

Watch the video “Schoolhouse Rock on Innovation” and answer questions 4 and 5.

<https://www.youtube.com/watch?v=gEGOUgWBQL4&list=PLKt00sUUapAKKZrQuxaa2oc9546RWKoOD&index=30>

4. What are some of the inventions that were shown in the video?

5. What is meant by the quote “Necessity is the Mother of Invention”? Some research might be needed. Do you think that is true?

Read “Fueling the Inventive Spirit” and answer questions 6 and 7.

6. Using the detail in the text, how are you able to tell that the parents of Dr. Lonnie Johnson were supportive?

7. Dr. Johnson specifically mentioned that knowledge of technology is a key point for future inventors. Why do you think that would be so important?

Part B:

Review the list of Inventions/Innovators of the 21st Century and answer questions 8 and 9. Source: www.ideafinder.com

8. The articles you've read state that inventions/innovations must be something that people need and then will buy. Look at the list of Ideas/Innovators and see if any are recognizable to you. As a group, put these into categories using the graphic organizer provided. Afterwards, choose one invention from each category (4 total). Research and find the problem that the chosen inventions solved. Using the provided graphic organizer write the "problem" in one square under the problem column and then under the invention column, list the invention and how it provided a solution for that problem.

9. Research an inventor or innovator from the list provided. (Use the Biography Research Organizer to keep your research organized.) Ensure that you also research any inspiration they may have had to create their idea. You will create a poster that gives information on your research. Be sure it is organized. There is a poster rubric with requirements.

Part C:

10. Become an inventor/innovator! Do some research of your own. Ask friends/family the survey questions on the attached sheet. Choose three problems that seem to need a solution. Research if there are any solutions in place already. Then narrow your choice to one. You will create an invention/innovation for the solution. Your teacher will give you further details and sheets to help guide your work. You will also need to write a project brief for it. Lastly, you will be tasked with creating a commercial for your invention. Remember, your audience should be based on who would buy your invention.

Read “How Patents Work” and answer questions 11 and 12.

11. According to the text, what would be some reasons a person should get a patent? After researching your inventor (from task 9), do you think having a patent for a limited time could be a problem? Why or why not?

12. The process of getting a patent is clearly defined in the article. Using your invention from question 10, would your invention be available to patent? Why or why not?

13. You have to convince potential investors (think *Shark Tank*) to help you launch your invention in the marketplace. One major issue for them is that it has been patented. Create a PowerPoint for the investors explaining how you have completed the patent process in your own words. You may also want to include details of your invention, who it will be marketed to and other marketing details.

Slide requirements for the PowerPoint include:

- Catchy cover slide (1 slide)
- Details of your invention (2 slides) -might want to include the problem you solved
- The way that you handled the patent process steps (3 slides)
- Who would want to buy your invention? (1 slide)
- How you plan on advertising it? (1 slide)
- Other marketing details (1 slide) – might want to include price
- Conclusion- This is where you plead your case! Why should they invest in you?

ARTICLES/STUDENT MATERIALS

“Where Quirky Is Welcome”

NEW YORK, New York (Achieve3000, August 29, 2011). When Ben Kaufman was a teen, he came up with an idea. He wanted to make headphones that are used with an iPod. But he didn't just dream about his idea. He decided to make and sell it. Kaufman's parents loaned him money. He flew to China. He made a deal with a company to create a new product. Now, Kaufman is 24. He helps others to create inventions. He uses a special Web site. It's called Quirky.com.

Kaufman started Quirky.com in 2009. The Web site gets ideas from online visitors. Some of the ideas become real products. How does it work? Quirky visitors vote for the best product ideas. Every Friday, two winners are picked. Quirky makes each winning product in their offices. Then, those products go into presale. If enough people decide to buy a product, Quirky takes it to market. The company uses a factory in China to produce products. Then, the products are shipped to stores.

Quirky's products aim to solve the problems that annoy just about everyone. One product is a dog leash that's easier to hold. Another is a power strip that has enough room for big, boxy plugs.

"There's a difference between your crazy scientist garage inventor and regular people," said Kaufman. "Regular people experience problems...everyday.... Those are what I think are everywhere. That's what Quirky is here to [do], to capture those problems...and turn them into products."

The Quirky community works together on products. Anyone who visits the Web site can take part. They can give ideas. They can also suggest ways to make ideas better. Quirky shares part of the money it makes with its community. It gives much of the money to inventors. But people who make suggestions can also earn money.

