

# INFOhio Career Exploration Unit



**Grade 9-12**

**Standards:**

**Reading, Writing, Math, Social Studies  
Fine Arts, Career Connection**

## Getting Started with The Lesson

Welcome to INFOhio's Career Exploration Units. These units contain multiple lessons which use INFOhio's digital resources to help students learn, practice, and master key learning standards while learning more about career options. In this lesson, students in Grades 9 -12 will learn more about jobs in the world of technology.

If you have any questions or comments, please go to [support.infohio.org](https://support.infohio.org).

## How to Access INFOhio Resources

INFOhio's license agreements require us to make sure that only Ohio's PreK-12 students, their parents, and educators can use the digital learning content.

We use IP recognition, cookies, and geo-authentication to make it easy for you to use our resources. If our system can automatically recognize that you should have access, you probably don't need to log in with a username and password.

If our system can't automatically recognize that you should have access, you can log in with your INFOhio username and password. You can find the INFOhio username and password for your school by [visiting the INFOhio website](#) and clicking Get Password in the blue box at the bottom of the page.

## Best Practices for Digital Reading

Reading on a screen is different than reading print. The best practices in this guide were collected by the INFOhio Early Learning Task Force from journals, education publications, and research studies. Use these best practices with students of any age to help them become readers who can comprehend, analyze, and evaluate text on the screen or in a book.

- [Best Practices for Digital Reading](#)

### Career Education

Each Career Exploration Unit includes one lesson focusing on careers within the theme to help children discover the variety of jobs available, connect the classroom to real-world situations, and develop work-readiness skills such as teamwork, decision making, and problem solving.

The Tech Careers: Coding and Beyond unit focuses on the Information Technology Cluster. This includes technical and professional level careers in the design, development, support, and management of hardware, software, multimedia, and systems integration services. The four IT pathways are Information Support and Services, Communication Network Services, Programming and Software Development/Applications, and Interactive Multimedia Development.

### Job Focus

Computer Programmer, Database Administrator, Website Developer, Systems Analyst, Technical Education Teacher, Graphic Designer, Software Engineer/Developer.

### Career Connections ODE Career Pathways

Ohio Department of Education has created many Career Pathways that offer an overview of the options available within a career cluster. Each pathway provides information on the education or training needed, outlook for the careers, and wages. Below are some Career Pathways that will be of interest to students interested in working in the world of information technology.

[Interactive Media](#)

[Network Systems 1](#)

[Network Systems 2](#)

[Programming 1](#)

[Programming 2](#)

[Support 1](#)

[Support 2](#)

## Ohio Learning Standards

The INFOhio Career Exploration Unit Tech Careers: Coding and Beyond aligns with these Ohio Learning Standards for Reading. See Extend the Learning for additional activities aligned to other content area standards. This unit address Ohio Learning Standards for Grades 9 -12, but it is easily adapted for other grade levels.

### **Anchor Standard**

Key Ideas and Details. 1. Read closely to determine what the text says explicitly and to make logical inferences from it. Cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

### **Reading Informational Text**

ELA.RI.9-10. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.

ELA.RI.11-12. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain.

## Pretest

Introduce the unit by discussing the term “information technology” and what it means to today’s students. Use a KWL chart to record responses about what students know and what they hope to learn as they explore the topic. Leave the third column (Learn) empty to discuss during the post assessment.

## KWL Chart.

Select a topic you want to research. In the first column, write what you already know about the topic. In the second column, write what you want to know about the topic. After you have completed your research, write what you learned in the third column.

