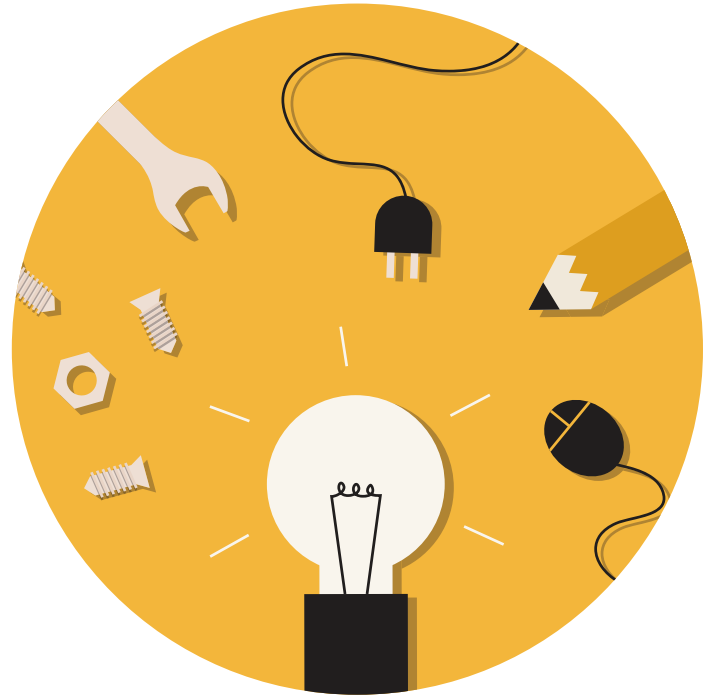


# Inventions Project

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**Let's Explore...**

*What is the most important invention of the 21st century?*

## Introduction

Welcome to your group research project about inventions! This month, you will work in a group to learn lots of interesting facts and history about some famous inventions and inventors.

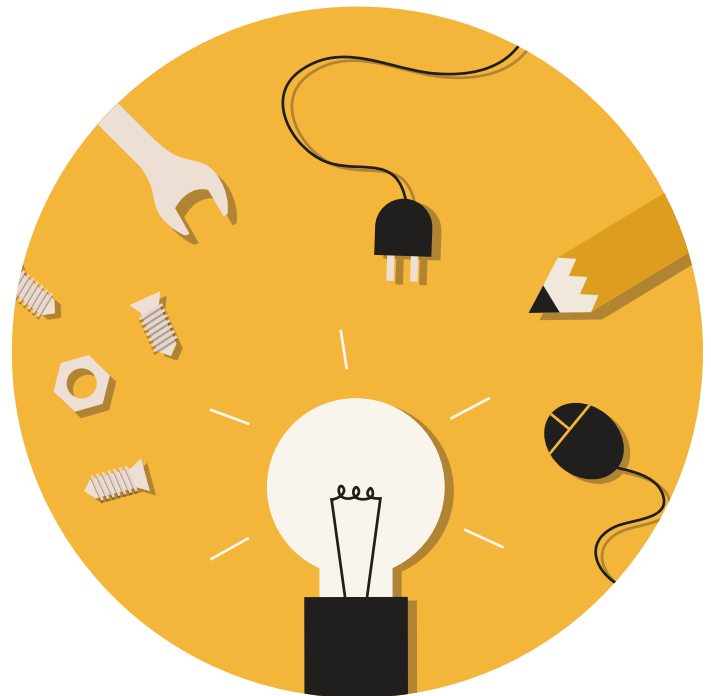
Next, you'll choose a 21st-century invention that you want to research. You'll also learn about the inventor and learn how to write a biography in the form of a timeline.

First, let's chat and read about some historic inventions.

## Warm-Up

### A. Class Discussion

1. Name some famous inventors.  
What did these people invent?
2. What invention could you not live without?
3. Which inventions have had a negative impact on the environment, and how?
4. What qualities do successful inventors have?
5. What recent inventions will no longer be relevant 20 years from now?



## Warm-Up cont.

### B. Brainstorming

Find a partner. Try to think of a large list of 21st-century inventions. If you can't think of 15 inventions, do some research. Put a star beside the three most important inventions. Share your ideas with your class.