"I'm always on Quirky," said Andrea Zabinski. Zabinski invented the Ventu. It's an all-in-one pasta strainer, mixing bowl, and serving bowl.

Zabinski says she has made over \$5,000 from sharing ideas about other people's inventions.

"You have to spend time there," Zabinski said. "You....have to work at it.... I'm getting little pennies here and there, but they all add up."

Kaufman believes that anyone can be an inventor. All it takes is creativity and hard work.

“Fueling the Inventive Spirit”

It's not easy to invent something new, and it's even harder to come up with something that sells like crazy. But it does happen. Think of the iPad and the mobile phone. Someone came up with those ideas. And now nearly everyone uses them.

Dr. Lonnie Johnson came up with an idea that became a phenomenon. He invented the "Super Soaker."

Have you ever tried taking apart a family appliance? If so, could you put it back together? As a kid, Lonnie took apart appliances. Then he moved on to making rocket fuel. One time, a batch caught on fire. In the kitchen. In one of his mother's saucepans. But Lonnie's parents didn't quash his ideas. Instead, they handed him a hot plate and told him to cook his rocket fuel outside.

Lonnie was asked what got him interested in the way things worked. He said that his dad let Lonnie watch as he tinkered. This taught Lonnie some important skills.

Lonnie went on to college and earned several degrees. Then, he went on to have a successful career as an engineer. He worked on the Space Shuttle Atlantis. He worked on the B-2 Stealth Bomber, too. He also worked on NASA's Galileo and Cassini missions. After all that, Lonnie decided to make a change. He would become a full-time inventor. Lonnie now has over 100 inventions.

These days, Lonnie is working on a new project. It is two special batteries. One will be used in hybrid and electric cars. The other will use lithium glass to create power. Neither battery uses fluids to make or store power, which is a real improvement over today's batteries.

Lonnie has some advice for other inventors. "Know that no one has a lock on any technology," he said. He says inventors must understand a technology and make it better. Lonnie also talks about selling inventions. He says that it is very important to show people how the invention works and to explain exactly why it will make money. "You can't make money without getting people interested in the invention," he said.

How Patents Work

Suppose you have a brilliant idea for an invention. Great—you'll turn the idea into a product and sell millions, right?

Actually, it's not that simple. First, you'll need to ensure that no one will steal your idea. If someone does, he or she will make the millions of dollars that would have been yours! How can you stop this? You need to apply for a patent. A patent is a property right. It says you "own" the idea. Patents are granted by the U.S. government to an inventor. They are only good for a limited time. What's the purpose of a patent? Patents "exclude others from making, using, offering for sale, or selling the invention throughout the United States." Patents also exclude others from "importing the invention into the United States." With these rights come responsibilities. Once the patent is granted, the holder must offer public disclosure of the invention. In other words, suppose you were granted a patent. You (the patent holder) must let the world know about your invention. Others need to be able to copy it. But the patent gives you ownership of the idea for a period of time. That means that it's against the law for anyone to steal the idea while you hold the patent. Patents give inventors a head start over any competition that might crop up once the patent has run out and the idea is up for grabs.

You can't just patent anything, however. According to the U.S. Patent and Trademark Office, there are three different types of patents. Utility patents are granted for "a new, nonobvious, and useful process, machine, article of manufacture, composition of matter, or improvement of any of the above." Another kind of patent is the ornamental design patent. These are granted for "an article of manufacture." Design and plant patents are granted for new types of plants. To receive any type of patent, an invention must be "novel, nonobvious, [well] described or enabled." They must also be claimed by the inventor in clear terms. Not everything can be patented. Laws of nature, physical events, and abstract ideas can't be patented. Neither can books, music, shows and artwork. (These can be Copyright protected.) Inventions that are not useful or are not tasteful are also unable to be patented.

It costs money to file a patent application. The amount depends on many things, including the type of patent.

Take a look at the flow chart below. It shows how the patent process works. Then read the information below the chart to learn more.

The Patent Process

Step 1. Check to see if your idea or invention has already been patented. If so, you can't get a patent for it.

Step 2. Determine which type of patent you'll need. Most ideas require utility patents.

Step 3. Decide where you want your patent protection. Do you want it in the U.S. only or in several nations?

Step 4. Decide which type of application you will file. Will it be a provisional or a non-provisional patent application? A provisional application has a lower filing fee. It will establish a filing date. It will also allow the inventor to use the term "Patent Pending" on the invention. However, this application runs out after one year. During that year, the inventor must file a non-provisional application. The non-provisional application begins the invention examination process. This is when the patent office determines whether the invention can be patented.