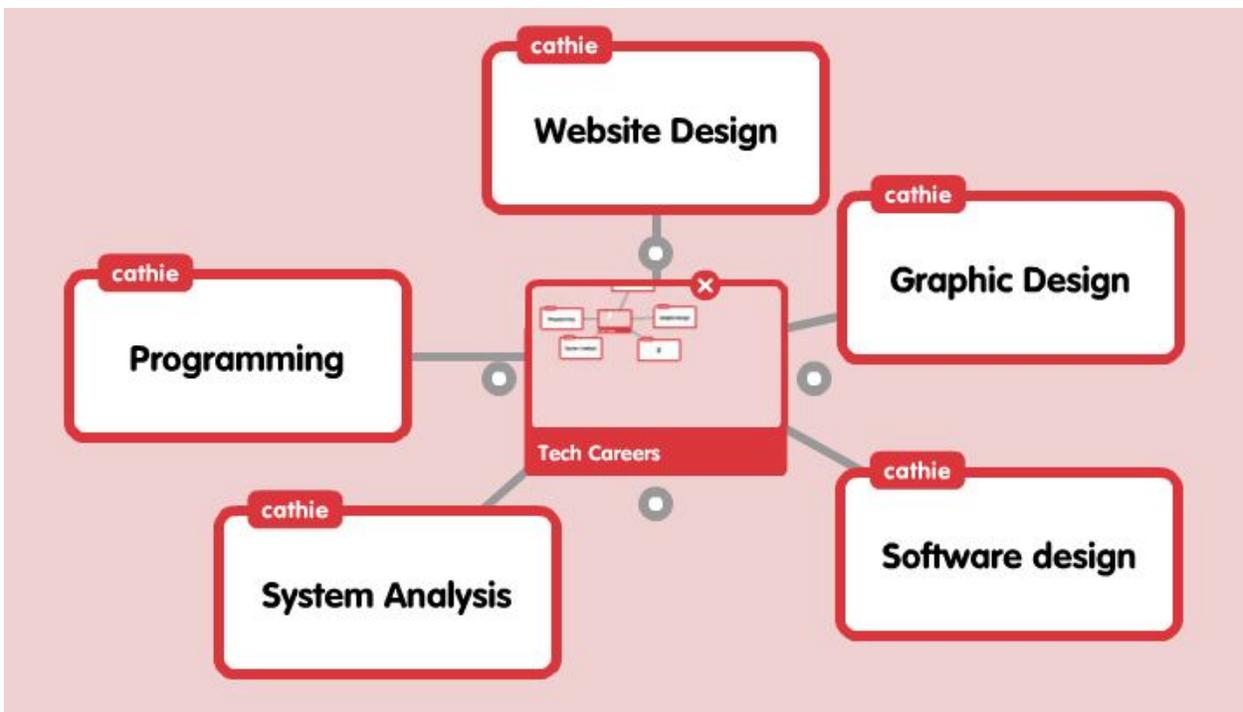
What I <b>K</b> now	What I <b>W</b> ant to Know	What I <b>L</b> earned

## Post Test

Revisit the KWL chart created during the pretest discussion.

- Discuss the information that students discovered as they read about information technology.
- Use a mind mapping tool such as [bubbl.us](https://bubbl.us), [Popplet](https://popplet.com), or [Mind Map \(a Google Chrome extension\)](#) to have students brainstorm a list of terms and ideas that they learned about information technology. What types of careers are part of the field?
- Use the brainstorming activity to add information to the “Learn” column. How did the information they learned change from what they wanted to learn or already knew?

Write a paragraph about information technology and possible careers in the field. Use information from the articles to support your claims.



