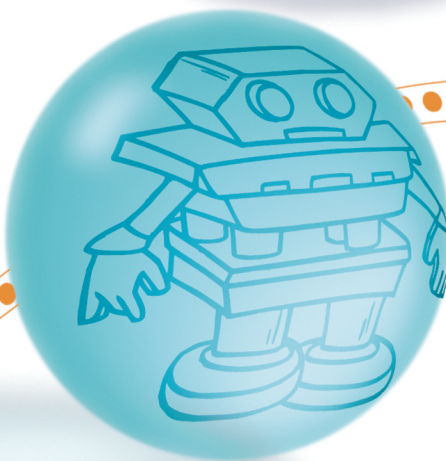


LEARN FROM THE PAST, CREATE THE FUTURE:

INVENTIONS AND PATENTS

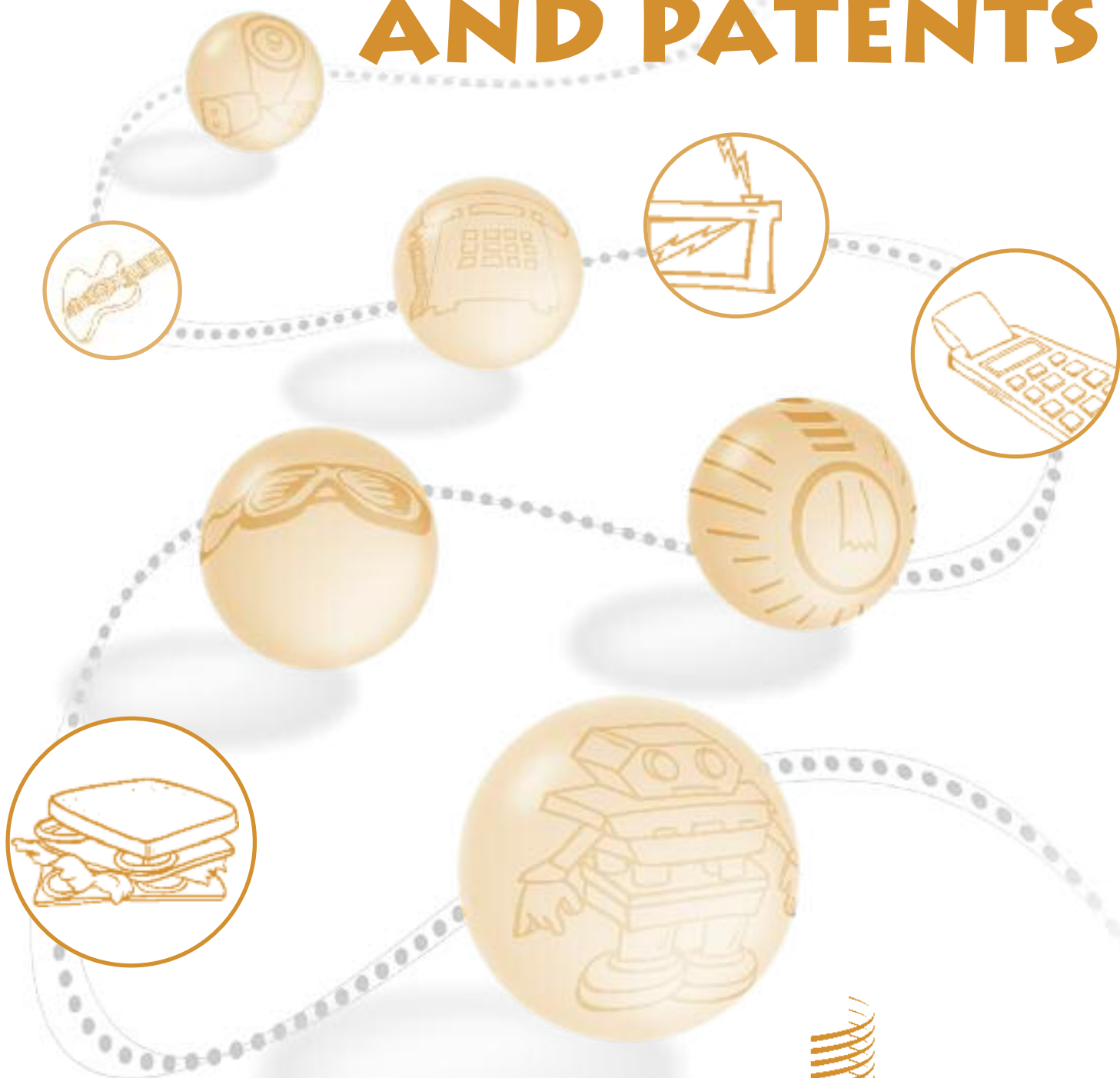




Disclaimer: The main purpose of this publication is to provide basic information, it is not meant as a substitute for professional legal advice. Mention of names of firms and organizations and their websites does not imply the endorsement of WIPO.

LEARN FROM THE PAST, CREATE THE FUTURE:

INVENTIONS AND PATENTS



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PREFACE

"Inventions and Patents" is the first of WIPO's *Learn from the past, create the future* series of publications aimed at young students.

This series was launched in recognition of the importance of children and young adults as the creators of our future.



Winners of a WIPO gold medal at the 2003 "To be an Inventor" challenge in Tayside, Scotland. These Netherlee Primary School students invented a "Floodbuster" device to prevent the bath from overflowing when unattended.

The first two parts of this publication are designed to provide basic information about inventions and patents. The aim is to communicate the importance of inventors, their inventions and patents through games, thought provoking exercises and concrete examples.

Part three provides a roadmap for invention and encourages young students to invent and patent their creations.

At the end of this publication are detailed answers to the games, an inventor's glossary and an invention journal to track the young inventor's work.

INVENTIONS

What are inventions?

Generally speaking, an **invention** is a new product or process that solves a technical problem. This is different from a **discovery**, which is something that already existed but had not been found.



Consider, for example, the telescope and the mountains of the moon. The telescope is an invention that was created in 1608 when Hans Lipperhey, a Dutch eyeglass maker, combined convex and concave glasses at either end of a tube. It was only with the invention of the telescope that humans (Galileo Galilei to be precise) were able to look far enough into the sky to see the mountains of the moon. Galileo didn't invent these mountains, he discovered them - with the help of an invention.

Just as inventions can lead to discoveries, discoveries can sometimes also lead to inventions. For example, Benjamin Franklin's discovery of the electrical effects of lightning led him to invent the lightning rod around 1752. This invention is still in use today and has made buildings much safer places during thunderstorms.

From the beginning of time, humans everywhere have been inventing. In fact, most of what is around you now was invented by someone in the past. We have grown so used to these things, however, that we often don't think of them as inventions.



Think about the alphabet that we are using to communicate right now. The ink and paper that these words are written on. The clothes you are wearing. The chair you are sitting on. All of these are inventions and there is a person, a human mind, behind each of them.

Think about it:

What other inventions have led to discoveries?

What other discoveries have led to inventions?

How many inventions can you identify in this scene?



What would your world be like without inventions?

Inventions are essential to our everyday life and yet most people know very little about their origins.

How do we know when inventions were first invented?

Many inventions were invented thousands of years ago so it can be difficult to know their exact origins. Sometimes scientists discover a model of an early invention and from this model they can accurately tell us how old it is and where it came from. However, there is always the possibility that in the future other scientists will discover an even older model of the same invention in a different part of the world. In fact, we are forever discovering the history of ancient inventions.

An example of this is the invention of pottery. For many years archeologists believed that pottery was first invented in the Near East (around modern Iran) where they had found pots dating back to 9,000 BC. In the 1960s, however, older pots from 10,000 BC were found on Honshu Island, Japan. There is always a possibility that in the future archeologists will find even older pots somewhere else.



Sometimes archeologists can only find pictures or written references of an ancient invention. Though they are proof that the invention existed, texts and pictures can make it difficult to determine when, where and by whom the invention was created.

This is the case of the compass. Scholars have found a clear description of a *sinan* (navigational device) in a Chinese text dating back more than two thousand years. While no actual models of this invention have been found to date, the description in this ancient text leads us to believe that this ancient form of compass was invented as



Sinan model by Susan Silverman
courtesy of Smith College, History of
Science and Technology Program

early as 2400 years ago in China, and it took more than 1000 years for it to be introduced to the West (via Arab traders) in the 13th Century AD.

When scientists are very lucky, they find texts that not only mention past inventions but also describe them in great detail and even reveal the name of the inventor and the approximate date of the invention. In these cases we have concrete proof of when, where and by whom the invention was created and we can give proper credit to the inventor.



This is how we know, for example, about the Greco-Egyptian engineer Heron of Alexandria who created countless machines in the late first century AD. Also known as *mekanikos* (machine man), Heron was famous in his time for his numerous inventions, especially his automatic machines that included a steam engine, a coin-operated slot machine and automatic doors.

