Warren Hills Cluster Schools
Pre-K – 8 Technology Mastery Indicators

8.1 Educational Technology

A. Technology Operations and Concepts	Pre-K Kindergarten	1	2	3	4	5	6	7	8
Use an input device to negotiate a simple menu on the screen (e.g., to print a picture)	**M**	M	M	M	M	M	M	M	M
Navigate the basic functions of a browser									
Use electronic devises (e.g., computer) to type name and to create stories with pictures and letters/words	**M**	M	M	M	M	M	M	M	M
Recognize that the number keys are in a row on the top of the keyboard	**M**	M	M	M	M	M	M	M	M
Use digital devices to create stories with pictures, numbers, letters and words	**M**	M	M	M	M	M	M	M	M
Use basic technology terms in conversations (e.g., camera, tablet, Internet, mouse, keyboard, and printer)	**M**	M	M	M	M	M	M	M	M
Demonstrate the ability to access and use resources on a computing device	**M**	M	M	M	M	M	M	M	M
Identify the basic features of a digital device and explain its purpose	B	D	**M**	M	M	M	M	M	M
Discuss the common uses of computer applications and hardware and identify their advantages and disadvantages	B	D	**M**	M	M	M	M	M	M
Create a document using a word processing application.	B	D	**M**	M	M	M	M	M	M
Compare the common uses of at least two different digital applications and identify the advantages and disadvantages of using each	B	D	**M**	M	M	M	M	M	M

Mastery Indicators (continued)	Pre-K Kindergarten	1	2	3	4	5	6	7	8
Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums)	B	D	**M**	M	M	M	M	M	M
Enter information into a spreadsheet and sort the information	B	D	**M**	M	M	M	M	M	M
Identify the structure and components of a database	B	D	**M**	M	M	M	M	M	M
Enter information into a database or spreadsheet and filter the information	B	D	**M**	M	M	M	M	M	M
Create a document with text using a word processing program		B/D	**M**	M	M	M	M	M	M
Demonstrate the ability to navigate in virtual environments that are developmentally appropriate		B/D	**M**	M	M	M	M	M	M
Demonstrate effective input of text and data using an input device				B	D	**M**	M	M	M
Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems				B	D	**M**	M	M	M
Create a document with text formatting and graphics using a word processing program				B	D	**M**	M	M	M
Format a document using a word processing application to enhance text and include graphics, symbols and/ or pictures				B	D	**M**	M	M	M
Create and present a multimedia presentation that includes graphics				B	D	**M**	M	M	M
Use a graphic organizer to organize information about problem or issue				B	D	**M**	M	M	M
Graph data using a spreadsheet, analyze and produce a report that explains the analysis of the data				B	D	**M**	M	M	M
Create a simple spreadsheet, enter data, and interpret the information				B	D	**M**	M	M	M
Export data from a database into a spreadsheet; analyze and produce a report that explains the analysis of the data				B	D	**M**	M	M	M

Mastery Indicators (continued)	Pre-K Kindergarten	1	2	3	4	5	6	7	8
Plan and create a simple database, define fields, input data, and produce a report using sort and query					B	B/D	D	M	**M**
Create a multimedia presentation including sound and images					B	D	M	M	**M**
Generate a spreadsheet to calculate, graph, and present information					B	D	M	M	**M**
Demonstrate knowledge of a real world problem using digital tools						B	B/D	D	**M**
Create a document (e.g. newsletter, reports, personalized learning plan, business letters or flyers) using one or more digital applications to be critiqued by professionals for usability						B	B/D	D	**M**
Use and/or develop a simulation that provides an environment to solve a real world problem or theory						B	B/D	D	**M**
Graph and calculate data within a spreadsheet and present a summary of the results						B	B/D	D	**M**
Create a database query, sort and create a report and describe the process, and explain the report results						B	B/D	D	**M**
Select and use appropriate tools and digital resources to accomplish a variety of tasks and to solve problems						B	B/D	D	**M**
B. Creativity and Innovation									
Create a story about a picture taken by the student on a digital camera or mobile device	**M**	M	M	M	M	M	M	M	M
Illustrate and communicate original ideas and stories using multiple digital tools and resources	B	D	**M**	M	M	M	M	M	M
Collaborative to produce a digital story about a significant local event or issue based on first-person interviews				B	D	**M**	M	M	M
Synthesize and publish information about a local or global issue or event (ex. telecollaborative project, blog, school web)						B	B/D	D	**M**

