Course Title:	Content Area:	Grade Level:	Credit (if applicable)
MS Grades 6-8 Technology Education	**MS CTE**	**Middle School**	**N/A**

Course Description:

In Middle School Technology Education, students engage in hands-on, project-based learning across 15-day trimester units covering Manufacturing, Construction, and Digital Technology. The units in this curriculum can be taught in any order across the grade-span they are written for. Throughout the course, learners master production lab safety to operate hand tools, power tools, and digital fabrication equipment, which includes 3D printers, laser engravers, and CNC machinery, to design and build custom physical artifacts. They apply precision measurement down to ⅛ inch tolerances by grade 8 while constructing 2D graphic media, parametric CAD models across x, y, and z-axes, and architectural floor plans. In computer science sequences, students write block code to automate physical robotics, program flight paths for drones using core aerospace mechanics (pitch, yaw, roll), and construct electrical circuits analyzed via Ohm's Law. Students also cultivate digital citizenship by managing data privacy, evaluating web sources and AI summaries for bias, and practicing effective AI prompting. By applying the 8-step Engineering Design Process within team environments, students continuously prototype, debug, and refine their work to solve real-world technical problems. Because learning sequences vertically align from Grade 6 through Grade 8 without requiring prerequisite knowledge, students build progressively deeper technical self-sufficiency whether they take a single trimester or enroll across multiple years.

Aligned Core Resources:

Advanced CT Career Clusters taught in BPS Gr. 9-12
(in bold are the aligned BPS Gr. 6-8 clusters)

- **Advanced Manufacturing**
- Arts, Entertainment, & Design
- **Construction**
- **Digital Technology**
- Education
- Financial Services
- Healthcare & Human Services
- Hospitality, Events, & Tourism
- Management & Entrepreneurship
- Marketing & Sales

CCTC Standards
ISTE Standards
ITEEA STEL Standards

Connection to the *BPS Vision of the Graduate*

The ISTE Standards create a seamless integration of and alignment to the Vision of the Graduate skills:

Meaningfully contribute to a global society
ISTE Standards
- 1.7 Global Collaborator
- 1.2 Digital Citizen

Effectively communicate in a global society
ISTE Standards
- 1.6 Creative Communicator
- 1.4 Innovative Designer

Successfully employ skills for self-sufficiency
ISTE Standards
- 1.1 Empowered Learner

Demonstrate Academic Knowledge and Skills
ISTE Standards
- 1.3 Knowledge Constructor
- 1.5 Computational Thinker

Additional Course Information:
Knowledge/Skill Dependent courses/prerequisites

Students may not elect to take Technology Education in grades 6, 7, and 8. The units have been designed to ensure that a foundation is built over time for students who do take more than 2 years of MS Tech Ed, but each unit can be successfully completed without any prior knowledge from a previous grade level.

Link to *Completed Equity Audit*

Equity Curriculum Review Audit MS TECH ED (2026-27)

Standard Matrix

Standards	Unit 1	Unit 2	Unit 3

CCTC (Common Career Technical Core)			
Career and Technical Education: Manufacturing Career Cluster			
Manufacturing **MN 1**: Evaluate the nature and scope of the Manufacturing Career Cluster and the role of manufacturing in society and in the economy.	✓		
Manufacturing **MN 3**: Comply with federal, state and local regulations to ensure worker safety and health and environmental work practices.	✓		
Manufacturing Production Process Development **MN-PPD 1**: Produce quality products that meet manufacturing standards and exceed customer satisfaction.	✓		
Manufacturing Production Process Development **MN-PPD 2**: Research, design and implement alternative manufacturing processes to manage production of new and/or improved products.	✓		
Manufacturing Production Process Development **MN-PPD 5**: Develop procedures to create products that meet customer needs.	✓		
Career and Technical Education: Architecture and Construction Career Cluster			
Design/Pre-Construction **AC-DES 2**: Use effective communication skills and strategies (listening, speaking, reading, writing and graphic communications) to work with clients and colleagues.	✓		
Architecture & Construction **AC 1**: Use vocabulary, symbols and formulas common to architecture and construction.		✓	
Architecture & Construction **AC 2**: Use architecture and construction skills to create and manage a project.		✓	
Architecture & Construction **AC 4**: Evaluate the nature and scope of the Architecture & Construction Career Cluster and the role of architecture and construction in society and the economy.		✓	
Construction **AC-CST 1**: Describe contractual relationships between all parties involved in the building process.		✓	
Career and Technical Education: Information and Technology Career Cluster			
Information Technology **IT 1**: Demonstrate effective professional communication skills and practices that enable positive customer relationships.			✓
Programming & Software Development **IT-PRG 1**: Analyze customer software needs and requirements.			✓
Information Support & Services **IT-SUP 1**: Provide technology support to maintain service.			✓
ISTE (International Society for Transforming Education) Standards			
1.1: **Empowered Learner** Students leverage technology to take an active role in choosing, achieving and demonstrating competency in their learning goals, informed by the learning sciences.			

1.1.a Learning Goals	✓		✓
1.1.b Customized Learning Environments	✓		✓
1.1.c Feedback to Improve Practice	✓		✓
1.1.d Technology Fundamentals	✓	✓	✓
1.2: **Digital Citizen** Students recognize the responsibilities and opportunities for positively contributing to their digital communities.			
1.2.a Digital Footprint			✓
1.2.b Online Interactions	✓	✓	✓
1.2.c Safeguard Well-being	✓		✓
1.2.d Digital Privacy			✓
1.3: **Knowledge Constructor** Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others.			
1.3.a Effective Research Strategies			✓
1.3.b Evaluate Information			✓
1.3.c Curate Information			✓
1.3.d Explore Real-World Issues			✓
1.4: **Innovative Designer** Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions.			
1.4.a Design Process	✓		✓
1.4.b Design Constraints	✓		✓
1.4.c Prototypes	✓	✓	✓
1.4.d Open-Ended Problems	✓	✓	✓
1.5: **Computational Thinker** Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.			
1.5.a Problem Definitions			✓
1.5.b Data Sets			✓
1.5.c Decompose Problems			✓
1.5.d Algorithmic Thinking			✓
1.6: **Creative Communicator** Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals.			

1.6.a Choose Platforms or Tools	✓		✓
1.6.b Original and Remixed Works	✓		
1.6.c Communicate Complex Ideas	✓		✓
1.6.d Customize the Message	✓		
1.7: **Global Collaborator** Students use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally.			
1.7.a Global Connections			✓
1.7.b Multiple Viewpoints	✓		✓
1.7.c Project Teams	✓	✓	✓
1.7.d Local and Global Issues			✓
ITEEA (International Technology and Engineering Educators Association) STEL (Standards for Technological & Engineering Literacy) Standards			
STEL-1: **Nature & Characteristics of Technology and Engineering**			
STEL-1J: Develop innovative products and systems that solve problems based on individual or collective needs and wants.	✓		
STEL-1K: Compare and contrast the contributions of science, engineering, mathematics, and technology.			✓
STEL-1L: Explain how technology and engineering are closely linked to creativity, resulting in intended and unintended innovations.	✓		
STEL-1M: Apply creative problem-solving strategies to the improvement of existing devices or processes.			✓
STEL-2: Core Concepts of Technology and Engineering			
STEL-2M: Differentiate between inputs, processes, outputs, and feedback in technological systems.			✓
STEL-2N: Illustrate how systems thinking involves considering relationships between every part.		✓	
STEL-2O: Create an open-loop system that has no feedback path and requires human intervention.			✓
STEL-2P: Create a closed-loop system that has a feedback path and requires no human intervention.			✓
STEL-2R: Compare how different technologies involve different sets of processes.	✓		
STEL-2S: Defend decisions related to a design problem.	✓		
STEL-3: Integration of Knowledge			
STEL-3E: Analyze how different technological systems often interact with economic, environmental, and social systems.			✓
STEL-3G: Explain how knowledge gained from other content areas affects technological development.			✓
STEL-4: **Impacts of Technology**			
STEL-4K: Examine the ways that technology can have both positive and negative effects at the same time.			✓