Step 5. Decide whether you need a lawyer. Some lawyers help inventors handle the most complicated parts of the patent process. But lawyers are expensive. Many inventors decide to do the work themselves rather than pay a lawyer.

Step 6. Apply for a patent. Use an online application provided by the U.S. Patent and Trademark Office.

Step 7. Wait while the patent office examines your application. Depending upon the type of patent, the wait could be two to three years.

Step 8. If the application is accepted, pay another fee to the U.S. Patent and Trademark Office to issue a patent. What if the application is denied? You can file for an appeal or start over with a new idea.

Source: U.S. Patent and Trad Key Innovations of the Twentieth Century

INVENTION and INNOVATIONS of the 20th Century

YEAR	INVENTION	INVENTOR
1900	Hershey Bar	Milton Hershey
1901	Assembly Line Electrostatic Motor Lionel Trains	Ransom Olds Elihu Thomson Joshua Lionel Cowen
1902	Air Conditioner Flashlight Teddy Bear	Willis Haviland Carrier Conrad Hubert Morris Michtom
1903	Airplane Airplane Engine Coat Hanger Crayons Radioactivity, study of Safety Glass Windshield Wipers	Wright brothers Charles Taylor Albert J. Parkhouse Binney & Smith Marie Curie Edouard Benedictus Mary Anderson
1904	Ice Cream Cone	Ernest Hamwi
1905	Popsicle Theory of Relativity	Frank Epperson Albert Einstein
1906	Planters Peanuts	Amedeo Obici
1907	Bakelite Dixie Cups Outboard Motor Paper Towels	Leo Baekeland Lawrence Luellen & Hugh Moore Ole Evinrude Arthur Scott
1908	Cellophane Mixer	Jacques Brandenberger Herbert Johnson
1912	Life Savers Candy Rocket, Liquid-fueled Shopping Bag	Clarence Crane Robert Goddard Walter H. Deubner
1913	Mass Production Erector Set Zipper	Henry Ford A.C. Gilbert Gideon Sundback
1914	Radio Remote Control Tinkertoy	John Hays Hammond Charles Pajeau
1916	Lincoln Logs	John Lloyd Wright
1919	Toaster	Charles Strite
1920	Band-Aid Hair Dryer Traffic Light	Earle Dickson Inventor Unknown William Potts
1921	Wheaties Wonder Bread	George Cormack Elmer Clime
1922	Blender	Stephen Poplawski

1923	Traffic Light	Garret Morgan
1925	Masking Tape Television, mechanical	Dick Drew John Logie Baird
1927	PEZ Candy Television	Eduard Haas III Philo T. Farnsworth
1928	Bread Slicer Bubble Gum Penicillin Yo-Yo	Otto Rohwedder Walter E. Diemer Alexander Fleming Donald Duncan
1929	Sunglasses	Sam Foster
1930	Toll House Cookies Cellophane Tape	Ruth Wakefield Dick Drew
1935	Ballpoint Pen Monopoly Trampoline	Ladislav & Georg Biro Charles Darrow George Nissen
1936	multiplane camera	Walt Disney
1937	Shopping Cart	Sylvan Goldman
1938	Nylon Stockings Xerography	Dr. Wallace H. Carothers Chester Carlson
1942	Duct Tape Nuclear Reaction	Johnson & Johnson Company Enrico Fermi
1943	Bouncing Putty	James Wright
1945	Microwave Oven Slinky Tupperware	Percy LeBaron Spencer Betty and Richard James Earl Tupper
1946	Bikini Swimsuit Disposable Diapers	Louis Reard Marion Donovan
1947	Kitty Litter Instant Photography Transistor	Ed Lowe Edwin Land J. Bardeen, W. Brattain and W. Shockley
1948	Velcro	George de Mestral
1949	LEGO	Ole Kirk Christiansen
1950	Frisbee "PEANUTS" Silly Putty	Walter Frederick Morrison Charles Schulz Peter Hodgson
1951	Liquid Paper Random Access Memory	Bette Nesmith Graham Jay Forrester
1956	Play-Doh Scotchgard TV Remote Control Yahtzee	Noah and Joseph McVicker Patsy Sherman and Sam Smith Robert Adler Edwin S. Lowe

