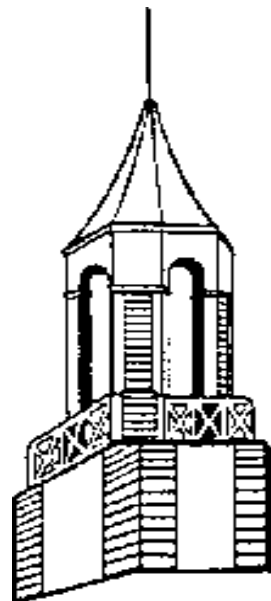


**TECHNOLOGY
COURSE OF STUDY
2004**



CHAGRIN FALLS EXEMPTED VILLAGE SCHOOLS
400 East Washington Street
Chagrin Falls, Ohio 44022

THE TECHNOLOGY COURSE OF STUDY

has been approved

by the

Chagrin Falls Board of Education

on

May 17, 2004

Resolution #04-033

ACKNOWLEDGEMENTS

The development of the Technology Course of Study reflects the efforts of the Chagrin Falls' Schools technology director and coordinators, classroom teachers, building administrators, and parents. Revisions of this Course of Study required a commitment of time and cooperation of all members. Our Course of Study review process included researching national and state standards, studying best practices in technology education, reviewing other districts' courses of study, visiting other district technology programs, developing a scope and sequence of knowledge and skills required at each level, and writing and revising this Course of Study. The dedication of the members of this Review Team is deeply appreciated. Special thanks are given to the following:

Pat Duffy, Director of Technology
Andy Spooner, 7 – 12 Technology Coordinator
Joelle Warsh, K – 6 Technology Coordinator
Carolyn Petite, Teacher, AP Computer Science
Todd Peltz, Teacher, Modular Technology
James Patrizi, Teacher, Grades 7 and 8 – Technology
Michelle Squires, Teacher, Grade 8, Social Studies
Amy Delsanter, Teacher, Grade 4, Intermediate School
Diane Cantor, Teacher, Grade 1, Gurney School

The following parent members of the Review Team lent their unique perspective to the process, ensuring the relevance and value of the Course for Chagrin students.

Donna Sauey, Parent
Susanne Tobin, Parent

Sharon M. Klimm,
Assistant Superintendent

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PHILOSOPHY OF THE CHAGRIN FALLS EXEMPTED VILLAGE SCHOOLS

Education is a lifelong process. We, the Chagrin Falls Board of Education, as the elected body being legally responsible for the public school portion of that education, subscribe to the following philosophy:

We recognize an obligation to organize and administer the educational program in a manner compatible with a democratic society. We recognize that the unique responsibility of the schools is to pass along a fund of knowledge; and in order to meet this goal, to provide enriched conditions which foster academic excellence and individual growth. We recognize that all persons in our school community have rights and responsibilities that are inherent within that society. We believe that our school system should educate toward responsibility and responsiveness.

We recognize that students differ in their physical, intellectual, emotional, and social growth and in the way they develop these aspects. We believe that the school must play a primary role in the students' education and that educational goals grow out of the needs of individuals.

We believe that students bring together different abilities, talents, and backgrounds. Intellectual growth will flourish in an environment of trust, respect, and teamwork. The school should strive to heighten the students' appreciation of the cultural and individual diversity within the human family.

We believe that students need the freedom to question and should be encouraged to use independent, reflective, and critical thinking. They should have the opportunity to exercise independent judgment by making decisions about their education in addition to following standardized requirements.

We believe that students should understand their relationship to the community, the country, and to the world. Our schools should provide meaningful opportunities for students to become familiar with, and react to, a segment of society outside of their own community.

We believe the education received in Chagrin Falls should fit the students' needs for supporting themselves in the future by preparing for further academic study and vocational opportunities.

We believe objectives and procedures of all educational programs are dynamic rather than static and must change to meet new conditions in an ever-changing world. We should consider changes in the educational program because of their demonstrated worth.

CHAGRIN FALLS EXEMPTED VILLAGE SCHOOLS DISTRICT GOALS

The Chagrin Falls Board of Education is committed to quality education as its top priority. The mission of the Chagrin Falls Schools is to provide a comprehensive range of learning opportunities through which students, staff and community, in partnership, can develop each student's knowledge, confidence and responsibility leading to individual success and lifelong learning.

The Board defines a quality education as one that prepares the student to compete effectively in any chosen endeavor. Consideration will be given to the academic, social, cultural, physical, practical and emotional development of students in an integrated effort to equip them with a set of functional life skills.

The Chagrin Falls Board of Education will establish district goals, set policy, monitor progress, and prioritize its instructional, human, and financial resources to ensure accomplishment of its educational mission and defines the following goals:

- ◆ Establish standards for student achievement in the areas of:
 - ◆ Achievement relative to ability;
 - ◆ Identification and achievement of personal goals and feelings of positive self-worth in each student;
 - ◆ Development of an understanding of the world, its people and the student's role and responsibilities toward others;
 - ◆ Development of well-rounded individuals;
 - ◆ Development and implementation of marketing strategies to assure district competitiveness in the areas of college acceptance and other post-secondary options;
 - ◆ Academic and social behaviors that support student achievement;
 - ◆ Technology.

- ◆ Establish standards of teacher effectiveness in the areas of:
 - ◆ Professional and personal growth;
 - ◆ Development and implementation of stimulating lessons;
 - ◆ Development and use of articulate and correct language in all phases of student and employee communication;
 - ◆ Instruction encompassing higher-level thinking and problem-solving skills for all students;
 - ◆ Integration of curricula;
 - ◆ Identification of individual learning styles and adaptation of teaching methods in order to reach all students.

- ◆ Establish a plan and allocate sufficient resources to provide support services for the educational mission, including:
 - ◆ A safe environment;
 - ◆ An efficient transportation system;
 - ◆ Healthy and appetizing food service;
 - ◆ Professional development of classified employees;
 - ◆ Up-to-date instructional equipment and supplies;
 - ◆ Specialized services to meet individual student requirements.

- ◆ Establish a long-term facility plan to ensure:
 - ◆ Facilities that will enhance the educational program;
 - ◆ Maintenance and preservation of the community's investment in district facilities, grounds and equipment.

- ◆ Establish working relationships and communication networks within the community to ensure:
 - ◆ Identification of citizen, Board, parent, and student educational goals;
 - ◆ Commitment of citizens, Board, parents and students to ongoing support of the educational mission of the schools.

- ◆ Establish standards for administrator effectiveness in the areas of:
 - ◆ Fiscal management;
 - ◆ Personnel recruitment and development;
 - ◆ Policy development;
 - ◆ Curriculum development and coordination;
 - ◆ Implementation of district goals;
 - ◆ Appropriate educational offerings for all students;
 - ◆ Effective communications with all sectors of the school community.

ORGANIZATION OF THE TECHNOLOGY COURSE OF STUDY

The Technology Course of Study is divided into grade levels and courses. Each of these is organized into Benchmarks, Indicators, Reference Code, Clarification, Resources/Suggestions, and Curriculum Connections or Pacing.

The **Benchmarks** column is the big idea or major concept that students should understand. The **Indicators** delineate the understandings students need to build the major concept (Benchmark). Many of the Benchmarks and Indicators in the Technology Course of Study come from the Ohio Academic Content Standards for Technology Education (2003). Leading Ohio technology educators developed the Standards to guide curriculum expectations.

The Benchmarks and Indicators that come from the Ohio Standards are noted with symbols in the Reference (REF.) column. The first line of upper case letters refers to the content standard (e.g. TPA = Technology Productivity Applications). On the next line, the upper case letter represents the Benchmark as it is organized in the state document. The first number on the next line is the grade level at which the indicator appears in the Ohio document. The second number is the state Indicator, as it is organized within the state Benchmark. The Indicators that do not have references are those originated by the Chagrin Falls staff that incorporate valuable understandings not included in the Ohio Standards.

The Indicators marked with an **asterisk (*)** are ones that lend themselves well to differentiation. These Indicators allow more room for student choice, creativity, and deeper and more complex understandings. Even though only some of the Indicators have an *, the teacher may develop varied levels of content, activities and modes of student production with any Indicator, as student needs dictate.

The **Clarifications** column provides information related to its adjoining Indicator. The information generally serves one of these purposes: (1) defines terms or concepts, (2) sets parameters for teaching broadly described concepts, (3) explains what students will do when they understand a particular concept, and (4) describes background knowledge needed to understand the concept. The members of the Technology Curriculum Committee developed the contents of the Clarification column.

The contents of the **Suggestions/Resources** column, also developed by Committee members, provide ideas for teaching the related Indicator. Ideas include: guest speaker, textbook pages, web site addresses, project ideas, and student activities. These are suggestions only. The teacher enacting the curriculum with students must decide what resources to use with his/her students.

The final column for each course will note either **Curriculum Connections** or **Suggested Pacing**. If the column is headed Curriculum Connections, the information describes a link between technology education and content in language arts, mathematics, social studies and/or science. These links are natural connections that teachers may want to make with their students to reinforce concepts from both technology and the content area. If the column is headed Suggested Pacing, guidelines as to the amount of time a teacher may use to teach an indicator is listed. This, of course, would be modified to meet the needs of the particular students a teacher has.

TECHNOLOGY EDUCATION PHILOSOPHY

The Chagrin Falls Board of Education strives to prepare students to realize their potential as contributing members in this increasingly technological and global information society. Each student should have the opportunity to develop skills and establish technology competencies integrated throughout all curricula.

TECHNOLOGY EDUCATION GOALS

1. Students will use technology as a tool to assist in learning.
2. Students will use technology to enhance their creativity and analytical thinking.
3. Students will be knowledgeable about the use and application of technology.
4. Students will have an understanding of the legal and ethical issues associated with the use of technology.
5. Students will recognize the increasing role of technology in society.
6. Technology will be used for student enrichment and remediation through differentiated instruction.
7. Multiple learning styles will be addressed through the use of technology.
8. Student time on task will increase through the use of technology.

TECHNOLOGY EDUCATION ACADEMIC CONTENT STANDARDS

NATURE OF TECHNOLOGY (NT)

(Students develop an understanding of technology, its scope, core concepts, characteristics and relationships between technologies and other fields.)*

Students learn that technology extends human potential by allowing people to do things more efficiently than they would otherwise be able to do. Students learn that useful technological development is a product of human knowledge, creativity, invention, innovation, motivation and demand for new products and systems. They learn that the natural and human-made designed worlds are different, and that tools and materials are used to alter the environment. Students learn that the development of emerging technology is exponential, driven by history, design, commercialization, and shaped by creative/inventive thinking, economic factors, and cultural influences.

*The core concepts of technology include systems, resources, requirements, optimization and trade-offs, processes and controls.

TECHNOLOGY AND SOCIETY INTERACTION (TSI)

(Students recognize interactions among society, the environment and technology, and understand technology's relationship with history. Consideration of these concepts forms a foundation for engaging in responsible and ethical use of technology.)

Students learn that the interaction between society and technology has an impact on their lives, that technology may have unintended consequences which may be helpful or harmful. They learn that interaction of technology will affect the economy, ethical standards, environment and culture. Students evaluate the impact of products or systems by gathering and synthesizing information, analyzing trends, and drawing conclusions. Students analyze technological issues and the implications of using technology. They acquire technological understanding, and develop attitudes and practices that support ethical decision-making and lifelong learning.

TECHNOLOGY FOR PRODUCTIVITY APPLICATIONS (TPA)

(Students learn the operations of technology through the usage of technology and productivity tools.)

Students use computer and multimedia resources to support their learning. Students understand terminology, communicate technically and select the appropriate technology tool based on their needs. They use technology tools to collaborate, plan and produce a sample product to enhance their learning, and solve problems by investigating, troubleshooting and experimenting using technical resources.

TECHNOLOGY AND COMMUNICATION APPLICATIONS (TCA)

(Students use an array of technologies and apply design concepts to communicate with multiple audiences, acquire and disseminate information, and enhance learning.)

Students acquire and publish information in a variety of media formats. They incorporate communication design principles in their work. They use technology to disseminate information to multiple audiences. Students use telecommunication tools to interact with others. They collaborate in real time with individuals and groups who are located in different schools, communities, states and countries. Students participate in distance education opportunities that expand academic offerings and enhance learning.

TECHNOLOGY AND INFORMATION LITERACY (TIL)

(Students engage in information literacy strategies, use the Internet, technology tools and resources, and apply information-management skills to answer questions and expand knowledge.)

Students become information-literate learners by utilizing a research process model. They recognize the need for information and define the problem, need or task. Students understand the structure of information systems and apply these concepts in acquiring and managing information. Using technology tools, a variety of resources are identified, accessed and evaluated. Relevant information is selected, analyzed and synthesized to generate a finished product. Students evaluate their information process and product.

DESIGN (D)

(Students will apply a number of problem solving strategies demonstrating the nature of design, the role of engineering, and the role of assessment.)

Students recognize the attributes of design; that it is purposeful, based on requirements, systematic, iterative, creative, and provides solution and alternatives. Students explain critical design factors and/or processes in the development, application, and utilization of technology as a key process in problem solving. Students describe inventors and their inventions, multiple inventions that solve the same problem, and how design has affected their community. They apply and explain the contribution of thinking and procedural steps to create an appropriate design and the process skills required to build a product or system. They critically evaluate a design to address a problem of personal, societal and environmental interests. Students systematically solve a variety of types of problems using different design approaches including troubleshooting, research and development, innovation, invention and experimentation.

DESIGNED WORLD (DW)

(Students understand how the physical, informational and bio-related technological systems of the designed world are brought about by the design process. Critical to this will be students' understanding of their role in the designed world: its processes, products, standards, services, history, future, impact, issues and career connections.)*

Students learn that the designed world consists of technological systems* reflecting the modifications that humans have made to the natural world to satisfy their own needs and wants. Students understand how through the design process the resources: materials, tools and machines, information, energy, capital, time and people are used in the development of useful products and systems. Students develop a foundation of knowledge and skills through participation in technically oriented activities for the application of technological systems. Students demonstrate understanding, skills and proficient use of technological tools, machines, instruments, materials and processes across technological systems in unique and/or new contexts. Students identify and assess the historical, cultural, environmental, governmental and economic impacts of technological systems in the designed world. *The technological systems areas include energy and power technologies, transportation technologies, manufacturing technologies, construction technologies, information and communication technologies, medical technologies, agricultural and related biotechnologies.

TECHNOLOGY EDUCATION COURSE FORMATS

Kindergarten	-	Integrated	Seventh Grade	-	Required
First Grade	-	Integrated	Eighth Grade	-	Elective
Second Grade	-	Integrated	Modular Technology	-	Elective
Third Grade	-	Integrated	Grades Nine-Twelve	-	Integrated
Fourth Grade	-	Integrated	AP Computer Science	-	Elective
Fifth Grade	-	Integrated	Web Page Design	-	Elective
Sixth Grade	-	Integrated	Computer Applications	-	Elective

Definitions:

Integrated – Indicators are taught simultaneously with indicators from another content area (e.g. language arts, music, foreign language)

Required – Indicators are taught to all students in a designated technology course (at the grade level noted.)

Elective – Indicators are taught to students who enroll in this course.