STEL-4N: Analyze examples of technologies that have changed the way people think, interact, and communicate.			✓
STEL-7: **Design in Technology and Engineering Education**			
STEL-7P: Illustrate the benefits and opportunities associated with different approaches to design.		✓	
STEL-7Q: Apply the technology and engineering design process.	✓		✓
STEL-7R: Refine design solutions to address criteria and constraints.	✓	✓	✓
STEL-7T: Assess design quality based upon established principles and elements of design.	✓		
STEL-7U: Evaluate the strengths and weaknesses of different design solutions.			
STEL-8: **Apply, Maintain, & Assess Systems**			
STEL-8H: Research information from various sources to use and maintain technological products or systems.		✓	
STEl-8I: Use tools, materials, and machines to safely diagnose, adjust, and repair systems.	✓	✓	
STEL-8J: Use devices to control technological systems.		✓	
STEL-8K: Design methods to gather data about technological products.			✓
STEL-8L: Interpret the accuracy of information collected.			✓

Unit Links

Grades 6-8 Technology Education
- Unit 1: Manufacturing
- Unit 2: Construction
- Unit 3: Digital Technology

Unit Title
Unit 1: Manufacturing

Relevant Standards:
CCTC • MN 1, MN 3, MN-PPD 1, MN-PPD 2, MN-PPD 5 • AC-DES 2 ISTE Standards for Students • 1.1, 1.4, 1.6, 1.7 ITEEA STEL • STEL-1, STEL-2, STEL-7, STEL-8

Essential Question(s)	Enduring Understanding(s)
• How do graphic designers combine visual elements to communicate a clear, effective message to an audience? • How do additive and subtractive manufacturing processes differ, and how do designers choose between them? • Why are precise dimensional planning and digital file preparation critical to successful physical fabrication? • How do spatial planning principles and building constraints shape architectural floor plans?	• Visual design relies on the intentional selection and arrangement of elements. This includes line, shape, color, texture, space, typography, and image to structure visual hierarchy and convey intended messaging. • Additive manufacturing builds products layer-by-layer from 3D models, whereas subtractive manufacturing removes material through cutting or engraving; choosing the right method depends on design complexity, material selection, and structural needs. • Accurate CAD modeling across spatial axes (X, Y, Z), proper file export formats (.STL/.OBJ), and slicing optimization prevent geometric print errors and ensure physical prototypes match intended dimensions. • Architectural design requires balancing structural rules, safety requirements (such as emergency escape windows), and room functionality when configuring walls, roof slopes, and interior layouts.
Demonstration of Learning	**Pacing for Unit**
See Assured Learning Experiences under Learning Sequence for specific tasks. Students will receive teacher and peer feedback as well as opportunities to self-reflect, refine, and revise their work.	15 Days
Family Overview (link below)	**Integration of Technology:**
Middle School Technology Education: Family Overview	• 2D graphic software to manipulate line, shape, color, typography, and image placement to build digital layouts like business cards, logos, calendars, and theme park brochures. • Students create parametric 3D CAD models defined along X, Y, Z axes, check geometry for printing errors, export .STL/.OBJ files, slice models in slicing software, and operate 3D printers to fabricate physical prototypes. • In Grade 7, students use architectural software to draw floor plans incorporating interior/exterior walls, escape windows, door types, and roof slopes. • Students use design software to prepare vector files, check cut/engrave lines, and run automated CNC machines, laser cutters, and vinyl plotters to produce coasters, dog tags, bookmarks, and water bottles.
Unit-specific Vocabulary	**Aligned Unit Materials, Resources, and Technology (beyond core resources)**

Graphic design elements, Line, Shape, Color, Texture, Space, Typography, Image, Layout, Visual hierarchy, Additive manufacturing, Subtractive manufacturing, 3D CAD modeling, Spatial axes (X, Y, Z), Extrude, Sketch, Measure, Scale, Slicing software, File export formats (.STL, .OBJ), Architectural floor plan, Laser cutting, CNC engraving.	***Suggested Materials:*** 3D printers, 3D filament, Laser engravers, CNC machines, Cricut vinyl cutters, Graphic design software, 3D CAD modeling software, Architectural software, Slicing software, Vinyl sheets, Dog tag blanks, Wood cutting board stock, Water bottles, Coasters, Paper, Cardstock. ***Required Software & Hardware:*** 2D graphic design software, 3D CAD modeling software, slicing software, architectural CAD software, 3D printers, laser engravers, CNC machinery, and Cricut vinyl cutters.
Opportunities for Interdisciplinary Connections:	**Anticipated misconceptions**
Coordinate Geometry & 3D Spatial Systems (CCSS.MATH.CONTENT.6.G & 8.G) • Translating 3D CAD modeling concepts onto coordinate systems across X, Y, and Z spatial axes, reinforcing geometric transformations, coordinate graphing, and 3D spatial visualization. Scale, Proportions & Ratios (CCSS.MATH.CONTENT.7.RP & 7.G) • Applying proportional reasoning and scale factors when converting real-world building dimensions into scaled architectural floor plans and 3D-printed digital models. Material Properties & State Changes (NGSS MS-PS1) • Comparing additive manufacturing (thermoplastic extrusion) and subtractive manufacturing (laser cutting and CNC engraving) based on how heat and mechanical forces alter physical states of polymers and materials. Geometric Composition & Layout (CCSS.MATH.CONTENT.6.G) • Applying plane geometry principles (lines, shapes, symmetry, area, and spatial ratios) when composing visual layouts in graphic design software.	• Students confuse layer-by-layer deposition with material removal, assuming 3D printers carve solid blocks or CNC machines build layers. • Students assume 2D screen visuals guarantee successful prints, ignoring wall thickness, supports, and spatial alignment across X, Y, Z axes. • Students view graphic design as mere decoration rather than strategic visual communication using typography, layout, and hierarchy. • Students assume standard image files work on machines without exporting to .STL/.OBJ format and generating slicing toolpaths.
Connections to Prior Units	**Connections to Future Units**
Engineering design practices are woven throughout all units. The ISTE standards are also taught in each unit of Grades 6-8.	Each learning sequence aligns vertically to a corresponding learning sequence in 7th and 8th grade.

