

**Tech Expert Zone** ■ Learn What You Need!

### New Technology

New technologies change and improve lives. Read about some examples from recent years.

#### Virtual Reality (VR)

When you use VR, you wear a headset. It is like a pair of special glasses. It makes you feel like you are inside a virtual place. Virtual things are created by computers. You cannot touch them because they are not physical objects in the real world. You can look around virtual places and move through them. You feel like you are there, even though you are not.

#### Artificial Intelligence (AI)

AI makes computers or machines do things that humans do. For example, they can talk, learn, and solve problems. AI is like a smart helper that helps you find information. It can also help drive cars and buses. It can even create art or help you play online games.

#### Virtual Assistant

This is an AI tool. It understands and does tasks you ask it to do by talking or typing. It makes communicating with your device easier.



## Section 1: How Technology Changes Our Lives

### Improvements in Technology

Technology helps people find new solutions to problems. It changes all the time because people are always working to make it better. Technology is part of your everyday life. It changes the way you do many things. Here are a few areas that technology has changed in major ways:

- communication
- learning
- entertainment
- lifestyle

### Technology and Communication

Today, you have many tools that help everyone stay in contact. This can happen even if they are far apart. Talking to someone on the other side of the world can be as easy as talking to your neighbor.

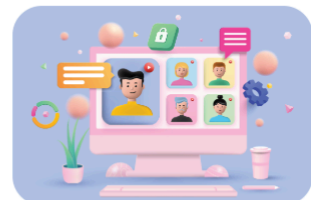
#### Social Media

Social media lets you share content like photos and messages. You learn what your friends are doing. Examples include Pinterest or GeckoLife.



#### Online Video Meetings

Online video meetings let you have face-to-face online conversations. This can happen even if you are in different places. All you need to do is find a host. This is an online place that will let you have the meeting. Some hosts are Google Meet, Zoom, and Microsoft Teams.



#### Email

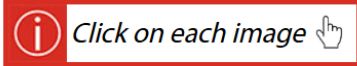
Email lets you send messages and files for school or conversations. Gmail, Yahoo, and Microsoft Outlook are examples of email services.





## Technology and Learning

Technology has changed how you can learn and read. In the past, people read books to find information. Now, you can get information more quickly. For example, when you do your homework, it is easy to search for information on the internet.



### Digital Learning

You can learn by taking online classes. This lets you learn with other students wherever you are. You can join live lessons with an online tutor or watch recorded lessons whenever you like.



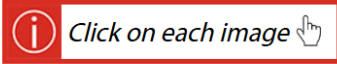
### Digital Books

These are books that you read on a computer screen or tablet. They are called e-books. You do not need a backpack for these books! You can have a lot of digital books on a single device.



## Technology and Entertainment

People use technology to have fun in their free time.



### Video Games

Many people enjoy playing video games on consoles, computers, or mobile devices. It is entertaining and a fun challenge.



### Virtual Reality (VR)

VR technology lets you feel like you are in a different place. You can be in a game, on a trip, or anywhere else. You can enjoy having a special adventure with VR headsets.



### Online Media


You can watch videos and movies online. You can also listen to music. You can do these things at the same time as your friends. This lets you talk about them together.



## Technology and Lifestyle

Technology affects and changes lifestyles, or how people live. It affects communities and the world. It gives people tools that help them work and study. It helps people take care of themselves. It also helps them shop so they save time and money.



Click on each image 

### Online Shopping

You can shop online from anywhere. Some websites and apps let you buy things such as books, clothes, computers, and phones. You can buy things from all over the world.



### House Automation Devices

These devices help you control things in your house automatically. This means these devices can do things on their own. However, they still need instructions from a user to tell them what to do. For example, you tell your device to turn on the lights at a set time. You can also set the temperature in your home so it is comfortable.



### Health and Fitness Devices

These are fitness trackers like smartwatches. You can track information like your heart rate or how many steps you have walked. They can tell you how well you have slept and if you need more rest.





## Effects of Technology



Technology can have positive effects. These are good for you. However, it can also have negative effects. These are bad for you.