Sometimes, different ancient civilizations independently invented very similar items. For example, almost every ancient civilization invented mirrors. Ancient mirrors made of polished volcanic glass (obsidian) have been found in Turkey and Mesoamerica, while polished bronze or copper mirrors were made

by the inhabitants of ancient Egypt, Mesopotamia, China, Greece, Rome, and the Indus valley.

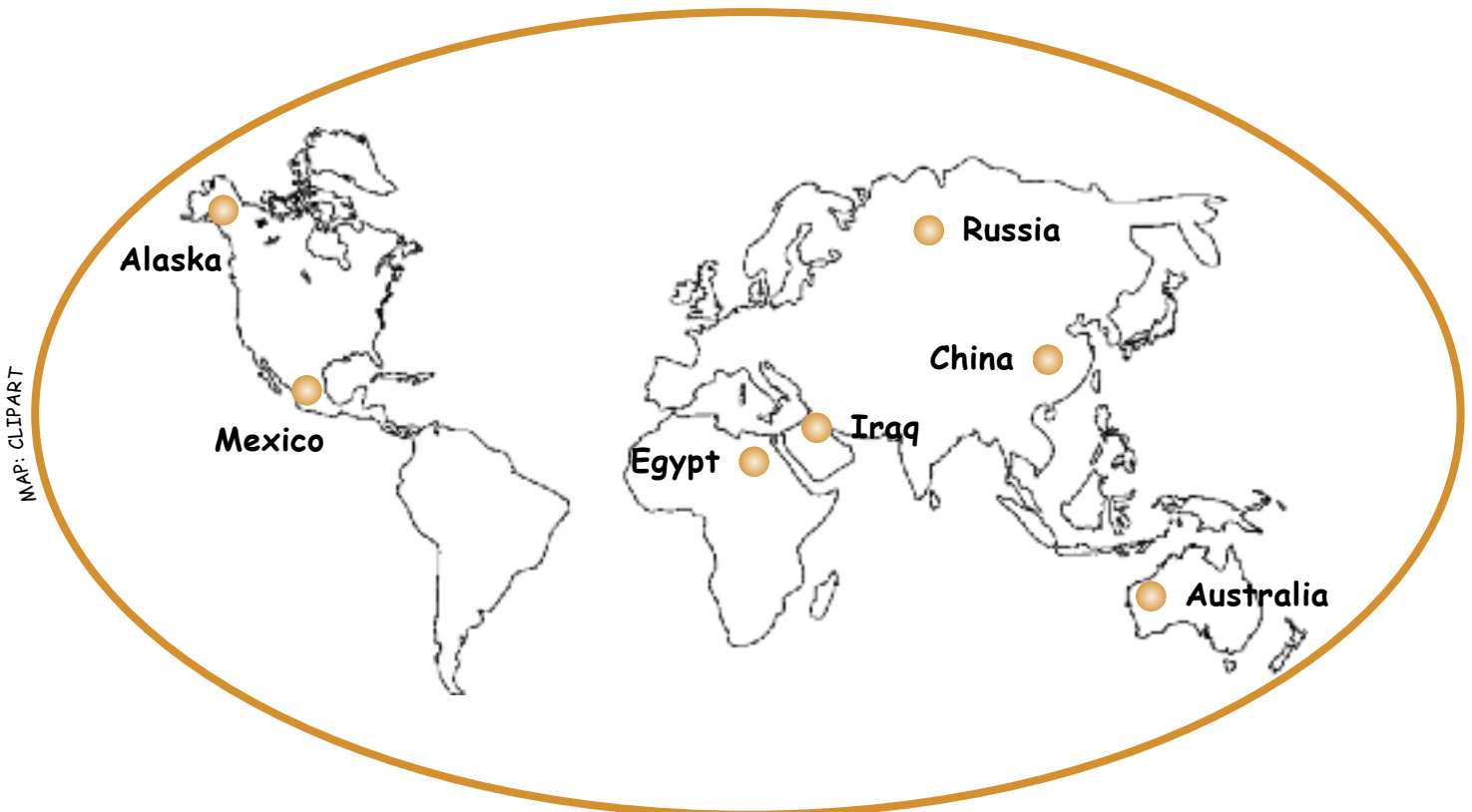
In modern times, patents help us to determine when, where and by whom an invention was invented. The second chapter in this book will give you more information about the use of patents.



Heron's steam engine model by Karen Fisher courtesy of Smith College, History of Science and Technology Program

Game* – Inventions of Ancient Civilizations

Some inventions from thousands of years ago are still in use today. Do you know the origins of these ancient inventions?



Kite



Chocolate



Lighthouse



Wheel



Boomerang



Snow Goggles



Skis

*See page 55 for answers

How are inventions invented?

Necessity is the mother of invention.

-famous proverb

In order to invent, inventors first identify a need or problem. They then think of a creative way to solve the problem, and work hard to make that solution possible.

Here are a few examples of things that have inspired inventors to invent.

1) Needing something that is not available in the market:

Invention Profile: Adding Machine

Blaise Pascal was a well-known French philosopher, mathematician and physicist but he was also a young inventor. His father was a tax collector who spent long hours calculating by hand how much tax he had to collect. In 1642, at the age of 19, Pascal invented a mechanical adding machine which his father could use to calculate the taxes more quickly and accurately. Pascal's machine was called the Pascaline.



2) Wanting to help somebody:

Invention Profile: Stop-motion Device for Textile Looms

In 1850, at the age of 12, Margaret Knight witnessed a serious accident at a textile mill. Concerned for the safety of the mill's workers, she invented a stop-motion device to quickly stop the powered textile looms in case something went wrong. Her invention was put to use at many mills where it increased the safety of all mill workers. This was only the first of Margaret's many inventions. She was granted more than 25 patents in her lifetime, including one for a flat-bottomed paper bag still used in some stores today.



3) Combining two or more products to produce a new and better product:

Think about it:

How many inventions can you uncover by combining two of the items listed below?

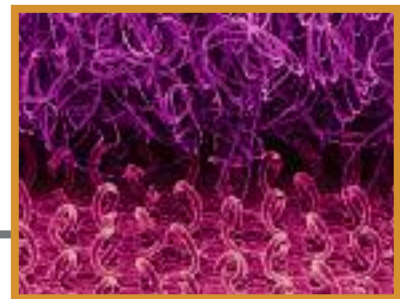
Motor	Camera	Book	Wheels
Clock	Computer	Shoes	
Bicycle	Telephone	Radio	

4) Applying a better understanding of nature:

Invention Profile - VELCRO®

One day in 1941, Swiss engineer *George de Maestral* took his dog for a walk in the Swiss Mountains. By the time they returned home, his clothes and his dog were covered with cocklebur seeds. Curious about what had made these seeds stick to fabric, *George* decided to examine them under a microscope. He found that the seeds had tiny hooks that had stuck to the loops of the fabric.

George decided to use the same principle of tiny hooks and loops to develop a new and better fastener than the zippers available at that time. After many experiments he developed two nylon tapes (one covered with tiny loops and the other with tiny hooks) which stuck together when pressed. The VELCRO® brand fastener was patented in 1951 and is now used in many products including shoes, jackets and bags.



Colorized scanning electron micrographic image of joined VELCRO®. © Dee Breger, Drexel University

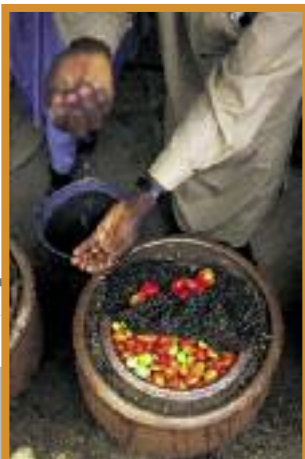
5) Combining traditional knowledge with modern scientific concepts:

Invention Profile - Pot-in-Pot Cooling System

Northern Nigeria is a hot, semi-desert rural area where many people have no electricity. Most people grow and sell their own crops, yet keeping fruits and vegetables fresh in this type of climate is a real challenge. Without refrigeration, most fresh food rots within a couple of days. Throwing away spoiled crops means lost income for poor families. Eating the rotting crops causes serious health problems.

Local teacher Mohammed Bah Abba was concerned about this problem and decided to find a solution for it. As a boy born into a family of clay pot makers, Mohammed knew that these traditional clay pots retained water even when dry. In 1995 he combined this traditional knowledge with his understanding of biology, chemistry and geology to design a pot-in-pot cooling system that acts as a "desert refrigerator".

Mohammed's cooling system is made up of a small pot placed inside a larger pot with wet sand filling the space between the two clay pots. The fruit and vegetables are kept in the smaller pot, covered with a damp cloth and left in a dry, ventilated place. When water from the sand evaporates, it causes the temperature in the pots to go down several degrees so the food in the smaller pot is always cool. With the pot-in-pot system food stays fresh much longer. For example, aubergine can stay fresh for 27 days instead of the usual three days.