Differentiation through *Universal Design for Learning*

	Engagement	Representation	Action & Expression
LT1	"Ad Breakdown Audit" analyzing real-world commercials, logos, and product packaging to critique effective vs. cluttered visual hierarchy.	Interactive digital element decoder guide mapping definitions and visual examples of line, shape, color, texture, space, typography, and image.	Annotate a sample advertisement using digital callouts, complete a visual element sorting puzzle, or record an audio critique of a graphic asset.
LT2	"Client Design Challenge" choosing a real-world scenario (theme park brochure, business card, or event calendar) for a specific target audience.	Video micro-tutorials on software tools (color pickers, alignment guides, typography rules) paired with customizable layout templates.	Design a digital graphic product (e.g., brochure, logo, or card) using vector design software and present a written or verbal design rationale.
LT3 G6&8	"Custom Accessory Challenge" designing functional physical objects (pencil toppers, dice, or keychains) to solve an everyday storage or organization problem.	Interactive 3D X/Y/Z spatial axis models, step-by-step visual slicing guides, and pre-print error checklists (wall thickness, supports, overhangs).	Build a multi-layer parametric 3D CAD model, export and slice an .STL/.OBJ file, and operate a 3D printer to produce a physical prototype.
LT3	"Tiny Home / Living Space Challenge" designing an	Color-coded architectural symbol key (exterior/interior	Draft a digital architectural floor plan incorporating walls,

G7	efficient residential floor plan balancing spatial functionality with safety constraints.	walls, door swing radii, escape window placement) and pre-built room component libraries.	doors, windows, and furniture, or record a virtual screen-recorded walkthrough of the layout.
LT4	"Custom Brand Fabrication" creating personalized physical products (engraved dog tags, coasters, water bottles, or wooden cutting boards).	Visual toolpath guides distinguishing vector cut lines (hairline stroke) from raster engraving fills, paired with machine setup safety checklists.	Prepare vector graphics in software, configure laser/CNC power and speed settings, and operate subtractive machinery to produce a finished product.

Supporting Multilingual/English Learners (*CELP standards*)

	Emerging	Expanding	Bridging
LT1	I can identify and explain the elements of graphic design that create a visually appealing product.* | I can match graphic design elements (color, contrast, alignment, space) to example images using a visual reference card and word bank.	I can identify design elements in a product and describe how they make it visually appealing using graphic organizers and sentence starters.	I can analyze and explain in detail how specific graphic design principles interact to create an aesthetically pleasing, professional product.
LT2	I can arrange text and image elements in a software program to build a layout using visual step-by-step checklists.	I can apply graphic design elements (fonts, color schemes, spacing) in software to create a digital layout using project templates	I can independently apply graphic design principles within digital software tools to design a cohesive, visually effective product.
LT3 G6&8	I can use 3D modeling software to design a prototype with multiple layers and produce it with additive manufacturing (3D printing).* | I can manipulate pre-made 3D shapes to build a multi-layer model in software and prepare it for 3D printing using visual icon guides.	I can design a multi-layer prototype using 3D modeling software and describe the 3D printing process using sequence sentence frames	I can design a multi-layered 3D prototype using modeling tools and evaluate how additive manufacturing layers material to produce the physical model.
LT3 G7	I can select and place basic rooms, doors, and windows on a grid in architectural software using visual menu guides.	I can create a labeled, functional floor plan in architectural software using software tools and sentence starters to describe spatial features	I can construct a scaled floor plan using architectural software, evaluating spatial layout choices and structural efficiency in writing.
LT4	I can draw a simple vector shape/cutline in design software and point out where a laser/CNC cutter removes material using visual cards.	I can design a prototype in modeling software and describe how subtractive tools (laser/CNC) cut away material using a flowchart and sentence frames.	I can create a precise prototype in modeling software and explain the technical process of subtractive manufacturing in producing the physical object.

Lesson Sequence	Learning Target	Success Criteria	Assured Learning Experiences GRADE 6	GRADE 7	GRADE 8
Learning Sequence 1: Graphic Design					
1	**Learning Target 1** I can identify and explain the elements of graphic design that create a visually appealing product.	• I can identify, define, and locate graphic design elements (line, shape, color, texture, space, typography, and image) in products. • I can describe the role of each element in a design and how they work together to convey a message.	***Theme Park Brochure***	***Calendars House for Sale***	***Logo Business Cards***
2-5	**Learning Target 2** I can apply the elements of graphic design within a software program to create a visually appealing product.	• I can use the tools embedded in graphic design software to create elements such as color, lines, shapes, images, typography, and text. • I can use correct design vocabulary when I talk about my work and others' work. • I can collaborate effectively with others to create a graphic design, give and receive feedback, and improve my work. • I can complete a project and explain how I used elements of graphic design to create a visually appealing product.			

Learning Sequence 2: Additive Manufacturing					
GRADE 6 & 8					
6	**Learning Target 3** I can use 3D modeling software to design a prototype with multiple layers and produce it with additive manufacturing (3D printing).	• I can explain what additive manufacturing is and how it differs from subtractive manufacturing. • I can plan my product with its dimensions before I use 3D modeling software.	**Pencil Toppers**		***3D Dice***
7-8		• I can use the 3D modeling software tools (such as extrude, sketch, and measure) to build my design. • I can create my model to the correct size and scale. • I can identify all 3 axis lines (X, Y, Z) used to create my model. • I can check my model for errors or imperfections that would lead to an error print • I can export my model in the correct file format (such as .STL or .OBJ) and prepare it in slicing software. • I can safely operate the 3D printer and remove my print. • I can evaluate my prototype and explain what I would change to improve it.			
GRADE 7					
6-8	**Learning Target 3** I can use Architectural Software to create a simple floor plan.	• I can create exterior and interior walls. • I can create various types of doors and understand where and when to use specific doors. • I can create various types of windows and understand where specific escape windows need to be placed. • I can create a roof and understand the differences in slope. • I can create furniture and appliances used for specific types of rooms. • I can edit and customize specific furniture or appliances.		***Floorplan***	
Learning Sequence 3: Subtractive Manufacturing					
9	**Learning Target 4** I can use modeling software to design a prototype and produce it with subtractive manufacturing (Laser/CNC printing).	• I can explain what subtractive manufacturing is and how it differs from additive manufacturing. • I can sketch or plan my product with its dimensions before I start modeling.	***Cricut*** **Dog Tags** **Book Marks**	***Cricut*** ***Cutting Boards*** ***Coins***	***Cricut*** ***Water Bottles*** ***Coasters***
10-12		• I can use graphic design software tools to build my design. • I can create my model to the correct size and scale. • I can check my model for errors to ensure the right elements will be cut or engraved and check for parts that won't print as expected.			
13-15		• I can export my model in the correct file format. • I can safely operate the Laser/CNC machine and remove my print. • I can evaluate my prototype and explain what I would change to improve it.			

Unit Title
Unit 2: Construction

Relevant Standards:
CCTC • AC 1, AC 2, AC 4, AC-CST 1 ISTE Standards for Students • 1.1, 1.2, 1.4, 1.7 ITEEA STEL • STEL-2, STEL-7, STEL-8