KINDERGARTEN

TECHNOLOGY KINDERGARTEN

OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	CURRICULUM CONNECTION
Understand and practice the ethical and legal use of technology.	1. Practice responsible use of technology systems and software.	TSI A K.3	Discuss that when you buy a game or a program at the store, you can only put it on one machine.	Computers in the classroom and lab	
Students will be introduced to computer and multimedia technology and use the correct terminology to discuss it.	2. Locate computer and multimedia technology in the classroom and identify them by name, e.g. computer, VCR, listening station, etc.	TPA A K.1		Computers in the classroom and lab	Number combo books
"	3. Name the basic parts of a computer, e.g. monitor, keyboard, mouse, tower, printer, etc.	TPA A K.2		Individual oral assessment	Number combo books
"	*4. Use a variety of computer and multimedia technology resources for directed learning activities with teacher assistance, e.g. computer, VCR, record player, cassette recorder, etc.	TPA A K.3		Computers in the classroom and lab	Centers/stations

Key to Reference Column:

Line 1: (Standard) NT = Nature of Technology
TCA = Technology & Communication Application
DW = Designed World

Line 2: Ohio Benchmark Within Standard

Line 3: Grade Level . Indicator Number

TSI = Technology & Society Interaction
TIL = Technology & Information Literacy

TPA = Technology for Productivity Applications
D = Design

TECHNOLOGY KINDERGARTEN

OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	CURRICULUM CONNECTION
Students will learn to operate technology tools that affect specific content areas.	5. Listen to directions and use proper care when handling computer and multimedia technology.	TPA B K.1		Computers in the classroom and lab	Number combo books
"	6. Follow the correct order for turning computers and multimedia technology resources on and off with teacher assistance. Store documents with teacher assistance.	TPA B K.2	Saving to Home folders		Number combo books
"	7. Identify/recognize the components of input and output devices to operate computers, e.g. mouse, keyboard, printer, etc. Use input, e.g. mouse, keyboard and output, e.g. printer devices to operate computer and multimedia technology resources with teacher assistance.	TPA B K.3		Mouse practice	

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TECHNOLOGY KINDERGARTEN

OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	CURRICULUM CONNECTION
Students will learn to operate technology tools that affect specific content areas. (cont.)	*8. Discuss software and why it is necessary to operate computer technology.	TPA B K.4	Discuss analogy like computer is an oven, and it needs ingredients to bake something.	Edmark	
"	9. Start, use, and exit software programs with teacher assistance.	TPA B K.2		All available software	
"	10. Save information with teacher assistance to specific location, e.g. save the current page, game lesson, etc.			Kid Pix, Kidspiration	Number Combo Books, Farm Web
"	11. Print information with teacher assistance.			Kid Pix, Kidspiration	Number Combo Books, Farm Web, Name Sheet
"	12. Use the keyboard to operate computers and multimedia equipment with teacher assistance.			Kid Pix, Kidspiration	Number Combo Books, Farm Web
Students use productivity tools to construct creative works and to manage and access data.	*13. Identify/recognize developmentally appropriate general purpose productivity tools, e.g. presentations, drawing programs, etc.	TPA C K.1		Kid Pix	Number Combo Books, Farm Web

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TECHNOLOGY KINDERGARTEN

OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	CURRICULUM CONNECTION
Students use productivity tools to construct creative works and to manage and access data. (cont.)	14. Identify/recognize technology resources, e.g. pre-selected Websites, educational software, etc.	TPA C K.2		Mrs. Butler's Fun Sites, Web Site Database	
Apply basic browser and navigation skills to find information from the Internet.	15. Discuss the Internet as an information source.	TIL C K.1	Talk about what information you can find on the Internet, e.g. the weather, maps, games.	Patterson's Western Reserve Cleveland Art Museum sites.	Pre-field trip information
"	16. Demonstrate with teacher assistance, simple Web browser use, e.g. scroll up and down page and click on hyperlink to go to a Website, return to previous screen (back button).	TIL C K.3		Web Site Database	
"	17. Click on Website links as directed by teacher for class activity.	TIL C 1.2		Mrs. Butler's Fun Sites	Chick unit
"	18. View information on the Internet with teacher assistance, e.g. online material for a lesson, author Website for a story, etc.	TIL C 1.2		Netscape, Internet Explorer, Mrs. Butler's Fun Sites	Number Combo Books, Farm Web

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TECHNOLOGY KINDERGARTEN

OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	CURRICULUM CONNECTION
Apply basic browser and navigation skills to find information from the Internet. (cont.)	19. Listen to information read by teacher from Website.	TIL C 1.2			
Students become aware of how to publish and present information in different formats.	20. Observe teacher creating document adding ideas as requested, e.g. text, pictures, color, etc.	TCA B K.1		Kidspiration, Superprint	Cards for holidays
Students participate in group interactive projects and activities using telecommunications.	*21. Participate in teacher directed activities that utilize online resources, e.g. use an author's Website to learn more about them.	TCA C 1.1		Web Site Database	
"	*22. Participate in teacher directed online projects, e.g. 100th day of kindergarten activities, field trips, etc.	TCA C K.1		Web Site Database	

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GRADE 1

TECHNOLOGY GRADE 1

OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	CURRICULUM CONNECTION
Identify responsible citizenship relative to technology and its use.	1. Clarify problem-solving strategies that use technology.	TSI A 1.1	Using the Internet as a resource to find practical information.	Netscape, Internet Explorer	Community study
Students will be introduced to computer and multimedia technology and use the correct terminology to discuss it.	2. Locate computer and multimedia technology equipment and know the terms used to describe it, e.g. computer, printer, VCR, DVD player, stereo, etc.	TPA A 1.1		Computers in the classroom and lab	Computer lab time for this benchmark
"	3. Identify various parts of a computer by name, e.g. monitor, mouse, keyboard, tower, power button, disk drive, CD/DVD drive.	TPA A 1.2		Computers in the classroom and lab	
"	*4. Use a variety of computer and multimedia technology resources for directed learning activities with teacher assistance, e.g. computer, VCR, DVD player, sound player/recorder, etc.	TPA A 2.4		Computers in the classroom and lab	

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TECHNOLOGY GRADE 1

OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	CURRICULUM CONNECTION
Students will learn to operate technology tools that affect specific content areas.	5. Discuss and demonstrate proper care when using computer and multimedia technology resources, e.g. describe rules, list directions, etc.	TPA B 1.1	Placing CDs in cases, using the proper method for ejecting CDs	Computers in the classroom and lab	Computer lab time for this benchmark
"	6. Follow the correct order for turning computer and multimedia technology resources on and off. Store documents with teacher assistance.	TPA B 1.2	Saving to Home folders		Writing stories and reports, Birds
"	7. Use input and output devices to operate computers, e.g. mouse, keyboard, printer, etc. Use input, e.g. mouse, keyboard and output, e.g. printer devices to operate computer and multimedia technology resources.	TPA B 1.5			Birds
"	8. Know that software is necessary to operate computer technology.	TPA B 1.3	Discuss analogy like computer is an oven, and it needs ingredients to bake something.		

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TECHNOLOGY GRADE 1

OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	CURRICULUM CONNECTION
Students will learn to operate technology tools that affect specific content areas. (cont.)	9. Start, use, and exit software programs with teacher assistance.	TPA B 1.4		All software titles	All topics
"	10. Save information with teacher assistance to a specific location, e.g. save the current page, game, lesson, etc.			Kids Works Deluxe, Kid Pix, Neighborhood Map Machine	Bird research, mapping
"	11. Print information with teacher assistance.			Kids Works Deluxe, Kid Pix, Neighborhood Map Machine	Bird research, mapping
"	12. Begin to locate letters and special keys on the keyboard with teacher assistance, e.g. enter key, escape key, space bar, etc.	TPA B 1.6		Read, Write and Type	Word processing stories and reports
Students use productivity tools to construct creative works and to manage and access data.	*13. Use developmentally appropriate general purpose productivity tool, e.g. presentations, drawing programs, word processing, etc.			Kids Works Deluxe, Kid Pix, Neighborhood Map Machine, Graph Club	Birds, insects, solid liquid gas or mammal slide show

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TECHNOLOGY GRADE 1

OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	CURRICULUM CONNECTION
Students use productivity tools to construct creative works and to manage and access data. (cont.)	14. Use technology resources, e.g. pre-selected Websites, launching applications, educational software, etc.	TPA C 1.2	Launching Edmark and logging in as themselves	Web site database, Mrs. Butler's Fun Sites	
Apply basic browser and navigation skills to find information from the Internet.	*15. Discuss the reasons why we use the Internet as an information source, e.g. to find facts about what we study, to find pictures of people and places. etc.			www.google.com www.picturesofplaces.com	Mrs. Butler's Website, All science
	16. Identify the basic browser buttons/tools, e.g. address, forward/back buttons, home button, favorite/bookmark.	TIL C 1.3		Netscape, Internet Explorer	
"	17. Choose a Website from a list of bookmarks/favorites, e.g. choose a teacher bookmark/favorite for a site with Ohio symbols from the Web browser.	TIL C 1.4		Netscape, Internet Explorer	Holidays, Community, Insects

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TECHNOLOGY GRADE 1

OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	CURRICULUM CONNECTION
Apply basic browser and navigation skills to find information from the Internet. (cont.)	18. Select/search for information with teacher assistance for class use, e.g. find date, weather, holiday meaning, etc.	TIL C 1.2		Netscape, Internet Explorer	Holidays, Community, Insects
Students become aware of how to publish and present information in different formats.	*19. Use graphic organizers and templates, with teacher assistance to organize ideas, e.g. use Webbing to describe what information will be included in a presentation.	TCA B 2.1		Kidspiration	Birds
"	20. Discuss how digital graphic images can be used in projects, e.g. students determine what images to use for a class project on animals.	TCA B 2.2	Imprinting images from the Internet	Kid Pix	Community study
"	21. Create a document with teacher assistance that uses text and graphics, e.g. make a card or letter for parents or friends.	TCA B 1.1		Kid Pix, Superprint	Holiday cards

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TECHNOLOGY GRADE 1

OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	CURRICULUM CONNECTION
Students become aware of how to publish and present information in different formats. (cont.)	22. Observe teacher use of email capabilities, e.g. writing email to ask permission to use online materials in a document or newsletter.	TCA B 1.2		www.askanexpert.com	Any research question
Students participate in group interactive projects and activities using telecommunications.	23. Compose, send and reply to email messages with teacher assistance.	TCA C 2.1	Example: class email to author.		Library
"	*24. Participate in teacher directed activities that utilize online resources, e.g. use an online weather site for children to learn more about weather concepts.	TCA C 1.1		Mrs. Butler's Fun Sites Webquests	All science

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GRADE 2

TECHNOLOGY

GRADE 2

OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	CURRICULUM CONNECTION
Students will be introduced to computer and multimedia technology and use the correct terminology to discuss it.	1. Identify and describe the purpose of various types of computer and multimedia technology equipment, e.g. what is it and what does it do.	TPA A 2.1	Discuss projectors, smartboards, laptops		Computer lab time
"	2. Communicate about computers and multimedia technology using developmentally appropriate and accurate terminology.	TPA A 2.2	Learn terms like print queue, restart, shut down, log in		Computer lab time
"	*3. Use a variety of computer and multimedia technology resources for directed learning activities, e.g. computer, VCR/DVD, sound device, camera, etc.	TPA A 2.4		Digital camera	Computer lab time
Students will learn to operate technology tools that affect specific content areas.	4. Demonstrate proper care of computer and multimedia technology resources.	TPA B 2.1	Placing CDs in cases, using the proper method of ejecting CDs		Computer lab time for this benchmark

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TECHNOLOGY

GRADE 2

OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	CURRICULUM CONNECTION
Students will learn to operate technology tools that affect specific content areas. (cont.)	5. Identify and use input and output devices to operate and interact with computers and multimedia technology resources, e.g. scanner, digital camera, video camera, etc.	TPA B 2.2			
"	6. Know that software is necessary to operate computer technology.	TPA A 2.3	Discuss analogy like computer is an oven; it needs ingredients to bake something.		
"	7. Start, use, and exit software programs.			All software titles	All topics
"	8. Create, name and save files to specific locations.			Student writing center	Writing activities
"	9. Print information as directed, e.g. color, black/white, special paper, etc.			Student writing center, Kid Pix, Kidspiration	All topics
"	10. Locate and use keys on the keyboard with teacher assistance.	TPA B 2.3		Read, write and type	

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TECHNOLOGY GRADE 2

OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	CURRICULUM CONNECTION
Students use productivity tools to construct creative works and to manage and access data.	*11. Use developmentally appropriate general purpose productivity tools, e.g. presentations, drawing programs, word processing, etc.	TPA C 2.1		Kid Pix, Super Print, student writing center	Rainforest, Native Americans
"	*12. Use technology resources for communication, and illustration of thoughts and ideas, e.g. creative stories, drawings, presentations, publication software, etc.	TPA C 2.2	Create class slide shows using Kid Pix as culmination project.	Kidspiration, Kid Pix, Kids Work Deluxe	Rainforest, Native Americans
Apply basic browser and navigation skills to find information from the Internet	13. Develop awareness of electronic information sources, e.g. Internet, CD ROM, DVD, etc.	TIL C 2.1		Netscape, Internet Explorer, www.infohio.org	Any research subject
"	14. Demonstrate the use of browser elements and explain their function, e.g. toolbar and buttons, favorites/bookmarks.	TIL C 2.1		Internet Explorer, Netscape	All topics
"	15. Use assigned Web pages, e.g. type in an address from list provided by the teacher.		Example: use links on Web site	Mrs. Butler's Fun Sites	Rainforest, Native Americans

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TECHNOLOGY

GRADE 2

OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	CURRICULUM CONNECTION
Apply basic browser and navigation skills to find information from the Internet. (cont.)	16. Read information from a Web site assigned by teacher.	TIL C 2.3		Mrs. Butler's Fun Sites	Rainforest, Native Americans, Sound
Students become aware of how to publish and present information in different formats.	*17. Use graphic organizers to plan a presentation, e.g. graphic organizing, charting or mapping software.	TCA B 2.1		Kidspiration	Oceans, Rainforest
"	18. Compare and contrast digital graphic images used to portray a topic, e.g. students are given images on the same topic from two different sources and explain why one may be better for the assignment than another.	TCA B 2.2			Venn Diagrams
"	*19. Create document that includes text and graphics, e.g. illustrate a story based on a writing prompt.	TCA B 2.3		Student writing center	Reading and writing activities

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TECHNOLOGY

GRADE 2

OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	CURRICULUM CONNECTION
Students become aware of how to publish and present information in different formats. (cont.)	20. Create age-appropriate curricular multimedia project with teacher or family assistance, e.g. hypermedia stack, slide show, photo album.			Kid Pix	Ocean, Rainforest, Native Americans
"	21. Participate in composing class email sent by teacher, e.g. each student has an opportunity to contribute ideas for email messages related to their studies.	TCA B 2.4		www.askanexpert.com	Class email project
Students participate in group interactive projects and activities using telecommunications.	22. Compose, send, receive and reply to email messages from an individual account.	TCA C 2.1		www.askanexpert.com	Class email project
"	*23. Participate in teacher directed online learning activities or units, e.g. use an online simulation of the rainforest.	TCA C 2.2		Website database	Science topics
"	*24. Participate in teacher directed online projects, e.g. animal activity sites for habitat study.	TCA C 2.2		Website database	Science topics

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GRADE 3

TECHNOLOGY GRADE 3

OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	CURRICULUM CONNECTION
Define responsible citizenship relative to technology and its use.	1. Identify and use several appropriate sources for resolving an information problem or question.	TSI A 3.1	Using the Internet as a resource to find practical information.	Internet Explorer, Netscape, Mrs. Butler's Fun Sites	Any research project
"	2. Explain why it is important for everyone to have access to information sources and to information technology.	TSI A 3.2	Discuss importance of technology and what we use it for and why everyone needs it.		Social studies
Students will select, use, discuss, and evaluate computer and multimedia technology.	3. Discuss the purpose of various types of computer and multimedia technology equipment using appropriate terminology e.g. what does it do and why do you use it.	TPA A 3.1	Discuss projector, smartboards, laptops, and digital cameras.		
"	4. Communicate about computers and multimedia technology using developmentally appropriate and accurate terminology.	TPA A 3.2	Learn terms like print queue, restart, shut down, log in.		
"	5. Use media and technology resources for presenting information, (e.g. projectors, video cameras, handheld devices, etc.)	TPA B 3.5	Use technology across the curriculum (e.g., projectors, video cameras, handheld, distance learning, etc.)		

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TECHNOLOGY

GRADE 3

OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	CURRICULUM CONNECTION
Students will learn to operate technology tools that affect specific content areas & network operations.	6. Understand that information can be saved, transported, (sent/ delivered), accessed from a variety of formats e.g. diskette, CD/DVD, portable storage media devices, hard drive, network, etc.	TPA B 3.1	Explain the difference between saving on the hard drive of a machine or the server and burning a CD.		
"	*7. Discuss networks and their use.	TPA B 3.2	Explain the basics why a network is helpful, e.g. being able to access your work from any computer on the network.		
"	8. Identify and use a variety of software programs, e.g. list the names of software programs used in the classroom.	TPA B 3.3		All software titles	
	9. Print information as directed e.g. color, black/white, special paper, etc.			Student writing center	Create class slide shows using kid pix as culminating project.