Area	Positive Effects	Negative Effects
Communication	<p>You can stay connected with family and friends online.</p> <p>You can share your feelings online.</p> <p>You can also share pictures with your family. This can make you feel closer to people who are far away.</p>	<p>Sometimes, people say mean things online. They can make fun of others, too. This is called cyberbullying.</p> <p>People can see the information you share online. Some people may use this information to do harm.</p>
Learning	<p>You can learn exciting things online. For example, you can discover the latest information about traveling in outer space.</p> <p>Exploring new subjects online can be fun and helpful.</p>	<p>Not everything on the internet is true. You must check your sources. A source is a place where the information came from. Getting information from a source that you cannot trust could mean learning incorrect things.</p>
Entertainment	<p>Some online games and puzzles challenge your mind. They can teach you new ways to solve problems.</p> <p>Watching movies online is entertaining. It can inspire your creativity.</p> <p>Listening to music online can calm you. It is a way to entertain yourself.</p>	<p>Too much gaming can hurt your schoolwork because you play more and study less. It can hurt friendships because you spend less time with friends in person. It can also hurt your eyes.</p> <p>Watching too many movies may make you less active.</p> <p>Listening to a lot of loud music can harm your hearing.</p>
Lifestyle	<p>You can buy almost anything online from businesses far away from you.</p> <p>Tracking your activity and getting advice online can help keep you in good health.</p>	<p>Packages from far away need to go on airplanes, ships, and trucks. This makes pollution worse.</p> <p>Not all online stores are safe. Some sites are scams. A <b>scam</b> is when</p>

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## Changes and Improvements in Technology

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### Technology and Careers

Technology changes how people live and work. It creates new kinds of jobs. It sometimes replaces old jobs. People use technology in many career fields, including medicine, law, and education. A **career** is the work you do to make a living for a long time.

Look at how technology has changed how people work.

#### Manufacturing

Manufacturing means making things. For a long time, people put things together in factories. In the past, people always needed to run the machines. Now robots can do many of these tasks. This is because we have new technology.

These are examples of new jobs in manufacturing.

**Automation experts** make machines and systems that work automatically, such as self-driving cars.

**Robotics engineers** make robots that can clean homes. These robots can also do other tasks to help people. Robots can enter places that are not safe for people.



#### Commerce

Commerce means buying and selling things. Some people work in warehouses, moving heavy packages. Now robots can sometimes do this job.

Today, fewer people work as cashiers in shops. This is because we have self-checkout machines. Stores do not need as many people to help customers.

An **e-commerce specialist** is an example of a new job in commerce. E-commerce specialists use the internet to improve online shopping.

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### Data and Information

Data entry is when people type numbers or names into a computer. Companies do not need as many people to do this job anymore.

These are examples of new jobs in data and information.

**Data analysts** study a lot of data to find patterns. This also helps them understand things better. For example, they try to understand why people spend money in certain ways.

**Online security** experts keep computer systems safe. They stop people who try to enter the systems when they should not.



### Education

Technology has changed jobs in learning and teaching, too. People who worked in schools used to keep student records and grades on paper. Now, most teachers and school workers do this on a computer.

These are examples of new jobs in education.

**Online educators** teach people over the internet. They also make materials on the internet for a lot of people. Students do not need to be in the classroom.

**Educational game creators** design and make exciting VR games. These games look and sound real.





**Unit 1**  
**Lesson 1****Changes and Improvements in Technology**... 12 **13** 14 15 16 ...Go to: **Activity Lab 1****Activity 1:**

1. Technology tools such as \_\_\_\_\_ can make online communication easier.

- ☐ A digital books
- ☐ B robots
- ☐ C email

2. Which is a negative effect of technology?

- ☐ A being able to have more conversations
- ☐ B communicating very quickly
- ☐ C getting incorrect information

3. Which technology makes you feel like you are in a different world?

- ☐ A artificial intelligence (AI)
- ☐ B virtual reality (VR)
- ☐ C robotics

**Activity 2:**

Fill in the blanks with the words from the box.

online security   communication   automation   robots

1. House \_\_\_\_\_ devices let you turn on the lights in your home from a smartphone.
2. \_\_\_\_\_ tools let you talk to people who are far away.
3. \_\_\_\_\_ can do jobs that are too difficult or unsafe for humans.

**Unit 1**  
**Lesson 1****Changes and Improvements in Technology**... 12 13 14 **15** 16 ...Go to: **Section 2: Improve Technology****Understand Human-Computer Interaction (HCI)**

Technology keeps changing the world. Think about how people and computers work together. This is called **human-computer interaction** (HCI). People who study HCI look for ways to make computers easier to use. They want people to understand how to use them. They also want computers to do what the user needs them to do.