Essential Question(s)	Enduring Understanding(s)
• Why is strict adherence to safety protocols mandatory when working in a production lab? • How does precision in measurement affect the quality and structural integrity of a constructed project? • How do builders select the proper tools, fasteners, and adhesives for a given material or assembly task? • How do surface finishes impact both the aesthetic appearance and longevity of built structures?	• Following shop rules, locating emergency equipment, maintaining tool discipline, and demonstrating safety mastery (scoring 90%+ on safety evaluations) are essential to preventing injuries and maintaining a safe shop environment. • Measuring and marking stock accurately within specified tolerance limits ensures that components assemble correctly and perform as intended. • Tool selection (hand vs. power tools) and joint connection methods (screws, nails, bolts, wood glue, hot glue) depend on raw material properties, required mechanical strength, and manufacturing efficiency. • Applying protective surface treatments such as wood stain, paint, or polyurethane can enhance project aesthetics while protecting raw materials from environmental wear and damage.
Demonstration of Learning	**Pacing for Unit**
See Assured Learning Experiences under Learning Sequence for specific tasks. Students will receive teacher and peer feedback as well as opportunities to self-reflect, refine, and revise their work.	15 Days
Family Overview (link below)	**Integration of Technology:**
Middle School Technology Education: Family Overview	• Technology is integrated through digital safety presentations and online safety exams (Google Forms). • Students use precision measuring instruments to mark physical stock within specified tolerances. • Students operate physical processing machinery to bore holes, cut, shape, and smooth raw stock. They select mechanical fasteners (screws, bolts, nuts), structural adhesives (wood glue, hot glue), and surface finish systems (stain, paint, polyurethane) to assemble finished projects like candy machines, birdhouses, and CO_2 cars.
Unit-specific Vocabulary	**Aligned Unit Materials, Resources, and Technology (beyond core resources)**
Production lab safety, Safety contract, Emergency procedures, Safety equipment, Measurement tolerance, Ruler, Tape measure, Hand tools, Power tools, Boring, Shaping, Cutting, Fasteners, Screws, Nails, Bolts, Nuts, Adhesives, Wood glue, Hot glue, Glue gun, Raw materials, Wood stain, Paint, Polyurethane finish	***Suggested Materials:*** Safety glasses, Rulers, Tape measures, Hand saws, Wood rasps, Clamps, Drill presses, Power sanders, Wood stock, Screws, Nails, Bolts, Nuts, Wood glue, Hot glue sticks, Wood stain, Paint, Polyurethane finish, CO2 car blocks.

	Required Software & Hardware: Interactive digital presentation tools, online assessment platforms (Google Forms), precision measuring tools, power tools (drill presses, power sanders, boring machinery), fasteners, adhesives, and finishing tools.
Opportunities for Interdisciplinary Connections:	**Anticipated misconceptions**
Fractions & Precision Measurement (CCSS.MATH.CONTENT.5.NF & 6.NS) • Performing fractional arithmetic and number-line partitioning down to $\frac{1}{2}$", $\frac{1}{4}$", and $\frac{1}{8}$" precision marks when measuring and marking physical stock materials. Structural Mechanics & Forces (NGSS MS-PS2) • Analyzing how physical forces (compression, tension, shear) act on constructed wooden structures, mechanical fasteners (screws, bolts, nails), and adhesive joints. Chemical Interactions of Finishes & Adhesives (NGSS MS-PS1) • Investigating chemical bonding and physical properties of materials when applying wood stains, paints, polyurethane, and adhesives to protect raw wood fibers. Geometric Tolerance & Construction Layout (CCSS.MATH.CONTENT.7.G) • Constructing perpendicular angles, parallel edges, and measuring within defined error tolerances to guarantee structural squareness and alignment.	• Students line up stock with the physical edge of a ruler instead of the zero mark. • Students misinterpret fractional marks and ignore saw kerf width, breaching tolerance limits. • Students use glue alone for load-bearing joints or drive screws without pre-drilling pilot holes, splitting stock. • Students treat stains, paint, and polyurethane as purely decorative rather than protective moisture barriers. • Students force power tools under physical pressure rather than letting tool speed and blade geometry cut safely.
Connections to Prior Units	**Connections to Future Units**
Engineering design practices are woven throughout all units. The ISTE standards are also taught in each unit of Grades 6-8.	Each learning sequence aligns vertically to a corresponding learning sequence in 7th and 8th grade.

Differentiation through *Universal Design for Learning*

	Engagement	Representation	Action & Expression
LT1	"Production Lab Safety Audit / Hazard Hunt" inspecting shop tools, locating emergency shut-offs, eyewash stations, and PPE to master lab protocols.	Interactive visual safety poster & digital tour mapping machine danger zones, color-coded floor boundaries, and PPE requirements side-by-side.	Pass the shop safety evaluation with 90%+ accuracy, perform a peer safety audit demonstration, or record an emergency procedure video walkthrough.
LT2	"Precision Measurement Challenge" measuring physical project stock against tiered tolerance limits (Grade 6: ½", Grade 7: ¼", Grade 8: ⅛") to pass quality control.	Color-coded physical/digital ruler fraction guides highlighting fractional increments (½", ¼", ⅛") aligned directly with stock marking diagrams.	Measure and mark physical stock within specified tolerances, complete a digital measurement matching activity, or explain kerf width and fractional marks in a video log.
LT3	"Hand Tool Master Craftsman Challenge" selecting and testing hand tools (rasps, hand saws, clamps) to shape wood stock for projects (e.g., tic-tac-toe, birdhouses).	Labeled tool wall infographic and tactile reference cards illustrating correct grip, direction of force, and specific tool applications.	Demonstrate proper hand tool usage by shaping a wooden artifact, completing a physical tool identification practical, or recording a video tutorial on hand saw safety and technique.
LT4	"Machining Workshop Challenge" operating drill presses and power sanders to bore precise holes and shape project components safely.	Step-by-step visual machine operation checklists and digital demonstration videos highlighting feed speed, stock clamping, and guard positioning.	Safely operate power tools to bore holes or sand edges on a project block, complete a teacher-observed practical assessment, or create a video safety guide for a specific machine.
LT5	"Joint Strength Experiment" testing how screws, nails,	Visual fastener & adhesive selection matrix detailing load	Assemble project components using appropriate

	bolts, wood glue, and hot glue withstand physical forces (tension/shear) on wooden joints.	capacities, pre-drilling pilot hole requirements, and cure times.	fasteners and adhesives, construct a joint sample board, or present a written justification for fastener choice based on joint load.
LT6	"Material Properties Lab" comparing raw wood stock, acrylics, and composites to determine optimal tools and cutting speeds for each material type.	Tactile material sample board paired with a reference chart matching material hardness to ideal saw blades and sanding grits.	Select and process appropriate materials to complete a multi-material project, write a material selection report, or present a digital pitch on raw material choices.
LT7	"Custom Surface Design Studio" experimenting with wood stains, paints, and polyurethane to achieve protective and aesthetic finishes on completed builds.	Visual finishing comparison guide showing grain emphasis, moisture protection levels, and step-by-step application technique cards.	Apply a multi-step finish (stain, paint, or topcoat) to a final project, present a finished prototype with a written finishing log, or record an instructional video on sanding and staining.

Supporting Multilingual/English Learners (*CELP standards*)

	Emerging	Expanding	Bridging
LT1	I can match lab safety rules and protective gear (e.g., eye protection, tie back long hair) using visual signage cards and picture clues.	I can describe lab safety procedures and emergency responses using visual checklists and sentence frames (*"I must wear ___ because..."*).	I can explain production lab safety rules, identify potential hazards, and justify safety protocols in writing.
LT2	I can measure project materials to specified lengths using color-coded rulers and visual target guides.	I can measure and verify that project dimensions fall within allowable tolerance limits using guided calculation charts and sentence starters	I can independently measure, evaluate, and explain whether project dimensions meet required tolerance specifications (½", ¼", or ⅛").
LT3	I can select and name basic hand tools (e.g., hand saw, hammer, file) using labeled picture cards and visual step guides.	I can describe how to safely select and use hand tools for specific tasks using graphic organizers and sentence starters	I can explain and execute proper hand tool selection, safe handling techniques, and maintenance steps for project fabrication.
LT4	I can identify power tools and match them to safety icons using visual guides and teacher demonstration checklists.	I can describe the safe operating steps for specific power tools using sequential sentence frames and safety checklists.	I can explain in detail proper operating procedures, safety features, and material handling techniques for designated power tools.
LT5	I can sort and match fasteners (screws, nails, bolts) and adhesives (wood glue, epoxy) to visual sample cards.	I can select and describe which fasteners or adhesives to use for specific material joints using sentence frames and guides.	I can compare, evaluate, and justify the selection of specific fasteners and adhesives based on joint strength and material properties.
LT6	I can identify and categorize raw materials (wood, acrylic, metal, composite) using physical samples and visual vocabulary cards.	I can describe how different materials behave and why they were chosen for project parts using graphic organizers and sentence starters.	I can analyze material properties (e.g., grain direction, hardness, flexibility) and explain why specific materials fit project requirements.
LT7	I can match finishing tools and materials (sandpaper grades, paint, stain, sealer) to visual picture cards.	I can describe the sequence of steps for surface preparation and finish application using flowcharts and sentence frames.	I can explain the technical purpose, surface preparation, and application steps of various finishes to protect and complete a project.