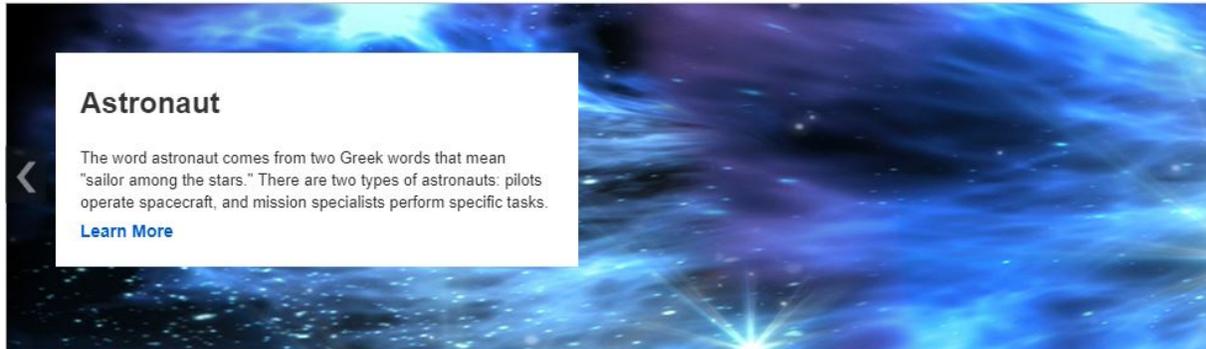
## Lesson 1: Web Design



Enter any words to find books, journals and more

Search

[Advanced Search](#) [Search History](#)



INFOhio provides access to this collection of educational and trade publications at no cost for Ohio students, teachers, and parents. EBSCO's Explora for Grades 9-12 contains full-text articles from magazines, journals, and newspapers.

**Note on PDFs.** Many of the articles in Explora are available in PDF format, which is a scanned image of the original article including pictures. Whenever possible, the PDF format is preferred. If you do not already have it on your computer, you can download a free version of [Adobe Reader](#).

For this lesson use the articles below:

- [Know the Fundamentals and Good Design Will Follow.](#) *Online.* Jan/Feb 2004. Lexile Reading Level: N/A.
- [Do These Web Sites Work?](#) *District Administrator.* March 2007. Lexile Reading Level: N/A.

You can access [Explora for Grades 9-12](#) using this link.

