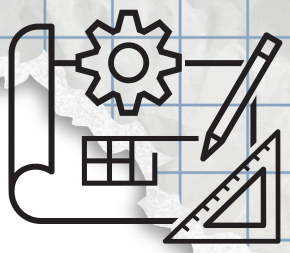
Professional Internship Program

Creative Projects

NKC SCHOOLS Professional Internship Program



ENGINEERING

Project 1: Engineering Solutions Analysis

In this project, you will explore the field of engineering by analyzing real-world designs and products. You will examine how engineers solve problems through design, materials, and functionality. Using your research, you will identify trends and make recommendations for effective engineering solutions.

Step 1: Study Designs/Products (4–5 hrs)

Study **5–8 engineered designs or products** (consumer products, structures, machines, systems, etc.)
Record the following for each:

- Product/design name
- Purpose (problem it solves)
- Key features and components
- Materials used
- Design considerations (efficiency, cost, durability, sustainability)

Step 2: Organize Your Data

- Create a comparison chart or table (Excel or Google Sheets)
- Clearly display all designs/products and their details
- Group or sort in a meaningful way (by function, materials, or complexity)

Step 3: Analyze Design Trends

Identify patterns such as:

- Common design features
- Use of materials and technology
- Trade-offs between cost, efficiency, and durability
- Innovations or unique approaches

Answer:

- What trends do you notice in engineering design?
- What makes a design effective?
- What challenges do engineers face when creating solutions?

Step 4: Draw Conclusions

Based on your findings, answer:

- What should engineers consider when designing new products or systems?

Provide **2–3 specific, realistic suggestions** and explain them.
Examples might include:

- Improving efficiency or sustainability
- Simplifying design for usability
- Selecting cost-effective and durable materials

Final Deliverables (2 Completed Projects)

1) Comparison Chart (Required)

A clear chart or table showing your **5–8 designs/products** and their details

2) Design Trends (Required)

Choose one format:

- 1–2 page written summary

OR

- 6–8 slide presentation

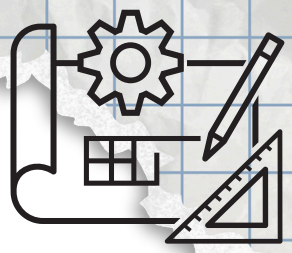
Your summary must include:

- Overview of designs/products analyzed
- Key engineering trends
- Explanation of effective design elements
- Your recommendations for improvement

Professional Internship Program

Creative Projects

NKC SCHOOLS Professional Internship Program



ENGINEERING

Project 2: Design Challenge

In this project, you will take on the role of an engineer by designing a solution to a real-world problem. You will apply engineering thinking to create a practical, well-reasoned design.

Step 1: Identify a Problem

Choose a problem that could be solved with an engineered solution.

Examples:

- Improving transportation
- Solving an environmental issue
- Making a daily task easier

Step 2: Brainstorm Solutions

Develop ideas by considering:

- Possible designs
- Materials and tools
- Constraints (cost, size, safety)

Step 3: Create Your Design

Your design should show:

- Key components
- How the system or product works
- Important features

Step 4: Explain Your Solution

Write a clear explanation that includes:

- The problem you are solving
- How your design works
- Why your solution is effective
- Any trade-offs or limitations

Final Deliverables (2 Completed Projects)

1) Sketches/Diagram (Required)

Visual representation of your engineering solution

2) Explanation (Required)

A written description of your design and how it solves the problem

3) Extension Activities (Optional)

Extension Activities

- Build a prototype or model
- Test and refine your design
- Present your solution as an engineering pitch