

ODE TECHNOLOGY GUIDELINES

~GRADE 3~

Nature of Technology—Students develop an understanding of technology, its characteristics, scope, core concepts and relationships between technologies and other fields.

Benchmark A: Compare and discuss the characteristics of technology in our community.

- ___1. Describe how things found in nature differ from things that are human-made (e.g., compare animal structures, such as nests and dens, and human-made structures used for shelter).
- ___2. Identify technology in the classroom and discuss its use.
- ___3. Demonstrate the use of technology in the classroom.
- ___4. List ways that society/government provides technology benefits for everyone (e.g., bus systems, water and sewage systems and mail delivery).

Benchmark B: Identify, describe and discuss the core concepts of technology.

- ___1. Identify the resources, tools and machines, materials, information, energy, people, capital and time that are needed to complete a task (e.g., digital camera, computer, paper, resource materials, electricity, students, money for notebooks and scheduled lab time).
- ___2. Describe different properties of materials: color, weight, mass, hardness, temperature.
- ___3. Describe how tools and machines extend human capabilities such as holding, lifting, carrying, fastening, separating and computing.

Benchmark C: Compare and discuss the relationships among technologies, and the connections between technology and other fields of study.

- ___1. List process examples from each of the seven technological systems (e.g., diagnosing, harvesting, transmitting, printing, flying, welding and building).
- ___2. Understand that each of the seven

technological systems have specialized tools and tools in common.

Technology and Society Interaction—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.

Benchmark A: Define responsible citizenship relative to technology.

- ___1. Discuss how technology may have positive and/or negative consequences.
- ___2. Identify and discuss how products are developed and modified to meet changing individual needs and wants.

Benchmark B: Investigate and explain the interrelationships between technology and the environment.

- ___1. Describe how technology affects the environment in positive and/or negative ways.

Benchmark C: Explain and demonstrate the influence of technology throughout history.

- ___1. Illustrate ways that people have made tools to provide food, make clothing and provide protection.
- ___2. Explain how technology and invention have changed economic and social development in our community.

Benchmark D: Practice responsible use of technology, understand school district guidelines for technology use, and explore technology ownership.

- ___1. Work collaboratively with others, respecting their ideas and needs, when using technology.

- ___2. Understand that people use technology to create new items (products, resources, etc.) and that the creator may own the rights to these items (e.g., an author may create a Web site, a programmer may create software, an inventor may create a device).
- ___3. Know that the district Acceptable Usage Policy (AUP) describes the rules for using classroom technology and the Internet.

Benchmark E: Identify development patterns and examine the influence of technology on the world.

- ___1. Investigate and assess the influence of a specific technology on an individual.
- ___2. Examine the trade-offs involved in selecting or using a product or system.

Technology for Productivity Applications—Students learn the operations of technology through the usage of technology and productivity tools.

Benchmark A: Understand computer and multimedia technology concepts and communicate using the correct terminology.

- ___1. Discuss the purpose of various types of computer and multimedia technology equipment using appropriate terminology.
- ___2. Communicate about computers and multimedia technology using correct terminology.

Benchmark B: Use appropriate tools and technology resources to complete tasks and solve problems.

- ___1. Identify and use input and output devices to operate and interact with computers and multimedia technology resources (e.g., scanner, digital cameras).
- ___2. Discuss networks and their use (e.g., how computers connect to printers, servers and the Internet).
- ___3. Identify and use a variety of software programs.
- ___4. Use technologies for particular content areas (e.g.,

calculators for math, computerized microscopes for science and books on CD-ROM for language arts).

- ___5. Show how you can find answers to problems by using electronic resources including the Internet.
- ___6. Tell a story using presentation software.
- ___7. Touch-type letters on the keyboard with both hands (e.g., begin to learn how to type/keyboard, use continuous keystrokes).

Benchmark C: Use productivity tools to produce creative works and prepare publications.

- ___1. Use and demonstrate how productivity tools support personal productivity (e.g., a word processing application can be used to create a letter, a spreadsheet application can be used to perform calculations, a database program can be used to compile and analyze data).
- ___2. Use and demonstrate how peripherals support personal productivity (e.g., digital cameras are used to create images; scanners are used to create digital images; printers are output devices that allow us to make copies of what is created using technology; storage devices make it possible to store large amounts of information).
- ___3. Identify/recognize technology resources for communication, collaboration, presentation and illustration of thoughts and ideas (e.g., e-mail, graphic organizers, video cameras, handheld devices).

Technology and Communication

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

Benchmark A: Identify the concepts and operations of communication systems.

- ___1. Include the elements of design such as contrast, size and arrangement of student-created projects in print and electronic media.
- ___2. Discuss the costs and connectivity of simple communication systems (e.g., e-mail, phones, Internet services).

Benchmark B: Develop, publish and present information in print and digital formats.