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_
7. \_\_\_\_\_
8. \_\_\_\_\_
9. \_\_\_\_\_
10. \_\_\_\_\_
11. \_\_\_\_\_
12. \_\_\_\_\_
13. \_\_\_\_\_
14. \_\_\_\_\_
15. \_\_\_\_\_

### C. Listen & Draw

1. First, look at the list of inventions you made in Part B.
2. Next, grab a pencil, an eraser, and a blank piece of paper (or use the back of this page). Draw one of the inventions you thought of.
3. Get into new pairs. Don't tell your partner which invention you drew. Describe your drawing.
4. Listen to your partner's description. Try to draw what he/she describes.
5. Compare drawings. Then switch roles.

## Warm-Up cont.

### D. Class Survey

Every day something new is invented! Which do you think is more interesting, the invention of the ballpoint pen or the invention of Braille? Ask your classmates which they want to learn more about and why.

We want to learn more about _____ because...	
Ballpoint Pen	Braille

Summarize what one of your classmates wants to learn about one of these inventions.

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Now let's read about the invention that your class wants to learn more about (use pages 5-6 or 7-8).

# Ballpoint Pens

## A. Vocabulary Preview

Match the words on the left with the correct meanings on the right.

- |                       |  |
|-----------------------|--|
| _____ 1. cartridge    | a) to come out of its container (fluid)    |
| _____ 2. rotate       | b) to make, to produce                     |
| _____ 3. smudge       | c) the creation of something new           |
| _____ 4. invention    | d) a competitor                            |
| _____ 5. popular      | e) well-liked                              |
| _____ 6. immensely    | f) upset because you can't do something    |
| _____ 7. leak         | g) in a large or significant manner or way |
| _____ 8. flood        | h) to blur or partly rub out               |
| _____ 9. frustrated   | i) a container that holds ink              |
| _____ 10. manufacture | j) to make something go around in a circle |
| _____ 11. rival       | k) to come up with a plan or idea          |
| _____ 12. devise      | l) to have too much of something           |



## Ballpoint Pens cont.

### B. Reading

1. The ballpoint pen is an instrument for writing on paper. It has a small, round ball made of brass, steel, or tungsten at its tip. When in use, ink from a **cartridge** inside the pen flows down to its tip. As the ball **rotates**, it picks up ink and deposits it on the paper.
2. Laszlo and Georg Biro of Hungary designed the first commercial ballpoint pen in 1935. Laszlo, a journalist, was tired of working with messy pens and had noticed how newspaper ink dried very quickly and did not **smudge**. He decided to construct a pen, with Georg's help, that used this kind of ink. The amount of ink coming out of their pen was controlled by a tiny ball bearing at its tip.
3. When World War II broke out, the Biro brothers moved to Argentina. They found financial backers for their **invention** and, in 1943, established Biro Pens of Argentina to manufacture their pens. Their first design had problems, so the pen was redesigned. The redesigned pens sold quite well in Argentina, but they became **immensely popular** in other countries after British fighter-plane pilots used them during the war (the pens did not **leak** at high altitudes).
4. After the war, several American companies also began to make ballpoint pens. Soon the market was **flooded** with poor-quality pens, which often leaked or would not write at all. The American public became **frustrated** and stopped buying ballpoint pens. Then, in 1954, a US company called Parker Pens **devised** a much better ballpoint pen, and the public started buying the pens again.
5. In 1950, Bic, a French company, had also begun to **manufacture** improved ballpoint pens. Over the years, Bic bought many of its manufacturing **rivals** and was soon producing and selling more pens than any other company. Today, Bic produces billions of inexpensive but good-quality pens that are used throughout the world.

*"The pen is mightier than the sword."*

—Edward Bulwer-Lytton

# Braille

## A. Vocabulary Preview

Match the words on the left with the correct meanings on the right.

- |                    |   |
|--------------------|---|
| ___ 1. allow       | a) army   |
| ___ 2. compose     | b) can be carried   |
| ___ 3. code        | c) to let, to permit, to enable   |
| ___ 4. military    | d) being able to see  |
| ___ 5. pattern     | e) a design or arrangement  |
| ___ 6. punctuation | f) a shortened form of a word   |
| ___ 7. recognize   | g) to create, to make (music, literature, etc.)                         |
| ___ 8. contraction | h) to know  |
| ___ 9. sighted     | i) a system of signs or symbols   |
| ___ 10. portable   | j) a system of putting marks into writing (e.g., periods, commas, etc.) |