1958	Hula Hoop Integrated Circuit Laser Video Game	Richard Knerr and Arthur Melin Jack Kilby and Robert Noyce Arthur Schawlow&Charles Townes William Higinbotham
1959	Barbie Doll	Ruth Handler
1960	Etch A Sketch The Game of Life	Arthur Granjean Reuben Klamer
1963	Easy-Bake Oven Lava Lamp	Kenner Products Edward Craven Walker
1965	Kevlar SuperBall	Stephanie Kwolek Norman Stringley
1966	Hand-held Calculator	Jack Kilby, J. VanTassel & J. Merryman
1968	Computer Mouse Microprocessor Speakers, Bose	Douglas Engelbart Ted Hoff Amar G. Bose
1971	eBooks Karaoke Machine	Michael Hart Daisuke Inoue
1972	Pong Video Game	Nolan Bushnell
1973	Ethernet Internet	Robert Metcalfe Vinton Cerf
1974	Post-it Notes Rubik's Cube	Art Fry and Spencer Silver Erno Rubik
1976	Personal Computer	Steve Jobs and Steve Wozniak
1977	Human Powered Flight PC Modem SIMON game	Paul MacCready Dennis Hayes & Dale Heatherington Ralph Baer
1978	Dyson Vacuum Cleaner	James Dyson
1979	Cellular telephone	Martin Cooper
1982	Computer Gaming itty bitty Booklight	Sid Meier Noel Zeller
1983	Cabbage Patch Kids Mobile Phone	Xavier Roberts Richard Frenkiel and Joel Engel
1986	Club, The	James Winner
1988	Smooth Staple®	John G. Knapp
1991	World Wide Web	Tim Berners-Lee
1992	Water Disinfection System	Ashok Gadgil
1993	Beanie Babies	H Ty Warner
1995	DVD player LeapFrog	(not credited) Michael Wood
1998	Google	Sergey Brin and Larry Page

Ideas/Inventions

Categorize the ideas/inventions/innovations into the category in which you feel they fit. Prepare to defend your answers. Note- Communication, Transportation and other solutions would fall under the miscellaneous solution section.

Household Solution	Technology Solution	Recreation Solution	Miscellaneous Solution

Problem

An empty rounded rectangular box with a blue border, intended for describing the problem.

An empty rounded rectangular box with a blue border, intended for describing the problem.

An empty rounded rectangular box with a blue border, intended for describing the problem.

An empty rounded rectangular box with a blue border, intended for describing the problem.

An empty rounded rectangular box with a blue border, intended for describing the problem.

Invention

An empty rounded rectangular box with a blue border, intended for describing the invention.

An empty rounded rectangular box with a blue border, intended for describing the invention.

An empty rounded rectangular box with a blue border, intended for describing the invention.

An empty rounded rectangular box with a blue border, intended for describing the invention.

An empty rounded rectangular box with a blue border, intended for describing the invention.

Name:

Biography Research

Persons Name:

Picture:

Early Life:

Family Life:

Major Accomplishments:

3 Interesting Facts:

Invention/Innovation Survey

One of the best ways to collect ideas for developing an innovation or invention is to take a survey. The following list of questions may help you to think about what you want to invent or change.

What does not work as well as you would like it to work?

What problem(s) would you like to see solved?

If you could invent something to make your life easier, what would you invent?

What is the most annoying problem:

At home?

At school?

At the airport?

On the road?

At the grocery store?

At the mall?

At the park or playground?

In the cafeteria?

Invention/Innovation Solution

1. What problem would you like to solve?
2. Are there any solutions already in place? If so, what could be done to improve them?
3. Write down your ideas for possible solutions to the problem.
4. What materials would you need to create the solution?
5. Who would your audience be?
6. How would you best advertise it?

POSTER RUBRIC

CATEGORY	5	4	3	2	1	Points Earned
Creativity/ Originality	The poster shows a very original presentation of the materials which captures the viewer's attention and shows that the student went over and beyond the requirements, which were all met and exceeded. A great deal of time was spent on creativity.	The poster shows a lot of originality; good variety and blending of materials. The poster is very interesting to the viewer. The student spent a lot of time on the work and most of the requirements were met. A lot of time was spent on creativity.	The poster has some originality and variety of materials. Some but not all the requirements were fulfilled. It shows some creativity and that a moderate amount of time was taken to create the poster. Viewers have some interest.	The poster has little originality or variety of materials. Few of the requirements are met. It shows little creativity and that a minimum amount of time was taken to create the poster. Viewers have little interest.	The poster has no originality. Insufficient use of materials. None of the requirements were met. It shows no creativity and that almost no time was taken to create the poster. Viewers have no interest.	
Quality of Poster Presentation	The poster is effective in relating all of the topics and requirements. Physical appearance of project shows attention to details in terms of lettering, organization, typing proofreading, neatness, picture, art labels, etc.	The poster is interesting and adequately addresses the requirements and topics. Good physical appearance. Minor flaws in details.	The poster is somewhat interesting and vaguely addresses the requirements and topics. Appearance is not very appealing. Moderate errors in details.	The poster is not interesting and barely addresses the requirements and topic. Some vital elements are missing. Physical appearance is not appealing. Major errors in details.	The poster is not interesting and does not meet the requirements or topic. Vital elements are incomplete or not appropriate. Unappealing with extreme errors in details.	

