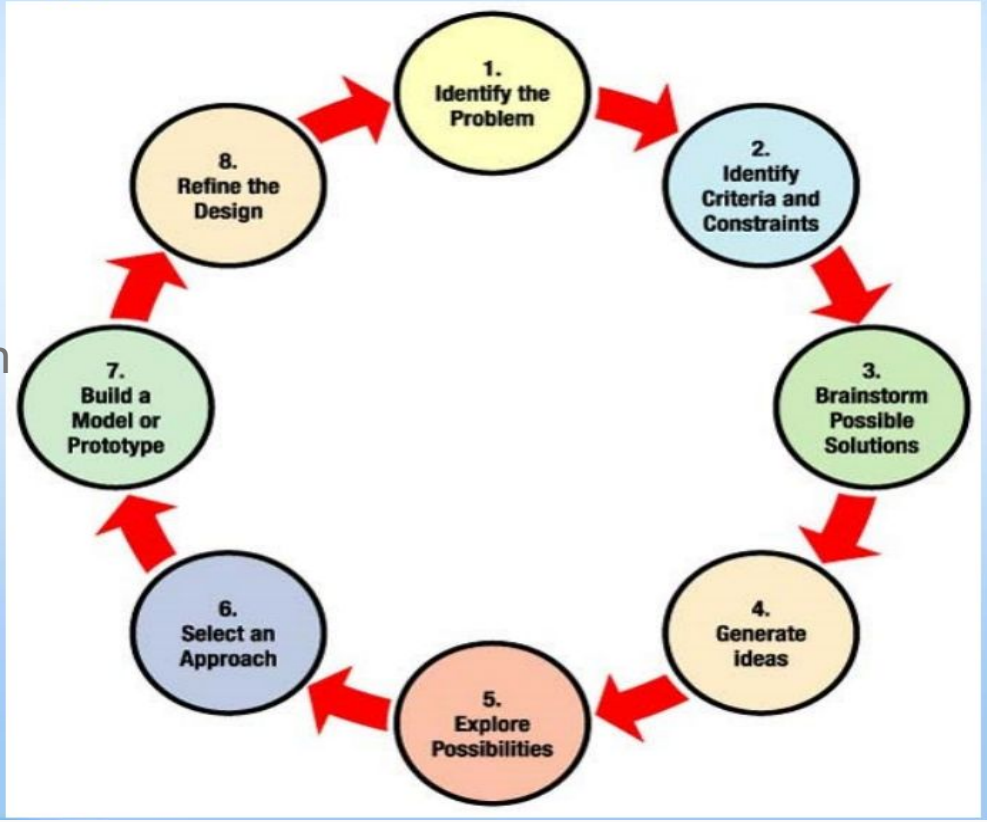
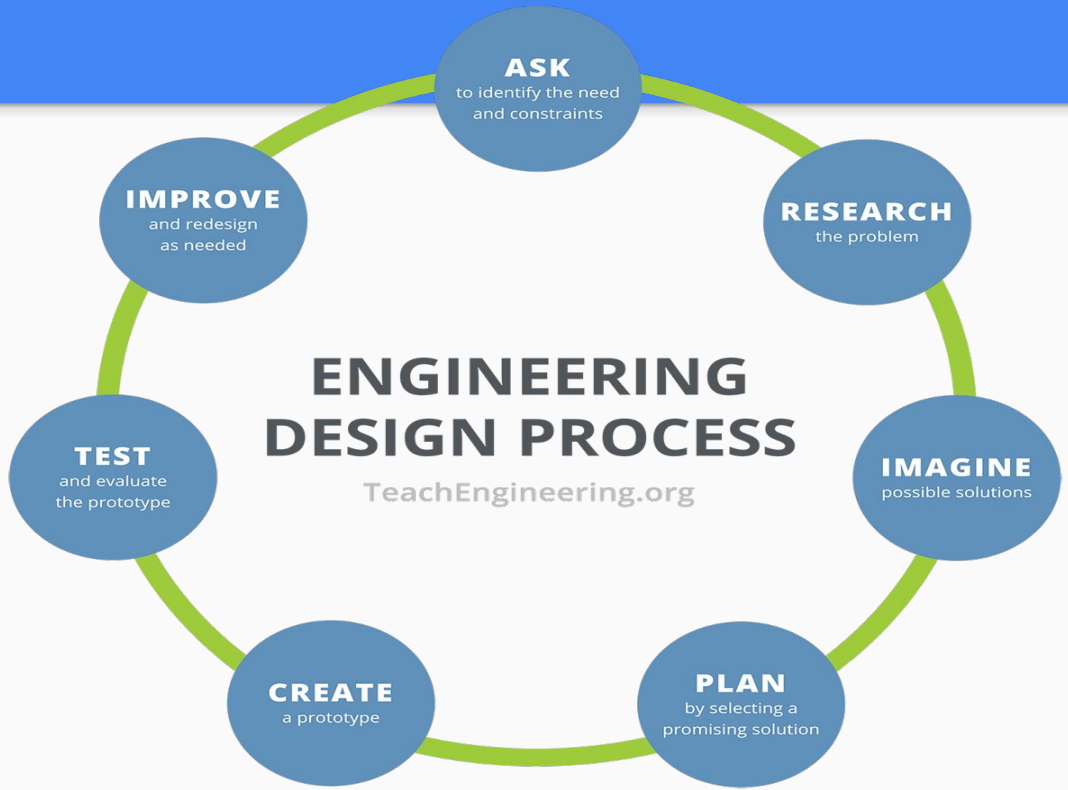
NASA Design Process