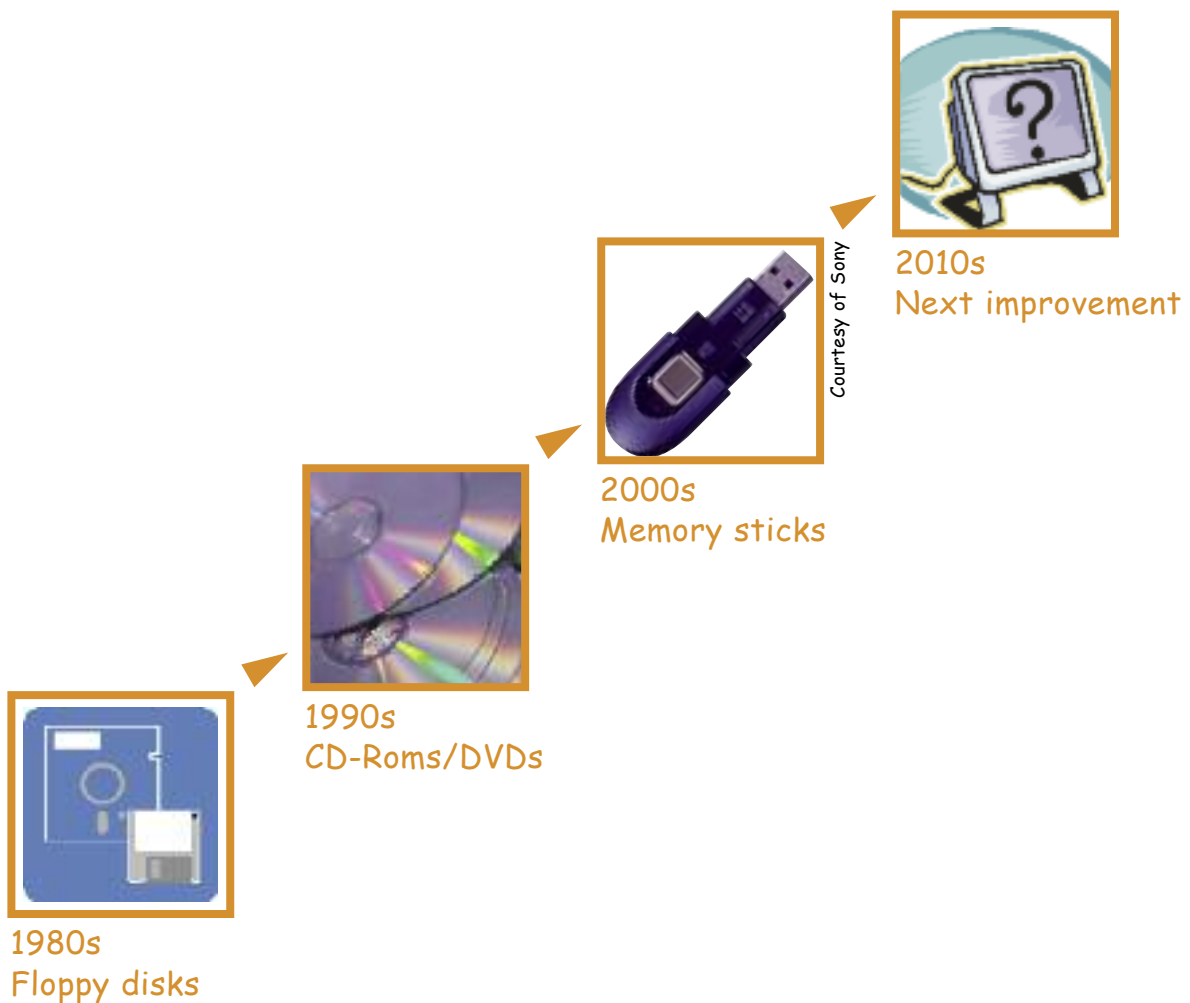


Mohammed's system has improved the lives of thousands of people, which is why in 2000 he won the prestigious Rolex Award for Enterprise.

6) Improving past inventions:

Not every invention has to provide a completely new solution. Some very good inventions are improvements on previous solutions.

In the short history of the home computer we have seen many improvements in the way data are externally stored. Small memory sticks can now store more information than the older, bigger and more fragile floppies. Can you imagine the next improvement for external data storage?



Inventions improve our lives

Inventions improve our lives in many ways. They make our tasks easier, entertain us, improve our knowledge of the world, and even save lives.

Think about it:

Make a list of inventions that make your life easier, better or simply more fun. Below are a few examples to get you started.

Inventions that make our lives easier:

- ◆ Cars

Inventions that increase our knowledge of the world:

- ◆ Microscopes

Inventions that entertain us:

- ◆ Televisions



Inventions that save lives:

- ◆ Fire extinguishers

Game* - Inventor Match-maker

We owe our modern way of life to all the inventors who came before us and yet most people cannot name more than one or two of them. This is quite surprising when you consider that the names of many inventors are hidden in the names of inventions we use everyday.

Can you match the inventions below with their inventors?

- | | | |
|----------------------|---|---|
| Gabriel Fahrenheit ● |  | coffee-making method and filter |
| Alessandro Volta ● |  | bread slices with filling of meat, cheese, etc. |
| George Eastman ● |  | writing system for the blind |
| Louis Braille ● |  | camera with roll film |
| Levi Strauss ● |  | battery |
| Earl of Sandwich ● |  | blue jeans |
| Melitta Bentz ● |  | mercury thermometer and temperature scale |

*See page 56 for answers

Think about it:

Can you find other inventors whose names are related to their inventions?

Here are a couple of examples to get you started:

- ◆ Diesel engines - invented in 1892 by German engineer Rudolf Diesel
- ◆ Pasteurization process - invented by French chemist Louis Pasteur in 1856
- ◆
- ◆
- ◆

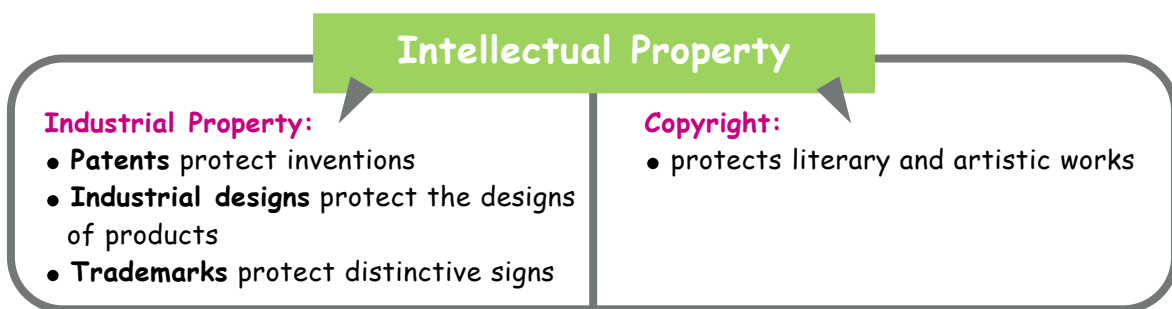
Inventions are so important to all of us that we should encourage talented inventors to keep inventing. One way to encourage inventors is by preventing people from stealing their inventions. In the next chapter we will see how patents help to achieve this.

PATENTS

What are patents?

A **patent** is an official document given to an inventor by a government. This document generally gives inventors the right to stop anyone else from copying, using, distributing or selling the invention without their permission.

Patents are a part of **Intellectual Property**, which is a legal way to protect all creations of the human mind. Intellectual Property is divided into **Industrial Property** and **Copyright**.



Why are patents important?

Inventions are the result of hard work. It may only take a moment of inspiration to think of a good idea but it takes a lot of research and experimentation to turn the idea into a useful and working invention.

Inventors deserve a reward for the amount of time they spend developing their ideas. They also need the security of knowing that if they share the invention with the rest of the world, nobody will steal it, use it or copy it without their permission.

Patents provide rewards and protection for inventors but they also benefit society. In return for patent protection, inventors agree to reveal all the technical information about their invention. This information is available to everyone and has enough details so anyone with basic knowledge

of the invention's field can reproduce the invention. In this way, patents help to spread new knowledge. This new knowledge can in turn help others to solve different problems, or to make further advances in science and **technology**.

Inventor Profile - Leonardo Da Vinci

Leonardo Da Vinci was a famous painter and sculptor but also a great inventor. He had an excellent understanding of how machines worked and invented many things during his lifetime. His inventions included parachutes, flying devices, diving gear and many other machines.

Before patents existed, some inventors kept their inventions secret for fear that they would be stolen or copied. Some historians believe that Da Vinci wrote the notes on his experiments backwards ("mirror writing") to make it harder for other people to read and copy them.