Lesson Sequence	Learning Target	Success Criteria	Assured Learning Experiences GRADE 6 GRADE 7 GRADE 8
Learning Sequence 1: Hand Tools			
1	**Learning Target 1** I can identify and explain how to be safe in the Production Lab.	• I can follow the shop rules without being reminded. • I can accomplish safety procedures in the event of an emergency. • I can locate and describe how to use essential safety equipment in the woodshop. • I can pass the safety quiz with 90% accuracy.	• ***Safety presentation*** • ***Tour of makerspace and location safety tools*** • ***Signed safety contract*** • ***Safety quiz*** • ***CTE Master Why SAFETY/Rules 23/24***

2	**Learning Target 2** I can produce a product with measurements that are accurate or within tolerance of: Grade 6: ½ inch Grade 7: ¼ inch Grade 8: ⅛ inch	• I can accurately measure and mark materials to the nearest 1/2" using standard measuring tools (such as a ruler or tape measure). • I can measure to the nearest ½ / ¼ / ⅛ inch mark on the measurement tool and know what each line stands for. • I line up the zero end (or the end of the tool) with the edge of my material. • I double-check my measurement before I mark or cut. • I can create a finished product with the correct measurements.	***Mug holder*** ***Tic Tac Toe*** ***Buzzing Bee***	***Candy Machine Letters*** ***Turkeys/Snowmen*** ***Note Pad/Holder*** ***Magic Belt holder*** ***3 Piece Puzzle*** ***Cube Puzzle***	***Pair of Dice*** ***Skills WS*** ***Bank*** ***Bird House*** ***CO_2 Cars***
3-5	**Learning Target 3** I can properly use hand tools to complete my project.	• I can clean up and put tools away before I leave. • I can use hand tools to smooth and shape my project • I can use hand tools to measure and cut the material to the proper size. • I can only use tools and machines I have been trained on. • I can identify what a hand tool is and what it is properly used for.			
Learning Sequence 2: Power Tools					
6-15	**Learning Target 4** I can properly use power tools to complete my project.	• I can clean the power tools before I leave. • I can use power tools to smooth and shape my project. • I can use power tools to bore holes in the material. • I can use power tools to cut the material to the proper size. • I can only use the power tools and machines I have been trained on. • I can identify what a power tool is and what it is properly used for.	***See above***	***See above***	***See above***
6-15	**Learning Target 5** I can properly use fasteners and adhesives to complete my project.	• I can use screws, nails, bolts, or nuts to fasten two pieces of wood together in my projects. • I can use glue, hot glue, or other fasteners to make materials stay together.			
6-15	**Learning Target 6** I can properly use various materials to complete my project.	• I can select and use a variety of materials to complete a project and I understand the proper tools needed to use on each specific type of material.			
6-15	**Learning Target 7** I can apply a variety of different finishes to complete the project.	• I can properly apply a finish to achieve a desired appearance for completion. This may include wood stain, paint, or polyurethane.			

Unit Title	
Unit 3: Digital Technology	
Relevant Standards:	
CCTC • IT 1, IT-PRG 1, IT-SUP 1 ISTE Standards for Students • 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7 ITEEA STEL • STEL-1, STEL-2, STEL-3, STEL-4, STEL-7, STEL-8	
Essential Question(s)	**Enduring Understanding(s)**
• How do individuals balance the benefits of digital tools and AI with online safety, privacy, and critical evaluation of information? • How do computer science principles and block coding enable physical automation and robotics? • How does the Engineering Design Process guide the development of creative solutions to real-world technical problems? • How do electrical principles govern the flow of energy in technological systems?	• Responsible digital citizenship requires maintaining personal data privacy, recognizing web tracking and phishing, managing digital footprints, and evaluating AI summaries and web content for bias. • Computer programming converts logical algorithms into block code sequences that control hardware actuators, process sensor feedback loops, and direct robotic and aerial drone movements. • The Engineering Design Process provides a systematic, iterative approach to defining problems, developing structural models, testing prototypes, and refining designs based on performance constraints. • Electrical energy flows through closed conductive loops where Voltage (V), Current (I), and Resistance (R) interact according to Ohm's Law (V = I/R) across Series, Parallel, or Short circuit configurations.
Demonstration of Learning	**Pacing for Unit**
See Assured Learning Experiences under Learning Sequence for specific tasks. Students will receive teacher and peer feedback as well as opportunities to self-reflect, refine, and revise their work.	15 Days
Family Overview (link below)	**Integration of Technology:**
Middle School Technology Education: Family Overview	• Students interact with search engines and AI interfaces to master AI prompt engineering, evaluate browser tracking/cache/cookies, analyze online bias, and cross-reference AI summary outputs against primary web sources. • Students write block code and text-based code in Scratch, Code.org, and Khan Academy to create software programs and debug code logic. They program Ozobot and Lego Spike robots to process sensor inputs (light/distance/touch) and control motor outputs. Students also write code to navigate aerial drones by applying flight physics principles (pitch, yaw, roll, lift, thrust, drag). • Students use virtual simulation software (Tinkercad Circuits) and physical Arduino hardware to design closed conductive energy loops. They apply Ohm's Law to compute missing variables and construct Series, Parallel, and Short circuits.
Unit-specific Vocabulary	**Aligned Unit Materials, Resources, and Technology (beyond core resources)**