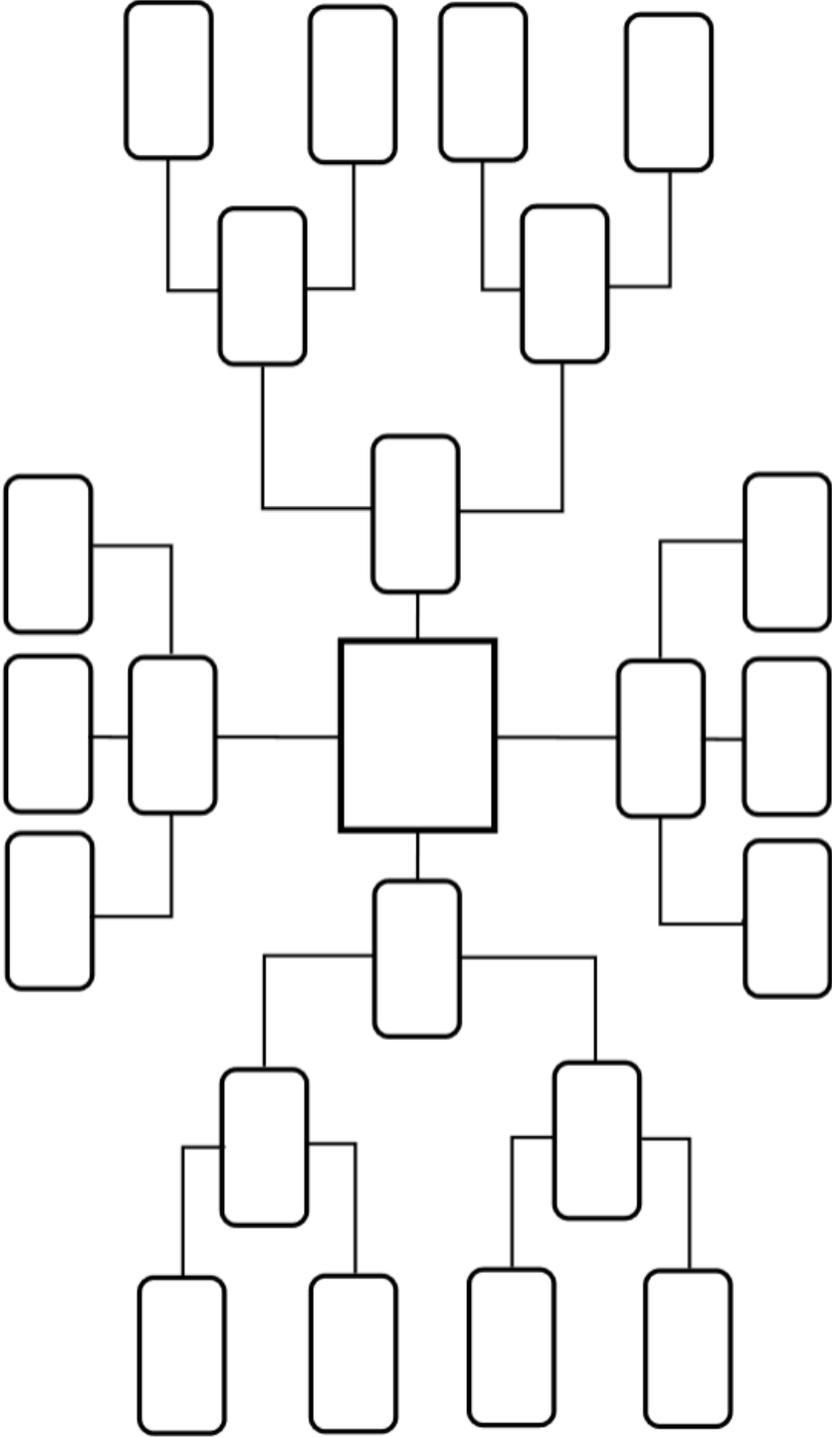
## Activity

### Read and Discuss

Most web professionals use a technique called storyboarding to create a plan for the design and navigation of a website. Storyboarding gives a visual representation of the site's layout to help web developers see the organization and navigational flow. Based on the information that you read about developing a website, create a plan for a new website for your school. Use the storyboard template, "A New School Website", to help with your plan. (60-120 minutes)

**A New School Website**

Use the storyboard to create a design for the basics for a new school website. You do not need to fill in all the boxes. Duplicate the storyboard if more space is needed.



## Differentiation

The article is provided in two formats: HTML and PDF. If using the HTML, the text can be read aloud. By changing the settings, a large box pop ups on the screen as the text is read aloud. Click on the gear next to LISTEN to change the settings for enhanced visibility and pop-up. PDF is in a visual format that can be projected to a white board and shared and discussed with a large group or by individual students.

## Assessment

Based on the information from the two articles, answer the questions using evidence from the text to support your answers.

1. Describe the purpose of the home page of a website.
2. Name two tips to follow for designing an effective website.
3. What does the term "ease of use" mean on a website?
4. What type of tool is useful for planning the design of a website?
5. Name two critical issues that need to change on the school district websites discussed in the article.

**Answers:** 1. Identify the school, direct visitors to more information about the school. 2. Maximize return with minimal effort, keep design simple and consistent, anticipate users' needs, provide a place for feedback. 3. Providing users with information with minimal clicks and minimal effort. 4. Storyboard. 5. Inconsistency in design, cluttered and unorganized pages, limited information about updates, navigation problems, too much information on some pages, not enough on others, links placed in random places, redundant search tool.

Links for standards-based rubrics are listed below or create your own.

### [Iowa Core Standards Based Rubrics](#)

### [Assessments and Rubrics \(Kathy Schrock\)](#)

## Read More About It

[ISearch](#) from INFOhio is the perfect place to read more about web design and maintenance. Find reliable information with just one search. Use the tabs to find articles from encyclopedias, newspapers, magazines, and journals along with primary sources, videos, and eBooks at your reading level. Some suggested search terms are web designer, websites, web design, social media, website development, web maintenance, and other related topics. For more about ISearch, view the [Research Made Easy With ISearch Video](#).