It took hundreds of years for scholars to find and decipher some of Da Vinci's notebooks. Recently, some people have started making models of inventions that Da Vinci described and drew in his notebooks more than 500 years ago. For example, in 2000 Katarina Ollikanen from Sweden built a rigid pyramidal parachute based on Da Vinci's drawings from 1485. She used only tools that would have been available in Da Vinci's day. Her English skydiver boyfriend, Adrian Nicholas, used this parachute to make a successful 3,000 meter descent in South Africa, proving that Da Vinci's parachute invention worked.



The first non-Da Vinci, modern parachute was invented in 1797 by André Jacques Garnerin, more than 300 years after Da Vinci sketched his version in his notebooks. Knowing this, we cannot help but wonder how history might have been different if Da Vinci had shared all his inventions with the rest of the world.

Think about it:

Think of three items that you use everyday. How different would your life be if the inventors of these items had not shared their inventions with the rest of the world?

When were patents invented?

In the 15th Century, Venice was a very important center for art, science, trade and commerce. Many inventors lived in Venice at the time and in 1474 the government invented the first law to protect the rights of inventors.

This Venetian law allowed any inventor of a workable invention to register it in a state office. With this registration, the inventor would have certain rights over his invention so nobody would be able to copy or sell it without the inventor's permission. This protection was limited to 20 years, after which time the invention could be copied or sold by anyone. In return for this protection, the inventor had to use the invention for the benefit of the state.

After Venice, other states began to encourage and protect their inventors with similar laws, and nowadays almost all countries have their own modern patent laws.



Modern patent laws

Modern patent laws protect the inventor for a specific period of time (usually 20 years) during which, in general, it is illegal for anyone else to copy, use, distribute or sell the invention without the approval of the inventor. In return for this protection, inventors reveal in their patent applications the technical details of how their inventions work, so that other people can learn from them.

Once inventors have patent protection, they can make money by being the only ones allowed to produce, distribute and sell their inventions. Some inventors are too busy working on their next idea to spend time trying to sell their previous inventions. In these cases, inventors may prefer to **license** their inventions.

When inventors license their patented inventions, they authorize another person or a company (the **licensee**) to produce, sell or distribute them as long as they pay a license fee. This license fee rewards inventors for their creations and allows licensees to "**commercialize**" inventions so that consumers can benefit from them.

If people copy, distribute or sell a patented invention without the patentee's permission, they commit a **patent infringement**. The patentee can sue the patent infringer in a law court.

When the patent protection expires, the invention enters the **public domain** and anyone can commercialize it without asking the inventor for permission.

How do inventors obtain patents?

Inventors obtain patents for their inventions by submitting a patent application to their national patent office. This application includes a detailed description and diagram of the invention and how it works.

Patent application forms and other patenting procedures can be complicated so many inventors employ a patent lawyer to help them through the process. Lists of recommended patent lawyers can usually be found at national industrial property offices or lawyers associations. Find the link to your country's industrial property office at the following Internet address:
<http://www.wipo.int/directory/en/urls.jsp>

Inventions can be as simple as a paperclip or as complicated as a robot but they must meet certain **conditions of patentability** before they can be patented.

These conditions are:

- 1) **Industrial Applicability (Utility)** - Meaning that the invention can be made or used in any kind of industry, or must have a practical use; it cannot be just an idea or a theory. If the invention is for a product, someone must be able to make that product. If the invention is for a process then it must be possible to carry out that process.

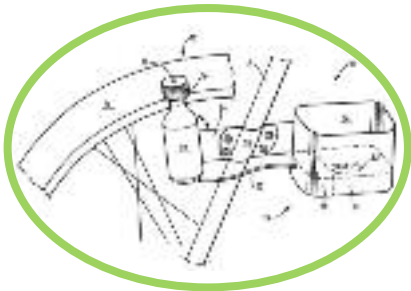


For example, a time machine may be a great idea but unless an inventor actually creates one that truly allows people to travel in time, the simple idea of the time machine cannot be patented.

- 2) **Novelty** - Meaning that the invention must have a new characteristic that is not part of the current knowledge in its technical field. In the application, the inventor must describe the invention in detail and compare it with previous existing technologies in the same field in order to demonstrate its newness.

Before inventors apply for a patent, they are strongly encouraged to research the technical fields of their inventions to make sure that no one else has already applied for a patent for the same invention. It is not easy to conduct a thorough **patent search** so it is advisable to seek professional help at this stage. A patent lawyer can help with this task. Alternatively, inventors can ask for help from experts at national **patent depository libraries**.

3) **Inventive Step (Non obviousness)** - Meaning that the new characteristic of your invention could not have been easily deduced by a person with average knowledge of that particular technical field.



For example, using the power generated from riding a bicycle to charge mobile phones is not an obvious use of bicycles, mobile phones or chargers. In 2001, by passing the non-obviousness test, British inventor Kieron Loy obtained patents in several countries for his "Pedal & Power" eco-friendly mobile phone charger.

When should an invention be patented?

When deciding whether or not to patent an invention, the first thing inventors need to do is to find out if their inventions meet the above-mentioned conditions of patentability.

Next, inventors should try to find out how interested other people are in their inventions and if customers would be willing to buy them. The patenting process can be long and expensive so inventors should make sure that once they have the patents they will be able to sell their inventions and recover the patenting and production costs.

Beware !!

Remember that novelty is one of the conditions for obtaining a patent. Participating in science competitions or invention exhibitions may be a great way to find out about your invention's appeal. However, making your invention available to the public and press before you apply for a patent may interfere with the novelty condition of patentability in some countries.

Once your invention is ready, study your potential market. Would anyone be interested in buying, selling or producing your invention on a large scale? If you think that the answer to this question is "yes" then consider carefully what the consequences would be of sharing your invention with others before you apply for patent protection.

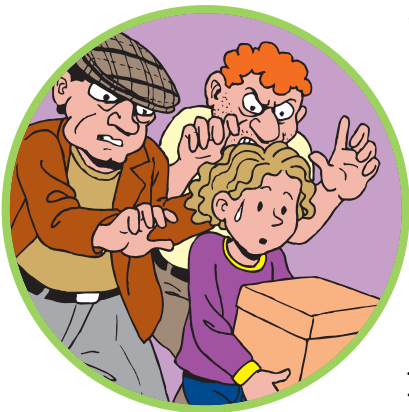
Keep in mind that the initial costs of applying for a patent are comparatively low (they increase as your application passes through the various stages of the patenting process). As soon as you apply for a patent, you can safely participate in fairs and exhibitions and share your invention with the public.

While your patent application is being processed, you will have time to find out if your invention is as appealing as you thought it would be. If your invention is successful then you will be glad that you have already taken the first step towards protecting it. On the other hand, if your invention does not appeal to anyone, then you can avoid paying further patenting costs by stopping your patent application.

While you wait for your patent to be granted, you can put a "patent pending" sign on your invention. Apart from warning others that you have taken steps to protect your invention, the "patent pending" sign may make your invention more attractive to potential investors and consumers who will view it as "cutting-edge" technology. Once the patent is granted, the patent pending phrase can be replaced with the patent number obtained. Note, however, that it is illegal to use the phrase "patent pending" if you have not applied for a patent!

What happens if an invention is not patented?

Inventions that are not patented can be copied, sold and distributed by anybody. This means that without a patent, inventors may miss out on the money they could have earned from their inventions. If the inventions are successful and many people want to buy them, there would be nothing to prevent copycat companies from selling the same inventions. Such competition would decrease the sales and profits that inventors could make from their own inventions.



In addition, without a patent it is more difficult to license an invention to investors, manufacturers or distributors. This means that if inventors want to make money from their unlicensed inventions, they have to take care of all the investment, production, distribution and sales by themselves. This is not an easy task!

It is also often the case that when inventors don't patent their inventions or share them with the public, at some point another inventor may think of the same invention and patent it. Once again, the original inventor would not receive any of the credit or financial rewards from the sale of this invention.

Finally, as we have seen before, when inventors do not patent their inventions, the new knowledge or technological information which led to those particular inventions sometimes does not get shared more widely. In some cases this can slow down the advancement of science and technology by limiting the availability of important information that could be used by other scientists and inventors.

Invention Profile: Re-sealable Cereal Boxes

Breakfast cereal became popular among American children in the 1930s. Although cereals were available in many shapes and flavors, they were all packed in the same type of box. The tops of cereal boxes had two flaps that were glued together. It was difficult to close these boxes again when the flaps had been torn apart, so once the box was opened the remaining cereal quickly became stale.

Mary Speath enjoyed fresh cereal for breakfast but was tired of it becoming stale soon after the box was opened. In 1946, when she was only eight years old, Mary began experimenting with a small toolbox and the cereal box flaps. She wanted to keep her cereal fresh by finding a way to re-seal the box flaps after they had been torn apart. After many experiments she succeeded by shaping a protruding notch on one of the flaps which would fit into a slit cut into the other flap.