## Braille cont.

### B. Reading

1. Braille is a form of communication that **allows** blind people to read, write, do math, and even **compose** music. It is not a language, but a system that can be used by blind people to read or write most of the world's languages.
2. Braille was developed in the 1820s by Louis Braille of France, who became blind after a childhood accident. While attending the National Institute for the Blind in Paris, he learned that French soldiers used a special **code** to send messages at night that could be read without a light. Raised dots and dashes formed a message on a piece of paper, which a soldier read by running a finger over them.
3. Louis Braille was just 11 years old, but he used this **military** code to create an alphabet system that people could read with their fingertips. It took him almost nine years, but his system is still used today.
4. In the Braille system, each letter of the alphabet is formed from a different **pattern** of up to six small raised dots. The system also includes symbols for numbers, **punctuation** marks, and musical notes.
5. To read Braille, people move their index finger from left to right along a series of symbols on each line of a page. This lets them put together letters to make words or to **recognize** shortened forms of whole words and things such as periods or commas.
6. Grade 1 Braille is the longer form of written Braille. Grade 2 Braille uses more short forms and **contractions** of words. Experienced readers can read Braille books as quickly as **sighted** readers can read regular books.
7. Braille can be written on paper, using either a sharp, pointed instrument called a stylus or a machine that looks like a typewriter but has only six keys. Today, computer software programs and **portable** electronic Braille notetakers are also available.

*“We must be treated as equals, and communication is the way we can bring this about.”*

—Louis Braille

# My Group

## A. Getting into Groups

It's time to get into groups for your project! Your teacher will tell you how many people each group will have. Which method do you prefer for choosing group members? Check your preference.

- I want to choose my group members.
- I want my teacher to choose my group members.
- I want group members to be chosen randomly.
- I have another idea for choosing group members.

Discuss your preferences as a class, and get into groups using one of the methods above.

## C. My Group Members

List your group members by name. Then find out what their strengths are (speaking, researching, technology, art, writing, interviewing, social media, etc.). Decide how you will contact each other outside of the classroom. Gather email addresses, social media profiles, cell numbers, etc. You may also want to plan to have a group chat outside of class time.

Name	Strengths	Contact Information

## B. Discussion

Discuss the quote below with your new group members. Talk about where ideas come from.

*“Imagination is more important than knowledge.”*

—Albert Einstein,  
world famous physicist

## Project Requirements

This section (pages 10–11) is a layout of your entire project. Your teacher will tell you the due dates for each section. Read through the project requirements and fill in your teacher’s due dates. Note that you do not have to choose your invention/inventor topic or complete these tasks yet. Each group will have to complete the following tasks over the next few weeks.

### A. About

Write a brief overview about your 21st-century invention (200 words max). This will be used in your introductory remarks during your presentation.

**Deadline:** \_\_\_\_\_

### B. Fact Sheet

Compile a list of facts and figures related to your invention. Keep a list of all of your research sources.

**Deadline:** \_\_\_\_\_

### C. Timeline

Write a short timeline (biography) about the inventor of your invention. Include one item that is NOT true and one item that is NOT mentioned in your presentation. Create an additional, jumbled-up version of your timeline for your classmates to put in order. Make photocopies.

**Deadline:** \_\_\_\_\_

### D. Visual

Prepare a poster or video about your invention and inventor. Your poster or video should include the following:

- a brief overview of your invention
- why you chose this topic
- a few interesting facts and key figures about the invention
- your timeline of your inventor (presented visually)

**Deadline:** \_\_\_\_\_



## Project Requirements cont.

### E. Presentation

On the day of your presentation, your group will present your video or poster to the class and summarize what you learned about your invention and inventor. You will also present your inventor's biography in a timeline.

**Deadline:** \_\_\_\_\_

**Our Presentation Date:** \_\_\_\_\_

### F. Timeline Task

Prepare a short timeline task to test your classmates' comprehension after your presentation. Your classmates will need to put your timeline in the correct order and identify one item that you did NOT mention in your presentation and one item that is NOT true.

**Deadline:** \_\_\_\_\_

### Notes & Tips

If your teacher has special notes, tips, or reminders about this project, add them here:

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# Thinking Like an Inventor

## A. Reading for Inspiration

ESL Library has an index of many different topics related to innovation and technology:  
<https://eslibrary.com/collections>

Before you choose your topic for the group project, your group will do a little research about two inventors from this list: *Hedy Lamarr, Steve Jobs, the Wright Brothers, or Alexander Graham Bell*. First, ask your teacher for a reading on **one** of the famous people above. Read the article with your group members and summarize the biography in your own words. You may also want to do some additional research.