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TECHNOLOGY

GRADE 3

OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	CURRICULUM CONNECTION
Students will learn to operate technology tools that affect specific content areas & network operations. (cont.)	10. Touch type letters on the keyboard with both hands e.g. begin to learn how to type/keyboard, use continuous keystrokes, etc.	TPA B 3.7		Type To Learn	
Students use productivity tools to prepare publications and to produce creative works.	*11. Use general-purpose productivity tools and peripherals to support personal productivity, e.g. word processing and spreadsheets, etc.	TPA C 3.1		Student writing center, digital camera, cruncher	
"	*12. Identify, recognize and use technology resources for communication, and illustration of thoughts and ideas e.g. Internet searches, etc.	TPA C 3.3	Create class slide shows using Kid Pix as culminating project.	Netscape, Internet Explorer, Kid Pix	Chagrin Falls history

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TECHNOLOGY

GRADE 3

OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	CURRICULUM CONNECTION
Students will understand the relationship between information and data. They will be able to organize and store information and data.	13. Discuss the ways information can be presented: Internet, CD, DVD, video, text, etc.	TIL A 4.3			
"	14. Discuss authorship and ownership of ideas and information.	TIL A 5.3	Discuss plagiarism and copyright issues.	Web site database	Library
Students will define tasks, identify strategies to find information, and locate (retrieve) information from a variety of resources.	*15. Use prescribed search strategies that align with identified information needs, e.g. brainstorm keywords, and discuss types of information needed.	TIL B 3.1 3.2		Netscape, Internet Explorer, www.infohio.org www.dictionary.com www.yahooligans.com www.google.com MapmakersToolkit	
"	16. Select needed information from a defined group of resources, e.g. Web sites, subscription databases, electronic resources.	TIL B 3.4		Mrs. Butler's Fun Sites www.infohio.com www.yahooligans.com www.kidsdomain.com	Animal reports, Chocolate, Penguins

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TECHNOLOGY GRADE 3

OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	CURRICULUM CONNECTION
Students will define tasks, identify strategies to find information, and locate (retrieve) information from a variety of resources. (cont.)	*17. Use an electronic encyclopedia, dictionary, almanac or online library catalog to find information on an assigned topic.	TIL B 3.3		World Atlas, Children's Encyclopedia	Electricity, Mapping, Biographies
"	*18. Create an information product, e.g. document, slide show, recording, video.	TIL B 3.4		Kid Pix	Biographies, Weather
"	19. List the sources used in creating the project, e.g. author, title, Web site or publication source and date.	TIL B 3.6	Create a webliography	Web site database, Webliographies	Biographies, Penguins
Students will use the Internet and other available electronic resources to find and evaluate information.	20. Label Internet browser elements and explain their function, e.g. toolbar and buttons, favorites/ bookmarks, history.	TIL C 4.1		Netscape, Internet Explorer	

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TECHNOLOGY

GRADE 3

OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	CURRICULUM CONNECTION
Students will use the Internet and other available electronic resources to find and evaluate information. (cont.)	*21. Access Internet-based or electronic general reference sources to find facts and answer questions, e.g. online dictionary, almanac, encyclopedia, map, etc.			www.infohio.com	Use technology across the curriculum (e.g. projectors, video cameras, handheld, distance learning, etc.)
"	22. Use a simple Internet directory to locate information, e.g. use a directory designed specifically for students, organized by topics.			Mrs. Butler's Fun Sites, www.yahooligans.com	Economy
"	23. Read list of sites located in directory and select relevant Web site. Create a bookmark/favorite for the site.	TIL C 3.3		Internet Explorer, Netscape, www.yahooligans.com Mrs. Butler's Fun Sites	Economy
"	24. Type search term in a search engine or online database, e.g. when looking for animal information, type in the name of the animal in a search box.	TIL C 3.1		www.yahooligans.com www.google.com	Penguins, Chocolate

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TECHNOLOGY GRADE 3

OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	CURRICULUM CONNECTION
Students will use the Internet and other available electronic resources to find and evaluate information. (cont.)	25. Identify information on a Web site, e.g. author, title, date produced, products, services, data, etc.	TIL C 4.6		Internet Explorer, Netscape	
Students use technology to develop problem-solving strategies.	26. Identify/recognize technology for problem solving, e.g. games, simulations, calculations.	TPA A 3.1	Use spreadsheets with formulas for calculations.	Math for the Real World Economy, Webquests	Economics
"	27. Determine when technology is useful, and select the appropriate tools and technology resources to solve problems.	TPA A 3.2	Use digital camera to document activities.	Kid Pix	Robots
Students practice developing, publishing and presenting information in a format that is appropriate for content and audience.	*28. Use graphic organizers to sequence and organize information and projects.	TCA B 2.1		Kidspiration	Robots

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TECHNOLOGY

GRADE 3

OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	CURRICULUM CONNECTION
Students practice developing, publishing and presenting information in a format that is appropriate for content and audience. (cont.)	29. Demonstrate basic operation of digital camera, e.g. quality settings, transferring and saving images.	TCA B 3.1		Kid Pix	Robots
"	*30. Generate document that includes graphic, e.g. use a drawing made with a paint program and add it to a text document.	TCA B 3.2		Kid Pix, Student writing center	Writing activities
"	*31. Create slide show with using graphics and text, e.g. create a presentation about Ohio's state bird, symbol, flag, etc. as a presentation using pictures.	TCA B 3.4		Kid Pix	Chocolate, Penguins, Animals

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Students practice developing, publishing and presenting information in a format that is appropriate for content and audience. (cont.)	32. Participate in composing class email sent by teacher, e.g. each student has an opportunity to write an email message related to their studies.	TCA C 3.1			Class email project
"	33. Participate in structured class online collaborative project.	TCA C 3.2		www.globalschoolhouse.com	Science topics
"	34. Incorporate the use of emerging technologies for curricular needs.	TCA B 3.4	Movie editing software for presentations	Imovie	
Students use telecommunications to participate in group online collaborative interactive projects and activities.	35. Participate in a course using video conferencing for an offering not otherwise available through the school, e.g. Weather School.	TCA C 4.2	Distance learning	Refer to online database, distance learning, Webquests, online projects	Animal reports, Chocolate, Penguins
"	*36. Participate in teacher/student direct online learning activities, e.g. Weather School.	TCA C 3.2		Web site database	Science topics

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GRADE 4

TECHNOLOGY

GRADE 4

OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	CURRICULUM CONNECTION
Define responsible citizenship relative to technology and its use.	*1. Discuss common uses of technology in daily life and the advantages and disadvantages those uses provide.	TSI A 4.1	Example: self check out at grocery store		Library
"	2. Discuss basic issues related to responsible use of technology and information and describe personal consequences of inappropriate use.	TSI A 4.2	Downloading software legally, plagiarism off the Internet, copyright issues. Copyrighted pictures	Website database	Library
Understand and practice the ethical and legal use of technology.	3. Practice respect for intellectual property rights.	TSI D 4.1	Downloading software legally, plagiarism off the Internet.	Website database	Library
Students will select, use, discuss, and evaluate computer and multimedia technology.	4. Learn and use new technology terminology based on the computer and multimedia technology resources being used.	TPA A 4.1	Learn terms like print queue, restart, shut down, log in, hyperlink and download.		
"	5. Define technological terms as discovered.	TPA A 4.2			

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GRADE 4

OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	CURRICULUM CONNECTION
Students will select, use, discuss, and evaluate computer and multimedia technology. (cont.)	6. Use media and technology resources for presenting information, e.g. projectors, video cameras, handheld devices, etc.	TPA C 4.3	Use technology across the curriculum, e.g., projectors, video cameras, handhelds, distance learning, etc.		
Use appropriate tools & technology resources to complete tasks and solve problems.	7. Use input and output devices to operate and interact with computers, e.g. scanner, digital camera, etc.	TPA B 4.1		Alpha Smarts	Ohio projects
"	8. Independently save, transport, and access stored information from portable devices, memory sticks, etc.	TPA B 4.6	Explain the difference between saving on the hard drive of a machine or the server and burning a CD.		
"	9. Discuss different software programs and what they do.	TPA B 4.3	Discuss differences between database, spreadsheet, word processing, multimedia software	Hyperstudio, student writing center, Inspiration, Appleworks	
	10. Save information as directed e.g. files, hard drive, folders, network, etc.			Hyperstudio, student writing center, Inspiration	Writing activities

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GRADE 4

OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	CURRICULUM CONNECTION
Use appropriate tools & technology resources to complete tasks and solve problems.	11. Demonstrate appropriate keyboarding skills	TPA B 4.8			
	12. Print information as directed e.g. color, black/ white, special paper, etc.			Hyperstudio, student writing center, Inspiration	Ohio studies
Students use productivity tools to prepare publications and to produce creative works.	*13. Use general-purpose productivity tools and peripherals to support personal productivity, remediate skill deficits and facilitate learning throughout the curriculum.	TPA C 4.1		Accelerated Reader, Accelerated Math, Hyperstudio	Plants, Ohio, Native Americans
"	*14. Use technology resources for communication and illustration of thoughts and ideas, e.g. Internet searches, etc.	TPA C 4.3	Create multimedia stacks.	Netscape, Internet Explorer	Plants, Ohio, Native Americans

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GRADE 4

OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	CURRICULUM CONNECTION
Students will use technology and select, evaluate, troubleshoot, and maintain the operation of technology systems.	15. Use menu options and commands.	TPA B 4.2		All software titles	
Students will understand the relationship between information and data. They will be able to organize and store information and data.	16. Demonstrate the use of information in multiple formats and storage options, e.g. print, media, digital, etc.	TIL A 4.3		Burn and use CDs.	
"	17. Recognize basic systems for organizing information, e.g. subject, site map, online folder system.	TIL B 4.4		Novell Network	

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TECHNOLOGY

GRADE 4

OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	CURRICULUM CONNECTION
Students will understand the relationship between information and data. They will be able to organize and store information and data. (cont.)	18. Use age-appropriate search tools designed for students, e.g. subject directions, school library catalogues, school Web resources, public library information lists.	TIL D 5.1		Mrs. Butler's Fun Sites, www.infohio.org	Library time
Use technology to find information, applying a research process to decide what information I needed, find sources, use information and check work.	19. Use prescribed search strategies that align with identified information needs, e.g. brainstorm keywords, discuss types of information needed, make list of sources.	TIL B 4.2 4.3		Netscape, Internet Explorer www.infohio.org www.dictionary.com www.yahooligans.com www.google.com Mapmakers Toolkit	Biographies, Ohio plants, Ohio Native Americans
	20. Identify ways to locate information: online library catalog, Web site, electronic formats, e.g. CD-ROM, DVD, audio files, etc.	TIL B 5.3		www.infohio.com www.yahooligans.com www.kidsdomain.com	Biographies, Ohio plants, Ohio Native Americans

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TECHNOLOGY GRADE 4

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Use technology to find information, applying a research process to decide what information I needed, find sources, use information and check work. (cont.)	*21. Select needed information from a defined group of resources.	TIL B 4.4		Mrs. Butler's Fun Sites	Biographies, Ohio plants, Ohio Native Americans
Identify, access and use electronic resources from both free and fee-based Internet sources.	22. Demonstrate how to search for information in an online library catalog.	TIL D 4.1		www.infohio.com	Biographies, Ohio plants, Ohio Native Americans
"	23. Use a variety of technology resources for directed activities.	TIL D 4.1	Use the Internet, content specific CDs.	Web site database	
"	24. Use a subscription database to locate information for a curricular need.	TIL D 4.2			

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Students will define tasks, identify strategies to find information, and locate (retrieve) information from a variety of resources. (cont.)	25. Compare facts in two different sources, e.g. CD, Internet.	TIL C 5.6			
"	*26. Use a simple rubric to evaluate Web sites, e.g. accuracy, currency, and authenticity.	TIL C 5.5		Web site database	
"	27. Record selected information for a curricular need.	TIL B 4.4			
"	28. List information sources used.	TIL B 4.5		Webliographies	
"	*29. Create an information product, e.g. document, slide show, recording, CD, video.	TIL B 5.4		Hyperstudio, Imovie	Biographies, Ohio plants, Ohio Native Americans
	30. Recognize need to use more than one source to produce better product.	TIL B 4.19			

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Line 2: Ohio Benchmark Within Standard

Line 3: Grade Level . Indicator Number

TECHNOLOGY GRADE 4

OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	CURRICULUM CONNECTION
Students will define tasks, identify strategies to find information, and locate (retrieve) information from a variety of resources. (cont.)	31. Evaluate project based on a defined rubric.	TIL B 4.6		Web site database	Biographies, Ohio plants, Ohio Native Americans
Students will use the Internet and other available electronic resources to find and evaluate information.	32. Use age-appropriate online database, e.g. online children's encyclopedia, subscription database of magazine articles, etc.	TIL C 4.2		Netscape, Internet Explorer	Biographies, Ohio plants, Ohio Native Americans
"	33. Perform a simple search in an age-appropriate search engine, e.g. type in one search term in a search engine specifically designed for children.	TIL C 4.2	Select a grade band for performing an infohio.org search.	www.yahooligans.com www.kidsdomain.com	Library

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TECHNOLOGY GRADE 4

OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	CURRICULUM CONNECTION
Students will use the Internet and other available electronic resources to find and evaluate information.	34. Read list of results from a simple search and select relevant Web sites.	TIL C 4.4		www.google.com	
"	35. Create bookmarks/ favorites for the sites.	TIL C 4.1		Netscape, Internet Explorer	
"	*36. Use a prescribed evaluation tool to judge the usefulness of a selected Web site, e.g. use a checklist to determine how useful a Web site is to the assignment at hand.	TIL C 5.5	Website evaluation rubrics	Website database	
"	*37. Identify information on a Web site, e.g. author, title, date produced, special features (images, puzzles, activities), products, services, resources, etc.	TIL C 4.6			

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TECHNOLOGY

GRADE 4

OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	CURRICULUM CONNECTION
Students use technology to develop problem-solving strategies.	*38. Use technology for problem solving, e.g. games, simulations, calculations.	TPA B 3.4	Use spreadsheets with formulas for calculations.	Appleworks webquests	Any topic
"	39. Determine when technology is useful, and select the appropriate tools and technology resources to solve problems.	TPA C 5.1	Use digital camera to document activities.		Pioneer days
Students practice developing, publishing and presenting information in a format that is appropriate for content and audience.	*40. Use storyboarding techniques to organize presentations, e.g. prior to creating the project use a storyboard to outline the presentation.	TCA B 4.1		Hyperstudio, Imovie	Plants, Ohio geology, Book reports, Biographies
"	41. Practice basic image editing using image-editing software, e.g. resizing images, cropping images, saving images.	TCA B 4.3		Kai's Photosoap	Plants, Ohio geology, Book reports, Biographies

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TECHNOLOGY

GRADE 4

OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	CURRICULUM CONNECTION
Students practice developing, publishing and presenting information in a format that is appropriate for content and audience. (cont.)	*42. Generate document that includes graphics from more than one source, e.g., find images that match assignment needs and insert them into a document.	TCA B 4.4	Use different Web sites to copy and paste or download images off the Internet.	Student writing center, Hyperstudio, Inspiration	Plants, Ohio geology, Book reports, Biographies
"	*43. Create slide show using graphics, text and audio, e.g. create a presentation with text, pictures and music or narration.	TCA B 4.5		Hyperstudio, Imovie	Plants, Ohio geology, Book reports, Biographies
"	44. Record a sound file to be used in a project, e.g. use the computer recording capability to record narration for a slide show.	TCA B 4.5	Use Hyperstudio to record voice.	Hyperstudio, Imovie	Plants, Ohio geology, Book reports, Biographies
"	*45. Participate in class video project, e.g. make a video of a science project.	TCA B 4.6		Imovie	City creation

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TECHNOLOGY GRADE 4

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Students practice developing, publishing and presenting information in a format that is appropriate for content and audience. (cont.)	46. Participate in composing class email sent by teacher, e.g. each student has an opportunity to write an email and respond to any response received.	TCA B 4.8			
"	*47. Participate in structured class online collaborative project.	TCA C 4.2		Website database	
Students use tele-communications to participate in group online collaborative interactive projects and activities.	48. Participate in video conferencing aligned with the curriculum, e.g. Study elephants with zoo as part of 4th grade proficiency goal -- studying needs of living things.	TCA A 4.2		Refer to online database, distance learning, Webquests, online projects	Biographies, Ohio plants, Ohio Native Americans

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GRADE 4

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Students use telecommunications to participate in group online collaborative interactive projects and activities. (cont.)	49. Produce curriculum related products using online resources, e.g. develop a timeline based on an online model.	TCA C 4.2		Website database, Timeliner	
"	*50. Participate in teacher/student directed online projects.	TCA C 3.2		Website database	Science topics