For many years Mary kept her cereals and crackers fresh by carefully ungluing the flaps of boxes and shaping them so that they could easily be closed and re-opened. Unfortunately, neither Mary nor her parents recognized her idea as an invention, so they never even thought about patenting it. In the 1960s cereal companies independently invented re-sealable closing flaps similar to the slit-and-tongue design that Mary had invented more than 14 years earlier. This type of re-sealable lid can be found in most box packages today.

Since Mary did not patent her invention, she did not make any money from her idea. In fact, most people don't even know that she was the original inventor of the re-sealable boxes which people use every day. In addition, since she did not patent her idea or make it known, the rest of the world had to eat stale cereals for many more years until the cereal companies finally thought of the solution on their own.





Are patented inventions protected worldwide?

Patent protection is only valid in the country that granted the patent. For example, if you are granted a patent in country A, your invention is not protected in country B, so anyone in country B can copy, use, distribute and sell your invention without your permission. In order to protect your invention in country B, you would have to obtain a patent from the government of country B.

Inventions such as airplanes and the Internet have made our world smaller. It is now faster and easier for people and ideas to travel around the world. Because of this, it is no longer enough for inventors to protect their ideas in only one country.

Obtaining patents can be a long and expensive process. Fortunately for inventors, in 1970 several countries decided to simplify the process for protecting patents around the world by creating the Patent Cooperation Treaty (**PCT**). Thanks to the PCT, inventors can submit just one international application which is valid in any or all of the more than 140 countries that are members of this Treaty. Inventors can decide if they want to apply for a patent in all of these countries or select a group of specific countries. Only inventors who are citizens or residents of the countries that are members of the PCT can use this easier system to file international patent applications. A list of PCT member states is available at:

<http://www.wipo.int/treaties/en/documents/pdf/pct.pdf>

Think about it:

Is your country a member of the PCT? If so, you could file an international patent application for your invention.

Another advantage of filing an international patent application under the PCT is the **international search report** and the written opinion. Inventors receive these documents about four months after they hand in their international patent applications. The report and the written opinion are very useful because they give inventors a better idea of whether their invention can meet the novelty and inventive-step requirements in order to obtain a patent in all the countries that they have selected. If they are negative, an inventor can use the information in them to improve or modify the invention so that it will then meet the novelty and inventive-step conditions. The inventor might also decide to abandon the invention at this stage before paying various patent application fees for an invention which may not be granted a patent.



The World Intellectual Property Organization (**WIPO**) in Geneva, Switzerland administers the PCT and every year receives thousands of applications from inventors around the world.

It's a fact:

In 26 years (1978-2004), WIPO received one million international patent applications.

1,000,000

Can there be different inventors for the same invention?

Humans all over the world have similar needs and problems for which they are trying to invent solutions. It is therefore quite common for similar inventions to be invented around the same time even in different parts of the globe.

In modern times, the patent document identifies the original inventor. Therefore, it is important that inventors patent their inventions as soon as possible, if they want to ensure that they are recognized as the inventors of their inventions.

It's a fact:

Alexander Graham Bell applied for a patent for the telephone on February 14, 1876, only a few hours before another inventor named Elisha Grey handed in his application for a telephone as well. Had Bell waited one more day to apply for a patent, Elisha Grey would today be considered as the inventor of the telephone.



Patents are a wonderful source of information

As we saw above, inventors have to provide detailed information about their inventions in their patent applications. Patent applications are public documents, which means that anyone can read and learn from them. Countries have patent libraries where anyone can go to find information about all the patents that the government of that country has granted. Thanks to the Internet, much of this information is now available on the web pages of most national patent offices.

Inventors research patent documents to increase their knowledge about the latest technological developments in their field and to find inspiration for their own inventions. Investors and companies who are looking for new products in which to invest also read patent documents.

Invention Profile: Incandescent Light Bulb

Thomas Edison, the famous American inventor who applied for more than 1,000 patents, also bought rights to patents owned by other inventors.

Two Canadian friends, Henry Woodward and Mathew Evans, patented an incandescent light bulb on July 24, 1874. They later agreed to sell their patent rights to Thomas Edison, who was at the time working on a similar invention.

Edison conducted thousands of experiments before he finally improved the incandescent light bulb. He did this by using lower current, a smaller carbonized fiber and a better vacuum inside the bulb. In 1879, Edison showed his incandescent lamp to the world.



The PCT Gazette

Every week, WIPO publishes a Gazette of all international patent applications published in that week. You can search this Gazette on-line and see, among other things, the first page of all PCT applications. This page contains information such as the number of the international publication (always starts with WO), the title of the invention, the name and address of the inventor as well as a short summary and sometimes a drawing of the invention.

The screenshot shows the WIPO International Patent Applications search page. The header includes the WIPO logo and navigation links for 'ABOUT WFO', 'IP SERVICES', 'PROGRAM ACTIVITIES', 'RESOURCES', and 'NEWS & EVENTS'. The main content area is titled 'International Patent Applications' and features an 'Advanced Search' section. Below this, there are search filters for 'Date' (set to 07/06/2007) and 'Search' (set to Front Page). A search input field is present, with a 'Search' button and a 'Reset' button. The 'Display Options' section allows users to sort results by 'Chronological' or 'By Relevance' and to show 25 results at a time. A table of search results is visible at the bottom, with columns for 'Pub. No.', 'Title', 'Pub. Date', 'Int. Class.', 'App. Num.', 'Inventor', 'Applicant', 'Abstract', and 'Image'. The table contains several rows of data, each with a checkbox in the 'Image' column.

Game* – PCT Detective

Follow this link and use the search function of WIPO's on-line PCT Gazette to answer the questions below:

<http://www.wipo.int/pctdb/en/search-adv.jsp>

Hints:

Before you start:

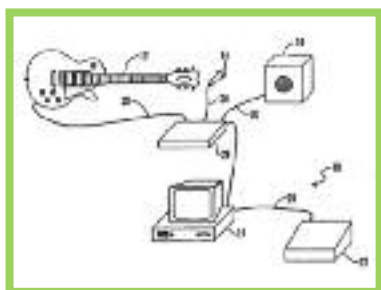
- ◆ select "all" weeks at the top
- ◆ open "display options" at the bottom and check the boxes for "image", "abstract" and "first inventor"

While searching:

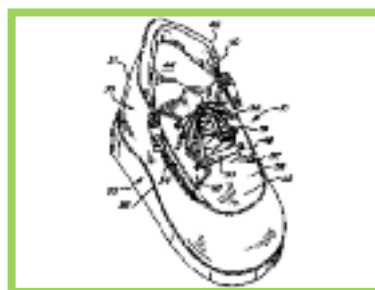
- ◆ refine your search by using various words connected by "and"

(1) Find the WO number for:

a) Digital guitar, invented by Gibson Musical Instruments



b) Shoe with see-through sole for toddlers, invented by Jeffrey Silverman

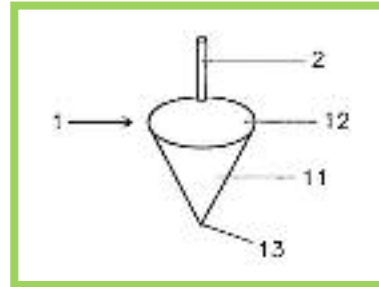


*See page 59 for answers

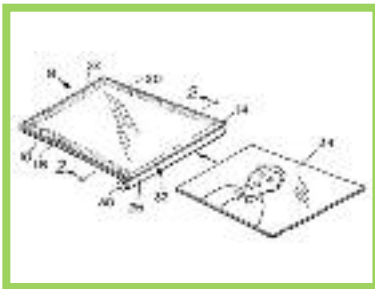
c) A wireless keyboard invented in Turkey



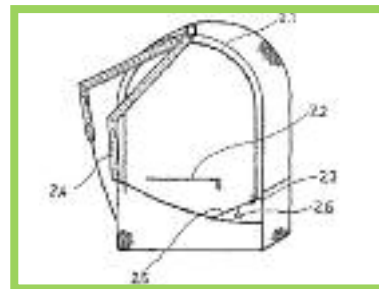
f) A sweet toy from Brazil



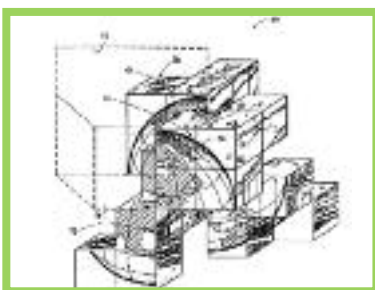
d) A personalized postcard from New Zealand



g) An anti-theft sack from the Republic of Korea



e) A Russian puzzle



h) An energy saving lamp from Germany



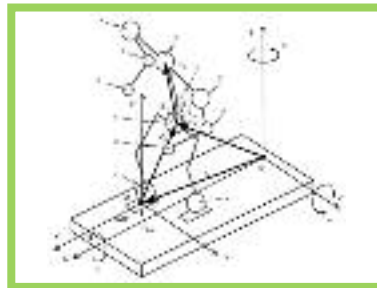
- (2) Some products have so many new elements that they can qualify for many patents. This is the case of the humanoid robot, Qrio, invented by Sony.