HCI improves technology because it does what humans need. It makes devices and apps easy to use. In the world of human-computer interaction, researchers and designers have created important rules and guidelines. These are like instructions for making sure computer systems work well with people. They make sure the technology is available, comfortable, and easy to learn. Here are some ways HCI can do these things.

**Available for everyone**

HCI makes sure everyone can use technology. This includes people with special needs. HCI has tools that respect all people's needs and abilities.

**Real-world example:**

HCI can change text into spoken words. This helps people get information online even if they cannot see well.

**Comfortable design**

HCI makes sure a device's design is user-friendly. That means it is comfortable and easy to use.

**Real-world example:**

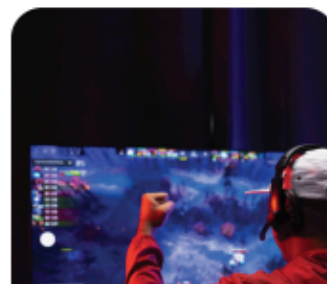
You can fold some laptops to work like a tablet. Sometimes you might want a tablet, while other times you might want a laptop.

**Easy to learn**

HCI makes sure technology is easy for everyone to understand. This way, you can learn how to use it quickly.

**Real-world example:**

Video games have icons to help players while playing a game.



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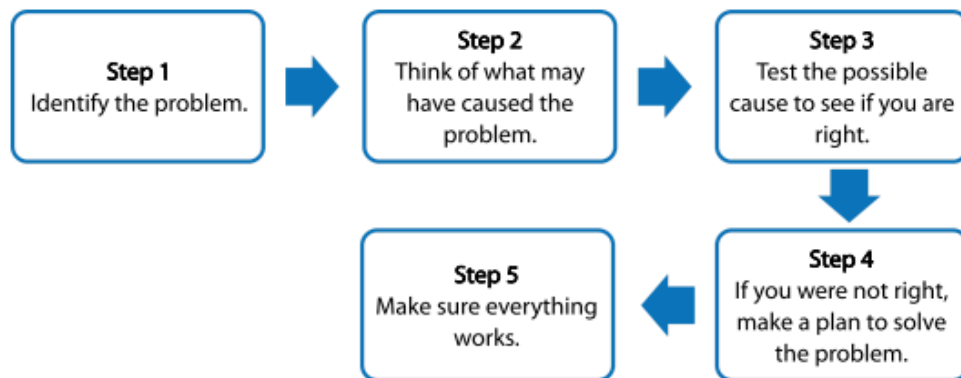
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### Troubleshooting

When you **troubleshoot** technology, you find and fix its problems. It is like being a technology detective. When things go wrong, you find out why and fix them. It is important to solve problems people have while using technology. This makes sure everyone can use technology easily.

Sometimes, problems might not come from the device you are using. They could come from other devices or hardware connected to it.

To identify and fix problems, you should have a plan. Follow these troubleshooting steps.



#### Example:

1. **Identify the problem:** The laptop is not charging.
2. **Think of what may have caused the problem:** The charger cable may have caused the problem.
3. **Test the possible cause:** Try another charger cable.
4. **If you were not right, make a plan to solve the problem:** Use *if-then* statements to find possible solutions. For example, *if trying the new charger did not work, then the problem may be with the laptop itself. I should take it to a professional who can fix it.*
5. **Make sure everything works:** Yes, the laptop started charging.

In this example, the problem was not the laptop. It was the charger cable. It is important to try different solutions to solve problems. It is also important to know that the problem is not always the device.

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### Watch and Learn!

Watch this video to learn more about troubleshooting.



Here are some tips to use when you are troubleshooting.

Problem	Possible troubleshooting step
Your computer is running slowly.	There might be too many programs open. Close the programs you do not need.
The monitor is not working.	Check that all the cables and wires are connected.
Your mouse has stopped working.	Unplug and plug it in again. If your mouse still does not work, change its batteries. You could also replace it with a working mouse.



### OOPS! Is that right?

Does a device that does not work always need to be replaced?

#### Answer

**No!** It could be a minor issue that can be solved with a troubleshooting plan. This could include checking the power source, making sure connections are correct, or restarting the device.