**Inventor:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## B. Listening for Inspiration

Now choose **one** of the other three famous people that you did not use in the section above.

Visit <http://blog.eslibrary.com/category/podcasts/> and search for the podcast on this topic.

Take some notes as you listen to the podcast. Summarize what you heard in your own words. You may also want to do some additional research.

**Inventor:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## Our Topic Proposal

Now it's time to choose a topic to focus on for your project. Work with your group to decide on a topic that you want to use. Do not choose a topic that you have already learned about in the page 12 tasks.

### A. Topic

Work together with your group members to brainstorm some 21st-century inventions that you're interested in. Narrow your topic down to at least as many inventions as there are members in your group. Identify the inventor(s) of each invention. Remember, you are looking for the most important inventions from this century.

#### Possible Inventions/Inventors:

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Vote on the topic that you want to focus on. Choose the one that gets the most votes or the strongest argument. Remember that you can't choose a topic that another group is using, so have a second and third choice.

#### Chosen invention/inventor:

1. 

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2. 

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3. 

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### B. Visual

Work together with your group members to decide what type of visual you want to prepare for your presentation.

#### Suggested Visuals:

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Vote on the type of visual that you will create.

#### Chosen Visual:

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#### Teacher's Comments & Initials

Share your topic proposal with your teacher. Make some notes about any questions or concerns that your teacher has. Get your topic approved before you move on.

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# To-Do Lists

## A. Project Checklist

Over the next few weeks, you will work with your group to complete Steps A–F from pages 10–11 (your About, Fact Sheet, Timeline, Visual, Presentation, and Timeline Task).

Use the checklist to the right to stay on track. Check off each task as your group completes it.

### PROJECT REQUIREMENTS

- About
- Fact Sheet
- Timeline
- Visual
- Presentation
- Timeline Task

## B. Further Planning

Use the space below to plan your project in more detail.

### RESEARCH

Here are our research plans:

- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

### PRODUCTION

Here are our plans for project development:

- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

### RESOURCES & EQUIPMENT

Here are some things we will need for our project and presentation:  
(Add team members' names beside items.)

#### Resources

- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

#### Equipment

- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

## Mini-Project

Before you can begin researching your own topic, you're going to complete a mini-project together. Read about the Internet and complete the assignment on page 16 with your group members. Analyze the skills of your group members as you work on this mini-project together.

### A. Reading

1. The Internet is made up of a large number of computer **networks** linked together by wires, cables, and wireless connections. The networks are run by governments, universities, and private businesses.
2. The idea of linking computers to share information started in the United States in the 1940s, mainly for defense purposes. By the 1970s, there were several computer networks, but they were not linked. Then, in 1979, two Americans developed the Internet **Protocol** (IP), which let packets of information be sent from one computer network to another until they reached their final **destination**. Computer networks could now be linked. Around 1982, several networks merged to form the Internet, but it was used mostly by **academics** and technical **experts**.
3. In 1989, Tim Berners-Lee created a computer language known as HTML and a protocol known as HTTP that made it possible to send and receive **documents** through the Internet. This was the beginning of the World Wide Web. The web consists of a series of documents or **sites** that are linked together. Each has a specific location, called a URL or web address.
4. The web **browser** was developed shortly after. A browser is a piece of software that recognizes HTML and the hyperlinks (references to other documents) within documents. When a computer user **clicks** on a hyperlink, the browser connects to the computer **storing** that data (the web server) and sends the data back to the user's computer. The web and the web browser allowed **ordinary** people to use the Internet. It holds billions of pages of information sent out to billions of users around the world.
5. The Internet has changed the world. We use it to **chat** with family and friends, share information, run businesses, work from home, and **keep in touch** with the world. When we can't **access** the Internet, we feel disconnected.



# Mini-Project cont.

## B. Comprehension

Work together as a group to complete the chart below. Notice that this short assignment is a mini-version of your big group project.