## Lesson 2: Cybersecurity



Searching: Points of View Reference Center | Search Other Databases  
Enter any words to find books, journals and more  Search ?  
Basic Search Advanced Search Search History

INFOhio

Points of View Reference Center

In the News

Engaging China Inclusive Restroom Police Brutality Voter Identification Laws Uber & the Ride-Sharing Industry Mental Illness Awareness

Browse by Category Show All

Reference Shelf

- Curriculum Standards
- Create an Essay Outline
- Charts/Graphs for Topics
- See all research guides

In the Spotlight

November

INFOhio provides access to a collection of educational and trade publications at no cost for Ohio students, teachers, and parents. Points of View includes multiple perspectives on current issues presented in overview essays and journal articles.

For this lesson use these resources:

[Points of View](#): >Internet > Hacktivism.

You can access [Points of View](#) using this link.

## Activity

### Read and Discuss

Hacktivism, cybersecurity, cyberterrorism, free speech, freedom of information. What do all these terms have in common? Should the Internet be used to promote social or political agendas? Research "Hacktivism" in Points of View (EBSCO). Read all three essays: Overview provides general background information on the issue, while the Point and Counterpoint essays present opposing perspectives. Investigate some of the sources cited in the Bibliography at the end of each Point of View essay to review the kinds of sources those authors consulted. Use the graphic organizer to take notes on each of the three short essays. Which arguments about hacktivism do you find the most compelling? Which support your values and beliefs? Based on the readings write a 500 - 1000-word argumentative essay explaining your point of view about using these methods to get across a message. Include a thesis statement, a claim based on your point of view, and textual evidence from the articles to support your claim. Include specific factual references that support your point of view. (60 -120 minutes)

## Point – Counterpoint: Hacktivism

Use the graphic organizer to take notes as you read the Overview, Point, and Counterpoint essays.

Source	Points Supporting Your Position	Points Opposing Your Position
Hacktivism: Overview		
Hacktivism: Point		
Hacktivism: Counterpoint		
Points of View: Hacktivism: Guide to Critical Analysis		
Works Cited: Source		
Works Cited: Source		

## Differentiation

The articles can be projected on a whiteboard or students can read it individually. Readers can choose to listen to the articles by clicking on the speaker. They can download the audio recording of the article as an MP3 or even change the accent of the recording. Lexile levels are available for articles in Points of View.

## Assessment

Use a rubric to assess the argumentative essay. Some examples that can be used or adapted include:

[Argumentative Writing Grading Rubric](#).

[Argumentative Performance Task Writing Rubric](#) (Grades 6-11)

[Persuasion Rubric](#) (Read/Write/Think)

[Rubric for the Assessment of Argumentative Essay](#)

Links for standards-based rubrics are listed below or create your own.

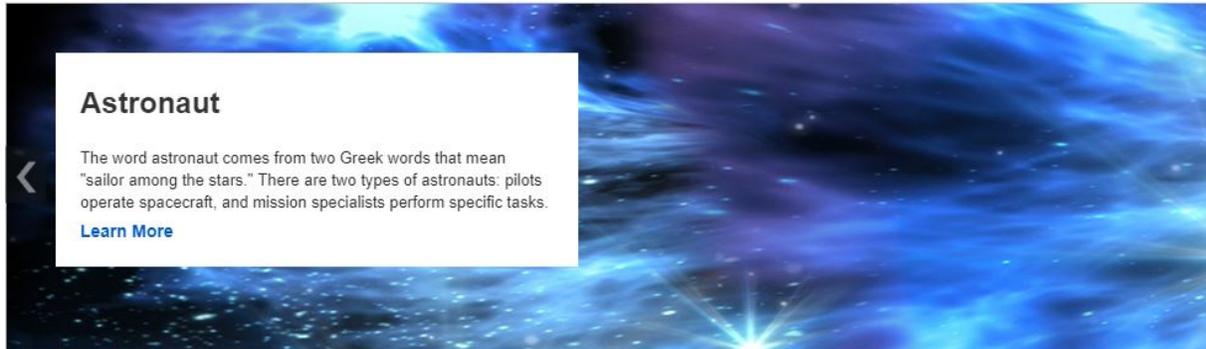
[Iowa Core Standards Based Rubrics](#)

[Assessments and Rubrics \(Kathy Schrock\)](#)

## Read More About It

[ISearch](#) from INFOhio is the perfect place to read more about cybersecurity and hacktivism. Find reliable information with just one search. Use the tabs to find articles from encyclopedias, newspapers, magazines, and journals along with primary sources, videos, and eBooks at your reading level. Some suggested search terms include hacktivism, hackers, cybersecurity, WikiLeaks, identify theft, cyber-attacks, cybercrime, and related topics. For more about ISearch, view the [Research Made Easy With ISearch Video](#).