Can you find the WO numbers related to the following parts of Qrio?

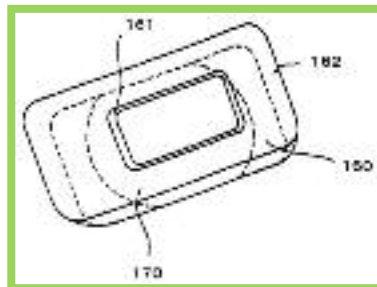


Courtesy of Sony

- a) Two-legged locomotion

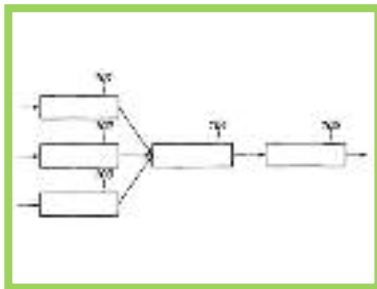


- b) Foot, which allows it to walk on irregular surfaces

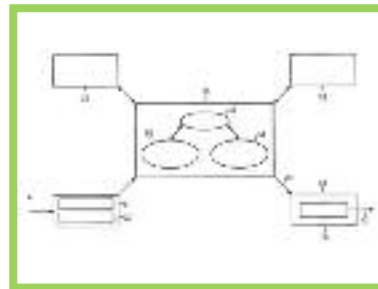


Qrio's ability to:

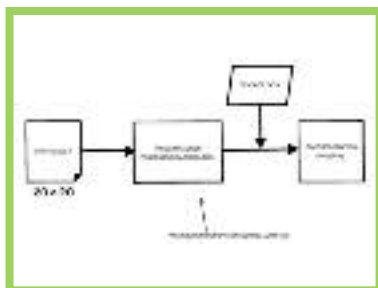
c) Recognize voice input



e) Have a dialogue with a user



d) Recognize a face



f) Display emotion



BECOME

"Always listen to children... they might have ideas we've never thought of."

- Alexander G. Bell

Movies like to portray inventors as either crazy or nerdy. In fact, the only traits that inventors have in common are creativity, curiosity and perseverance. It's not surprising then that anyone can be an inventor regardless of age, gender, race or nationality.



Team New Zealand winners of a WIPO Gold Medal Award at the "2003 Enterprise Olympics" for their braille menu invention.

Young people are particularly well suited to be inventors. For starters, young people can be just as talented and creative as adults. In addition, they often have more open minds and enthusiasm than older people. It is the young people of today who will improve our future world.

Now that you know more about inventions and patents, you are ready to become an inventor. Understanding the invention process can help you enjoy inventing and avoid some problems. Follow this roadmap for invention:

AN INVENTOR

(1) Identify a need or problem

The first thing you need to become an inventor is an idea, an inspiration for something new.

Do you need a better product than that which you can find on the market? Invent it!

Can you think of something that will make a task easier for you or for someone you know? Invent it!

Young Inventors Profile: Sergio Meza, Eduardo González and Alejandro Maureira

These young student inventors from Chile wanted to find an easy, cheap and environmentally friendly method of producing more fresh water for the dry, northern part of their country. After many experiments they succeeded in producing a new method of desalinating seawater with the use of solar energy.

In 2004, their project impressed judges at their national EXPLORA-CONICYT science congress. The young inventors are now producing their invention on a larger scale so that more water can be produced in less time. The students want to teach residents of northern Chile to use their invention so that they can produce more fresh water for drinking and growing crops.



Courtesy of CONICYT Chile

(2) Research

Once you have identified a need or problem and thought of a useful invention to solve it, it is time to start your research. Find out everything you need to know about the science and technology related to your idea.

Your textbooks may not contain all the information that you need for your research. Find additional, more specific sources of information at your local library and on the Internet. Don't be shy about asking teachers and librarians for advice and guidance.

Inventor Profile - Yuanchen Zhu

Nineteen-year-old Yuanchen Zhu from China, wanted to generate faster and higher quality three-dimensional computer graphics. He wanted to improve the detail and speed up the time needed to produce these images. In order to achieve his goal, Zhu had to learn a lot of mathematics and computer programming. He understood that these were essential tools to help him reach his goal.

Zhu's studies paid off in 2004 when he won one of the first three prizes (US\$50,000 and a high performance computer) at the Intel International Science and Engineering Fair. Zhu's project demonstrated a method for rapidly generating computer graphics depicting moving and highly detailed objects. Zhu's method could be used in 3-D games, virtual reality, medical visualization systems and flight simulators.



Courtesy of Intel Corporation

(3) Experiment and keep an open mind

"I have not failed. I've just found 10,000 ways that won't work."

"Just because something doesn't do what you planned it to do doesn't mean it's useless."

- Thomas Alva Edison

Once you have done your research, start experimenting and adjust your invention until it works properly. Remember to keep notes with descriptions and drawings of your experiments and of your final invention.

At this point it is important to be patient and persistent. Don't despair if at first you don't succeed. Remember that most inventors fail many times before they finally reach the result they want.

Remember also to keep an open mind at this stage. Experiments that go "wrong" can have excellent, unexpected uses. If your experiment fails, look at the result in a different way; can you find another use for this "failed" result?

Invention Profile: Post-It® Notes

In 1968, Dr. Spencer Silver, a research scientist for the 3M company was trying to develop stronger glue for the company's adhesive tapes. Instead of producing stronger glue, his experiments created very weak glue. This weak glue however, was special because it was reusable and did not leave a sticky residue when removed from a surface. Silver decided to patent this special glue in 1970, even though he was not sure what to do with it.

Four years later, Art Fry, one of Silver's colleagues, found the perfect use for the weak glue resulting from this "failed" experiment. Fry was tired of his scrap paper bookmarks constantly falling out of his hymnbook. One day Fry had the idea that Silver's weak glue could keep his bookmark from falling while still allowing him to remove it easily without damaging the book. It worked!

This was the start of a process that developed the sticky notes we know today as Post-It® notes. These notes are currently used by millions of people around the world, but they would have never existed if an inventor had not recognized that the results of a failed experiment could have a different, unexpected use.



Courtesy of 3M

(4) Apply for a patent

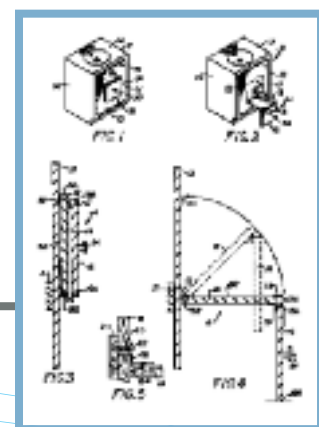
As we have seen before, applying for a patent can be a long and complicated process, so many inventors hire lawyers to help them with this stage. Do not be discouraged by this! There are many examples of young people who have successfully obtained patents for their inventions. Remember the benefits of obtaining patent protection for your invention and what the risks are if you do not.

Once you have a working invention, do some research on the Internet to find out if there are other people who have already invented something similar. You can search using your country's patent office site, the PCT Gazette or a normal Internet search engine. If you are confident that your invention meets the three conditions of patentability and that it can make money in the market, consult a patent lawyer and apply for a patent.

Young Inventor Profile - Jeanie Low

Jeanie Low had to use a plastic step stool to reach the bathroom sink when she was very young. Though useful, the plastic stool was not very stable and took up space in the small bathroom. In addition, Jeanie's father often broke the stool when he stepped on it by mistake. While still in kindergarten, Jeanie decided to solve this problem. Armed with wood, screws, hinges and magnets from the local hardware store, she created a sturdier, fold-up stool. The stool could be unfolded to allow Jeanie and her siblings to reach the sink, and when they were finished they could fold it up again so that it would not take up unnecessary space in the small bathroom.

Encouraged by friends at a local inventors' association, Jeannie hired a lawyer and applied for a patent. The lawyer helped Jeannie with the patent search and with the filing of the patent application (including drawing diagrams and drafting a description for the kiddie stool). In 1992, at the age of 11, Jeannie was granted US patent #5,094,515 for her "Folding step for cabinet doors" invention.



Courtesy of the USPTO

(5) Enter a competition

Entering a science or invention competition is an excellent way to show your invention to potential investors and consumers. Ask your science teacher for information about local and national competitions in your country.

If you succeed at local and national competitions, you may be nominated to show your invention at an international competition. These competitions give you a chance to travel to other countries and meet young fellow inventors from around the world.

Young inventors at international competitions have won cash awards, scholarships, internships and further travel opportunities. WIPO also awards gold medals to young inventors at events around the world.

