

**Elizabethtown Area School District
Scope & Sequence - Quick Reference**



Department: Applied Engineering & Technology Education, 18 Weeks

Course: Engineering Design / Honors

Grade Level(s): 11-12

<i>Unit Title</i>	<i>General Topic(s)</i>	<i>Pacing</i>
1. Introduction To Engineering Design	<ul style="list-style-type: none"> ● Engineering ● Engineering Disciplines ● Engineering Design Process ● Design Thinking 	2 Weeks
2. Ship The Chip	<ul style="list-style-type: none"> ● Problem & Design Brief ● Research & Gathering Information <ul style="list-style-type: none"> ○ Functions of A Package ○ Types of Packages ○ Materials Used In Packaging and Cushioning ○ Manufacturing and Construction of A Package ○ Postal Shipping Costs and Requirements ○ Pringles Chip Characteristics ● Developing Ideas & Solutions ● Choosing The Best Solution ● Construction Drawings ● Building Prototypes ● Testing & Data Collection ● Evaluation & Analysis 	5 Weeks

<p>3. Creative Crane</p>	<ul style="list-style-type: none"> ● Problem & Design Brief ● Research & Gathering Information <ul style="list-style-type: none"> ○ Types of Cranes & Parts of a Crane ○ Forces & Loads that Act on Structures ○ Geometric Shapes & Structural Design ○ Pulleys: Mechanical Advantage (Block & Tackle) ○ Gears: Gear Ratios (Speed vs. Torque) ○ Glue & Adhesive Types (Holding Strength) ○ Crane Stability: Rotational Overturning & Counterweight ● Developing Ideas & Solutions ● Choosing The Best Solution ● Construction Drawings ● Building Prototypes ● Testing & Data Collection ● Evaluation & Analysis 	<p>6 Weeks</p>
<p>4. Team America Rocketry Challenge</p>	<ul style="list-style-type: none"> ● Problem & Design Brief ● Research & Gathering Information <ul style="list-style-type: none"> ○ Types and Parts of a Payload Model Rocket ○ Newton's Laws of Motion: Forces & Loads ○ Aerodynamics and Rocket Stability ○ Rocket Materials and Construction ○ Recovery Systems ○ Payload Cushioning & Lofting ○ Rocket Launch Stages & Engines ○ Meteorology 	<p>5 Weeks</p>

	<ul style="list-style-type: none"> ● Developing Ideas & Solutions ● Choosing The Best Solution ● Construction Drawings ● Building Prototypes ● Testing & Data Collection ● Evaluation & Analysis 	
5. Honors Project	<ol style="list-style-type: none"> 1. Engineering Inventions & Innovations 2. Societal Impacts 	Bi-weekly