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GRADE 5

TECHNOLOGY GRADE 5

OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	CURRICULUM CONNECTION
Define responsible citizenship relative to technology and its use.	1. Distinguish basic issues related to responsible use of technology and information and relate personal consequences of inappropriate use.	TSI A 5.3	Downloading software legally, plagiarism off the Internet.	Website database	Library
Students will select, use, discuss, and evaluate computer and multimedia technology.	2. Define technological terms as needed.	TPA A 5.1			
Use appropriate tools & technology resources to complete tasks and solve problems.	3. Use media & technology resources for presenting information (e.g. projectors, video cameras, handheld devices, etc.)	TPA B 5.4	Use technology across the curriculum, e.g., projectors, video cameras, handhelds, distance learning, etc.		
"	4. Use input and output devices to operate and interact with computers, e.g. scanner, digital camera, etc.	TPA B 4.1			Social studies projects
"	5. Use appropriate hand/ finger positions to key all letters (e.g. demonstrate ability to appropriately keyboard and asses accuracy.)	TPA B 5.6			

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TECHNOLOGY GRADE 5

OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	CURRICULUM CONNECTION
Students will learn to operate technology tools that affect specific content areas and network operations. (cont.)	6. Select the appropriate device to store needed information e.g. do I need to take the information with me, how large is the saved information, do others need to use the information?	TPA B 5.2	Know how much data can be stored on a CD, a zip drive.		
Students use productivity tools to prepare publications and to produce creative works.	*7. Use general-purpose productivity tools and peripherals to support personal productivity, remediate skill deficits and facilitate learning throughout the curriculum.	TPA C 5.1		Accelerated Reader, Accelerated Math, Hyperstudio	
"	*8. Identify/recognize technology resources for individual and collaborative writing, communication and publication of creative works, e.g. video editing, desktop publishing, etc.	TPA C 5.2	Create multimedia stacks, movies or brochures.	Hyperstudio, Student writing center, Imovie	Explorers, Science symposium

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TECHNOLOGY GRADE 5

OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	CURRICULUM CONNECTION
Use technology to find information, applying a research process to decide what information is needed, find sources, use information and check work	9. Understand information sources and the ways they can be used for school projects.	TIL B 5.2		Web sites with data, e.g. www.weather.com www.timeforkids.com www.infohio.com	All topics
"	10. Identify ways to locate information: online library catalog, Web site electronic formats, e.g. CD-ROM, DVD, audio files, etc.	TIL B 5.3		World Atlas, www.infohio.org www.yahooligans.com www.kidsdomain.com	Native Americans, Explorers, Science symposium
Describe types of information: facts, opinions, primary/secondary sources; and formats of information: numbers, text, sound, visual, multimedia. Use information for a purpose	*11. Distinguish between relevant and irrelevant information in an information source.	TIL A 5.4			Language arts

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GRADE 5

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Identify, access and use electronic resources from both free and fee-based Internet sources.	12. Examine information in different types of subscription databases to locate information for a curricular need, e.g. magazine database, online biography source, subject source.	TIL D 5.2	Use INFOhio in library	www.infohio.org	Explorers, Native Americans, Science symposium
"	13. Understand that there are conditions where information cannot be used, e.g. copyright restrictions.	TIL A 5.3	Discuss copyright issues.	Web site database	Language arts, library
"	14. Evaluate Web sites, e.g. ownership, point of view, currency, etc.	TIL C 5.5	Look at Web sites for bias.	Refer to Web site database for evaluation sites	All topics
"	15. List information sources used.	TIL B 5.5		Webliographies	All topics
"	*16. Create an information product, e.g. document, slide show, recording, CD, video.	TIL B 5.4		Hyperstudio, Imovie	Explorers, Science symposium
"	17. Evaluate project based on defined rubric.	TIL B 5.6		Web site database	

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GRADE 5

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Identify, access and use electronic resources from both free and fee-based Internet sources.	18. Use a username and password to access an information source, e.g. a district network requiring student log in, etc.	TIL D 5.1		Novell log in software	
Use technology to find information, applying a research process to decide what information is needed, find sources, use information and check work.	19. Practice standard methods and procedures to use software for specific learning needs, e.g. accessing CD on endangered animals for a science project.	TIL B 5.3		www.dictionary.com www.infohio.com www.thesaurus.com	
Use the Internet to find, use and evaluate information.	20. Identify elements of a Web page, e.g. title, author information, navigation bars, hyperlinks, date the page was created or updated.	TIL C 5.6		Netscape, Internet Explorer	Colonial America, American revolution
"	21. Use teacher-specified search engine to perform a simple search, e.g. enter a single search word in a search engine search box.	TIL C 5.2		www.google.com	All research reports

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GRADE 5

OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	CURRICULUM CONNECTION
Use the Internet to find, use and evaluate information. (cont.)	22. Perform simple searches using a variety of key words in a search engine, e.g. use more than one term to search for information about states.	TIL C 5.3	Select a grade band for performing an INFOhio.org search.	www.yahooligans.com www.kidsdomain.com	Library
"	23. Read list of hits and create a list of relevant sites to be saved for future use, e.g. make bookmarks or favorites.	TIL C 5.4		Netscape, Internet Explorer	All research reports
Students use technology to develop problem-solving strategies.	*24. Apply technology for problem solving, e.g. games, simulations, calculations.	NT A 5.1	Use spreadsheet with formulas for calculations.	Appleworks, Webquests	Colonial American, American revolution
"	25. Determine when technology is useful, and select the appropriate tools and technology resources to solve problems.	NT A 5.4	Use digital camera to document activities		Explorers
Develop, publish and present information in print and digital formats.	*26. Use and evaluate storyboarding techniques to organize presentations.	TCA B 5.1		Hyperstudio, Imovie	Science symposium, Explorers

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Develop, publish and present information in print and digital formats. (cont.)	27. Scan images to use in communication projects, manipulating and saving images as appropriate to an assignment, e.g. choose print images related to a state project and scan for use in digital format.	TCA B 3.2			Social studies projects
"	*28. Create slide show using text, graphics and sound with appropriate transitions and effects.	TCA B 5.1		Hyperstudio, Imovie	Science symposium, Explorers
"	*29. Participate as part of a production team in class video project, e.g. act as cameraperson, actor or director in a video project as a part of a unit of study.	TCA B 5.2		Imovie	American revolution
"	30. Participate in composing class email sent by teacher e.g. each student has an opportunity to write an email with an attachment, continuing the correspondence as responses are received.	TCA C 5.1			

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Students practice developing, publishing & presenting information in a format that is appropriate for content and audience. (cont.)	*31. Participate in small group collaborative online projects.	TCA A 5.3		www.globalschoolhouse.com	
Students use tele-communications to participate in group online collaborative interactive projects and activities.	32. Participate in video conferencing aligned with the curriculum, e.g. Annenberg projects and electronic field trips.	TCA C 5.2	Distance learning	Refer to online database, distance learning, Webquests, online projects	Distance learning with Historical Society
"	*33. Participate in teacher/student direct online learning activities, e.g. Weather School, etc.	TCA C 5.3		www.globalschoolhouse.com	Webquests

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GRADE 6

TECHNOLOGY

GRADE 6

OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	CURRICULUM CONNECTION
Understand and practice the ethical and legal use of technology.	1. Analyze a situation to determine the steps necessary to respect intellectual property rights.	TSI D 6.2	Downloading software legally, plagiarism off the Internet.	Internet Explorer	Animal research, web pages
"	2. Analyze a situation in terms of its relationship to intellectual freedom.	TSI D 6.3			
"	3. Demonstrate knowledge of current changes in information technologies and the effect those changes have on the workplace and society.	TSI A 6.2			
"	4. Exhibit legal and ethical behaviors when using information technology, and discuss consequences of misuse.	TSI D 6.1	Discuss that when you buy a game or a program at the store, you can only put it on one machine.		
"	5. Research and evaluate the accuracy, relevance, appropriateness, comprehensiveness and bias of electronic information sources concerning real-world problems.	TIL A 6.4			

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GRADE 6

OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	CURRICULUM CONNECTION
Students will use and discuss computer and multimedia technology.	6. Use terms appropriate to the lesson, software, computer or multimedia technology used in the lesson.	TPA A 6.1		www.dictionary.com	All computer-based projects
Select appropriate technology resources to solve problems and support learning.	7. Demonstrate an understanding of hardware, software, and connectivity.	TPA B 6.1			
"	8. Demonstrate proper keyboarding techniques, assess keyboard accuracy and develop speed.	TPA B 6.2			
Develop, publish and present information in a format that is appropriate for content and audience.	9. Select the appropriate device to store needed information (e.g. do I need to take the information with me, how large is the saved information, do others need to use the information?)	TCA B 8.2			
"	10. Understand networks are used to access, share, and store information, e.g. software, printers, folders, files, etc.	TPA A 6.2		Novell network software	

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TECHNOLOGY

GRADE 6

OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	CURRICULUM CONNECTION
Students use productivity tools to construct technology-enhanced models, to prepare publications, and to produce creative works.	11. Use content specific tools, software, and simulations to support learning and research.	TPA C 6.1		Internet Explorer, Netscape, Science court	Light and sound
"	*12. Use technology resources for individual and collaborative writing, communication and publication of creative works, e.g. video editing, desktop publishing, etc.	TPA C 6.2		Student writing center, Appleworks, Imovie	
Students will use technology and select, evaluate, troubleshoot, and maintain the operation of technology systems.	13. Use media and technology resources for presenting information, e.g. distance learning equipment, interactive boards etc.	TCA C 6.3	Create presentations and use projectors to share with class.	Hyperstudio, Adobe Page Mill, laptops, projectors	Animal research, Web pages, Caravans

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Students will use technology and select, evaluate, troubleshoot, and maintain the operation of technology systems. (cont.)	14. Identify/Recognize strategies for identifying and solving routine hardware and software problems that occur during everyday use.	TPA D 6.2	Paper jams in printer, changing printers, making alias		
Students will process, organize and maintain information and data.	15. Recognize how information sources can be used in learning.	TIL A 6.1		www.infohio.org	Library
"	16. Identify primary and secondary source information, e.g. read an account about a time period in an online encyclopedia, then read a document written by a person in that time period.	TIL A 5.5		www.infohio.org	Library
"	17. Choose and use different types of information to meet a curricular need.	TIL B 6.3			Library

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Students will process, organize and maintain information and data. (cont.)	18. Use a prescribed method to list information sources used in a project.	TIL B 6.6		Webliographies	African research
"	19. Identify main ideas and supporting facts using summarizing and paraphrasing in note taking.	TIL A 6.1		www.infohio.org	Any research project
"	20. Use a prescribed management system for saving project information.	TIL A 6.6		Novell network	Any computer use time
Students will process, organize and maintain information and data.	21. Organize information in a prescribed system and retrieve for practical application, e.g. save to a school network and personal drive space.	TPA B 6.4		Novell network	Any computer use time
"	22. Digitize information using scanners and other electronic tools to transfer information into new formats, within copyright guidelines, e.g. create digital video, pictures, sound, etc.	TPA B 6.3	Use digital cameras for pictures	Digital camera, Appleworks, Kai's Photosoap	Caravans, oceanography, animal research, Web pages.

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Use technology to conduct research & follow a research process model which includes the following: develop essential question; identify resources; select, use and analyze information; synthesize and generate a product; and evaluate both process & product.	*23. Generate questions to be answered or a position to be supported when given a topic.	TIL B 6.1			These topics are good for this whole benchmark: world studies, oceanography, animal research
Develop search strategies, retrieve information in a variety of formats and evaluate the quality and appropriate use of Internet resources.	24. Modify a search through the use of different keywords, e.g. search for conservation information using “garbage” and search again using “waste disposal.”	TIL C 6.4		Netscape, Internet Explorer, www.infohio.org Any search engine, e.g. www.google.com	
Select, access and use appropriate electronic resources for defined information need.	25. Use online library catalog to choose and locate a variety of resources on a topic.	TIL D 6.2		Web site database	Library

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Select, access and use appropriate electronic resources for defined information need. (cont.)	26. Demonstrate search techniques for subscription databases.	TIL D 6.1		www.infohio.org	Library
"	27. Uses a variety of technology resources for curriculum needs.	TIL B 6.7	CD ROMs, Web sites, subject specific software	Web site database	All subjects
"	28. Examine information in different types of subscription databases to locate information for a curricular need.	TIL B 6.4			Library
Evaluate the accuracy, authority, objectivity, currency, coverage and relevance of information and sources.	29. Determine that information located is able to be used legally and choose appropriately, i.e., locate copyright information for print and graphic information and check for copyright restrictions.	TIL A 6.2		Internet	Library
"	30. Identify relevant facts, check facts for accuracy and record appropriate information.	TIL B 6.5			Library

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"	*31. Create information products to share information using different formats, e.g. print, audio recording, digital, video, slide show, stack, etc.	TIL B 6.2		Hyperstudio, Inspiration, Imovie	
"	32. Evaluate how information was found and assess the quality of the product.	TIL B 6.7			Language Arts, any research
Students will identify, differentiate, and evaluate information retrieved by accessing the Internet and other available electronic resources.	33. Locate and use help features in an online information source, e.g. network resource, subscription database, etc.	TIL C 8.1			These topics are good for this whole benchmark: world studies, oceanography, animal research
"	34. Choose and use software for a class assignment, e.g. for a project on ancient civilizations use software appropriate to that topic.	TIL C 6.7		Mapmakers Toolkit, Timeliner	World studies, Oceanography, Animal research

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Students will identify, differentiate, and evaluate information retrieved by accessing the Internet and other available electronic resources. (cont.)	35. Explain the function of a Web browser, e.g. what is the difference between the browser software and a page on the Internet?	TIL C 6.1		Internet Explorer, Netscape	
"	36. Recognize that some Web information requires special software for its use, e.g. discuss what plug-ins are and how they expand the use of the Internet.	TIL C 6.2		www.shockwave.com www.flash.com	
"	37. Search for information using assigned directories and search engines.	TIL C 7.1		www.infohio.org www.google.com	
"	38. Use quotation marks for phrase searching in appropriate search engines to improve results, e.g. for a biography project, type in the person's name with quotation marks to limit the number of results.	TIL C 7.2		Netscape, Internet Explorer	

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Line 3: Grade Level . Indicator Number

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TIL = Technology & Information Literacy

TPA = Technology for Productivity Applications
D = Design

TECHNOLOGY

GRADE 6

OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	CURRICULUM CONNECTION
Students will identify, differentiate, and evaluate information retrieved by accessing the Internet and other available electronic resources. (cont.)	39. Explain the difference between a subscription (fee-based) database and the free Internet.	TIL C 6.6			
"	*40. Identify and chart elements that make a Web site effective, e.g. author, date, images, and site organization, etc.	TIL C 6.5		Netscape, Internet Explorer, Appleworks	
"	41. Explain the choice of a Web site for a school project using information from an evaluation rubric, e.g. Why is the Web site appropriate for the project.	TIL C 7.4		Web site database	
Students will use the principles and operations of communication in their products.	*42. Learn and demonstrate basic principles of design when creating print media, multimedia, video and Web products.	TCA A 6.2		Adobe Page Mill, Hyperstudio	These topics are good for this whole benchmark: world studies, oceanography, animal research

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OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	CURRICULUM CONNECTION
Students will use the principles and operations of communication in their products. (cont.)	*43. Apply principles of design when selecting and formatting fonts for print media and multimedia, video and Web pages, e.g. number of fonts, size of fonts.	TCA A 8.5		Adobe Page Mill, Hyperstudio	
Students develop, publish and present information in a format that is appropriate for content and audience.	*44. Use graphic organizers and storyboarding to organize presentations.	TCA B 6.1		Inspiration, Hyperstudio	These topics are good for this whole benchmark: world studies, oceanography, animal research
"	45. Use photo-editing software to enhance digital images, e.g. contrast, brightness, color, and special effects.	TCA B 7.5		Kai's Photosop, Appleworks	
"	*46. Create posters or fliers representing curriculum concepts that include text & graphics, e.g. make a brochure about an event in American history.	TCA B 6.1		Appleworks	

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Students develop, publish and present information in a format that is appropriate for content and audience. (cont.)	*47. Create slide show using text, graphics and sound with appropriate transitions and effects.	TCA B 6.2		Hyperstudio, Imovie	
"	48. Create original sound files, e.g. create a music file, create a spoken audio file.	TCA B 7.3		Hyperstudio, Imovie	
Students develop, publish and present information in a format that is appropriate for content and audience.	49. Participate in composing class email sent by teacher, e.g. each student has an opportunity to write emails as appropriate to studies.	TCA C 6.1		Web chat	“Watsons go to Birmingham”
"	*50. Participate in small group collaborative online projects.	TCA C 6.2		www.globalschoolhouse.com	