Digital safety, Password security, Phishing, Data privacy, Cache, Cookies, Targeted ads, AI prompt engineering, Artificial Intelligence, Media bias, Primary sources, Data centers, Computer science, Coding, Robotics, Block coding, Debugging, Sensors, Motors, Actuators, Pitch, Yaw, Roll, Lift, Thrust, Weight, Drag, Drones, Engineering Design Process, Conductive energy loop, Voltage, Current, Resistance, Ohm's Law (V = I/R), Series circuit, Parallel circuit, Short circuit.	***Suggested Materials:*** Ozobot robots, Lego Spike robotics kits, Aerial drones, Arduino microcontroller kits, Breadboards, LEDs, Connecting wires, Power sources, Lego building bricks, Solar panels, Mini wind turbines, Marbles, Paper, Cardboard, Computers. ***Required Software & Hardware:*** Web browsers, AI prompt interfaces, programming environments (Scratch, Code.org, Khan Academy), Ozobot robots, Lego Spike robotics kits, aerial drones, Tinkercad Circuits, and Arduino microcontroller kits.
Opportunities for Interdisciplinary Connections:	**Anticipated misconceptions**
Forces, Motion & Aerodynamics (NGSS MS-PS2) • Analyzing physical force vectors (balancing lift against weight (gravity) and thrust against drag) while programming drone flight movements across pitch, yaw, and roll axes. Algebraic Equations & Ohm's Law (CCSS.MATH.CONTENT.8.EE & NGSS MS-PS3) • Applying linear single-variable algebra and proportional reasoning to solve for missing variables using Ohm's Law ($V = I \cdot R$) in electrical circuits. Energy Transfer & Renewable Systems (NGSS MS-PS3) • Exploring energy transformations by constructing mechanisms that harness natural energy sources (wind, solar, hydro, gravity) to generate electrical or mechanical work. Human Impacts on Earth Systems & Data Infrastructures (NGSS MS-ESS3) • Evaluating environmental resource consumption by analyzing the electrical and thermal energy demands of global AI data center infrastructure.	• Students assume robots possess inherent intelligence, failing to realize hardware strictly executes programmed block code. • Students trust AI summaries as absolute facts, ignoring algorithmic bias, errors, and the need to verify primary sources. • Students believe electrical current gets consumed by loads rather than flowing continuously in a closed loop to ground via Ohm's Law. • Students expect adding parallel loads to dim lights equally, confusing parallel branching with series voltage division. • Students assume higher propeller speed drives drones forward, confusing thrust with lift and directional control (pitch, yaw, roll).
Connections to Prior Units	**Connections to Future Units**
Engineering design practices are woven throughout all units. The ISTE standards are also taught in each unit of Grades 6-8.	Each learning sequence aligns vertically to a corresponding learning sequence in 7th and 8th grade.

Differentiation through *Universal Design for Learning*

	Engagement	Representation	Action & Expression
	GRADE 6		
LT1	"Password & Phishing Mystery" analyzing real vs. fake login emails and testing password strength meters to prevent data breaches.	Color-coded internet safety checklist and visual infographics contrasting secure vs. unsecure digital footprints.	Create a digital safety infographic, complete an interactive phishing identification challenge, or record a tutorial video on password security.
LT2	"AI vs. Primary Source Detective" evaluating web search outputs and AI summaries against primary sources to spot bias.	Side-by-side source evaluation matrix highlighting primary sources, AI-generated content, and indicators of bias.	Write a critical evaluation report comparing sources, sort web results into valid/biased categories, or record a screencast explaining how to verify online information.
LT3	"Robot Anatomy & Code Breakdown" dissecting physical Ozobots and Lego Spike robots to map hardware parts to software code blocks.	Visual computer science word wall and flashcard deck connecting terms (algorithm, loop, sensor, actuator) to physical robot actions.	Complete a physical card-sorting puzzle matching CS terms to actions, construct a visual vocabulary diagram, or present an oral explanation of robotics terminology.
LT4	"Ozobot / Lego Spike Maze Challenge" programming a physical robot to navigate an obstacle course or complete a delivery route.	Step-by-step block-coding flowchart templates and visual bug-hunting/debugging guides.	Write block code to execute a multi-step robot task, record a video walkthrough explaining code logic and debugging, or demonstrate live robot execution on a

			challenge mat.
LT5	"Real-World Engineering Mishaps" analyzing famous engineering design triumphs and failures to explore why iteration matters.	8-step Engineering Design Process visual wheel and flowchart with distinct icon prompts for each stage (Ask, Imagine, Plan, Create, Test, Improve).	Map a historical engineering problem onto the EDP flowchart, present a written breakdown of EDP steps, or create an interactive digital presentation explaining the process.
LT6	"Renewable Energy Structure Challenge" designing and building a gravity or wind-powered structure (e.g., Lego car or tower) to solve a functional problem.	Multimodal design brief outlining structural constraints, energy input/output diagrams, and physical testing criteria.	Build and test a physical prototype using given materials, document design iterations in an engineering log, or present a pitch justifying design changes based on test data.
GRADE 7			
LT1	"Data Privacy & Targeted Ads Audit" investigating how web searches generate cookies, cache data, and targeted advertisements on personal devices.	Color-coded data tracking infographic mapping browser cookies, cache files, and targeted advertising loops side-by-side.	Create a digital privacy guide, record a video tutorial explaining how to clear browser cache and cookies, or complete a scenario-based data privacy audit worksheet.
LT2	"AI Prompt Engineering Challenge" crafting and refining AI prompts to assist in writing, brainstorming, or solving everyday problems while analyzing AI benefits and risks.	Comparative visual guide displaying ineffective vs. effective AI prompt structures alongside privacy rule checklists (what NOT to share in prompts).	Present a portfolio of AI prompt iterations and generated outputs, record a screencast demonstrating prompt refinement techniques, or write an evaluation comparing AI assistance to traditional research.
LT3	"Game & App Development Lab" writing digital lines of code to build interactive software programs or animations.	Step-by-step code logic reference cards and visual syntax/debugging flowcharts to isolate software errors.	Program a functional software demo, record a video walkthrough explaining code execution and debugging steps, or submit an annotated digital code portfolio.
LT4	"Robotic Navigation Challenge" writing block code sequences to program physical robots to complete multi-step tasks across simulated environments.	Visual block-coding drag-and-drop templates and step-by-step sequential logic planning sheets.	Execute a successful live robot demo, record a video explaining block code logic and peer feedback adjustments, or present a flowchart detailing the robot's automated sequence.
LT5	"Automated Sensor & Manipulator Challenge" programming robots to process real-time sensor feedback (light, distance, touch) to trigger motor actions and manipulate physical objects.	Interactive hardware diagram mapping sensor inputs to motor actuations alongside conditional logic templates (If/Then statements).	Program a robot to navigate an obstacle course using active sensors, present a video breakdown of sensor-triggered code loops, or construct a physical/digital flow diagram of hardware responses.
LT6	"Real-World Structural Design Challenge" applying the Engineering Design Process to construct physical structures or systems that solve authentic real-world problems.	Scaffolded 8-step Engineering Design Process documentation organizer with visual icons for each iterative phase.	Construct and test a physical structural prototype, maintain a detailed engineering design journal documenting iterations, or deliver a design pitch explaining test performance and refinements.
LT7	"Virtual & Physical Circuit Lab" using Tinkercad Circuits and Arduino hardware kits to build closed conductive loops and analyze electrical current flow.	Color-coded electrical schematic guides illustrating closed loops, voltage sources, loads (LEDs), resistor placements, and Ohm's Law formulas.	Assemble a physical/virtual circuit that lights an LED, complete a multi-step Ohm's Law calculation worksheet, or produce an instructional video explaining how voltage, current, and resistance interact in a closed circuit.
GRADE 8			
LT1	"AI Field Audit" investigating real-world applications of artificial intelligence across medicine, art, agriculture, autonomous transportation, and manufacturing.	Interactive infographics and visual case study cards mapping real-world AI applications to specific industry sectors.	Create a digital poster/presentation summarizing real-world AI uses, record a podcast interview on AI's transformation of industries, or complete a matching grid pairing AI tools to industry problems.
LT2	"Data Center & Tech Footprint Challenge" analyzing the hidden environmental impact of AI data centers, energy demands, and viral social media trends on global society.	Visual infographic contrasting the electrical and water demands of AI data infrastructure against global resource sustainability alongside digital footprint maps.	Draft a critical opinion report on the environmental costs of AI data centers, create a digital infographic on social media consumption, or present a group debate on