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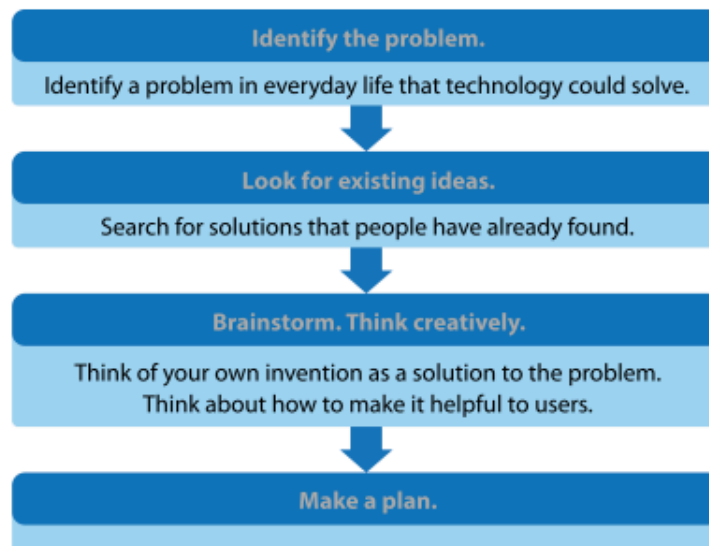


### Dive into STEAM

To create an invention, engineers use the engineering design process. The **engineering design process** is a step-by-step plan. It creates something new to solve a problem. It starts with understanding what problem you want to solve, thinking of ideas, and then trying them out. Keep trying ideas until the invention is just right. This way you can make sure your invention or solution works well!

### Creating Inventions

People get ideas for inventions when they notice a problem that needs solving. For example, people long ago needed to do things when it was dark. They wanted to work, cook, and read. Those things were difficult to do when it got dark. This need caused Thomas Edison to invent the lightbulb.





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Go to: **Improving Inventions**

A major part of the invention process is making inventions better. Here are some steps you can follow when you are trying to improve something.

**Choose the Right Information**

Suppose you are creating a new vehicle. You need to decide which details matter. For example, does the size of the wheels or the vehicle's shape affect how fast it will go?

**See How the Data Connects**

Think about the vehicle's speed. How do the size of the wheels, the weight, and the engine's power work together? Understanding these connections will help you improve your design.

**Test and Make It Better**

Imagine you have built your invention based on your plan. But when you test it, things do not go well. Compare what you thought would happen with what really happened. If they do not match, find out why. Then you make changes. Problems might have happened because of the vehicle's weight or how its engine works.

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Go to: **Activity Lab 2****Activity 1:**

1. How does human-computer interaction (HCI) help improve technology?

- ☐ A It makes technology more expensive.
- ☐ B It creates devices that are difficult to use.
- ☐ C It studies how people need technology and how to make it better.

2. What is an important step when you want to improve an invention?

- ☐ A Have a solution.
- ☐ B Test the invention.
- ☐ C Change the device.


**Activity 2:**

Fill in the blanks with the words from the box.

troubleshooting   user-friendly   humans

- 1. HCI is about how \_\_\_\_\_ and computers work together.
- 2. You can find and fix problems in technology by \_\_\_\_\_.
- 3. When technology is comfortable and easy to use, it is \_\_\_\_\_.

**Activity 3:**

Suppose you want to use your computer, but it does not turn on. Troubleshoot and solve the problem. Open the file *Troubleshooting.pptx* . It has a troubleshooting diagram with the steps you should take. Fill in each step.

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Go to: **Activity 4:**

Put the engineering design process steps in order.

Drag each box 

- Step 1      Brainstorm. Think creatively.
- Step 4      Make a plan.
- Step 2      Identify the problem.
- Step 3      Try to improve your idea.
- Step 5      Look for existing ideas.

**Activity 5:**

You are an inventor. You are creating a robot car. You designed it carefully. However, when you test it, you are not happy with its speed.

Choose the correct answer. There can be more than one.

1. What should you think about when you are troubleshooting the speed of the robot car?

- ☐ A the size of the wheels
- ☐ B the color of the robot car
- ☐ C the weight of the robot car

2. How would you improve the speed of the robot car?

- ☐ A Make changes to the design.
- ☐ B Change the color of the robot car.
- ☐ C Adjust the wheel size or car weight.