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Students select appropriate telecommunication tools and design collaborative interactive projects and activities to communicate with others.	51. Conduct a research project by posting questions on a message board. Participate in directed curricular chat on specific topics, e.g. discuss November elections with election official Mrs. Jones.	TIL C 6.4		www.globalschoolhouse.com	These topics are good for this whole benchmark: world studies, oceanography, animal research
Students design and use instruments to gather and use data to analyze trends.	52. Employ the use of measuring instruments to collect data.	TPA B 6.1		Appleworks	Chemistry, Forces of the earth

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GRADE 7

TECHNOLOGY

GRADE 7

OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	SUGGESTED PACING
Apply the core concepts of technology in a practical setting.	1. Recognize that technological systems can be connected to one another.	NTS B 7.2	Define LAN & WAN. Examine network structure and server connections	Computer Lab A and Room M112	4 days
"	2. Recognize that malfunctions of any part of a system may affect the function and quality of the system.	NTS B 7.3	Discuss : malfunctions = computer freezing, data corruption, or busy system.	Novell network system	
Analyze the relationships among technologies and explore the connections between technology and other fields of study.	3. Describe the situational interdependence of technologies.	NTS C 7.1	Examine desktops, laptops, scanner, digital cameras, and PDAs.	Internet Explorer www.dell.com www.hp.com www.palm.com	4 days
"	4. Identify products that have been applied to alternative settings.	NTS C 7.2			
"	5. Explain how knowledge from other fields of study may impact the development of technological systems and products.	NTS C 7.3		Internet Explorer	

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Explore and compare responsible citizenship relative to technology and its use.	6. Describe the ethical issues related to the development and use of technology.	TSI D 7.7	Discuss ethical uses of network computers and shareware/freeware/pirating software.	Relevance to academic classes www.lawguru.com	5 days
"	7. Classify how new technologies have resulted from the demands, values and interests of individuals, businesses, industries, and societies.	TSI A 7.1	New technologies = smart boards, VTEC, handhelds within academic setting	Distance Learning Lab: <ul style="list-style-type: none"> • Smartboards • Airports: laptops • VTEL equipment 	
"	8. Relate the changes in information technologies and the effect those changes have on the workplace and society.	TSI A 7.2	Discuss how information technology has shaped the communication and behavioral methods of society.		
"	9. Understand situations to determine the steps necessary to respect intellectual property rights.	TSI D 7.8		www.w3.org/IPR	
"	10. Explain how economic, political, and cultural issues are influenced by the development and use of technology.	TSI A 8.1	Examine timelines of technology and relevance on the country/globe.	Internet Explorer www.usatoday.com www.cnn.com	

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Explore and compare responsible citizenship relative to technology and its use. (cont.)	11. Describe how social and cultural priorities and values are reflected in technological devices.	TSI A 7.3	New technologies: smartboards, VTEC, handhelds, virtual reality	Control panel within computers: <ul style="list-style-type: none"> • Language • Date/time settings Internet Explorer www.usatoday.com www.cnn.com	
Develop an understanding of technology and its interrelationship with the environment.	12. Explain how the development and use of technologies often put environmental and economic concerns in direct competition with one another.	TSI B 7.1			
Develop an understanding of the influence of technology throughout history.	13. Describe how inventions have evolved by using a slow and methodical process of tests and refinements.	TSI C 7.1	Analyze the Internet: Gopher, text-based, first computers, first calculators, laptops, PDAs	Internet Explorer	3 days
Understand and practice the ethical and legal use of technology.	14. Analyze a situation to determine the steps necessary to respect intellectual property rights.	TSI D 7.1	Define and discuss plagiarism, copyrights and infringement.	www.lawguru.com	5 days
"	15. Demonstrate knowledge of current changes in information technologies and the effect those changes have on the workplace and society.	TSI A 7.2	Analysis of news stories, global events as broadcast on TV and the Internet	www.usatoday.com www.cnn.com www.pcmagazine.com	

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Understand and practice the ethical and legal use of technology.	16. Exhibit legal and ethical behaviors when using formation technology, and discuss consequences of misuse.	TSI D 8.1	Plagiarism, copyright infringement, pirating software	www.lawguru.com	
Explore and compare responsible citizenship relative to technology and its use.	17. Research and evaluate the accuracy, relevance appropriateness, comprehensiveness and bias of electronic information sources concerning real-world problems.	TIL A 7.3			
Students will use and discuss computer and multimedia technology.	18. Use vocabulary related to computer and multimedia technology hardware e.g. peripheral, serial, parallel, universal serial bus, etc.	TPA A 7.1		www.techweb.com www.netlingo.com	
"	19. Use terms appropriate to the lesson, software, computer or multimedia technology used in the lesson.	TPA A 7.1	CPU – output A: drive – input H: drive Novell system Cat-5 cables	www.techweb.com www.netlingo.com	6 days

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Students will learn to operate technology tools that affect specific content areas and network operations.	20. Demonstrate an understanding of hardware, software, and connectivity.	TPA A 7.2	Define: <ul style="list-style-type: none"> • CPU – output • A: drive – input • H: drive • Novell system • Cat-5 cables Students log into computers and navigate through desktop.	Desktop computer Network printers Microsoft Windows XP	7 days
	*21. Independently use network capabilities.			Word, Excel, Power Point assignments Microsoft Office 2000 professional books	
"	22. Develop speed and accuracy when keyboarding and transition to a word processing environment.	TPA B 7.4	Review keyboard posture and home rows.	Software for assessment, teaching keyboarding	
Students use productivity tools to construct technology-enhanced models, to prepare publications, and to produce creative works.	23. Use content specific tools, software and simulations to support learning and research.	TPA C 7.1	Define and explain research projects: students independently research personal topics or subject specific.	Word, Excel, Power Point, Internet Explorer	5 weeks

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Students use productivity tools to construct technology-enhanced models, to prepare publications, and to produce creative works. (cont.)	24. Apply technology resources to support personal productivity, group collaboration, and learning throughout the curriculum.	TPA C 7.2	Health projects using Microsoft Publisher. Use of smartboards in science and math. Operation Montserrat.	Distance Learning Lab, smartboards, Internet Explorer, laptops	
Apply technology resources to support personal productivity, group collaboration, and learning throughout the curriculum.	*25. Choose the most appropriate media and technology resources for presenting information and justify that choice.	TCA B 7.1			5 days
Students will process, organize and maintain information and data.	26. Manipulate information sources to meet curricular needs e.g. extract data save searches.	TIL C 7.4	Primary sources used in social studies		5 days
	27. Select and use primary source information for a project.		Discuss elements that critique a valid/invalid Web site.		
Students will process, organize and maintain information and data.	28. Determine how to record and organize information, e.g. bibliography, webbing, graphic organizer, etc.	TIL A 7.5	Internet projects: internal and external citations	Webliographies www.apastyle.org	

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	29. Use a systematic method for citation of sources used in a project, e.g. appropriate bibliographic citation.				
Students will process, organize and maintain information and data.	30. Develop electronic notes and outlines for curricular needs, e.g. take notes on a social studies topic, including the source of information and location.	TIL B 7.4			
"	31. Demonstrate how to access information in multiple ways, e.g., online sources, media sources, CD, DVD, digital resources.	TPA B 7.3	Explain simple and advanced searches - CD-Rom vs. CD-RW. Scanners, digital cameras and USB ports	Internet Explorer Search and Metasearch engines www.google.com www.yahoo.com	
Select, access and use appropriate electronic resources for a defined information need.	32. Use appropriate software for sharing Web pages, audio and video files and other presentations within copyright guidelines, e.g. software and hardware tools used for downloading and storing information.	TIL D 7.4		Power Point Internet Explorer Windows Media Player	

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Students will define tasks and identify strategies to find information using a variety of resources. Students will organize and communicate information using a variety of resources.	*33. Develop open-ended research questions about a defined information need.	TIL B 7.1	Semester-end research projects: Internet based.	Any search engine www.yahoo.com www.google.com	18 days
Select, access and use appropriate electronic resources for a defined information need.	34. Modify a search through the use of different keywords.	TIL D 7.1	Simple and advanced searches	Webliographies www.apastyle.org www.mla.org	
Students will define tasks and identify strategies to find information using a variety of resources. Students will organize and communicate information using a variety of resources.	35. Select and evaluate relevant information about a specific topic in several sources.	TIL B 7.5		Internet Explorer Any search engine www.yahoo.com www.google.com	

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Select, access and use appropriate electronic resources for a defined information need.	36. Examine information in different types of subscription databases to locate information for a curricular need.	TIL D 7.2		www.ohiolink.org Newsnet groups	
"	37. Compare and contrast information to determine which is more relevant.	TIL A 7.4		Internet Explorer rubric	
"	38. Record selected information for a curricular need.	TIL A 7.5	Reinforce copyrights and plagiarism.	Webiographies www.apastyle.org	
Use technology to conduct research and follow a research process model, which includes the following: develop essential question; identify resources; select, use, analyze information; synthesize and generate a product; and evaluate both process and product.	39. Create information products to share information using different formats, e.g. print, audio recording, digital, video, slide show, stack.	TIL B 7.5		Sound recorder Power Point, Word, Excel Internet Explorer Digital camera	

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Use technology to conduct research and follow a research process model, which includes the following: develop essential question; identify resources; select, use, analyze information; synthesize and generate a product; and evaluate both process and product. (cont.)	40. Create an information product to share information, e.g. print document, audio recording, CD, slide show, film.	TIL B 7.5		Microsoft Office 2000 Microsoft Notepad Microsoft Visual Basic	
"	41. Make a list of sources used, following a teacher prescribed or online citation creation tool, e.g. APA, MLA, or other bibliographic tool.	TIL B 8.5	Internal and external citations	Webliographies www.apastyle.org www.mla.org	
"	42. Evaluate how information was found and assess the quality of the product.	TIL B 7.6		Internet Explorer rubric	

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Use technology to conduct research and follow a research process model, which includes the following: develop essential question; identify resources; select, use, analyze information; synthesize and generate a product; and evaluate both process and product. (cont.)	43. Select various ways to revise and edit own product.	TIL B 8.7	Student-centered evaluations, student presentations, Web page development, Publisher documents	Microsoft Office 2000 Internet Explorer	
"	44. Review and evaluate research process used.	TIL B 8.8		Internet Explorer assessments	
Students will identify, differentiate, and evaluate information retrieved by accessing the Internet and other available electronic resources.	*45. Search for information using student-selected directories and search engines, e.g. given previous experience with age-appropriate tools, choose one to do a search for curriculum based information need.	TIL C 7.1		www.yahoo.com www.google.com	

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Students will identify, differentiate, and evaluate information retrieved by accessing the Internet and other available electronic resources. (cont.)	46. Search for information using a metasearch engine, e.g. a search engine designed to search a group of other search engines.	TIL C 7.4		www.dogpile.com	
"	47. Use Boolean operators in the search process, e.g. use Boolean logic to expand a search (AND), use Boolean logic to limit a search (AND, NOT).	TIL C 7.3	Simple and advanced searches	Netscape, Internet Explorer www.INFOhio.org Any search engine www.yahoo.com www.google.com	
"	48. Perform searches for specific types of information, e.g. images, journal articles, preformatted articles requiring a browser plug-in, etc.	TIL C 7.2			
"	49. Report elements of a Web site that make it effective as outlined in an evaluation rubric, e.g. describe why the Web site is appropriate for the particular information need.	TIL C 7.5			

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Students will use the principles and operations of communication in their products.	50. Learn and demonstrate basic principles of design when creating print media, multimedia, video and Web products.	TCA A 7.2	Discuss Web design elements.	Microsoft Office 2000 Macromedia Director	3 days
"	51. Create a non-linear electronic slideshow with multimedia effects, in that links are made outside the presentation or from one slide back and forth to another section of the slide show.	TCA A 7.3	Explain how hyperlinks, bookmarks and action buttons can be utilized for navigation.	Microsoft Office 2000 • Power Point Internet Explorer	
"	*52. Apply principles of design when selecting file formats such as jpg, .wav, and .avi for print media and multimedia.	TCA A 7.2			
Students develop, publish and present information in a format appropriate for content and audience.	53. Use photo editing software to enhance digital images, e.g. contrast, brightness, color, special effects.	TCA B 7.5		Adobe Photoshop (elements) Microsoft Paint	
"	54. Use original sound files in a multimedia product, e.g. record original sound or music.	TCA B 7.3		Power Point Sound Recorder Microsoft Sound Recorder	

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Students develop, publish and present information in a format appropriate for content and audience. (cont.)	55. Present research in multimedia format including adding a sound track for a presentation.	TCA B 7.3		Sound recorder within Power Point Microsoft Sound Recorder	
"	56. Understand and use image file formats appropriate to communication need and audience.	TCA B 7.4		Internet Explorer	
"	57. Evaluate communication project process and product.	TCA B 8.3		Rubric	
Students select appropriate telecommunication tools and design collaborative interactive projects and activities to communicate with others.	58. Participate in virtual learning and video conferencing with the specific purposes of gathering and disseminating information, e.g. Astronomy.	TCA C 7.2	Live Web casts on current events and days (Friday)	Distance Learning Lab Smartboards Netscape, Internet Explorer www.learnline.com Distance Learning Lab Smartboards	
"	59. Participate in electronic field trips and virtual projects.	TCA C 7.2		Distance Learning Lab	

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GRADE 8

TECHNOLOGY GRADE 8

OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	SUGGESTED PACING
Synthesize information relative to the characteristics of technology and apply in a practical setting.	1. Demonstrate the practical application of hardware, software and connectivity to learning and problem solving.	NTS B 8.1			10 days
Analyze the relationships among technologies and explore the connections between technology and other fields of study.	2. Demonstrate ways that technological systems interrelate.	NTS C 8.1	Define LAN & WAN networks. Display peripheral devices on the desktop computer.	Novell network system PDA and cradle USB cables	5 days
"	3. Explain ways that invention and innovation within one field can transfer into other areas of technology.	NTS C 8.4		www.usatoday.com www.cnn.com	
Explore and compare responsible citizenship relative to technology and its use.	4. Discuss the ethical issues related to the development and use of technology.	TSI D 8.5	Discuss importance of ethical issues such as hacking, copyright, infringement and plagiarism. Shareware, freeware, pirating software	www.lawguru.com Relevance to academic classes	5 days

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Explore and compare responsible citizenship relative to technology and its use. (cont.)	5. Explain how economic, political and cultural issues are influenced by the development and use of technology.	TSI A 8.1	Examine timeliness of technology and relevance on the country/globe.	Internet Explorer www.usatoday.com www.cnn.com	2 days
"	6. Discuss how social and cultural priorities and values are reflected in technological devices.	TSI A 8.2	New technologies: smart boards, VTEC, handhelds, virtual reality	Control panel within computer Internet Explorer www.usatoday.com www.cnn.com	
"	7. Analyze situations to determine the steps necessary to respect intellectual property rights.	TSI D 7.8	Plagiarism and copyright infringement	www.lawguru.com	
Understand and practice the ethical and legal use of technology.	8. Exhibit legal and ethical behaviors when using information technology, and discuss consequences of misuse.	TSI D 8.1	Plagiarism, copyright infringement, pirating software	www.lawguru.com	2 days
"	*9. Research and evaluate the accuracy, relevance appropriateness, comprehensiveness and bias of electronic information sources concerning real-world problems.	TIL A 8.2			

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Develop an understanding of technology and its interrelationship with the environment.	10. Describe why and how the management of waste produced by technological systems is an important societal issue.	TSI B 8.1	Recycling lesson	Recycling brochures	4 days
Develop an understanding of the influence of technology throughout history.	11. Describe how the specialization of function has been at the heart of many technological improvements.	TSI C 8.1			
Students will learn to operate technology tools that affect specific content areas and network operations.	12. Demonstrate an understanding of hardware, software, and connectivity.	TPA A 8.1			2 days
"	13. Independently save and access stored information from portable devices e.g. zip or jazz drives, memory sticks, etc.		Peripheral devices: scanner, printers- setup, digital cameras. Explain zipdrives and USB keys. Power Point: students are required to give Power Point presentation in 8th grade social studies.	Microsoft Power Point Desktop computer Diskettes Zip disks	10 days