			emerging technology ethics.
LT3	"Interactive Software Studio" using programming platforms (Scratch, Code.org, or Khan Academy) to write lines of code that animate graphics, calculate math, or build interactive tools.	Step-by-step digital syntax reference guides, logic flowcharts, and visual code-debugging checklists.	Program an interactive digital application, record a video walkthrough explaining code execution and debugging steps, or submit an annotated digital code repository.
LT4	"Flight Physics & Aerodynamics Simulator" analyzing physical force vectors (lift vs. weight, thrust vs. drag) and rotation axes (pitch, yaw, roll) on aircraft and drones.	Interactive 3D aircraft diagrams highlighting flight controls alongside visual force vector diagrams (thrust, drag, lift, weight).	Demonstrate flight movement axes using a physical model drone, complete an aerodynamic force labeling task, or record a video explaining how pitch, yaw, and roll manipulate flight paths.
LT5	"Aerial Drone Obstacle Course Challenge" programming autonomous flight paths for aerial drones to perform precision landings, altitude holds, and obstacle navigation.	Visual drone flight-block coding templates paired with step-by-step troubleshooting & pre-flight safety checklists.	Execute a live autonomous drone flight mission, record a screencast explaining flight code revisions and troubleshooting, or present a flight path blueprint with written code explanations.
LT6	"Engineering Challenge Case Study" examining structural challenges (e.g., marble runs, paper airplanes, bridges, or strongest columns) through the Engineering Design Process lens.	Visual 8-step Engineering Design Process diagram mapping structural design constraints, force testing rules, and failure analysis prompts.	Write a reflective engineering report explaining each EDP step used in a challenge, create a digital EDP flowchart for a completed build, or deliver an oral presentation detailing design choices.
LT7	"Clean Energy Mechanical Design Challenge" applying the EDP to build a prototype (e.g., bridge, tower, or marble mechanism) powered by natural energy sources (wind, solar, hydro, or gravity).	Multimodal design brief outlining energy conversion models, material limitations, and physical performance measurement criteria.	Construct and test a physical prototype driven by natural energy, document trial data and structural refinements in an engineering log, or present a design pitch with performance evidence.
LT8	"Circuit System Audit" testing physical and virtual Arduino circuits to discover how current paths behave across Series, Parallel, and Short circuit configurations.	Color-coded circuit schematic diagrams contrasting Series (single path), Parallel (multiple branches), and Short (zero-resistance bypass) circuit configurations.	Build and test physical/virtual Arduino circuits for each circuit type, draw and label electrical schematics explaining current flow differences, or record an instructional video explaining the properties and hazards of short vs. series/parallel circuits.

Supporting Multilingual/English Learners (*CELP standards*)

	Emerging	Expanding	Bridging
	GRADE 6		
LT1	I can sort information into "safe to share" vs. "private" using visual cards and picture prompts.	I can describe online safety rules and ways to protect personal data using sentence frames ("I keep my data safe by...").	I can explain strategies for maintaining privacy online and evaluate potential digital security risks in writing.
LT2	I can identify everyday digital tools and activities using labeled icon cards.	I can describe how digital tools help with daily tasks using graphic organizers and sentence starters.	I can analyze and explain the positive and negative impacts of digital literacy on daily learning, communication, and life.
LT3	I can match basic CS vocabulary (algorithm, loop, code, automation) to visual icons and picture definitions.	I can define basic CS terms and describe how they connect to automation using sentence frames and visual organizers.	I can explain CS terminology in detail and justify how algorithms and code enable automated tasks in everyday technology.
LT4	I can sequence visual direction blocks (arrows, start/stop) to guide a robot through a path using visual guides.	I can write block-based code to perform specific robot tasks using a step-by-step coding checklist and sentence starters.	I can construct, test, and debug code scripts to command a robot to complete multi-step tasks independently.
LT5	I can place the steps of the Engineering Design Process (Ask, Imagine, Plan, Create, Improve) in order using a visual flowchart.	I can explain how each step of the EDP helps solve problems using graphic organizers and sentence starters.	I can evaluate and explain in detail how engineers systematically apply the EDP to solve complex problems.

LT6	I can apply the engineering design process to find creative solutions to problems by drawing or building a simple solution following a visual EDP step-by-step checklist.	I can apply the EDP to design a creative problem solution using guided planning sheets and sentence starters.	I can independently apply all stages of the EDP to research, prototype, test, and refine creative solutions to design challenges.
GRADE 7			
LT1	I can sort types of web data (search history, clicks, location) using visual icon cards and sorting charts.	I can describe what data companies collect online and how it affects my device using sentence frames ("Companies track ___ to show...").	I can analyze how web tracking impacts user privacy, targeted content, and device performance, explaining findings in writing.
LT2	I can match digital tools (email, search engines, apps) to daily activities using picture cards.	I can describe the role of digital literacy in personal and academic life using graphic organizers and sentence starters.	I can evaluate the multi-faceted impact of digital literacy on modern communication, productivity, and daily routines.
LT3	I can arrange pre-made visual code blocks in order to complete a digital task using step-by-step software prompts.	I can write functional computer code to solve specific tasks using guided coding templates and sentence starters.	I can design, write, and debug computer code to execute complex program tasks, explaining code logic in writing.
LT4	I can select and order visual commands to control a robot using color-coded block cards.	I can write block-based code to perform robot tasks using visual troubleshooting guides and sentence frames.	I can write, test, and refine programming scripts to command a robot to execute multi-step tasks.
LT5	I can match robot sensors (touch, light, distance) and motors to their functions using visual picture cards.	I can program a robot to respond to sensor inputs or drive motors using guided code blocks and sentence frames.	I can design and program an automated robot that uses multiple sensor inputs and motor outputs to complete complex tasks.
LT6	I can identify a design problem and draw a solution using a visual EDP organizer.	I can apply the EDP stages to build and test a creative solution using structured design logs and sentence starters.	I can execute the full EDP to design, construct, test, and iterate creative solutions to engineering challenges with written reflections.
LT7	I can label the components of a circuit (power, wire, LED/load, ground) on a diagram using visual vocabulary cards.	I can describe how electrical energy flows in a closed circuit using sentence frames ("Energy flows from the power source through the load to...").	I can explain and demonstrate the mechanics of a closed conductive loop, detailing the roles of power, load resistance, and ground.
GRADE 8			
LT1	I can match AI applications (facial recognition, recommendation algorithms, chatbots) to picture cards.	I can identify and describe real-world AI examples across different industries (healthcare, transport, media) using sentence starters.	I can analyze and explain diverse real-world applications of AI across various professional fields and daily life.
LT2	I can sort images of emerging tech into positive and negative impact categories using visual graphic organizers.	I can describe how AI affects individuals, local communities, and global society using cause-and-effect sentence frames.	I can evaluate the societal, ethical, and economic impacts of AI and emerging technologies on personal, local, and global scales.
LT3	I can assemble visual code blocks to execute program actions using a visual step-by-step guide.	I can write and test code to complete specific software tasks using reference cards and sentence starters.	I can develop, test, and optimize code in a programming environment to perform complex computational tasks.
LT4	I can label the 4 forces of flight (lift, weight, thrust, drag) and movements (pitch, roll, yaw) on a model aircraft diagram.	I can describe core flight movements and aerospace physics principles using labeled diagrams and sentence starters.	I can explain the physics of flight and how control surfaces manipulate pitch, roll, and yaw to steer aerospace vehicles.
LT5	I can select visual flight commands (takeoff, move, turn, land) to build a drone flight route on a grid.	I can program a drone to navigate a course or complete tasks using block coding templates and flight checklists.	I can write, test, and debug flight programs enabling drones to autonomously execute complex, multi-step tasks.
LT6	I can match EDP stages to their visual descriptions using flowcharts and picture cards.	I can explain how the EDP provides a structured framework for technical problem solving using sentence starters.	I can explain the iterative nature of the EDP and justify how engineers use it to systematically resolve design challenges.

