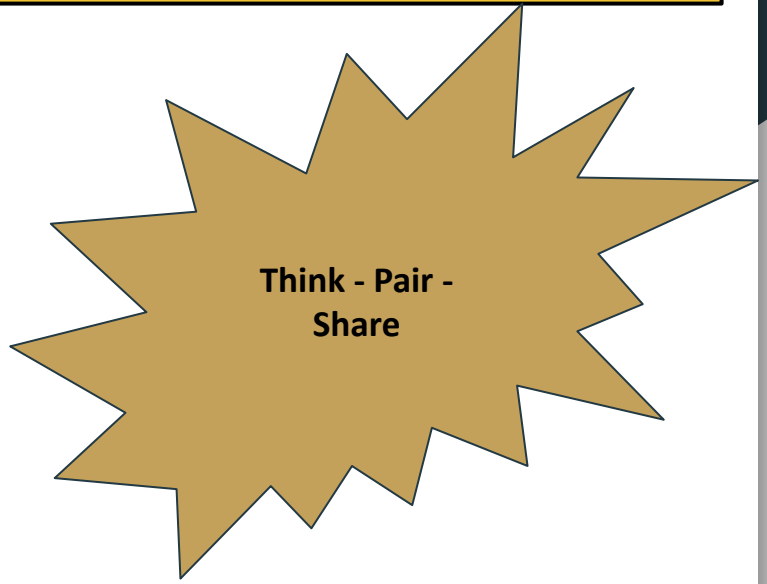
Engineering Design Process: From Challenge to Solution

Warm-Up:

- **Look around the classroom**
- **Identify 3 engineered items**
- **How do they make your life easier?**
- **Share with a partner**



Introduction to Engineering Design

What is engineering?

- Problem-solving through design
- Real-world applications
- Impact on society

Activity:

Watch the assigned video, then answer all questions on the worksheet.

- **Intro to the Engineering Design Process for Elementary & Middle School, NGSS 3-5-ETS1-1, MS-ETS1-1**(You Tube)
- **Worksheet**

Video Discussion Questions:

1. What are the main steps in engineering design?
2. Why is testing important?
3. How do engineers learn from failures?
4. What role does teamwork play?

The Engineering Design Process Steps

1. **Define the Problem**
2. **Research the Problem**
3. **Brainstorm Solutions**
4. **Choose the Best Solution**
5. **Create a Prototype**
6. **Test and Evaluate**
7. **Improve and Redesign**

Engineering Challenge Discussion

Key Points to Consider:

- Technical limitations
- Resource constraints
- Time management
- Budget restrictions
- Safety requirements



Impact on Society

Improved quality of life:

- Efficient solutions
- Technological advancement

Drawbacks:

- Cost considerations
- Environmental impact
- Maintenance needs

Environmental Considerations

- **Sustainable materials**
- **Carbon footprint**
- **Waste management**
- **Resource conservation**
- **Ecological impact**

Activity:Research Project Introduction

Small Group Research: Engineering Design in Action

Group Size: 2–4 students

Goal: Research an **engineering design** that solves a real-world problem.

What to Do:

1. **Choose a Topic**
   Explore designs like:
   - Bridges
   - Skyscrapers
   - Renewable Energy
   - Transportation
   - Water Management
   - Robotics

Research & Document using **Google Slides** or **Canva**

Google Slides Template

Documentation Requirements

Your Presentation Should Include:

- Material selection
- Safety features
- Design aesthetics
- Energy efficiency
- Cost analysis
- Maintenance plan
- Problem-solving approach



Presentation Guidelines

Using Canva/Google Slides:

- Clear organization
- Visual elements
- Data presentation
- Design process



Project Timeline

Day 1: Topic selection and initial research
Day 2: Documentation and analysis
Day 3: Presentation preparation
Day 4: Group presentations



Wrap-Up Question

Individual Writing Prompt:

- What did you learn about engineering?
- How does engineering impact your daily life?
- What challenges would you like to solve?

Exit Ticket: One new thing learned today.