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OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	SUGGESTED PACING
	14. Identify and use input and output devices to operate and interact with computers and multimedia technology resources.			Microsoft Office 2000 Internet Explorer	
	*15. Independently use network capabilities.			Microsoft Office 2000 Microsoft Notepad Macromedia Director Microsoft Visual Basic	
Students will process, organize and maintain information and data.	16. Increase speed and accuracy when keyboarding and utilize a word processing environment.	TPA B 8.1	Review keyboard posture and home rows.		
Students use productivity tools to construct technology-enhanced models, to prepare publications, and to produce creative works.	*17. Use content specific tools, software and simulations to support learning and research.	TPA C 8.1		Microsoft Office Package: Word, Publisher, Excel, Power Point, Access Director, Dreamweaver, Notepad, HTML, Visual Basic	8 days
"	*18. Choose the most appropriate media and technology resources for presenting information and justify that choice.	TPA C 8.2	Online research, simulations	Internet Explorer Distance Learning Lab Smartboards Laptops	

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OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	SUGGESTED PACING
	19. Apply strategies for identifying and solving routing hardware and software problems that occur during everyday use.		Discuss and display computer freezing or students not being able to log in.	Novell network Cat-5 cables Desktop computers Laptops	
	20. Create and store information electronically e.g. network, CD, DVD, portable storage device.			CD-RW disks	
Students will define tasks and identify strategies to find information using a variety of resources. Students will organize and communicate information using a variety of resources.	21. Identify main concepts, opinions and supporting facts using systematic note taking strategies.	TIL B 8.2		Internet Explorer rubric	
"	22. Identify relevant facts, check facts for accuracy and record appropriate information.	TIL B 8.2	Internal and external citations	Webiographies www.apastyle.org	
	23. Develop an appropriate management system for organizing and storing information.		File management on H: drive and C: drive	Novell network	

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OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	SUGGESTED PACING
Evaluate the accuracy, authority, objectivity, currency, coverage and relevance of information and data sources.	24. Understand structure and organization of information sources e.g. guide words, indexes and headings	TIL A 8.1			
Students will define tasks and identify strategies to find information using a variety of resources. Students will organize and communicate information using a variety of resources.	25. Digitize information for archiving and future use, e.g. creating an electronic portfolio of curricular projects.	TIL B 8.6	Students will learn how portfolio assessment is a tool used to gauge progress throughout a period of time	CD-RW disks Microsoft Office 2000 Microsoft Notepad Novell network	
"	26. Use recognized research process model to conduct research.	TIL B 8.1			15 days
Select, access and use appropriate electronic resources for a defined information need.	27. Demonstrate search techniques for subscription databases.	TIL D 8.2		Newsnet groups	

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Evaluate the accuracy, authority, objectivity, currency, coverage and relevance of information and data sources.	28. Demonstrate how to determine copyright issues when creating new products, e.g. permissions to use articles and graphics, credit information to be included.	TIL A 8.2	Students will learn how copyrights come into play with literature and graphics.	Internet Explorer www.copyright.gov	2 days
"	29. Identify relevant facts, check facts for accuracy and record appropriate information.	TIL A 8.4			
"	30. Use rubric to evaluate Web site, e.g. authority, currency, relevance, etc.	TIL A 8.3			
Students will define tasks and identify strategies to find information using a variety of resources. Students will organize and communicate information using a variety of resources. (cont.)	31. Analyze information, finding connections that lead to a final product.	TIL B 8.3	Students will create various projects using the technology as available to them.	Microsoft Office 2000	

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Students will define tasks and identify strategies to find information using a variety of resources. Students will organize and communicate information using a variety of resources. (cont.)	32. Find information patterns and group information into organized outline.	TIL B 8.3			
"	33. Demonstrate how to determine copyright issues when creating new products, e.g. permission to use articles and graphics, credit information to be included, intellectual property issues.	TIL B 8.4	Citations and references Copyrights and plagiarism	Webiographies www.apastyle.org	
"	34. Use a recognized citation style manual to credit sources used in work, e.g., MLA Style Manual, APA Guidelines, etc.	TIL B 8.5		www.apastyle.org www.mla.org	
"	35. Evaluate how information was found and assess the quality of the product.	TIL B 8.8			

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Students will define tasks and identify strategies to find information using a variety of resources. Students will organize and communicate information using a variety of resources. (cont.)	36. Select various ways to revise and edit own product.	TIL B 8.7	Review processes/ steps in completing a project.	Project Guidelines Sheet	
Students will identify, differentiate, and evaluate information retrieved by accessing the Internet and other available electronic resources.	37. Troubleshoot error messages in a Web browser, e.g. procedure to use when a page isn't found to verify the address, use refresh and stop buttons.	TIL C 8.1			
	38. Understand and use plug-ins for using and downloading information in all formats from the Internet, e.g. audio, video and portable document formats.		Definitions: shockwave, flash, director Explain different formats: .wav, .evi, .ram.	www.techweb.com www.netlingo.com	4 days

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Students will identify, differentiate, and evaluate information retrieved by accessing the Internet and other available electronic resources. (cont.)	39. Use Boolean operators in the search process routinely for curricular needs, e.g. know the basic Boolean operators and use them in a search for science topic information.	TIL C 8.2	+ "...” and/or	Netscape, Internet Explorer www.INFOhio.org Any search engine www.yahoo.com www.google.com	
"	40. Compare information found in searches done on different search engines and discuss differences in how search engines select and provide information, e.g. ranked results by relevancy, popularity, or paid placement.	TIL C 8.3		Netscape, Internet Explorer	
Select, access and use appropriate electronic resources for a defined information need.	*41. Choose the appropriate database to use for a specific assignment, e.g. for a science research project, use a database designed for science topics.	TIL D 8.1		Search engines www.yahoo.com www.google.com	

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Select, access and use appropriate electronic resources for a defined information need. (cont.)	42. Review and practice using rubrics for evaluating Web site(s) for a curricular need, e.g. Authorship, Ownership, Commercial site, government site etc.	TIL D 8.1	Web site endings: .org, .gov, .com, .edu, .net, .k12.oh.us	Internet Explorer	
Students will identify, differentiate, and evaluate information retrieved by accessing the Internet and other available electronic resources.	43. Compare several Web sites on the same topic and evaluate the purpose of each site, e.g. use several sites for a school project and note whether the sites have similar data or conflicting data.	TIL C 8.4	Discuss the features of each Web site and its ending. Rubric, Web site endings: .org, .com, .gov, .net, .edu	Internet Explorer	
"	44. Use an evaluation rubric to determine the authenticity, accuracy, bias, and consistency of Web information used for class assignments.	TIL C 8.3			
Students will use the principles and operations of communication in their products.	45. Learn and demonstrate basic principles of design when creating print media, multimedia, video and Web products.	TCA A 6.3	Discuss the elements of a Web site (font and background)	Front Page, Dreamweaver, Director, Microsoft Office 2000	8 days

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OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	SUGGESTED PACING
Students will use the principles and operations of communication in their products. (cont.)	*46. Apply principles of design when selecting file formats such as jpg, .wav, and .avi for print media and multimedia.	TCA A 8.2			
"	47. Use principles of design when creating file formats such as jpg, .wav, and .avi for video and Web pages.	TCA A 8.5		Microsoft Office 2000 Microsoft Front Page Macromedia Director Adobe Photoshop	
"	48. Apply principles of design when selecting and formatting fonts for print media and multimedia, video and Web pages, e.g. number of fonts, size of fonts, legibility.	TCA A 8.5			
"	*49. Use principles of design when selecting color for print media and multimedia, video and Web pages used in independent projects, e.g. contrast, backgrounds.	TCA A 8.5		Microsoft Office 2000 Paint	

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Students will use the principles and operations of communication in their products. (cont.)	50. Apply principles of design when creating print media and multimedia, video and Web pages, such as framing shots and set design for video.	TCA A 8.6			
"	51. Use universal design principles in projects, e.g. image size, alt attributes/tags, use of tables and frames, use of style sheets, use of color, text-legibility and readability, fonts and formatting, captioning.	TCA A 8.5	Discuss HTML and how it is used within a Webpage environment.	HTML Guide Microsoft Notepad Microsoft Front Page	
Students develop, publish and present information in a format that is appropriate for content and audience.	52. Preview presentation and revise based on student-designed rubric, which includes design, usage (spelling/grammar) and content.	TCA B 8.3			3 days
"	*53. Create brochures, flyers, and newsletters using desktop publishing programs for curricular projects.	TCA B 8.1		Microsoft Publisher Microsoft Office online template gallery	

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OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	SUGGESTED PACING
	54. Understand purpose of Web markup language basic source code, e.g. check and change Web page headings and font size.		Explain the HTML language.	Microsoft Notepad and Front Page	
Students select appropriate telecommunication tools and design collaborative interactive projects and activities to communicate with others.	55. Conduct a research project by posting questions on a message board and participate in directed curricular chat, e.g. post results of community surveys.	TCA C 8.4		www.blackboard.com www.edline.net	5 days

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MODULAR TECHNOLOGY 1

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BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	SUGGESTED PACING
Understand basic operations and concepts for Robotics	1. Compare Robotic systems to humans			Introduction to Robotics Video	2 Weeks introduction, sustained throughout unit.
"	2. Identify the major parts of a robot		Arm, Pivot, Gripper		
"	3. Recognize and describe the function of the computer interface ports.		Converts instructions from the computer to the robot.		
"	4. Describe the function of the controller.		(Same as interface)		
"	5. Locate the parts of the robot.	NT A 8.3			
"	6. Describe the importance of the home position.		Acts as a starting point for programs		
"	7. Identify some of the hazardous tasks for which robots are used.		Bomb removal		
"	8. Design a simple flowchart.			Flowchart Worksheet	
"	9. Identify some of the repetitive tasks for which robots are used.		Assembly line work	Robotics Video	
"	10. Identify careers associated with Robotics.				

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BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	SUGGESTED PACING
Utilize technology productivity tools for Robotics	11. Move the robot arm using the computer keyboard			Sscorbot Robot and software	2 Weeks introduction, sustained throughout unit.
"	12. Interpret and correct the "motor error" message		Robot moved beyond limits.		
"	13. Set and use positions of the robot arm.				
"	14. Describe the Cartesian Coordinate System used by the software.	NT B 8.5	Coordinate system based on distance along X, Y, and Z axis.		
"	15. List, delete and print positions.				
"	16. Program a sequence of motions using the GO statements.				
"	17. Use the speed command to set the robot speed				
"	18. Edit a program				
"	19. Program the speed of an arm movement.				
"	20. Identify uses for speed control and pauses.			** End of Unit Project Students will write a program for the robot that will move a stack of material.	

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MODULAR TECHNOLOGY 1

BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	SUGGESTED PACING
Understand basic operations and concepts for computer animation	21. Define animation			Show students different forms of animation and have them evaluate.	2 Weeks introduction, sustained throughout unit.
"	22. Describe how animation is used as a communication tool.		Entertainment, advertising		
"	23. Identify titling techniques used on television and movies.				
"	24. Describe the process of cell animation.	TPA B 6.1		Animation Video	
"	25. Describe the effect of animation speed on perception of motion.		Correct speed with create smooth motion	Alter speed to show students the effect.	
"	26. Identify uses for cell animation.		Movies		
"	27. Identify careers associated with computer animation.			Guest Speaker	

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BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	SUGGESTED PACING
Understand technology productivity tools for computer animation	28. Draw basic shapes on the screen.			Animator Pro Software	2 Weeks introduction, sustained throughout unit.
"	29. Switch tool types.	TCA B 7.5			
"	30. Select colors				
"	31. Fill areas with different colors.				
"	32. Move drawing elements on the screen.				
"	33. Create a cell animation using Animator				
"	34. Recall previously saved files.				
"	35. Insert frames into an animation				
"	36. Set a path for animated objects.				
"	37. Insert frames one at a time.				
"	38. Use Blue Frames to view previous frames.				
"	39. Create backgrounds for animations.				

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BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	SUGGESTED PACING
Understand technology productivity tools for computer animation (cont.)	40. Use Animator to create Tweens.		Technique used to create the illusion of motion.		
"	41. Identify uses for tweening in animation.				
"	42. Use tweening as part of an animation.				
"	43. Use Animator to create titles for animations.			**End of Unit Project Students will create a 30 second commercial animation to sell a product of their choice.	
Understand basic operations and concepts for digital music	44. Describe what a MIDI system does.	TPA A 7.3	Music Instrument Device Interface		2 Weeks introduction, sustained throughout unit.
"	45. List three advantages of composing music with a MIDI system.		Experiment with sound, change notes	Introduction to MIDI Video	
"	46. Identify the parts of a MIDI system		Controller, synthesizer and ports		
"	47. Describe the concept of sequencing.		Combination of different musical parts		
"	48. Describe the use of step entry for composing music.				

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MODULAR TECHNOLOGY 1

BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	SUGGESTED PACING
Understand basic operations and concepts for digital music (cont.)	49. Describe notes in terms of time value.	TPA A 7.3	Group of notes that take a specific time to play		
"	50. Define the term measure.				
"	51. Describe the meaning of time signatures.				
"	52. Identify careers associated with digital music.		Guest Speaker		
Utilize technology productivity tools for digital music	53. Open and play digital music files stored on a computer disk.			Musik Time Deluxe Software	2 Weeks introduction, sustained throughout unit.
"	54. Use a music keyboard to enter notes				
"	55. Use the computer to edit music.				
"	56. Use the keyboard entry method for composing music.	TPA A 8.1			
"	57. Describe the use of a music keyboard to step enter notes.				
"	58. Change time value of notes with the computer keyboard.				

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MODULAR TECHNOLOGY 1

BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	SUGGESTED PACING
Utilize technology productivity tools for digital music (cont.)	59. Describe the use of cutting and pasting to repeat sequences of notes.				
"	60. Add a second part of a musical score.				
"	61. Create chords.				
"	62. Add titles and credit to music.				
"	63. Record music directly off keyboard.			**End of Unit Project Students will write, record and print out sheet music for an original piece.	
Understand basic operations and concepts for audio communications	64. Understand how a radio works.			Introduction to Audio Communication Video	2 Weeks introduction, sustained throughout unit.
"	65. Demonstrate an understanding of possible careers and occupations available in the field of audio communications.		Radio, TV	Field Trip	
"	66. Understand the operations of the equipment used in this unit.				
"	67. Understand how sound travels.				

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Understand basic operations and concepts for audio communications (cont.)	68. Discuss the communications wave of the future, digital satellite networks.				
Utilize technology productivity tools for audio communications	69. Perform basic editing functions.			Students will use recording equipment for these Indicators.	2 Weeks introduction, sustained throughout unit.
"	70. Record the introduction to your broadcast.				
"	71. Record a commercial that advertises a unique product.				
"	72. Read and edit current news stories.	TPA B 8.4			
"	73. Record a song into your broadcast.				
"	74. Record audio tracks into your broadcast.				
"	75. Report a weather bulletin.				
"	76. Record the sports into your broadcast.			**End of unit project Students will create a 10-minute news show.	

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MODULAR TECHNOLOGY 2

MODULAR TECHNOLOGY 2

BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	SUGGESTED PACING
Understand basic operations and concepts for graphic design	1. Describe the uses of graphic design	TCA A 6.2		Introduction to Graphic Design Video	1 Week introduction, sustained throughout unit.
"	2. Identify at least four careers related to the graphic design industry		Guest Speaker		
"	3. Describe the education required for a career in graphic design	NT A 7.1			
Utilize technology productivity tools for graphic design	4. Load and view files stored on a disk.	TCA B 7.5		Use Corel Draw for hands on activities.	2 Weeks introduction, sustained throughout unit.
"	5. Start a new file				
"	6. Create basic shapes		Rectangle, Circle, Square		
"	7. Use the pencil, rectangle and ellipse tools				
"	8. Stretch and distort images				
"	9. Draw smooth lines				
"	10. Adjust line thickness		1 point, 2 point		
"	11. Duplicate drawn objects	TCA B 7.1	Copy Command		

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MODULAR TECHNOLOGY 2

BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	SUGGESTED PACING
Utilize technology productivity tools for graphic design (cont.)	12. Create blends between objects				
"	13. Create text using CorelDraw				
"	14. Select different fonts and styles of text		Times New Roman or Ariel		
"	15. Rotate text		45 to 90 degrees		
"	16. Demonstrate a working knowledge of the graphic editing capabilities of CorelDraw software.			**End of unit project: Combine several images and create T-Shirt	1 Week for project
Understand basic operations and concepts for flight trainer	17. Describe four primary flight controls and their use in controlling an aircraft in flight.	NT A 6.3	Yoke, Ailerons, pedals, flaps		1 Week introduction, sustained throughout unit.
"	18. Demonstrate the ability to use a map to plan a flight.				
"	19. Identify at least four careers related to the aviation industry			Guest Speaker	
"	20. Identify different training programs necessary for a career in aviation.				