## Lesson 3: Video Game Development

[Advanced Search](#) [Search History](#)

INFOhio provides access to this collection of educational and trade publications at no cost for Ohio students, teachers, and parents. EBSCO's Explora for Grades 9-12 contains full-text articles from magazines, journals, and newspapers.

**Note on PDFs.** Many of the articles in Explora are available in PDF format, which is a scanned image of the original article including pictures. Whenever possible, the PDF format is preferred. If you do not already have it on your computer, you can download a free version of [Adobe Reader](#).

For this lesson use the articles below:

- [Work for Play: Careers in Video Game Development](#). Occupational Outlook Quarterly. Fall 2011.
- [Preparing for a Game Dev Career](#). Computer Graphics World. Oct. 2007. Lexile: N/A.

You can access [Explora for Grades 9-12](#) by using this link.

### Activity

#### Read and Discuss

Video games are an exciting part of the lives of many people, and it takes many different types of jobs to create them. It is one of the fastest growing career fields in IT. Video game designers are a part of a team that creates video games. They come up with the concepts, characters, setting, storyline, and game play. Read the two articles about video game development and then design your own video game. Use the playing guide to create an outline. Include instructions for the players and a description of the game. (60-120 minutes)



## GAME ON

Video game designers are part of a team that creates video games. As a game designer, you will create a basic outline about your game to share. Remember that every action in your game has an equal and opposite reaction. Key

Vocabulary includes:

*Room*; The two-dimensional world of the game with background.

*Sprites*: Images placed in the game.

*Objects*: Elements created and scripted to things in the game.

*Actions*: Things that the objects do triggered by an event.

*Events*: Things that happen to cause objects to act, e.g. Objects colliding with one another, player presses a key or mouse, a timer, etc.

If you need more space, duplicate the chart or attach additional pages.

Describe the parts of the game:

Room:

Sprites:

Objects:

Actions:

Events:

Describe the rules of the game. (Keep them simple)

Describe how an event might take place.

If \_\_\_\_\_ (event) happens, then \_\_\_\_\_ happens  
(action).

How points are scored.

How points are blocked.

## Differentiation

The articles are provided in two formats: HTML and PDF. If using the HTML, the text can be read aloud. By changing the settings, a large box pop ups on the screen as the text is read aloud. Click on the gear next to LISTEN to change the settings for enhanced visibility and pop-up. PDF is in a visual format that can be projected to a white board and shared and discussed with a large group or by individual students.

## Assessment

Based on the information found in the articles, answer the questions. Use evidence from the text to support your answers.

1. Programmers have an important role in video game development. Name two types of programmers and explain what role they play in the programming process.
2. What are the four career fields that make up a video game development team?
3. Describe the job skills and/or education that is necessary to become a video game artist.
4. What are the average salaries that video game development workers can expect? Include as many different types of salaries as you can find.
5. Explain two ways that someone can find work in video game development.

**Answers:** 1. Lead programmer: Assigns works and develops schedules. AI programmer: Develops how computer-controlled opponents and allies react. Network programmer: Codes for online playing and develops security. Physics programmer: Codes for natural laws, like gravity. Tools programmer: Codes to automate tasks. User interface programmer: Codes for user commands. 2. Programming, Visual arts, Audio, Design, Production, Quality Assurance. 3. Most artists have attended art school. Develop portfolio of work. 4. Develop, record, and process a game's music, dialogue, and other sounds. 5. Work for a small studio in game development. Visit the websites, blogs and online forums that developers frequent. Identify influential people in the industry. Network with people in the field.