LT7	I can follow an EDP visual checklist to guide building and testing a creative project prototype.	I can apply the EDP to design, prototype, and refine a project solution using engineering notebook templates.	I can apply the complete EDP to innovate, gather test data, analyze results, and optimize creative solutions for engineering problems.
LT8	I can match the 3 major circuit types (series, parallel, combination) to visual schematic diagrams.	I can identify and describe series, parallel, and combination circuits using schematic diagrams and sentence starters.	I can compare, contrast, and analyze series, parallel, and combination circuits, explaining current and voltage behavior in each.

Lesson Sequence	Learning Target	Success Criteria	Assured Learning Experiences GRADE 6	GRADE 7	GRADE 8
GRADE 6					
Learning Sequence 1: Digital Citizenship					
1	**Learning Target 1** I can keep myself and my personal information safe when online.	• I can identify ways to stay safe online • I can explain characteristics of a strong password • I can determine if something is a phishing attempt			
2	**Learning Target 2** I can recognize the impact of digital literacy on my daily life.	• I can use multiple sources and searches to find the most accurate information possible. • I can use multiple sources to identify bias. • I can determine if my search results are an AI summary or a primary source and use both effectively.			
Learning Sequence 2: Automation & Programming (Coding & Robotics)					
3	**Learning Target 3** I can identify and explain basic computer science terms and describe how they relate to automation and programming.	• I can define key terms related to coding and robotics. • I can define and identify what computer science is and why it is important. • I can explain why code is needed to make a computer do something.			
4-9	**Learning Target 4** I can create code to perform certain tasks with a robot.	• I can use accurate coding and robotics terms when I talk and write about my work. • I can use block coding to program a sequence of events in the correct order. • I can use block coding to complete a desired task. • I can reflect upon and improve my work when the robot does not perform the task accurately. • I can identify the relationship between coding and robotics. • I can collaborate effectively with others to create code, give and receive feedback, and improve our collective work.	***Code Terms*** ***Robotic Terms*** ***Ozobot*** ***Lego Spike***		
Learning Sequence 3: Engineering Design Process					
10	**Learning Target 5** I can explain how the engineering design process is used to solve problems.	• I can identify the steps of the engineering design process. • I can complete a project and explain how I used each step of the engineering design process. • I can explain how the Engineering Design Process is used to solve Real-World Problems.	***Lego Cars*** ***Lego Towers***		
11-15	**Learning Target 6**	• I can determine how to harness natural energy sources (wind, solar, hydro, or gravity) to be used to power a structure/system built to solve the problem proposed.			

	I can apply the engineering design process to find creative solutions to problems.	• I can create a structure using materials given, to solve any problem proposed. • I can explain the components used to try to create any structure.			
GRADE 7					
Learning Sequence 1: Digital Citizenship					
1	**Learning Target 1** I can explain the information companies gather from my web activity and how it affects me and my devices.	• I can identify which information is appropriate to share online. • I can identify targeted ads and how the information I provide leads to them. • I can determine when and how to clear my cache and cookies.			
2	**Learning Target 2** I can recognize the impact of digital literacy on my daily life.	• I can identify which information is appropriate in an AI prompt. • I can explain the personal benefits and risks of using AI. • I can write an effective and efficient series of AI prompts. • I can use AI to generate ideas or refine my communication.			
Learning Sequence 2: Automation & Programming (Coding & Robotics)					
3-4	**Learning Target 3** I can create code to perform certain tasks within a computer program.	• I can use Digital Lines of Code to create coding to write a computer program. • I can debug my code when an error occurs. • I can refine my code when it does not perform as expected. • I can reflect upon and improve my work when my program does not perform the task accurately.			
5-6	**Learning Target 4** I can create code to perform certain tasks with a robot.	• I can use accurate coding and robotics terms when I talk and write about my work. • I can use block coding to program a sequence of events in the correct order. • I can use block coding to complete a desired task. • I can reflect upon and improve my work when the robot does not perform the task accurately. • I can identify the relationship between coding and robotics. • I can collaborate effectively with others to create code, give and receive feedback, and improve our collective work.			
7-10	**Learning Target 5** I can program a robot to use sensor(s) and/or motor(s) to complete a task.	• I can write and modify code that controls various sensors or motors to solve problems • I can use sensor inputs to control the robot's actions. • I can program a robotic motor to operate in various actions to manipulate objects.			
Learning Sequence 3: Engineering Design Process					
10-11	**Learning Target 6** I can apply the engineering design process to find creative solutions to problems.	• I can explain how the engineering design process is used to solve problems. • I can design and construct a structure used to solve a real world problem given.		***Audrino Kits*** ***TinkerCad*** ***Circuits***	
12-15	**Learning Target 7** I can explain a closed conductive loop that allows electrical energy to flow from a	• I can explain how voltage, current, and resistance are used to create a system. • I can apply Ohm's Law to solve missing variables in order for the system to work (Voltage, Current, and Resistance).			

	power source through any load (LED), and back to ground.	• I can create a system that uses all variables in order to make a conductive energy loop.			
GRADE 8					
Learning Sequence 1: Digital Citizenship					
1	**Learning Target 1** I can recall real-world examples of AI in varied fields.	• I can summarize why it is important to learn about AI. • I can define artificial intelligence. • I can explain how Artificial Intelligence is transforming the world around us.			
2	**Learning Target 2** I can recognize the impact of AI and emerging technologies on myself, my community, and the world.	• I can describe the environmental impacts of data centers. • I can identify how viral trends can impact society. • I can explain what it means to be a critical consumer of social media and other online information.			
Learning Sequence 2: Automation & Programming (Coding & Robotics)					
3-4	**Learning Target 3** I can create code to perform certain tasks within a computer program.	• I can use lines of code to write a computer program. • I can debug my code when an error occurs. • I can refine my code when it does not perform as expected. • I can reflect upon and improve my work when my program does not perform the task accurately.			***Khan academy*** ***Scratch*** ***Code.org*** ***Drones***
5	**Learning Target 4** I can understand the core flight movements and basic physics of aerospace.	• I can explain what pitch, yaw, and roll are. • I can explain lift, thrust, weight and drag.			
6-9	**Learning Target 5** I can program drones to complete a series of tasks.	• I can test my code and identify problems. • I can troubleshoot and revise my code. • I can program my aerial robot to complete an assigned task.			
Learning Sequence 3: Engineering Design Process					
10	**Learning Target 6** I can explain how the engineering design process is used to solve problems.	• I can identify the steps of the engineering design process. • I can complete a project and explain how I used each step of the engineering design process. • I can explain how the Engineering Design Process is used to solve Real-World Problems.			***Marble madness*** ***Paper airplane*** ***Strongest Column*** ***Bridge Design*** ***Audrino Kits***
11	**Learning Target 7** I can apply the engineering design process to find creative solutions to problems.	• I can determine how to harness natural energy sources (wind, solar, hydro, or gravity) to be used to power a structure/system built to solve the problem proposed. • I can create a structure using materials given, to solve any problem proposed. • I can explain the components used to try to create any structure.			
12-15	**Learning Target 8** I can identify the 3 major circuit types applied to electronics.	• I can understand the differences in a Series, Parallel, or Short Circuit. • I can create a Parallel Circuit system and explain how it works.			