- ___1. Use graphic organizers to sequence and organize information and projects.
- ___2. Incorporate the use of a digital image into a document (e.g., clipart, picture from digital camera or scanned images).
- ___3. Use software to publish information in printed form (e.g., card, calendar, banner).
- ___4. Use graphics and text within a slide show (e.g., create a presentation about Ohio's state bird, symbol or flag, as a presentation using pictures).
- ___5. Send and receive e-mail.

Benchmark C: Use technology communications to participate in online group collaborative interactive projects and activities.

- ___1. Compose, send and reply to e-mail messages with teacher direction.
- ___2. Engage in online learning (e.g., Web activities, virtual field trips, videoconferencing).

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

Benchmark A: Describe types of information: facts, opinions, primary/secondary sources; and formats of information: number, text, sound, visual, multimedia; and use information for a purpose.

- ___1. Distinguish between the concepts of information (organized data and facts) and data (raw facts and figures) and identify examples of each.
- ___2. Recognize that information-gathering is based upon a need (e.g., gather information to learn more about a topic or gather information to answer questions).

Benchmark B: Use technology to find information by applying a research process to decide what information is needed, find sources, use information and check work.

- ___1. Develop questions about an assigned topic and determine where the information may be found.
- ___2. Discuss search words: author, title, subject or topic.
- ___3. Search for information in an online library catalog, electronic encyclopedia or teacher-selected list of Web sites.
- ___4. Select, record and use needed information to answer a question or complete a project.
- ___5. Explain how to find copyright information on a resource (e.g., date of publication, copyright notice, statement of ownership).
- ___6. Give credit to the sources used for work by listing the author, the name of the source and the copyright date.
- ___7. Explain how information was selected.

Benchmark C: Use the Internet to find, use and evaluate information.

- ___1. Label Internet browser elements and explain their function (e.g., toolbar and buttons, favorites/bookmarks, history).
- ___2. Type a simple search term in a teacher- or librarian-selected search engine to find general information (e.g., "weather").
- ___3. Review the home page of a teacher- or librarian-selected Web site.
- ___4. Read the list of results retrieved from a simple search performed in a search engine, select one of the search results and review the information it provides.

Benchmark D: Identify, access and use electronic resources from both free and fee-based Internet sources.

- ___1. Use appropriate access code (username, password) to gain access to online resource (e.g., district network resources, subscription databases and resources that can be accessed remotely—outside the school and/ or from home).
- ___2. Use age-appropriate Internet resources and fee-based (subscription resources) delivered by the Internet.

Design—Students apply a number of problem-solving strategies demonstrating the nature of design, the role of engineering and the role of assessment.

Benchmark A: Describe and apply a design process to solve a problem.

- ___ 1. Describe the purpose of the design process (e.g., a purposeful method of planning practical solutions to problems).
- ___ 2. List the main elements of the design process—problem identification, possible solutions, refinement, analysis, decision, implementation and feedback.
- ___ 3. Identify and collect information about everyday problems that can be solved by technology (e.g., pollution, energy shortage, housing).
- ___ 4. Make sketches to visualize possible solutions to a technological problem (e.g., sketch possible locations to more effectively place trash bins in the cafeteria using a computer drawing program or hand drawings).
- ___ 5. List questions to use in evaluating solutions to a technical problem and distinguish between practical and poor solutions (e.g., does the solution really solve the problem? is it too expensive? is it too hard to do?).

Benchmark B: Describe how engineers and designers define a problem, creatively solve it and evaluate the solution.

- ___ 1. Describe the importance of creativity in designing an object.
- ___ 2. Identify natural forces that buildings must be designed to withstand (e.g., rain, earthquakes, tornados).
- ___ 3. Recognize the importance of the materials to be used in a design (e.g., materials differ in strength, aesthetics, resistance to corrosion and wear).

Benchmark C: Understand the role of troubleshooting in problem-solving.

- ___ 1. Describe how troubleshooting is a way to

find out why something does not work, so that it can be fixed.

- ___ 2. Identify people whose jobs regularly require them to troubleshoot (e.g., a cable repair person and a computer repair technician).

Designed World—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.

Benchmark A: Develop an understanding of how physical technologies enhance our lives.

- ___ 1. Describe how life would be different if we did not have energy delivered to our homes.
- ___ 2. Describe how transportation systems move people and goods from place to place.
- ___ 3. Diagram a processing system that converts natural materials into products (e.g., lumber harvested, transported to lumber mill, debarked, sawn to dimension, dried, transported to lumberyard, purchased, transported to site).
- ___ 4. List systems that are used in buildings (e.g., electrical, heating and air conditioning, plumbing).

Benchmark B: Recognize appropriate modes of technical communication across technological systems.

- ___ 1. Explain how the processing of information, through the use of technology, can be used to help humans make decisions and solve problems.
- ___ 2. Explore the importance of both the sender and receiver having the same understanding of the message.

Benchmark C: Develop an understanding of how bio-related technologies improve our lives.

- ___ 1. Know that vaccines are designed to prevent diseases from developing and spreading; medicines are designed to relieve symptoms and stop diseases from developing.
- ___ 2. Describe how artificial ecosystems are human-made environments that are designed to function as a unit and are comprised of humans, plants and animals.