Links for standards-based rubrics are listed below or create your own.

[Iowa Core Standards Based Rubrics](#)

[Assessments and Rubrics \(Kathy Schrock\)](#)

## Read More About It

[ISearch](#) from INFOhio is the perfect place to read more about video game design and programming. Find reliable information with just one search. Use the tabs to find articles from encyclopedias, newspapers, magazines, and journals along with primary sources, videos, and eBooks at your reading level. Some suggested search terms include: video games, computer programmers, coding, computer programming, video game design, and the names of specific video games, designers, or coding practices. For more about ISearch, view the [Research Made Easy With ISearch Video](#).

## Lesson 4: Careers in Information Technology

**Students**  
**Find Reliable Sources for School Projects**

1. Type a few simple words in the ISearch search box.
2. Explore results on all the tabs to find books, articles, videos, and more.
3. Use the limiters in the left column on every tab to narrow results.
4. Click the View/Download button

**Teachers**  
**Find High-Quality Digital Content for Your Students**

1. Type a few simple words about your unit, topic, or subject in the search box.
2. Explore results on all the tabs to find the right resources for your students.
3. Use the limiters in the left column on every tab to narrow results.

Search nearly all INFOhio digital resources from a single search box.

INFOhio provides access to a collection of educational and trade publications at no cost for Ohio students, teachers, and parents. ISearch lets users search nearly all of INFOhio's digital resources from a single search box.

For this lesson use the resources listed below.

[ISearch](#). Search term: [Information Technology](#). Click the Encyclopedias tab and use the Research Starter.

You can access [ISearch](#) using this link.

## Activity

### Read and Discuss

Information Technology is one of 16 career clusters identified nationally and in Ohio. It involves the design, development, and management of hardware, software, multimedia, and information systems. Read the *Information Technology* Research Starter at the top of the Advanced Sources results list in [ISearch](#) to learn more information technology. Then identify the four pathways within the [Information Technology Career Cluster framework](#). Choose one of the pathways and create a PowerPoint or multimedia project about it. What are some of the career specialties within the pathway? Include information about education, certification, or other required skills. The Research Starter and other ISearch resources can help you locate information for the project. Use the graphic organizer, "Information Technology – Pathways to Your Future," to take notes to help create the project.

## Information Technology – Pathways to Your Future

Choose one of the four pathways and create a PowerPoint or other multimedia project about the pathway. Use ISearch (including the Research Starter) and the Career Cluster framework to locate information.

Career Specialties	
Job Responsibilities	
Salary Range	
Job Outlook	
Levels of Education, Certifications, etc.	
High School Classes which support knowledge in this pathway	
Activities the build tech skills	
Information skills needed in the workplace	



## Differentiation

Basic and advanced sources in ISearch articles can be projected on a whiteboard or students can read them individually. Readers can choose to listen to the articles by clicking on the speaker. They can even change the accent of the audio recording. PDF versions of articles may be available with graphs, charts, and images.

## Assessment

Based on the information presented in the Research Starter, answer the following questions. Use evidence from the text to support your answers.

1. Describe the difference between network management and database management.
2. Name two ways that the web enhances the use and transfer of information.
3. In addition to a degree in information technology, describe other types of training that an information technology professional needs to complete.
4. How does information technology connect with medical services?
5. List two applications for information technology that are being developed and what role they will play for future generations.

**Answers:** 1. Network management: Acquiring, maintaining, and managing computer networks, including hardware and software. Database management: Managing, storing, and updating data. 2. Makes information accessible and usable. Increased speed in sharing information. 3. Certification programs such as Microsoft, Cisco, etc. 4. Electronic medical records: Improve the quality of care, scheduling, billing, and operations. E-prescribing: Easy to determine availability of drug, send prescription to pharmacy, and bill to insurance. Digital imaging: Easy to access and share images between different medical facilities. 5. *Medical informatics*: Fine tuning/integration of existing hospital systems and development of electronic health records. Share health information easily, improve quality of care. *Mobile devices and cloud computing*: Make information readily available. *Security management*: Manage information in ethical, legal, secure way.