Mastery Indicators(continued)	Pre-K Kindergarten	1	2	3	4	5	6	7	8
C. Communication and Collaboration									
Collaborate with peers by participating in interactive digital games or activities	**M**	M	M	M	M	M	M	M	M
Engage in a variety of developmentally appropriate learning activities with students in other classes, schools, or countries using various media formats such as online collaborative tools, and social media	B	D	**M**	M	M	M	M	M	M
Engage in online discussions with learners of other cultures to investigate a worldwide issue from multiple perspectives and sources, evaluate findings and present possible solutions, using digital tools and online resources for all steps				B	B/D	**M**	M	M	M
Collaborate to develop and publish work that provides perspectives on a global problem for discussions with learners from other countries						B	B/D	D	**M**
D. Digital Citizenship									
Develop an understanding of ownership of print and nonprint information	B	D	**M**	M	M	M	M	M	M
Understand the need for and use of copyrights				B	B/D	**M**	M	M	M
Analyze the resource citations in online materials for proper use				B	B/D	**M**	M	M	M
Demonstrate an understanding of the need to practice cyber safety, cyber security, and cyber ethics when using technologies and social media				B	B/D	**M**	M	M	M
Understand digital citizenship and demonstrate an understanding of the personal consequences of inappropriate use of technology and social media				B	B/D	**M**	M	M	M
Understand and model appropriate online behaviors related to cyber safety, cyber bullying, cyber security, and cyber ethics including appropriate use of social media						B	B/D	D	**M**

Mastery Indicators(continued)	Pre-K Kindergarten	1	2	3	4	5	6	7	8
Demonstrate the application of appropriate citations to digital content						B	B/D	D	**M**
Demonstrate an understanding of fair use and Creative Commons to intellectual property						B	B/D	D	**M**
Assess the credibility and accuracy of digital content						B	B/D	D	**M**
Understand appropriate uses for social media and the negative consequences of misuse						B	B/D	D	**M**
E. Research and Information Fluency									
Use the Internet to explore and investigate information with a teacher's support	**M**	M	M	M	M	M	M	M	M
Use digital tools and online resources to explore a problem or issue affecting children, and discuss possible solutions.	B	D	**M**	M	M	M	M	M	M
Use digital tools to research and evaluate the accuracy of, relevance to, and appropriateness of using print and non-print electronic information sources to complete a variety of tasks				B	B/D	**M**	M	M	M
Effectively use a variety of search tools and filters in professional public databases to find information to solve a real world problem						B	B/D	D	**M**
F. Critical Thinking, Problem Solving, and Decision-Making									
Use geographic mapping tools to plan and solve problems	B	D	**M**	M	M	M	M	M	M
Apply digital tools to collect, organize, and analyze data that support a scientific finding				B	B/D	**M**	M	M	M
Explore a local issue, by using digital tools to collect and analyze data to identify a solution and make an informed decision						B	B/D	D	**M**

8.2 Technology Education, Engineering, and Design, and Computational Thinking

A. Nature of Technology: Creativity and Innovation	Pre-K Kindergarten	1	2	3	4	5	6	7	8
Describe how technology products, systems, and resources are useful at school, home, and work	B	D	**M**	M	M	M	M	M	M
Define products produced as a result of technology or of nature	B	D	**M**	M	M	M	M	M	M
Describe how designed products and systems are useful at school, home and work	B	D	**M**	M	M	M	M	M	M
Identify a system and the components that work together to accomplish its purpose	B	D	**M**	M	M	M	M	M	M
Choose a product to make and plan the tools and materials needed	B	D	**M**	M	M	M	M	M	M
Collaborate to design a solution to a problem affecting the community	B	D	**M**	M	M	M	M	M	M
Compare and contrast how products made in nature differ from products that are human made in how they are produced and used				B	D	**M**	M	M	M
Investigate and present factors that influence the development and function of a product and a system				B	D	**M**	M	M	M
Investigate and present factors that influence the development and function of products and systems, e.g., resources, criteria and constraints				B	D	**M**	M	M	M
Compare and contrast how technologies have changed over time due to human needs and economic, political and/or cultural influences				B	D	**M**	M	M	M
Identify how improvement in the understanding of materials science impacts technologies				B	D	**M**	M	M	M
Investigate factors that influence the development and function of technology products and systems				B	D	**M**	M	M	M
Using a digital format, compare and contrast how a technology product has changed over time due to economic, political, and/or cultural influences				B	D	**M**	M	M	M