Remember, however, that competitions are more about learning than about winning. The research and experimentation steps of the invention process will have taught you a lot about the science related to your invention. Participating in a competition will also teach you important communication skills. Competitions usually require you to present information about your invention in writing. You also have to explain and demonstrate your invention to judges at the event. Talking to other people about your invention at a competition will give you practice for later on when you decide to sell it. Competitions also provide an opportunity to find out how other people perceive your invention, and how you can make it even more interesting if necessary.

The thought of presenting your invention at a competition can seem intimidating but most young inventors actually have great memories of the competitions in which they participated. The chance to talk about the problem that they are trying to solve with interested adults and similar minded young inventors is really worth the effort. Finally, do not give up even if you do not win at a competition. Many young inventors have invented wonderfully successful and patentable inventions even if they have not won a science competition.

Inventor Profile: Ryan Patterson

In 2001, 17 year-old Ryan Patterson won a US\$50,000 college scholarship at the Intel International Science and Engineering Fair. His "Braille Glove" invention translates sign language into text in an attempt to help deaf people better communicate with people who cannot understand sign language.

The press was as impressed with Ryan's invention as the judges. In the November 18, 2002 issue of *Time Magazine*, a picture and description of Ryan's glove appeared as one of the best inventions of the year.



Courtesy of Intel Corporation

Links to some international science and invention competitions for young people:

- ◆ **Intel International Science and Engineering Fair (Intel ISEF)**
Founded in 1950 and sponsored in large part by the Intel Corporation, this international fair is held every May in the United States of America.
<http://www.sciserv.org/isef/>
- ◆ **The European Union Contest for Young Scientists**
This annual event organized by the European Commission brings together young scientists and inventors from European states and some non-European guest countries.
<http://europa.eu.int/comm/research/youngscientists/index2.htm>
- ◆ **Young Inventors Awards**
Sponsored by Hewlett Packard Asia Pacific and the Far Eastern Economic Review, this competition has been recognizing the innovative spirit among the Asian region's university students since the year 2000.
http://www.feer.com/yia/YIA_main.html
- ◆ **EUREKA - World Exhibition for Innovation, Research and New Technology**
This yearly exhibition is organized by the Belgian Chamber of Commerce and includes a Young Inventor Prize program specially designed to promote young talent (less than 25 years old).
<http://www.eureka-international.com/>
- ◆ **International Exhibition of Inventions, New Techniques and Products**
This annual event is sponsored by the Swiss Federal Government and by the State and the City of Geneva. Among the many prizes offered at this exhibition are the WIPO Awards, including a Gold Medal for Best Young Inventor.
<http://www.inventions-geneva.ch/gb-index.html>

(6) Commercialize your invention

After going through so much effort in producing and patenting a workable invention, it is a shame that many inventions don't go any further. Remember that inventors can only make money if people buy their inventions. Commercially successful inventions become **innovations** that change the way people do things.

Creating a working invention that can be of use to people and patenting it are only the first steps towards obtaining your reward. If no one knows about the invention, no one will buy it, no matter how good it is.

As seen above, science and invention fairs are excellent opportunities to showcase your invention and attract media attention. Licensing your invention is an excellent way to make money from it while letting investors cover the production costs and marketing specialists take care of the sales. Your country's Small Business Bureau can help you contact potential licensees or provide you with resources on how to commercialize your own invention. You can also check WIPO's Internet pages dedicated to Small and Medium Sized Enterprises for information: <http://www.wipo.int/sme>.

Beware!!

You have already seen that inventing and patenting are not fast and easy processes - do not think that commercializing your inventions will be any faster or easier. Inventors who try to take a short cut at this stage can be cheated out of money and even their inventions. Be careful before you sign any agreement for licensing or commercializing your invention.

Young Inventor Profile – Sven Siegle

This young German inventor was concerned about air and water pollution and the destruction of forests that can result from the normal pulp and bleaching processes used to make paper. To help solve this problem, Sven decided to invent a new, environmentally friendly process for pulp production using straw, reed, and hemp instead of wood.

Sven's natural pulping invention won several awards, including first prize at the 1995 EU contest for young scientists. Soon after, Sven obtained a national patent, filed an international patent application for his invention, and founded his own company in 1997 with his father's assistance. He also made a detailed business plan to attract investors and started contacting pulp producers in South Africa (where there is insufficient wood for the paper industry) to see if they would be interested in his invention.

Sven is the Chief Executive Officer (CEO) of his Natural Pulping® company, which employs 25 people to produce environmentally friendly paper at low cost.



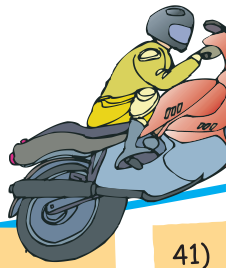
Courtesy of Natural Pulping® AG

Game – Patent Journey

Review all you have learned about patents and inventions with this board game.

To play:

- 1) Find a sample of a small invention to represent you in the game or cut out the small invention pictures on page 49.
- 2) Take turns to toss a coin. Choose in advance which side will allow your invention to go forward two squares and which side will allow it to go forward three squares.
- 3) To win the game you must reach the last square with an exact number. Otherwise, when you reach the last square go backwards with the remaining numbers.



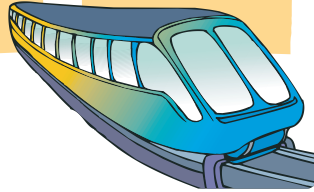
41)

40) Your invention is so successful you hire 100 people to help produce it - go to 43

39)

38)

37) Your patented invention increases knowledge in your field - go to 41



36)



35) You succeed in licensing your patented invention - go to 38

34)

33) Someone saw your patent and wants to invest in your invention - go to 36

32)

31) You don't promote your invention so nobody buys it - go back to 27

30) Thanks to the PCT your invention is protected abroad - go to 34



18)

17)

16)

15) Someone steals the invention you forgot to patent - go back to 9



14)

13)

12) Your experiments succeed - you now have a working invention - go to 16

11)

10) You find a good use for one of your failed experiments - go to 14

9)

8) Experiments for your invention fail - go back to 5

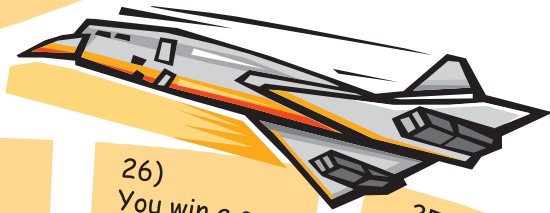
7)





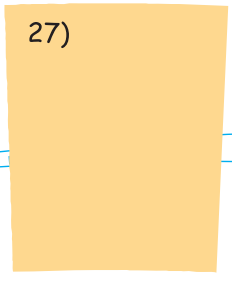
42)

43) CONGRATULATIONS!
You have helped society with your patented invention



29)

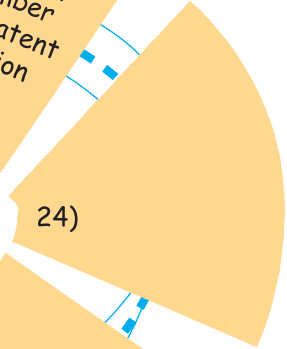
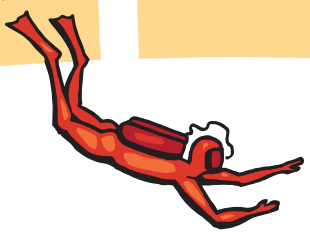
28) You did not apply for patent protection in other countries - go back to 24



27)

26) You win a case against unauthorized use of your patented invention - go to 32

25) Your country is a member of the Patent Cooperation Treaty - go to 29

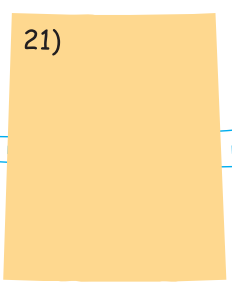


24)

19) Further research reveals that your invention is not new - go back to 13

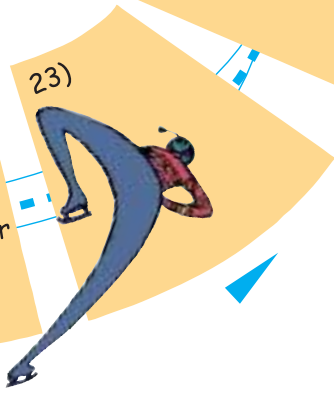


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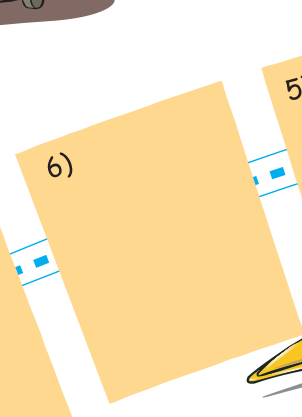


21)