Links for standards-based rubrics are listed below or create your own.

### [Iowa Core Standards Based Rubrics](#)

### [Assessments and Rubrics \(Kathy Schrock\)](#)

#### Read More About It

[ISearch](#) from INFOhio is the perfect place to read more about careers in information technology. Find reliable information with just one search. Use the tabs to find articles from encyclopedias, newspapers, magazines, and journals along with primary sources, videos, and eBooks at the right reading level. Some suggested search terms for this project are: information technology, computer networks, web design, database management, software engineering, and other related terms. For more about ISearch, view the [Research Made Easy With ISearch Video](#).

### Ohio Learning Standards - Writing

**Text Types and Purpose.** 1. Write arguments to support claims in an analysis of substantive topics or texts using valid reasoning and relevant and sufficient evidence.

**Extension Lesson:** Will mobile computing and the cloud eliminate the need for more traditional modes of computing? Write a 500 - 1000-word argumentative essay supporting a pro or con approach to the topic. Use evidence from [Points of View](#) or sources from [I Search](#) such as the Research Starter on information technology (Advanced Sources) to support your argument. (60-120 minutes)

**Text Types and Purpose.** 2. Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

**Extension Lesson:** What technology advances do you anticipate in the next few years? What would you like to see developed or invented? What would be the name of the career specialty for these new technologies? How will these changes influence the education needed to be successful in future? Write a 500 – 1000-word informative essay to address the questions. Use evidence from information that you located using [I Search](#) to support your answers. (60-120 minutes)

### Ohio Learning Standards - Math

1. Make sense of problems and persevere in solving them.
2. Attend to precision.

**High School Algebra.** Expressions. Equations and inequalities. Connections to Functions.

**High School Geometry.** Connections to Equations.

**Extension Lesson.** Many algebraic and geometric concepts can be taught through computer coding and programming. Concepts like order of operations, function composition and definition and solving word problems are all a part of programming and game design. Each year teachers across the country schedule an “Hour of Code.” Use [I Search](#) to locate some information about it. Then explore the resources on Coding found on INFOhio’s Pinterest [Coding](#) board. Choose two of the free resources that allow users to practice programming. Use the resource to practice programming /coding. Write a brief description of both resources including your experience. How are math skills used in the resource? In what ways does it connect to real world problems? (60-120 minutes)

## Ohio – Social Studies Standards

Course: Contemporary World Issues.

Topic: Technology.

Content Statement: 14. The development and use of technology influences economic, political, ethical and social issues.

**Extension Lesson.** Use Science Online to locate and read about computer scientists and their contributions to the field of information technology. Choose six names from the list to research and take notes about achievements and impact on society. Use the notes to create a timeline in [World Book Timelines](#). (45-90 minutes)

## Ohio – Fine Arts Standards

### Visual Art: Producing/Performing (PR)

HS – Beginning. Investigate how to access available digital tools and innovative technologies to create and manipulate artwork.

HS – Intermediate: Understand and demonstrate how to access digital tools and innovative technologies to create and manipulate artwork.

HS – Advanced: Explore and expand on personal art applications through the use of available digital tools, innovative technologies and media arts.

**Extension Lesson:** Create an infographic about 6 Simple Tips and Tricks to Making a Great Website. Use a free online digital tool such as [Canva](#), [Piktochart](#), [Easel.ly](#), or even Microsoft Office to design the infographic. Keep the information short and simple but create a visual impact. Be sure to include the sources you used. (30-90 minutes)

- [INFOhio Educator Tools](#)

For additional assessments, instructional strategies and resources, and cross curricular connections by standard, go to INFOhio's Educator Tools.

- [INFOhio Pinterest](#)

Looking for more resources about "Tech Tools" and "Coding." Check out INFOhio's Pinterest boards.