

SIEMENS STEM DAY ACTIVITY

IT CAREERS

OBJECTIVES

Students will be able to:

- **Identify** various types of IT careers
- **Analyze** and categorize a multitude of IT career possibilities
- **Achieve** a comprehensive understanding of a chosen IT career

THIS LESSON FOCUSES ON

Engineering Design Cycle

- Communicating Results

21st Century Skills

- Collaboration

OVERVIEW

In this activity, students will investigate, categorize, and explore a multitude of IT careers. Students will read several IT-career cards to learn about the vast opportunities that are possible within this career field. Then as a small group, students will sort the career cards into four categories: services, software, infrastructure, and hardware. Lastly, students will select a specific IT career profession, further research the career, and create an infographic to demonstrate all that was learned.

STEM incorporates Science, Technology, Engineering, and Mathematics to focus on real-world issues and problems guided by the engineering design process. This type of instruction supports students in developing critical thinking, collaboration, reasoning, and creative skills to be competitive in the 21st century workforce.

Each Siemens STEM Day classroom activity highlights one or more components of the engineering design cycle and an essential 21st century skill.

MATERIALS

- **IT Career Cards and Headings**, *one set per two students*
- **IT Career Research Notes** *handout*, *one per student*
- computers with internet access for research

HAVE YOU EVER WONDERED . . .

What career would I most enjoy in the Informational Technology field?

MAKE CONNECTIONS!

How does this connect to students?

Lots of students are naturally interested in using technology and learning about **new cutting-edge technological advancements**. Exposure to the various IT careers can broaden students' understanding of all that is involved in learning about information technology.

Additionally, students of all ages start to understand about and plan for their **potential future career**. Learning about the multitude of IT careers can spark an interest in students wanting to learn more about a specific IT profession and technology in general.

How does this connect to careers?

"Employment of computer and information technology occupations is projected to grow 12% from 2018 to 2028, much faster than the average for all occupations. These occupations are projected to add about 546,200 new jobs."¹

How does this connect to our world?

New technologies are being created and designed at exponential rates. The demand for IT professionals will continue to grow throughout the world with an ever-increasing emphasis on cloud computing, collection and storage of big data, and information security.

Technology has the potential to make improvements to our world. Whether creating carbon dioxide catchers, robots with improved dexterity, or new-wave nuclear power, technology is paramount in these advancements.

BLUEPRINT FOR DISCOVERY

1. To engage students in what they will be learning, ask them to collectively brainstorm as many Information Technology careers they can identify. Record the groups ideas on a display board or dry erase board. To gain a sense of the students' prior knowledge, ask them to also try to explain what each professional does.
2. Explain to students that there are four main categories of IT professionals: services, software, infrastructure, and hardware.
 - services: front end of IT, which collaborates with customers to understand their needs and objectives, as well as maintenance of the internal IT systems that are needed
 - software: IT professionals who design, implement, and troubleshoot programs using computer code languages

¹ "Occupational Outlook Handbook" U.S. Bureau of Labor Statistics. <https://www.bls.gov/ooh/computer-and-information-technology/home.htm>.