Description									
Research a product that was designed for a specific demand and identify how the product has changed to meet new demands							B	D	**M**
Examine a system, consider how each part relates to other parts, and discuss a part to redesign to improve the system							B	D	**M**
Investigate a malfunction in any part of a system and identify its impacts							B	D	**M**
Redesign an existing product that impacts the environment to lessen its impact(s) on the environment							B	D	**M**
Describe how resources such as material, energy, information, time, tools, people, and capital contribute to a technological product or system							B	D	**M**
Explain the impact of globalization on the development of a technological system over time							B	D	**M**
B. Technology and Society									
Brainstorm and devise a plan to repair a broken toy or tool using the design process	B	D	**M**	M	M	M	M	M	M
Identify how technology impacts or improves life	B	D	**M**	M	M	M	M	M	M
Demonstrate how reusing a product affects the local and global environment	B	D	**M**	M	M	M	M	M	M
Identify products or systems that are designed to meet human needs	B	D	**M**	M	M	M	M	M	M
Identify how the ways people live and work has changed because of technology	B	D	**M**	M	M	M	M	M	M
Investigate the influence of a specific technology on the individual, family, community, and environment	B	D	**M**	M	M	M	M	M	M
Examine ethical considerations in the development and production of a product through its life cycle				B	D	**M**	M	M	M
Examine systems used for recycling and recommend simplification of the systems and share with product developers				B	D	**M**	M	M	M

Mastery Indicators (continued)	Pre-K Kindergarten	1	2	3	4	5	6	7	8
Investigate ways that various technologies are being developed and used to reduce improper use of resources				B	D	**M**	M	M	M
Research technologies that have changed due to society's changing needs and wants				B	D	**M**	M	M	M
Explain the purpose of intellectual property law				B	D	**M**	M	M	M
Compare and discuss how technologies have influenced history in the past century			B	B	D	**M**	M	M	M
Design and create a product that addresses a real-world problem using the design process and working with specific criteria and constraints						B	B/D	D	**M**
Evaluate the history and impact of sustainability on the development of a designed product or system over time and present results to peers							B	D	**M**
Identify the desired and undesired consequences from the use of a product or system							B	D	**M**
Research and analyze the ethical issues of a product or system on the environment and report findings for review by peers and /or experts							B	D	**M**
Research examples of how humans can devise technologies to reduce the negative consequences of other technologies and present your findings							B	D	**M**
Identify new technologies resulting from the demands, values, and interests of individuals, businesses, industries and societies.							B	D	**M**
Compare and contrast the different types of intellectual property including copyrights, patents and trademarks							B	D	**M**
Analyze the historical impact of waste and demonstrate how a product is upcycled, reused or remanufactured into a new product							B	D	**M**
Solve a science-based design challenge and build a prototype using science and math principles throughout the design process							B	D	**M**

Mastery Indicators (continued)	Pre-K Kindergarten	1	2	3	4	5	6	7	8
C. Design									
Brainstorm ideas on how to solve a problem or build a product.	B	D	**M**	M	M	M	M	M	M
Create a drawing of a product or device that communicates its function to peers and discuss.	B	D	**M**	M	M	M	M	M	M
Explain why we need to make new products	B	D	**M**	M	M	M	M	M	M
Identify designed products and brainstorm how to improve one used in the classroom.	B	D	**M**	M	M	M	M	M	M
Describe how the parts of a common toy or tool interact and work as part of a system.	B	D	**M**	M	M	M	M	M	M
Investigate a product that has stopped working and brainstorm ideas to correct the problem.	B	D	**M**	M	M	M	M	M	M
Collaborate with peers to illustrate components of a designed system				B/D	D	**M**	M	M	M
Explain how specifications and limitations can be used to direct a product's development				B/D	D	**M**	M	M	M
Research how design modifications have led to new products				B/D	D	**M**	M	M	M
Collaborate and brainstorm with peers to solve a problem evaluating all solutions to provide the best results with supporting sketches or models				B/D	D	**M**	M	M	M
Explain the functions of a system and subsystems				B/D	D	**M**	M	M	M
Examine a malfunctioning tool and identify the process to troubleshoot and present options to repair the tool				B/D	D	**M**	M	M	M
Work with peers to redesign an existing product for a different purpose				B/D	D	**M**	M	M	M
Explain how different teams/groups can contribute to the overall design of a product						B	B/D	D	**M**
Explain the need for optimization in a design process.						B	B/D	D	**M**
Evaluate the function, value, and aesthetics of a technological product or system, from the perspective of the user and the producer						B	B/D	D	**M**