Rubric for Invention/Innovation Project & Commercial

	4	3	2	1
Oral Presentation	<p>Was able to clearly explain invention and how it works. Answered all of the following:</p> <ul style="list-style-type: none"> •How individual came up with the idea. •How it would be made. •How the product is used and why it is useful. 	<p>Was mostly able to explain invention and how it works. Answered all of the following:</p> <ul style="list-style-type: none"> •How individual came up with the idea. •How it would be made. •How the product is used and why it is useful. 	<p>Was partially able to explain invention and how it works. Answered 2 out of 3:</p> <ul style="list-style-type: none"> •How individual came up with the idea. •How it would be made. •How the product is used and why it is useful. 	<p>Was not able to explain invention and how it works. Answered 1 or none:</p> <ul style="list-style-type: none"> •How individual came up with the idea. •How it would be made. •How the product is used and why it is useful.
Commercial Appeal	<p>This is the equivalent of a TV commercial, informative and persuasive.</p> <p>Themes are clearly used and demands consumer action.</p>	<p>Skit is very persuasive.</p> <p>Lacks a clear theme.</p>	<p>Skit is well done but lacks persuasion for buying your invention.</p>	<p>Skit is not persuasive at all.</p> <p>No themes are taken advantage of.</p>
Product Information	<p>Information about invention is plentiful.</p> <p>Information is useful and presented creatively.</p> <p>Included logo and jingle.</p>	<p>A lot of information is given about Invention.</p> <p>Not creative enough.</p> <p>Included logo and jingle.</p>	<p>Some information about invention is given.</p> <p>Not very unique.</p> <p>Included either the logo or jingle, but not both.</p>	<p>No real information about invention is given.</p> <p>Included neither the logo or the jingle.</p>
Invention Model	<p>Shows great effort, thought and creativity.</p>	<p>Shows much effort, thought and creativity.</p>	<p>Shows some effort, thought and creativity.</p>	<p>Shows little effort, thought and creativity.</p>

Grading Rubric for a Power Point Project

	5	4	3	2	1
Content	Content is accurate and information is presented in a logical order.	Content is accurate but some information is not presented in a logical order, but is still generally easy to follow.	Content is accurate but information is not presented in a logical order, making it difficult to follow.	Content is questionable and information is not presented in a logical order, making it difficult to follow.	Content is inaccurate and information is not presented in a logical order, making it difficult to follow.
Slide Creation	Presentation flows well and logically. Presentation reflects extensive use of tools in a creative way. Correct number of slides.	Presentation flows well. Tools used correctly. Correct number of slides. Overall presentation is interesting.	Presentation flows well. Some tools used to show acceptable understanding. Correct number of slides.	Presentation is unorganized. Tools are not used in a relevant manner. Lacking in number of slides.	Presentation has no flow. No tools used. Insufficient number of slides.
Slide Transitions	Transitions are smooth and interesting. Transitions enhance the presentation.	Smooth transitions are used on most slides.	Smooth transitions are used on some slides.	Very few transitions are used and/or they distract from the presentation.	No transitions used.
Pictures, Clip Art & Background	Images are appropriate. Layout of images is pleasing to the eye.	Images are appropriate. Layout is cluttered.	Most images are appropriate.	Images are inappropriate.	No images.
Mechanics	No spelling errors. No grammar errors. Text is in authors' own words.	Few spelling errors. Few grammar errors. Text is in authors' own words.	Some spelling errors. Some grammar errors. Text is in authors' own words.	Some spelling errors. Some grammar errors. Most of text is in authors' own words.	Many spelling errors and/or text is copied.
Technology Connection	Comprehensive use of technology is apparent.	General understanding of technology.	Acceptable understanding of technology.	Little understanding of technology.	No understanding of technology.



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