This is a cyclic engineering process of problem solving.

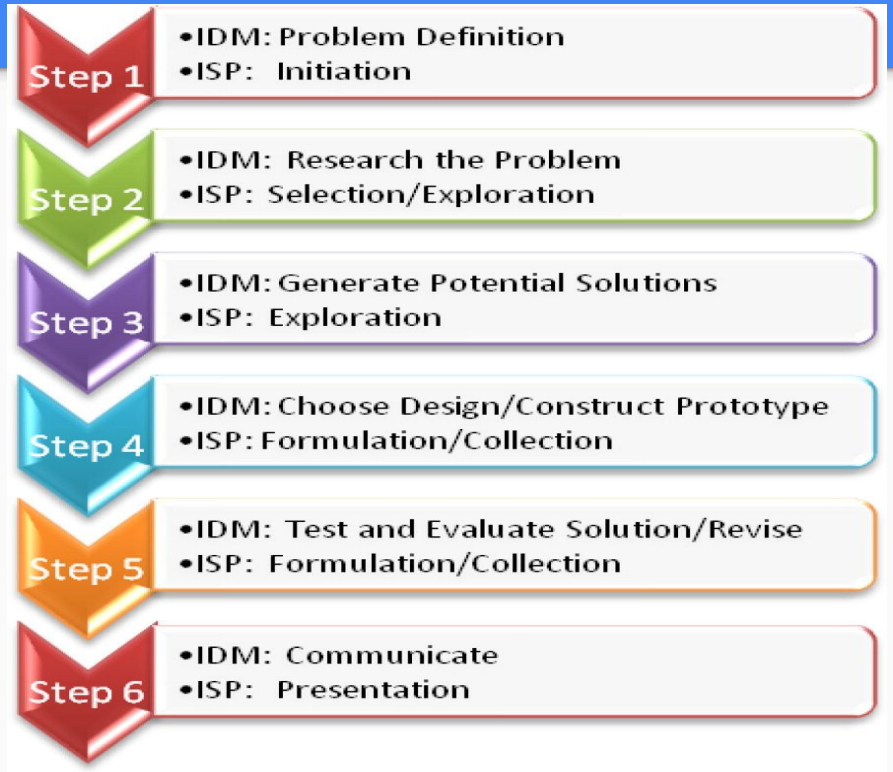


Design Process Synthesis

This is a cyclic engineering process of problem solving.



Informed Design Process (Burghardt & Hacker 2004)