Mastery Indicators (continued)	Pre-K Kindergarten	1	2	3	4	5	6	7	8
Identify the steps in the design process that would be used to solve a designated problem						B	B/D	D	**M**
Explain the interdependence of a subsystem that operates as part of a system						B	B/D	D	**M**
Create a technical sketch of a product with materials and measurements labeled						B	B/D	D	**M**
Collaborate to examine a malfunctioning system and identify the step-by-step process used to troubleshoot, evaluate and test options to repair the product, presenting the better solution						B	B/D	D	**M**
Collaborate with peers and experts in the field to research and develop a product using the design process, data analysis and trends, and maintain a design log with annotated sketches to record the developmental cycle						B	B/D	D	**M**
Develop a proposal for a chosen solution that include models to communicate the solution to peers						B	B/D	D	**M**
D. Abilities for a Technological World									
Collaborate and apply a design process to solve a simple problem from everyday experiences	B	D	**M**	M	M	M	M	M	M
Discover how a product works by taking it apart, sketching how parts fit, and putting it back together	B	D	**M**	M	M	M	M	M	M
Identify the strengths and weaknesses in a product or system.	B	D	**M**	M	M	M	M	M	M
Identify the resources needed to create technological products or systems	B	D	**M**	M	M	M	M	M	M
Identify how using a tool aids in reducing work	B	D	**M**	M	M	M	M	M	M
Identify and collect information about a problem that can be solved by technology, generate ideas to solve the problem, and identify constraints and trade-offs to be considered				B/D	D	**M**	M	M	M

Mastery Indicators (continued)	Pre-K Kindergarten	1	2	3	4	5	6	7	8
Evaluate and test alternative solutions to a problem using the constraints and trade-offs identified in the design process to evaluate potential solutions				B/D	D	**M**	M	M	M
Follow step by step directions to assemble a product or solve a problem				B/D	D	**M**	M	M	M
Explain why human-designed systems, products, and environments need to be constantly monitored, maintained, and improved				B/D	D	**M**	M	M	M
Describe how resources such as material, energy, information, time, tools, people and capital are used in products or systems				B/D	D	**M**	M	M	M
Explain the positive and negative effect of products and systems on humans, other species and the environment, and when the product or system should be used				B/D	D	**M**	M	M	M
Explain the impact that resources such as energy and materials used in a process to produce products or system have on the environment				B/D	D	**M**	M	M	M
Design and create a product that addresses a real world problem using a design process under specific constraints						B	B/D	D	**M**
Identify the design constraints and trade-offs involved in designing a prototype by completing a design problem and reporting results in a multimedia presentation, design portfolio or engineering notebook						B	B/D	D	**M**
Build a prototype that meets a STEM-based design challenge using science, engineering, and math principles that validate a solution						B	B/D	D	**M**
Research and publish the steps for using and maintaining a product or system and incorporate diagrams or images throughout to enhance user comprehension						B	B/D	D	**M**

Mastery Indicators (continued)	Pre-K Kindergarten	1	2	3	4	5	6	7	8
Explain the impact of resource selection and the production process in the development of a common or technological product or system						B	B/D	D	**M**
Identify and explain how the resources and processes used in the production of a current technological product can be modified to have a more positive impact on the environment						B	B/D	D	**M**

E. Computational Thinking: Programming

	Pre-K Kindergarten	1	2	3	4	5	6	7	8
List and demonstrate the steps to an everyday task	B	D	**M**	M	M	M	M	M	M
Demonstrate an understanding of how a computer takes input through a series of written commands and then interprets and displays information as output	B	D	**M**	M	M	M	M	M	M
Create algorithms (a sets of instructions) using a pre-defined set of commands	B	D	**M**	M	M	M	M	M	M
Debug an algorithm (i.e., correct an error)	B	D	**M**	M	M	M	M	M	M
Use appropriate terms in conversation (e.g., basic vocabulary words: input, output, the operating system, debug, and algorithm)	B	D	**M**	M	M	M	M	M	M
Identify how computer programming impacts our everyday lives				B	D	**M**	M	M	M
Demonstrate an understanding of how a computer takes input of data, processes and stores the data through a series of commands, and outputs information				B	D	**M**	M	M	M
Using a simple, visual programming language, create a program using loops, events and procedures to generate specific output				B	D	**M**	M	M	M
Use appropriate terms in conversation (e.g., algorithm, program, debug, loop, events, procedures, memory, storage, processing, software, coding, procedure, and data)				B	D	**M**	M	M	M

Mastery Indicators (continued)	Pre-K Kindergarten	1	2	3	4	5	6	7	8
Identify ways computers are used that have had an impact across the range of human activity and within different careers where they are used						B	B/D	D	**M**
Demonstrate an understanding of the relationship between hardware and software						B	B/D	D	**M**
Develop an algorithm to solve an assigned problem using a specified set of commands and use peer review to critique the solution						B	B/D	D	**M**
Use appropriate terms in conversation (e.g., programming, language, data, RAM, ROM, Boolean logic terms)						B	B/D	D	**M**