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BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	SUGGESTED PACING
Utilize technology productivity tools for flight trainer	21. Use the rudder, elevator and ailerons to keep the plane airborne for five minutes.	NT B 8.5		Microsoft Flight Simulator	2 Weeks introduction, sustained throughout unit.
"	22. Demonstrate the ability to make coordinated turns to a specific heading				
"	23. Interpret heading and altitude instrument readings.				
"	24. Use the throttle and yoke to adjust the heading and altitude to settings				
"	25. Taxi airplane to a designated runway.			Microsoft Flight Simulator	
"	26. Perform an engine run-up to check magnetos				
"	27. Take off and climb out to a specified altitude and heading.				
"	28. Perform a takeoff				
"	29. Fly specified headings and altitudes and land				
"	30. Use basic navigation tools.			**End of unit project. Students will navigate to 3 different airports.	1 Week for project

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MODULAR TECHNOLOGY 2

BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	SUGGESTED PACING
Understand basic operations and concepts for 3D modeling	31. Describe some of the uses of three-dimensional modeling.	NT B 7.2	Architecture, engineering		1 Week introduction, sustained throughout unit.
"	32. Recognize the use of three-dimensional modeling in the media.			Watch video of uses in media	
"	33. Identify the different basic primitive shapes.		Box, cylinder, prism		
"	34. Identify at least four careers related to computer graphics industry.			Internet Research	
Utilize technology productivity tools for 3D modeling	35. Combine primitives to create complex 3D objects.	NT A 8.1		Use 3d Studio Max software	2 Weeks introduction, sustained throughout unit.
"	36. Combine primitives to create representations of actual objects.				
"	37. Adjust the screen size of objects.				
"	38. Render objects to view them as solid 3D.	TPA B 7.2	Render- redraw an image in its solid form.		
"	39. Demonstrate an ability to create and modify objects.				

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MODULAR TECHNOLOGY 2

BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	SUGGESTED PACING
Utilize technology productivity tools for 3D modeling (cont.)	40. Select objects to be modified.				
"	41. Describe the use of surfaces in 3D modeling.		Surface – a skin of an object to be modified.	Use 3d Studio Max software	
"	42. Apply surfaces to make realistic 3D images.				
"	43. Create a simple two-dimensional drawing.		Object that has width and length, but no depth.		
"	44. Create text as 2D object.	TCA A 8.4			
"	45. Describe the use of lofting as a tool to make round objects.		Lofting – the process of giving a 2D image depth.		
"	46. Loft and render complex 2D graphics into 3D shapes.				
"	47. Describe the location of points.	TCA A 8.5			
"	48. Use the N-gon and text tools.		Create polygons with any number of sides.	**End of unit project. Students will create a 3D animation.	1 Week for project

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MODULAR TECHNOLOGY 2

BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	SUGGESTED PACING
Understand basic operations and concepts for digital photography	49. Identify possible careers and occupations available in the field of digital photography.			Guest Speaker	1 Week introduction, sustained throughout unit.
"	50. Identify different training programs necessary for a career in digital photography.				
Utilize technology productivity tools for digital photography	51. View a slide table.			Use photo enhancer software.	2 Weeks introduction, sustained throughout unit.
"	52. View an image created with the digital camera.				
"	53. Zoom in and out on an image.				
"	54. Manipulate the control options of the digital camera to take pictures in many different situations.	TCA B 7.5			
"	55. Take pictures with a digital camera.				
"	56. Connect the digital camera to the computer.			Use Photo enhancer software.	

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MODULAR TECHNOLOGY 2

BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	SUGGESTED PACING
Utilize technology productivity tools for digital photography (cont.)	57. Operate the major controls of the camera through the software interface with the computer.		Zoom, shutter speed, flash		
"	58. Clear images from the camera by using the software controls.	TCA B 7.5	Edit-Erase all		
"	59. Demonstrate knowledge of lighting techniques by manipulating the light prior to taking a photograph.		Direct and Indirect light		
"	60. Explain the difference between the different types of lighting a photographer can utilize.		Natural, artificial	**End of unit project. Students will take and edit photographs.	1 Week for project

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COMPUTER APPLICATIONS

COMPUTER APPLICATIONS

OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	CURRICULUM CONNECTION
Analyze ethical and legal technology issues and formulate solutions and strategies that foster responsible technology usage.	1. Practice responsible usage of technologies (e.g., download legally, install licensed software, adhere to copyright restrictions).	TSI D 9.1	Students will read and discuss current events in technology regarding illegally downloaded files, installing non-licensed software, and copyright restricted files.	Newspaper, magazine and Internet articles.	
"	2. Describe/discuss the ethical considerations involved in the development or deployment of a technology.	TSI D 10.1			
"	3. Predict what might happen if the principles of intellectual property were ignored in one's own community.	TSI D 12.1	Students will generate a written paper discussing their technology predictions for the future.	Microsoft Office Suite	
"	4. Forecast changes in laws and legislation that might result from the exponential growth of technology.	TSI D 12.2	Students will generate a written paper discussing their technology predictions for the future.	Microsoft Office Suite	
"	5. Respect the principles of intellectual freedom and intellectual property rights.	TSI D 12.3	Students will generate a written paper discussing their technology predictions for the future.	Microsoft Office Suite	

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OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	CURRICULUM CONNECTION
Integrate conceptual knowledge of technology systems in determining practical applications for learning and technical problem solving.	6. Explore state-of-the-art devices to store data that will be used for researching projects.	TPA A 9.1	Students will save data to a network drive, floppy drive and CD-ROM.	Network computer with floppy and CD burner.	
"	7. Apply strategies for identifying and solving routine hardware and software problems that occur during everyday use.	TPA A 10.3	Students will develop a troubleshooting list of common problems with computers and printers.	Microsoft Suite	
"	8. Explore state-of-the-art devices to store data.	TPA A 11.2	Students will save data to a network drive, floppy drive and CD-ROM.	Network computer with floppy drive and CD burner.	
Identify, select and apply appropriate technology tools and resources to produce creative works and to construct technology-enhanced models.	9. Demonstrate proficiency in all productivity tools (e.g., word processing, spreadsheet, database, desktop publishing).	TPA B 9.2	Students will perform basic word processing functions. Students will create spreadsheets with formulas. Students will sort data within a spreadsheet. Students will modify and enhance spreadsheet data.	Microsoft Suite	

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OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	CURRICULUM CONNECTION
	10. Use effective keyboarding skills			Mavis Beacon software and assessment	
Identify, select and apply appropriate technology tools and resources to produce creative works and to construct technology-enhanced models. (cont.)	11. Demonstrate proficiency in all productivity tools (e.g., word processing, spreadsheet, database, desktop publishing). (cont.)	TPA B 9.2 (cont.)	Students will graph spreadsheet data. Students will apply database design principles. Students will search/sort databases. Students will apply queries to a database and generate database reports. Students will apply design principles to a brochure layout using desktop publishing software.	Microsoft Suite	
"	12. Identify and use input and output devices to operate and interact with computers and multimedia technology resources.	TPA B 9.1	Students will save, retrieve and print documents.	Appropriate peripheral devices	
"	13. Identify/recognize state-of-the-art technology tools for solving problems and managing personal/professional information.	TPA B 10.3			

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Identify, select and apply appropriate technology tools and resources to produce creative works and to construct technology-enhanced models. (cont.)	14. Utilize advanced word processing and desktop publishing features and programs.	TPA B 10.1	Students will merge data from all productivity tools (e.g., word processing, spreadsheet, database, desktop publishing).	Microsoft Suite	
"	15. Use equipment related to computer and multimedia technology imaging (e.g., digitalization, optical characters recognition, scanning, calculators, computerized microscopes).	TPA B 10.2	Students will insert media into all productivity tools (e.g., word processing, spreadsheet, database, desktop publishing).		
"	16. Apply emerging technology tools and resources for managing and communicating personal/professional information (e.g., distance-learning, voice-recognition tools, personal digital devices).	TPA B 11.1	Students will be exposed to the uses of PDAs, etc.		

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OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	CURRICULUM CONNECTION
Apply appropriate communication design principles in published and presented projects.	17. Format text, select color, insert graphics and include multimedia components in student-created media/ communication products.	TCA A 9.1	Students will create, format and edit documents.	Microsoft Suite	
"	18. Examine how and why image, language, sound and motion convey specific messages designed to influence the audience	TCA A 9.3			
Create, publish and present information, utilizing formats appropriate to the content and audience.	19. Use technology to publish information in electronic form (e.g., Web, multimedia, digital video, electronic portfolio).	TCA B 9.2	Students will create a basic web page. Students will create a multimedia presentation.	Microsoft Suite	
"	20. Publish information in printed and electronic version, and select appropriate publication format (e.g., paper, Web, video).	TCA B 10.1	Students will create handouts for a multimedia presentation.		

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Create, publish and present information, utilizing formats appropriate to the content and audience. (cont.)	21. Archive communication products in appropriate electronic forms (e.g., store electronic publications so that they may be accessed when needed).	TCA B 11.1	Students will save, retrieve and print documents.	Microsoft Suite	
"	22. Use Web technologies to disseminate information to a broader audience.	TCA B 12.1	Students will create a web page for a class with links to pages specifically relative to that class.	Microsoft Suite	
Formulate advanced search strategies, demonstrating an understanding of the strengths and limitations of the Internet, and evaluate the quality and appropriate use of Internet resources.	23. Identify multiple directories and search engines matching curricular need (e.g., given an assignment, use knowledge of tools to pick an appropriate tool to search for information).	TIL C 9.1	Students will complete a web-based scavenger hunt.	Internet Browser	

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Formulate advanced search strategies, demonstrating an understanding of the strengths and limitations of the Internet, and evaluate the quality and appropriate use of Internet resources. (cont.)	24. Construct search strategies focused on the retrieval of specific search results by incorporating Boolean operators (AND, OR, NOT) and adjacency/proximity techniques.	TIL C 9.2			
"	25. Compare and chart the search results from multiple Web sites to check for consistency of information (e.g., compare data on acid rain from more than one site).	TIL C 9.3			
"	26. Establish a criteria for evaluating the information retrieved through Internet searching: author's expertise, bias, coverage of topic and timeliness.	TIL C 9.4			

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Formulate advanced search strategies, demonstrating an understanding of the strengths and limitations of the Internet, and evaluate the quality and appropriate use of Internet resources. (cont.)	27. Construct an effective search strategy to retrieve relevant information through multiple search engines, directories and Internet resources.	TIL C 10.1	Students will evaluate different types of search engines and determine what types are most effective for various types of searches.	Internet Browser	
"	28. Narrow or broaden the search strategy by modifying the keywords entered in the original search strategy.	TIL C 10.2			
"	29. Employ a systematic approach to judge the validity of Web information and the match against the defined information need (e.g., researching an author through the Web requires finding biographical information plus criticisms of the author's works).	TIL C 10.3			

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Formulate advanced search strategies, demonstrating an understanding of the strengths and limitations of the Internet, and evaluate the quality and appropriate use of Internet resources. (cont.)	30. Examine the information retrieved through Internet searching for authenticity of information, bias, currency, relevance and appropriateness.	TIL C 10.4	Students will use a predefined tool for checking a website's bias.	Internet Browser Kathy Schrock's Teacher Web Tools: www.kathyschrock.net	
"	31. Demonstrate the use of parentheses for nesting search terms to alter retrieval strategies through multiple Internet resources.	TIL C 11.1			
"	32. Create a product on a specific curricular topic that includes annotated Web sites constructed according to a standard style manual (e.g., electronic pathfinder on careers).	TIL C 11.2			
"	33. Develop a systematic approach to judge the value of the retrieved Web information.	TIL C 11.3			

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Formulate advanced search strategies, demonstrating an understanding of the strengths and limitations of the Internet, and evaluate the quality and appropriate use of Internet resources. (cont.)	34. Synthesize search results retrieved from a variety of Internet resources to create an information product for a targeted audience.	TIL C 12.3			
"	35. Incorporate defined field searching by initiating a search string identifying the desired field of information to be retrieved (e.g., search author or title).	TIL C 12.1	Students will create a web page for a class with links to pages specifically relative to that class.		
"	36. Critique research retrieved through the Internet for authority, accuracy, objectivity, currency, coverage and relevancy.	TIL C 12.4			

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Evaluate choices of electronic resources and determine their strengths and limitations.	37. Integrate search strategies within the electronic resource that target retrieval for specific information need (e.g., limit by date of publication, focus on specific format such as image, sound file).	TIL D 9.1			
"	38. Review strengths and weaknesses of various types of electronic resources for research need (e.g., compare subject specific magazine database to general online index of articles).	TIL D 9.2			

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GRADES 9-12

TECHNOLOGY

GRADES 9-12

OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	CURRICULUM CONNECTION
Students will use and discuss computer and multimedia technology.	1. Use equipment related to computer and multimedia technology imaging, e.g. digitization, scanning, calculators, computerized microscopes, optical characters recognition, etc.	TPA B 10.3	Students will write a summary of a current technology article from a newspaper or magazine.	Microsoft Office	Newspaper, photography, computer graphics, marketing, social studies
Students will learn to operate technology tools that affect specific content areas and network operations.	2. Identify and use input and output devices to operate and interact with computers and multimedia technology resources.	TPA B 9.2	Students will scan photographs and include them within a multi-media presentation	Scanner, digital camera, Adobe Photoshop, PowerPoint, PageMaker	Cross curriculum, computer graphics
	3. Increase speed and accuracy when keyboarding in a word processing environment and transition to desktop publishing.				Advanced computer applications

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TECHNOLOGY

GRADES 9-12

OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	CURRICULUM CONNECTION
Students use new and emerging productivity tools to construct technology-enhanced models, to prepare publications and to produce creative works.	4. Identify/recognize emerging technology tools for managing personal/professional information.	TPA B 10.1	In preparation for college visits, 11 th and 12 th grade students will burn their career passport files to CD to show admission officers.	Tax software, Excel, Internet	Career Passport, stock market simulation, accounting
Students will process, organize and maintain data and generate new data, information and knowledge	5. Cite sources using a standard bibliographic method.	TIL B 9.5		Library	Career Passport, English, library, psychology
"	6. Use an organized system to store and maintain information.	TIL B 9.4			
"	7. Describe a variety of systems for organizing information resources, e.g. networks, external storage drives, digital media.		Students will send an email to their teacher with their homework attached.	NIMS email system	Across curriculum

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GRADES 9-12

OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	CURRICULUM CONNECTION
Students will process, organize and maintain data and generate new data, information and knowledge. (cont.)	8. Digitize information for archiving and future use, e.g. creating an electronic portfolio of curricular projects.	TPA A 9.2	Students will create a portfolio directory in their home folder on the network; they will create the components of the career passport and maintain and update those each year.	Office Suite	Career Passport
Capitalize on the synergy between and among technologies and other fields of study when solving technological problems.	9. Describe how trademarks, patents and copyrights protect technological ideas and intellectual property.	NT D 10.2	Students will check papers they have written for plagiarism utilizing Turn-It-In.com.	www.turnitin.com	Business law, AP computer science, library
"	10. Cite examples of how technological progress is integral to the advancement of science, mathematics and other fields of study.	NT C 10.3			Across curriculum
Students will learn to operate technology tools that affect specific content areas and network operations.	11. Demonstrate proficiency in word processing and desktop publishing.	TPA B 9.1		Office Suite	Across curriculum, advanced apps, newspaper, yearbook

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GRADES 9-12

OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	CURRICULUM CONNECTION
Students will compare technologies and select, evaluate, troubleshoot and maintain the operation of emerging technology systems.	12. Use media and technology resources for presenting information, e.g. distance learning equipment, interactive boards, etc.	TPA B 9.2	Students will use wireless laptops to research specific content areas.	Smart Board, Distance Learning Lab, wireless cart	Across curriculum
"	13. Identify/recognize strategies for identifying and solving routine hardware and software problems that occur during everyday use.	TPA A 9.1	Students will start or re-start their computers.		Across curriculum
Students will define tasks, identify strategies to find information and evaluate the effectiveness of their solutions.	14. Use a recognized research model or personally developed model to conduct independent research.	TIL B 12.1	Students will distinguish good and bad Internet sites.	Internet, various library resources	English, social studies, library
"	15. Develop effective search strategies for defined information needs for both school projects and personal needs.	TIL C 10.1			Library

