Professional Internship Program

Creative Projects

NKC SCHOOLS Professional Internship Program

AEROSPACE ENGINEERING

Project 1: Exploring Aerospace Systems

In this project, you will explore real-world aerospace systems (aircraft, spacecraft, and drones) to understand how they are designed and what they are used for. You will identify patterns in how different systems are built and what makes them effective.

Step 1: Research Aerospace Systems

Find 6–8 aerospace systems, such as:

- Commercial airplanes
- Military aircraft
- Rockets or spacecraft
- Drones

For each system, record:

- Name of the system
- Manufacturer (if available)
- What it is used for
- Key features (size, wings, engines, etc.)
- One interesting fact

Keep research simple—focus on understanding, not technical depth

Step 2: Organize Your Information

- Create a table or chart (Google Sheets, Excel, or paper)
- Include all your systems and their details
- Organize in a clear way (by type, size, or purpose)

Step 3: Identify Patterns and Trends

Look at your systems and answer:

- What do similar systems have in common?
- How are different systems designed for different purposes?
- What features seem important for success?

Focus on basic patterns, not advanced analysis

Step 4: Draw Conclusions

Answer:

- What makes an aerospace system effective?
- What did you learn about how engineers design aircraft or spacecraft?

Final Deliverables (2 Completed Projects)

1) Data Table (Required)

A clear chart showing your 6–8 systems and their details (as best as you can determine from your research)

2) Summary of Findings (Required)

Choose one format:

- 1–2 page written summary

OR

- 6–8 slide presentation

Your analysis must include:

- What you researched
- Key patterns you noticed
- What makes systems effective

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Project 2: Introduction to Aerospace Engineering Design

In this project, you will explore how engineers design aerospace systems by examining real examples and applying basic engineering thinking. You will create your own simple design and explain your choices.

Step 1: Explore Real Aerospace Systems

Look at 5–6 aerospace systems, such as:

- Airplanes (commercial or military)
- Rockets or spacecraft
- Drones

For each one, identify:

- Its purpose
- Key design features (shape, wings, engines)
- What it is designed to do well (speed, range, etc.)

Step 2: Understand Basic Engineering Ideas

Using your examples, think about:

- *Trade-offs* (speed vs fuel use, size vs efficiency)
- *Design for purpose* (cargo vs passenger vs defense)
- *Performance vs efficiency*

Answer:

- What patterns do you notice?
- How does design connect to purpose?

Step 3: Create Your Own Simple Design Concept

Choose one scenario:

- Passenger airplane
- Delivery drone
- Rocket or spacecraft

Describe:

- What it is used for
- What it looks like
- Key features
- Why you chose those features

Step 4: Explain Your Design Choices

Answer:

- Why did you design it this way?
- What is it good at?
- What are its limitations?

Final Deliverables (2 Completed Projects)

1) Exploration Notes (Required)

Any notes from Steps 1-2

2) Design Concept (Required)

Choose one:

- 1–2 page written description
- OR
- 6–8 slide presentation

3) Optional Sketch (Recommended)

A labeled drawing of your design