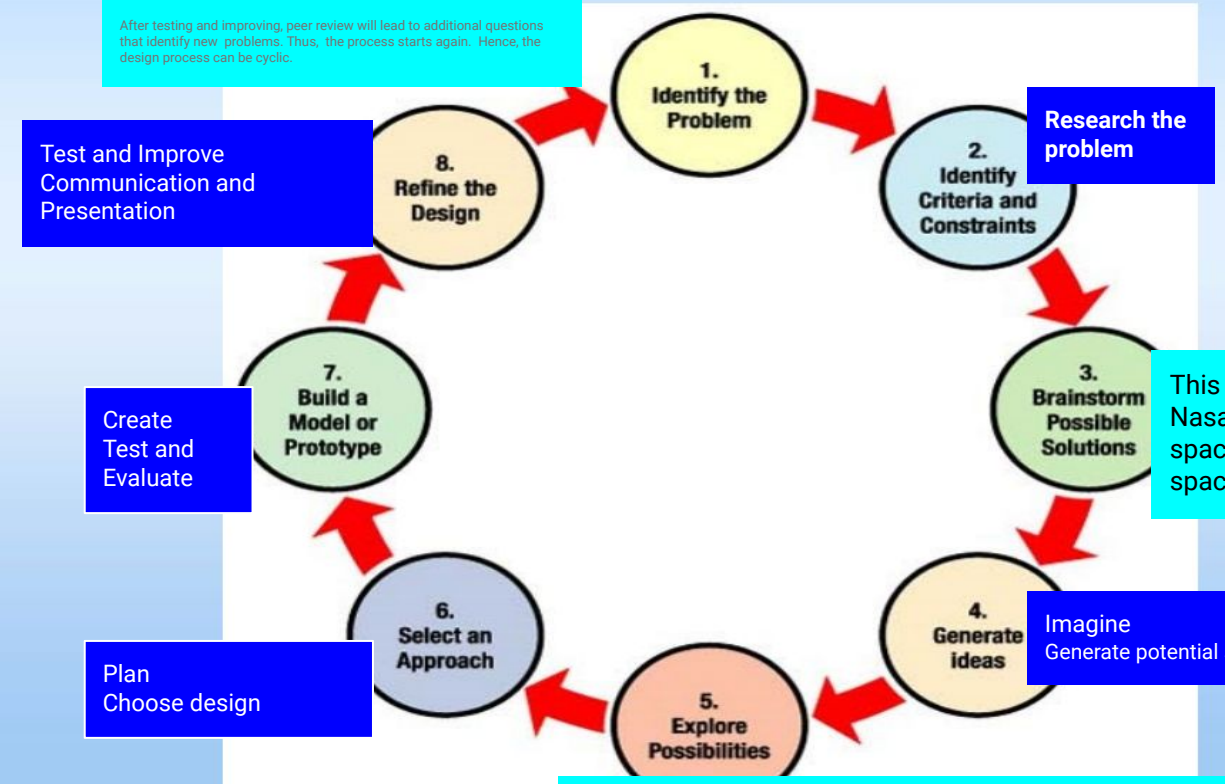


This is a linear engineering design process.

Similarities	Differences
Iterative Nature: All three processes are iterative, meaning they involve repeated cycles of designing, testing, and refining.	**NASA Engineering Design Process**: • **Specific to Space Missions**: Tailored to the unique challenges of space exploration • **Highly Structured**: Follows a rigorous, formalized set of steps with a strong emphasis on safety, reliability, and meeting mission objectives. • **Technical Requirements**: focus on meeting stringent technical and engineering standards
Problem-Solving Focus: Each process aims to solve problems by creating effective solutions	**General Design Process**: • **Broad Application**: Can be applied to a wide range of fields beyond engineering, such as graphic design, product design, and architecture. • **Flexible Phases**: Typically includes stages like empathizing, defining, ideating, prototyping, and testing, but can be adapted to different projects. • **User-centric**: often emphasizes understanding user needs and creating user-friendly solutions.
Stakeholder Involvement: They all consider the needs and constraints of stakeholders or end-users	**Informed Design Process**: • **Educational focus**: designed to enhance learning and build knowledge and skills in students. • **Guided Research**: Incorporates guided research and investigation to help students understand key concepts related to the design challenge. • **Skill Development**: Aims to develop students' problem-solving, critical thinking, and technical skills through hands-on design activities
Research and Analysis: Research and analysis are crucial steps in all three processes to gather information and inform design decisions	

NASA Design Process

Incorporated with **Design process** and **informed design process.**



After testing and improving, peer review will lead to additional questions that identify new problems. Thus, the process starts again. Hence, the design process can be cyclic.

Research the problem

Test and Improve
Communication and Presentation

This is a major difference between the Nasa model and other models. Going to space is a novelty, so all scenarios in space have to be figured out.

Create
Test and Evaluate

Imagine
Generate potential solution

Plan
Choose design

After imagining and generating potential solutions, another round of exploring all possibilities is necessary depending on the severity of the problem.

Reference:

SEH 4.0 System Design Processes - NASA

Tec_Informed_Design_Tech_Teacher.pdf

What Is Design Process and Why Is It Important? | Domestika

The 5 Stages in the Design Thinking Process | IxDF