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TECHNOLOGY GRADES 9-12

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Students will define tasks, identify strategies to find information and evaluate the effectiveness of their solutions. (cont.)	16. Modify a search through the use of different keywords and other techniques specific to a database or search engine.	TIL D 11.1	Students will apply Boolean logic to Internet searching.	Internet	Library
"	17. Routinely use more than one search engine to perform an advanced search.	TIL C 10.1		Internet meta-search engines	Library
"	18. Identify and evaluate relevant information and select pertinent information found in each source.	TIL A 10.1			Library
"	19. Use a variety of technology resources for curriculum needs and personal information needs.	TIL A 11.1	Students will use the on-line catalog to check if a book or resource is available		Career Passport, stock market, accounting
"	20. Use online resources to meet needs for research and communication on a routine basis.	TIL C 10.2		Edline, Email	Across curriculum

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GRADES 9-12

OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	CURRICULUM CONNECTION
Students will define tasks, identify strategies to find information and evaluate the effectiveness of their solutions. (cont.)	21. Adhere to copyright and intellectual property rights when creating new products.	TSI D 12.3		www.turnitin.com	Across curriculum
"	22. Identify relevant facts, check facts for accuracy and record appropriate information.	TIL A 10.2			Across curriculum
"	23. Evaluate information, e.g. accuracy, currency, bias, profit generating, etc.	TIL A 9.1		Office Suite	Across curriculum
"	24. Use standard bibliographic format to list sources.	TIL A 10.3	Students will use on-line resources to help generate a bibliography.	www.noodle.com	English, social studies, library
"	25. Create an information product to communicate information.	TCA A 9.1		Office Suite	Across curriculum
"	26. Review and evaluate research resources used.	TIL A 12.3		Office Suite	Across curriculum
"	27. Determine if completed product reflects original information need.	TIL B 9.6		Office Suite	Across curriculum

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TECHNOLOGY GRADES 9-12

OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	CURRICULUM CONNECTION
Students will identify, differentiate, evaluate and incorporate information retrieved by accessing the Internet & all other available electronic resources.	28. Generate search strategies and choose appropriate tool or site for need, e.g. search for information on an author for a paper about their particular literary style.	TIL C 9.1	Students will distinguish good and bad Internet sites.		English, social studies, library
"	29. Use Boolean searching routinely as appropriate to specific search engines and their structure.	TIL C 9.2			Web class
"	30. Demonstrate differences between search engines by comparing search results.	TIL C 9.2			Web class
"	31. Use a systematic approach to judge the validity of Web information, e.g. examine each Website used for authority, accuracy, consistency and currency.	TIL C 9.4	Students will distinguish good and bad Internet sites.		Web class

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TECHNOLOGY

GRADES 9-12

OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	CURRICULUM CONNECTION
Students will apply appropriate communication design principles in their published and presented projects.	32. Explore and manipulate design elements when creating print media, multimedia, video and Web products.	TCA A 10.2	Teacher will display various newspaper front pages and students will evaluate them based on appearance and organization.	Newspapers, magazines, Internet	Advanced apps, newspaper, photography, computer graphics, marketing, social studies
"	33. Select and evaluate message appropriate fonts and formatting for print media and multimedia, video and Web pages for curricular and personal needs.	TCA A 11.2		Office Suite	Advanced apps, newspaper, photography, computer graphics, marketing, social studies, Web class
"	34. Evaluate the psychological impact and cultural connotations of color when designing for print media and multimedia, video and Web pages.	TCA A 11.1		Newspapers, magazines, Internet	Computer graphics, marketing
"	35. Apply principles of design when selecting or creating graphics and images for print media and multimedia.	TCA A 11.3	Students will create a brochure selling a product.	Office Suite	Computer graphics, marketing

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 DW = Designed World

TSI = Technology & Society Interaction
 TIL = Technology & Information Literacy

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Line 2: Ohio Benchmark Within Standard

Line 3: Grade Level . Indicator Number

TECHNOLOGY

GRADES 9-12

OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	CURRICULUM CONNECTION
Students will apply appropriate communication design principles in their published and presented projects. (cont.)	36. Apply principles of design for curricular and personal needs when manipulating file formats such as jpg, wave, and avi for video and Web pages.	TCA A 10.2	Students will create an I-movie	I-movie software	Computer graphics, marketing
"	37. Apply principles of design when creating print media and multimedia, video and Web pages, such as framing shots and set design for video.	TCA A 12.6	See #36		Computer graphics, marketing, modular technology
Students define, develop, publish and present information, selecting formats appropriate to the content and audience.	38. Preview presentation and revise based on student-designed rubric, which includes design, usage (spelling/grammar) and content.	TCA B 10.2			Across curriculum
"	39. Understand and use image file formats appropriate to communication need and audience.	TCA B 12.2	Students will develop a box to help sell a product.	Adobe software, Office Suite	Computer graphics, marketing, Web design, advanced apps

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TECHNOLOGY

GRADES 9-12

OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	CURRICULUM CONNECTION
Students define, develop, publish and present information, selecting formats appropriate to the content and audience. (cont.)	40. Create non-linear electronic slideshows with multimedia effects.	TCA B 12.3		Office Suite	Computer graphics, Web design, advanced apps, social studies, marketing
"	41. Create video production with original script for defined communication need and audience.	TCA A 12.2		I-movie software	Drama, modular technology
"	42. Understand and use basic markup language as needed to improve a Web product.	TCA B 9.2	Students will generate a basic Web page for a core content area teacher.	Office Suite	Web design
"	43. Evaluate communication project process and product.	TCA A 12.1			Across curriculum

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TECHNOLOGY GRADES 9-12

OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	CURRICULUM CONNECTION
Students identify communication needs, select appropriate telecommunication tools and design collaborative interactive projects and activities to communicate with others, incorporating emerging technologies.	44. Incorporate online resources into research, course work, and inquiries, formatting, evaluating and disseminating findings.	TCA C 11.2	Students will create a presentation with active Internet links.	Office Suite, Internet	Across curriculum
"	45. Create and present collaborative online projects, e.g. conduct research on local employers and job opportunities.	TCA C 11.3		Office Suite, Internet	Web design

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WEB PAGE DESIGN

WEB PAGE DESIGN

OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	SUGGESTED PACING
Understand principles of Web page design	1. Plan a Web site	TPA A 112.1	Identify the goal of the page, analyze the audience, and diagram the site.	Storyboard	3 weeks introduction, sustained throughout course.
"	2. Understand what attracts users and what causes users to leave a page.	TCA A 11.3	Make good choices of colors, fonts, font sizes, using images and icons for navigation, aligning text and images, using background images	Visit commercial Web sites to view examples of good and bad design.	
Create Web pages using Web development software.	3. Use wizards and templates to create Web pages.		Modify templates, graphics, bullets, and horizontal bars	Dreamweaver, Adobe Acrobat	3 weeks introduction, sustained throughout course.
"	4. Insert headings, images, tables, references within page and hyperlinks. Create PDF files				
Understand Basic HTML tags	5. Learn how to view HTML code		File, View Source	First Page or Visual Studio	2 weeks introduction.
"	6. Edit and modify existing HTML code		Can use notepad, but Visual Studio color codes tags		

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WEB PAGE DESIGN

OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	SUGGESTED PACING
Understand Basic HTML tags (cont.)	7. Use HTML tags to create: text formatting, color changes, hyperlinks, images.		Create basic pages to gain familiarity with tags		
Understand Advanced HTML tags	8. Use HTML tags to create: tables, rules, headers, titles, comments, references within pages		Create complex pages to further familiarity with tags		2 weeks introduction.
Increase productivity and master intermediate Web design techniques	9. Create and use style sheets, forms, Javascript, image maps, applets, Flash graphics		What is Java? Evolution of the JavaScript Language JavaScript Versions and Browser Support Find Java Applets Java Applet Examples Understanding class files The <APPLET> Tags and Attributes	Dreamweaver/Flash Java to produce applets	Differentiated instruction according to student ability; 2-3 weeks introduction.

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WEB PAGE DESIGN

OHIO BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	SUGGESTED PACING
Master FTP protocol	10. Update High School Web page according to assigned responsibility	TPA B 11.1	Upload files to the Web	FTPexplorer	1 week introduction, sustained throughout course.
Automate Web updating tasks using perl scripts	11. Master syntax of perl programming language: Conditionals Iterative statements File manipulation Interactive scripts		Creation of cgi scripts using perl	perl assembler	Differentiated instruction according to student ability; 2-3 weeks introduction.
Learn the use of a digital camera and manipulation of digital images	12. Master use of digital camera, lighting, lens settings.		“Cover” various CFHS events	Adobe Photoshop	3 weeks introduction, sustained throughout course.
"	13. Master digital photo editing, special effects, resolution, brightness, contrast, color balance.		Manipulate images for appropriate use		

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**ADVANCED PLACEMENT
COMPUTER SCIENCE**

ADVANCED PLACEMENT COMPUTER SCIENCE

COLLEGE BOARD BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	SUGGESTED PACING
Object Oriented Program Design Class Design	8. Design and implement a class. 9. Design an interface 10. Choose appropriate data representation and algorithms. 11. Apply functional decomposition. 12. Extend a given class using inheritance. 13. Design and implement a set of interacting classes. 14. Choose appropriate advanced data structures and algorithms	I B1 I B2 I B3 I B4 I B5 I B1 I B3	 AB only AB only	http://www.chagrin-falls.k12.oh.us/CFHS/apcs/Lab7.htm http://www.chagrin-falls.k12.oh.us/CFHS/apcs/karellab3.htm http://www.daveranck.com/SoftwareDev/NetReference/136.aspx	6 months
Program Implementation Implementation Techniques	15. Methodology Object-oriented development Top-down development Encapsulation and information hiding Procedural abstraction	II A1a II A1b II A1c II A1d	Introduce using ideal prototypical example – reinforce through every lab in course	http://chortle.ccsu.edu/CS151/Notes/chap33/ch33_1.html	ALL

ADVANCED PLACEMENT COMPUTER SCIENCE

COLLEGE BOARD BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	SUGGESTED PACING
Program Analysis Testing	21. Testing classes and modules in isolation 22. Identifying boundary cases and generating appropriate test data 23. Integration testing	III A1 III A2 III A3		http://www.collegeboard.com/student/testing/ap/compsci_a/case.html	
Program Analysis Debugging	24. Categorizing errors: compile-time, run-time, logic 25. Identifying and correcting errors 26. Techniques	III B1 III B2 III B3	Using a debugger, adding extra output statements, hand-tracing		
Program Analysis Code	27. Understanding and modifying existing code 28. Extend existing code using inheritance	III C III D		Karel J Robot http://csis.pace.edu/%7Ebergin/KarelJava2ed/Karel++JavaEdition.html	
Program Analysis Error Handling	29. Understand error handling Understand runtime exceptions Throw runtime exceptions	III E1 III E2	AB only	http://java.sun.com/docs/books/tutorial/essential/exceptions/throwing.html	2 weeks
Program Analysis Reasoning about programs	30. Pre/post conditions 31. Assertions 32. Invariants	III F1 III F2 III F3	AB only	http://www.cs.duke.edu/~ola/patterns/plopd/invariant.html	1 week

ADVANCED PLACEMENT COMPUTER SCIENCE

COLLEGE BOARD BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	SUGGESTED PACING
Program Analysis Analysis of algorithms	33. Informal comparisons of running times 34. Exact calculation of statement execution counts 35. Big O notation 36. Worst case/average case time and space analysis	III G1 III G2 III G3 III G4	Insert timers into sort code and compare running time Predict Big O results and compare to actual times AB only	http://www.minich.com/education/wyo/datastructures/datastructuresch18/Sorting_Algorithm_Summary.pdf	2 weeks
Program Analysis Numerical representations and limits	37. Representation of numbers in different bases 38. Limitations of finite representations	III H1 III H2	Integer bounds, imprecision of floating-point representations, and round-off error – For example perform factorials and see results become 'negative' when overflow		1 week
Standard Data Structures	39. Simple data types	IV A	int, boolean, double		Throughout course
	40. Classes	IV B			ALL
	41. One-dimensional arrays	IV C			6 months
	42. Two-dimensional arrays	IV D			2 months

ADVANCED PLACEMENT COMPUTER SCIENCE

COLLEGE BOARD BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	SUGGESTED PACING
	43. Linked Lists	IV E	Appendix D AB only – Create a calendar of events using linked lists	http://www.chagrin-falls.k12.oh.us/CFHS/apcs/CalendarLabAB.htm	4 weeks
	44. Stacks	IV F	Appendix E AB only – Convert an infix expression to postfix	http://www.spsu.edu/cs/faculty/bbrown/web_lectures/postfix/	3 weeks
	45. Queues	IV G	Appendix E AB only – create a small email program		2 weeks
	46. Trees	IV H	Appendix D AB only – write a guessing game that ‘learns’	http://www.cs.hope.edu/~algaanim/cca/tree.html	6 weeks
	47. Heaps	IV I	AB only – convert a heap to a binary tree	http://www.diku.dk/forskning/performance-engineering/Jesper/heaplab/heapsurvey_html/rapport.html	2 weeks
	48. Priority queues	IV J	Appendix E AB only		1 week
	49. Sets	IV K	AB only		2 weeks
	50. Maps	IV L	AB only		2 weeks

ADVANCED PLACEMENT COMPUTER SCIENCE

COLLEGE BOARD BENCHMARK	INDICATOR	REF.	CLARIFICATION	RESOURCES/ SUGGESTIONS	SUGGESTED PACING
Operations on data structures	51. Traversals 52. Insertion 53. Deletion 54. Iterators	V A1 V A2 V A3 V A4	AB only	http://www.doc.ic.ac.uk/~sjn/5/java/Lecture9.pdf	3 weeks
Searching	55. Sequential 56. Binary 57. Hashing	V C1 V C2 V C3	AB only	http://www.cis.temple.edu/~ingargio/cis587/readings/more-research.html	3 weeks
Sorting	58. Selection 59. Insertion 60. Mergesort 61. Quicksort 62. Heapsort	V D1 V D2 V D3 V D4 V D5	Compare efficiency and algorithms AB only AB only	Sorting animations http://www.cs.hope.edu/~deshem/reu/posters97/brummund/research/ccaa/sandeep.html	3 weeks
Major hardware components	63. Primary and secondary memory 64. Processors 65. Peripherals	VI A1 VI A2 VI A3		http://www.staff.uaf.edu/fnjbh/WebComputer%20Basics_files/frame.html	1 week
System software	66. Language translators 67. Virtual machines 68. Operating systems	VI B1 VI B2 VI B3			1 week
Types of systems	69. Single-user 70. Networks	VI C1 VI C2			1 week
Responsible use of computer systems	71. System reliability 72. Privacy 73. Legal issues and intellectual property 74. Social & ethical ramifications of computer use	VI D1 VI D2 VI D3 VI D4		http://cyberethics.cbi.msstate.edu/	1 week

EVALUATION

Evaluation is an integral part of the instruction and curricular processes because it provides the means for measuring the outcomes of instruction in relation to the established technology benchmarks and indicators.

PUPIL EVALUATION TECHNIQUES

- Student assessment will be enhanced through the applications and use of appropriate technology tools.
- A mechanism will be put in place to measure student progress with respect to the development of basic technology skills.
- Appropriate remediation resources will be available to support new students and teachers in the district who may be deficient in basic technology skills.

PROGRAM EVALUATION

Baseline technology skills and competencies will be reviewed each year to ensure their appropriateness and relevance.

**CHAGRIN FALLS EXEMPTED VILLAGE SCHOOLS
COURSE OF STUDY DEVELOPMENT**

2002-2003	Technology Business Library	2010-2011	English/Language Arts	2018-2019	Art Social Studies
2003-2004	Mathematics Health Physical Education	2011-2012	Foreign Language Family and Consumer Science	2019-2020	Computer Business Library
2004-2005	English/Language Arts	2012-2013	Music Science K-12 Guidance	2020-2021	English/Language Arts
2005-2006	Foreign Language Family and Consumer Science	2013-2014	Art Social Studies	2021-2022	Foreign Language Family and Consumer Science
2006-2007	Music Science K-12 Guidance	2014-2015	Technology Business Library	2022-2023	Music Science K-12 Guidance
2007-2008	Art Social Studies	2015-2016	Mathematics Health Physical Education	2023-2024	Art Social Studies
2008-2009	Technology Business Library	2016-2017	Foreign Language Family and Consumer Science	2024-2025	Technology Business Library
2009-2010	Mathematics Health Physical Education	2017-2018	Music Science K-12 Guidance		