

# 2017 Ohio Technology Standards



## 8<sup>th</sup> Grade LBMS Pre-Engineering Class

*STRAND: Information and Communications Technology The understanding and application of digital learning tools for accessing, creating, evaluating, applying and communicating ideas and information.*







**Topic 1: Identify and use appropriate digital learning tools and resources to accomplish a defined task.**

	Sketching	Architecture	Robotics	KidWind	Electronics / Solar
<ul style="list-style-type: none"> <li>Develop criteria for selecting digital learning tools and resources to accomplish a defined task.</li> </ul>					
<ul style="list-style-type: none"> <li>Select and use digital learning tools or resources to support planning, implementing, and reflecting upon a defined task.</li> </ul>					
<ul style="list-style-type: none"> <li>Evaluate the use of digital learning tools and resources to support learning and productivity.</li> </ul>					

**Topic 2: Use digital learning tools and resources to locate, evaluate and use information.**

	Sketching	Architecture	Robotics	KidWind	Electronics / Solar
<ul style="list-style-type: none"> <li>Use advanced search techniques to locate needed information using digital learning tools and resources.</li> </ul>					
<ul style="list-style-type: none"> <li>Use multiple criteria to evaluate the validity of information found with digital learning tools and resources</li> </ul>					
<ul style="list-style-type: none"> <li>Apply principles of copyright, use digital citation tools and use strategies to avoid plagiarism.</li> </ul>					

**Topic 3: Use digital learning tools and resources to construct knowledge.**

	Sketching	Architecture	Robotics	KidWind	Electronics / Solar
<ul style="list-style-type: none"> <li>Analyze and integrate textual, visual, and quantitative information (images, diagrams, maps, graphs, infographics, videos, animations, interactives, etc.) from multiple digital learning tools and resources.</li> </ul>					
<ul style="list-style-type: none"> <li>Analyze data collected or retrieved from a variety of digital learning tools and resources to determine if patterns or trends are present.</li> </ul>					
<ul style="list-style-type: none"> <li>Create artifacts using digital learning tools and resources to demonstrate knowledge.</li> </ul>					

**Topic 4: Use digital learning tools and resources to communicate and disseminate information to multiple audiences.**

	Sketching	Architecture	Robotics	KidWind	Electronics / Solar

<ul style="list-style-type: none"> <li>Use digital learning tools and resources to identify communication needs considering goals, audience and content.</li> </ul>					
<ul style="list-style-type: none"> <li>Select and use a variety of media formats to communicate information to a target audience.</li> </ul>				✓	✓
<ul style="list-style-type: none"> <li>Discuss and identify ways to communicate and disseminate information so that users with varied needs can access information.</li> </ul>				✓	✓
<ul style="list-style-type: none"> <li>Evaluate the effectiveness of a digital tool to communicate information with multiple audiences.</li> </ul>					

**STRAND: Society and Technology**

The interconnectedness of technology, self, society and the natural world, specifically addressing the ethical, legal, political and global impact of technology.

**Topic 1: Demonstrate an understanding of technology's impact on the advancement of humanity – economically, environmentally and ethically.**

	Sketching	Architecture	Robotics	KidWind	Electronics / Solar
<ul style="list-style-type: none"> <li>Advocate and exhibit ethical, legal and responsible practices when utilizing technology.</li> </ul>					
<ul style="list-style-type: none"> <li>Explore the advantages and disadvantages of widespread use, accessibility, and reliance on technology in your world.</li> </ul>					
<ul style="list-style-type: none"> <li>Review and demonstrate ethical considerations and legal requirements involved in the creation and use of digital technologies.</li> </ul>					
<ul style="list-style-type: none"> <li>Analyze an environmental concern and investigate technology solutions to that problem.</li> </ul>		✓		✓	✓

**Topic 2: Analyze the impact of communication and collaboration in both digital and physical environments.**

	Sketching	Architecture	Robotics	KidWind	Electronics / Solar
<ul style="list-style-type: none"> <li>Critique specific instances of how technology has impacted access to information, communications and collaboration.</li> </ul>		✓		✓	✓
<ul style="list-style-type: none"> <li>Explain the positive and negative impact the use of technology can have on personal, professional and community relationships.</li> </ul>		✓		✓	✓
<ul style="list-style-type: none"> <li>Investigate how social media impacts society and the digital identities of individuals and organizations.</li> </ul>					
<ul style="list-style-type: none"> <li>Apply appropriate interactions and digital etiquette in varying</li> </ul>					