- infrastructure: back end of IT, including all physical, network, storage, and computing components of the system
 - hardware: IT professionals who research, design, develop, and test computer systems and their components, including the circuitry, processors, memory devices, routers, and networks
3. Ask students to form small groups of 3–4 people. Pass out the **IT Career Cards** sort activity. Explain that the objective of this activity is for them to collaborate to first match each career with the correct corresponding job description. The second task is for the students to categorize the careers according to the four main areas of IT: services, software, infrastructure, and hardware. Be sure to explain that some careers involve aspects of more than one IT category. For example, app developers could be categorized into both services and software since their responsibilities pertain to both IT aspects.
 - *Note:* It is important to have the Category Headings and IT Career Cards cut out and shuffled, since the IT Career Cards handout is the actual answer key that displays each career using the corresponding description.
 4. Use the IT Career Cards handout to check the groups' final work. Confirm that students matched each career with the most accurate description, then engage the class in a discussion about types of career. Encourage students to explain their thinking about which careers best fit into each IT career category.
 - *Note:* An answer key is not provided for matching each career to the category headings. This is meant to encourage interpretation and discussion rather than one correct answer.
 5. Pass out the **IT Career Research Notes** handout. Direct each student to select one specific IT career that they would like to research. Students will need access to the Internet to gather information on their selected career.
 6. Using the **IT Career Research Notes** handout, instruct the students to create an infographic for their chosen career. Students may wish to complete this digitally or by hand. Here are a few suggested websites: www.venngage.com, www.infogram.com, www.piktochart.com, and www.canva.com.
 - *Note:* It is encouraged that students view a few infographic samples together as a group and emphasize the significance of visual representation when creating an infographic.
 7. Conclude the lesson by facilitating a gallery walk of the completed infographics for students to communicate their results. As students read each other's work, encourage them to leave a compliment or positive comment.

TAKE ACTION!

- Students can take a STEM career survey: <https://stemstudy.com/stem-program-quiz/> to determine which careers best suit them. Another website: <https://www.stemjobs.com/stem-type-quiz-main/> can be used to determine if they fall more into the category of advisor, designer, explorer, integrator, investigator, maker, producer, or solver. This can help direct students to the IT careers that best suit them.

NATIONAL STANDARDS

[Standards for Technology
Literacy](#)

Standard 1: Students will develop an understanding of the Nature of Technology. This includes acquiring knowledge of the characteristics and scope of technology.

Standard 3: Students will develop an understanding of the Nature of Technology. This includes acquiring knowledge of the relationships among technologies and the connections between technology and other fields.

<p>Information Technology (IT)</p>	<p>The broad term for jobs that involve using computer programming, data, and analysis</p>
<p>IT Consultant</p>	<p>Focuses on integrating information technology into businesses and showing clients how to use IT</p>
<p>Systems Developer</p>	<p>Analyzes an organization's current computer systems and procedures, then designs information systems solutions to help the organization operate more efficiently and effectively</p>
<p>Data Mining Specialist</p>	<p>Finds the hidden information in vast stores of data, decides the value and meaning of this information, and understands how it relates to an organization</p>
<p>Computer Network Architect</p>	<p>Designs and builds data communication networks</p>
<p>Computer Systems Analyst</p>	<p>Integrates business management and data analysis and assesses how automated systems can be implemented to solve complex business problems</p>
<p>Software Engineer</p>	<p>Applies mathematical analysis and the principles of computer science in order to design and develop computer software</p>
<p>Information Security Analyst</p>	<p>Plans and carries out security measures to protect an organization's computer networks and systems</p>

<p>App Developer</p>	<p>App Developer</p>
<p>IT Consultant</p>	<p>Creates, tests and programs apps for computers, mobile phones, and other types of electronic devices</p>
<p>Computer Programmer</p>	<p>Writes and tests code that allows computer applications and programs to function</p>
<p>Network and Computer Systems Administrator</p>	<p>Takes care of the day-to-day operation of all networks and organizes, installs, and provides support for an organization's computer system(s)</p>
<p>Cloud Developer</p>	<p>Designs and develops secure cloud applications, services, and products</p>
<p>Computer Hardware Engineer</p>	<p>Researches, designs, develops, and tests computer systems and components, such as circuit boards</p>
<p>Cloud Systems Administrator</p>	<p>Configures, fine tunes, and manages cloud infrastructure services and cloud servers</p>
<p>Computer User Support Specialist</p>	<p>Answers questions or resolves computer problems for clients in person, via telephone, or electronically</p>

T CAREERS- CATEGORY HEADINGS

Services	Software
Infrastructure	Hardware

IT CAREER RESEARCH NOTES

T Career:		Salary Range:
Main Responsibilities:	Main Responsibilities:	Required Skills:
How does this career affect the world?		Job Outlook:
Additional Interesting Facts:		Similar Careers