<p><b>About</b></p> <p>Write a 100–200 word overview about the Internet.</p>	<hr/> <hr/> <hr/> <hr/>
<p><b>Fact Sheet</b></p> <p>Share some point-form facts about the Internet (in your own words). Choose the most interesting points from the reading.</p>	<ul style="list-style-type: none"> <li>• <hr/></li> <li>• <hr/></li> <li>• <hr/></li> <li>• <hr/></li> <li>• <hr/></li> <li>• <hr/></li> <li>• <hr/></li> </ul>
<p><b>Timeline</b></p> <p>Write some key points and dates about the invention. Place the items in chronological order.</p>	<ol style="list-style-type: none"> <li>1. <hr/></li> <li>2. <hr/></li> <li>3. <hr/></li> <li>4. <hr/></li> <li>5. <hr/></li> </ol>
<p><b>Visual</b></p> <p>Find and watch a video about the invention of the Internet. Share the link here.</p>	<hr/> <hr/>

## Creating a Timeline

You and your group members are going to create a timeline about the inventor(s) of your invention. Your timeline must include at least ten points. After you create the text version, think of a way to present it in a visually appealing way during your presentation. After your presentation, you will give your classmates a jumbled-up version of your timeline. Your classmates will try to place it in the correct order based on what you taught them.

### A. Elements of a Timeline

#### Essential Elements

- includes brief background from early years
- includes milestones & setbacks (key dates and events)
- does NOT include very specific details unrelated to main topic
- includes present status or date and reason of death
- includes legacy or concluding statement

#### Structure

- only one tense is used (usually past tense)
- third person narrative voice is used
- sentences don't all start with the same word
- complete sentences are used
- items are placed in chronological order

#### Note:

The Timeline Task you create for your classmates will also include:

- one true item that you do NOT mention in your presentation  
(*Your classmates will guess where it belongs in the timeline.*)
- one item that is NOT true  
(*Your classmates will have to find it and cross it out.*)

## Creating a Timeline cont.

### B. Building a Biography

Here are some guidelines for writing a chronological timeline. This timeline is about Norman Bethune, the Canadian inventor of the mobile health clinic.

#	Type of Entry	Example Entry
1	Birth & Early Years/Family	<ul style="list-style-type: none"> <li>Norman Bethune was born on March 4, 1890, in Gravenhurst, Ontario.</li> <li>He followed in his grandfather's footsteps by studying medicine at the University of Toronto.</li> </ul>
2	Interests & Education	<ul style="list-style-type: none"> <li>Bethune took a break from school and joined the army, where he became a stretcher-bearer.</li> <li>He completed his medical degree.</li> </ul>
3	Milestones & Setbacks	<ul style="list-style-type: none"> <li>Doctors saved Bethune's life by collapsing his diseased lung.</li> <li>When the Spanish Civil War broke out in 1936, Bethune went to Spain to help treat the wounded.</li> <li>He invented the mobile blood transfusion service, which saved thousands of refugees and soldiers from blood loss and shock.</li> <li>In 1938, Bethune discovered a massive shortage of doctors in Communist China.</li> <li>He taught Chinese nurses and doctors about sanitation and basic surgery.</li> <li>Bethune invented mobile clinics with mules and convinced the Chinese not to build hospitals in war zones.</li> </ul>
4	Death & Legacy	<ul style="list-style-type: none"> <li>Norman Bethune died of blood poisoning in 1939.</li> <li>Chinese leader Mao Zedong wrote an essay memorializing Norman Bethune.</li> <li>"In Memory of Norman Bethune" became a required reading in China.</li> <li>The highest medical honor in China is the Norman Bethune medal.</li> </ul>

## Assessment Information

### A. Overview

For your group project, you will be assessed individually and as a group. Your teacher will review your progress and group participation during every stage of development (see pages 10–11). Individual assessment includes teacher evaluation, peer evaluation, and self-reflection. Your group will also receive an overall mark for the project.

#### In Summary

You will be marked on your ability to:

- work together
- solve problems
- make group decisions
- meet deadlines
- create an attractive finished product
- speak in front of others
- develop a biographical timeline

### B. Evaluation Areas (The 4 C's)

#### Critical Thinking

- considering the project's driving question
- choosing relevant topics
- narrowing down a topic
- figuring out what's important to learn and teach
- finding ways to test others' knowledge
- analyzing sources

#### Collaboration

- coordinating and meeting group deadlines
- working with new people
- isolating group members' strengths and weaknesses
- delegating tasks
- sharing research with group members
- making suggestions
- editing and providing peer feedback

#### Communication

- participating in informal group discussions
- listening and reading for information
- following written and spoken instructions
- paraphrasing and summarizing
- presenting information in writing
- delivering a prepared presentation
- writing written reflections
- citing sources

#### Creativity

- finding interesting ways to make group decisions
- finding unique ways to include everyone in the project
- finding a variety of types of research sources
- presenting information in a unique way
- keeping the audience interested
- finding an interesting way to reach a public audience
- making the end product attractive