contexts, reflecting upon potential impacts in both digital and physical environments.					
<b>Topic 3: Explain how technology, society, and the individual impact one another.</b>					
	Sketching	Architecture	Robotics	KidWind	Electronics / Solar
<ul style="list-style-type: none"> <li>Discuss and define how issues (such as economic, political, scientific and cultural) are influenced by the development and use of technology.</li> </ul>		✓	✓	✓	✓
<ul style="list-style-type: none"> <li>Explain how new technology development is driven by factors such as commercialization, creative/inventive thinking, and cultural/historical influence.</li> </ul>	✓	✓	✓	✓	✓
<ul style="list-style-type: none"> <li>Analyze how technological innovations/inventions can have multiple applications, both intended and unintended.</li> </ul>	✓	✓	✓	✓	✓
<ul style="list-style-type: none"> <li>Describe the impact of an individual's wants, values and interests on the development of new technologies.</li> </ul>		✓	✓	✓	✓
<ul style="list-style-type: none"> <li>Manage components of your digital identity and your digital footprint.</li> </ul>		✓		✓	✓
<ul style="list-style-type: none"> <li>Evaluate current and past revisions to laws, rules and policies as society responds to technological advancements.</li> </ul>		✓		✓	✓
<b>STRAND: Design and Technology</b>					
Addresses the nature of technology to develop and improve products and systems over time to meet human/societal needs and wants through design processes.					
<b>Topic 1: Define and describe technology, including its core concepts of systems, resources, requirements, processes, controls, optimization and trade-offs.</b>					
	Sketching	Architecture	Robotics	KidWind	Electronics / Solar
<ul style="list-style-type: none"> <li>Explore and document how technology can impact efficiency.</li> </ul>		✓		✓	✓
<ul style="list-style-type: none"> <li>Analyze how tools, materials and processes are used to alter the natural and human- designed worlds.</li> </ul>		✓	✓	✓	✓
<ul style="list-style-type: none"> <li>Define and categorize the requirements of a design as either criteria or constraints.</li> </ul>		✓		✓	✓
<ul style="list-style-type: none"> <li>Explain how optimization is the process of making a product as fully functional and effective as possible.</li> </ul>	✓	✓		✓	✓
<ul style="list-style-type: none"> <li>Describe how trade-offs involve a choice of one quality over another.</li> </ul>		✓		✓	✓
<ul style="list-style-type: none"> <li>Give examples of how trade-offs must occur when optimizing a</li> </ul>		✓		✓	✓

design in order to maintain design requirements.					
<b>Topic 2: Identify a problem and use an engineering design process to solve the problem.</b>					
	Sketching	Architecture	Robotics	KidWind	Electronics / Solar
<ul style="list-style-type: none"> <li>Apply a complete design process to solve an identified individual or community problem: research, develop, test, evaluate and present several possible solutions, and redesign to improve the solution.</li> </ul>					
<ul style="list-style-type: none"> <li>Describe how invention is a process of turning ideas and imagination into devices and systems</li> </ul>					
<ul style="list-style-type: none"> <li>Explain how innovation is the process of modifying an existing system or system element(s) to improve it.</li> </ul>					
<ul style="list-style-type: none"> <li>Consider multiple factors, including criteria and constraints, (e.g. research, cost, time, materials, feedback, safety, etc.) to justify decisions when developing products and systems to solve problems.</li> </ul>					
<ul style="list-style-type: none"> <li>Identify and explain why effective designs develop from non-linear, flexible application of the design process.</li> </ul>					
<b>Topic 3: Demonstrate that solutions to complex problems require collaboration, interdisciplinary understanding, and systems thinking.</b>					
	Sketching	Architecture	Robotics	KidWind	Electronics / Solar
<ul style="list-style-type: none"> <li>Collaborate to solve a problem as an interdisciplinary team modeling different roles and functions.</li> </ul>					
<ul style="list-style-type: none"> <li>Explain ways that invention and innovation within one field can transfer into other fields of technology.</li> </ul>					
<ul style="list-style-type: none"> <li>Evaluate the effectiveness of the group's collaboration during the engineering design process and the contribution of the varying roles</li> </ul>					
<ul style="list-style-type: none"> <li>Give examples of how changes in one part of a system can impact other parts of that system.</li> </ul>					
<ul style="list-style-type: none"> <li>Deconstruct a system into its component parts and describe how they interrelate.</li> </ul>					
<b>Topic 4: Evaluate designs using functional, aesthetic and creative elements.</b>					
	Sketching	Architecture	Robotics	KidWind	Electronics / Solar

<ul style="list-style-type: none"><li>Examine the progression of a product to identify how the functional, aesthetic and creative elements were applied</li></ul>					
<ul style="list-style-type: none"><li>Analyze environments or products that are examples of the application of the principles of universal or inclusive design.</li></ul>					
<ul style="list-style-type: none"><li>Apply the design principle "form follows function" to develop a product.</li></ul>					