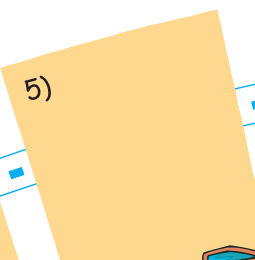
22) Your government grants you a patent for your invention - go to 27



23)

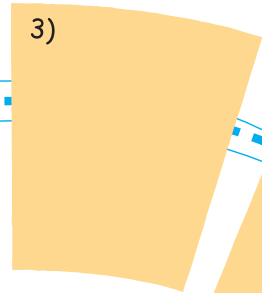


6)

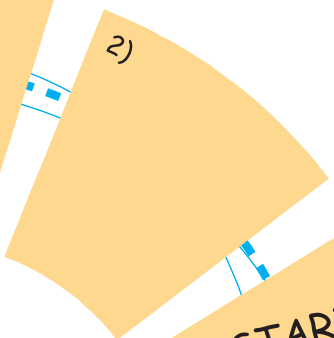


5)

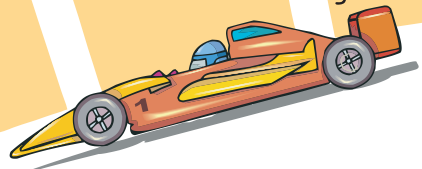
4) You're inspired with an idea for an invention to solve problem - go to 7



3)

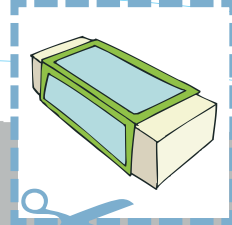
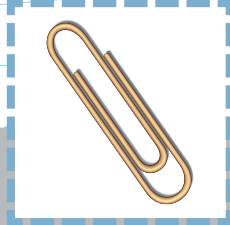
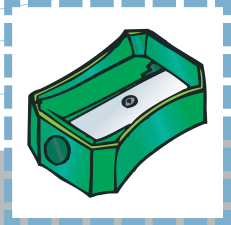


2)



Patent Journey

1) START
You have a problem to solve...





FINAL THOUGHTS

Inventing, patenting and commercializing new products and processes are not always easy. However, they provide many lessons and much satisfaction for those who take up the invention challenge.



Innovation happens when a new invention changes a way of doing things. Innovation moves science, technology and mankind forward and this is the highest reward that an inventor can receive.

Use your imagination, knowledge and enthusiasm to become part of a new generation of innovators. Improve our world with your inventions!



INVENTION JOURNAL

Describe the problem you want to solve in one or two sentences:

List some possible solutions to your problem:

1)

2)

3)

4)

5)

Research all subjects related to your proposed solutions. Divide your findings for each proposed solution into positive and negative findings. (Examples of positive findings could be: the solution is technically possible, or all materials needed to produce a prototype are easily available. Examples of negative findings could be: someone else has already patented a similar solution, or the materials to build a prototype are too expensive.)

1) Positive findings

Negative findings

2) Positive findings

Negative findings

3) Positive findings

Negative findings

4) Positive findings

Negative findings

5) Positive findings

Negative findings

Experiment and build a prototype of your solution.

(Begin experimenting with the solution that has the most positive research findings and the least negative research findings. Try to overcome the negative research findings. For example: can you substitute some expensive materials for cheaper alternatives, or improve the patented solution you found during your research.)

Write down the results of your experiments:

What problems did you encounter during your experiments?

How did you solve these problems?

Were you able to make a working prototype of your idea?

(If your experiments for this solution did not result in a prototype, pick another possible solution from your initial list and start experimenting again. Remember to keep an open mind - did your "failed" experiment produce an interesting result that could have other uses?)

How well did your prototype work?

Can you make it better? If so, how?

(Keep experimenting until your prototype works properly.)

Give a name to your invention:

Date:

Your name and signature:

ANSWERS TO GAMES

Game – Inventions of Ancient Civilizations



Kites - Ancient Chinese kites are recognized as the earliest form of aircraft. According to written records, the first kites were made more than 2000 years ago in **China**. These kites were made of wood and were large enough to lift a man up in the air. Following the invention of paper (also in China), paper kites became less expensive and more widely used. Today young and old people around the world still enjoy playing with this ancient invention.



Skis - The oldest skis that scientists have found so far were made of wood more than 8000 years ago. These skis were discovered during the 1960s in the Ural Mountains of **Russia**. The front ends of the skis were carved in the shape of an elk's head. This carving not only symbolized speed but also helped stabilize the skier and acted as a brake when needed.



Snow goggles - The ancestors of the Eskimos in **Alaska** invented wooden goggles around 2000 years ago. They wore these goggles to prevent snow blindness (eyes can be damaged by the sunlight reflected from the snow). The goggles have very narrow slits for the eyes and provide a clear panoramic view when worn close to the face. This was a very important advantage while hunting since the snow goggles allowed Eskimos to observe their prey without turning their heads from side to side (a movement which would warn animals and scare them away).



Lighthouse - The first known lighthouse was built around 280 BC on the Pharos island in the harbor of Alexandria, **Egypt**. Known as the Pharos of Alexandria, this lighthouse was not only a useful invention but was also considered as one of the seven wonders of the ancient world. The stone and marble lighthouse was more than 120 meters tall and its polished bronze mirrors projected light from a large, permanent fire to guide ships to the harbor.



Boomerang - These curved sticks that return to the thrower, were invented by the Aborigines of **Australia** more than 10,000 years ago. Boomerangs were used as instruments for hunting and war. Nowadays, they are used worldwide for sport.



Wheel - The oldest wheel known to humans was found in a part of modern **Iraq** known as ancient Mesopotamia. This wheel is more than 5000 years old. When they were first invented, wheels were used to work clay (potters' wheel) and later fitted into carts used to transport heavy objects. Today we still use wheels to assist with pottery making and transport. Wheels are also essential in clocks and most machines.



Chocolate - The Aztecs living in ancient **Mexico** invented a royal chocolate drink approximately 2000 years ago. The *xocoatl* drink was a very expensive mixture of chocolate, chili peppers, cornflower and water. This bitter mixture was not to the taste of the Spanish conquerors who later modified it by replacing the chilies with sugar, cinnamon and vanilla.

Game – Inventor Matchmaker



Gabriel Fahrenheit - mercury thermometer and temperature scale

Prussian physicist Gabriel Fahrenheit invented the mercury thermometer in 1714. Though Galileo Galilei had invented a water thermometer 100 years earlier, this was very basic and not as accurate as Fahrenheit's mercury thermometer. Gabriel Fahrenheit also invented a temperature scale - the Fahrenheit scale - which he used to determine the boiling points of liquids.



Alessandro Volta - battery

In 1800, Italian Count Alessandro Volta invented the first method of producing a steady flow of electric current. His battery, called the Voltaic Pile, consisted of a pile of copper and zinc disks separated by cardboard disks moistened in salt solution. Electricity flowed through a wire connecting the top and bottom disks. This battery was the first portable energy source in the story of mankind and without it many other inventions requiring electricity

would not have been possible. In recognition of this great achievement, the measurement unit for electricity, the volt, is named after Count Volta.



Louis Braille - writing system for the blind

A 12-year-old French boy called Louis Braille invented the Braille code in 1821. Louis had the idea for his code when a former soldier called Charles Barbier visited his school to share his "night-writing" invention. Charles had invented a code composed of 12 raised dots so soldiers could read military messages at night without any light. Louis simplified Charles' code by reducing it from 12 to 6 raised dots. By the time Louis was 15 he published his first Braille book and continued to work on the code for many years, adding symbols for music and mathematics. By 1868 the Braille code spread worldwide, and now blind people in almost every country in the world use it as a way of communication.



Earl of Sandwich - bread slices with filling of meat, cheese, etc.

John Montagu, the fourth Earl of Sandwich, was an accomplished 18th century politician, yet he is most famously remembered as the inventor of the sandwich. One day in 1762, the Earl was enjoying a game of cards and though he was hungry, he did not want to leave the gaming table. To solve this problem, he asked his butler to bring him some sliced meat and bread. He then put the slices of meat between the bread and began to eat his snack while playing. The principle of the sandwich became instantly fashionable and it continues to be a popular snack around the world.



Melitta Bentz - coffee-making method and filter

German housewife, Melitta Bentz loved coffee. She did not, however, like the grounds and bitter oils that got into the brewed coffee made with the traditional method (boiling loose coffee grounds in water). She had the idea that coffee could be improved if she could prevent loose coffee grounds and oils from getting into the brew - by filtering them. She experimented with many different materials and methods until she finally decided that blotting

paper from her son's notebook, cut into a disk and placed at the bottom of a perforated brass pot, produced the best results. Her filters produced a rich coffee without bitterness or grounds. Mrs. Bentz patented her invention and established a company with her husband in 1908. More than 100 years later, households around the world still use the *Melitta*[®] method and filters to make their morning coffee.



Levi Strauss - blue jeans

Levi Strauss, owner of a dry goods store, and tailor Jacob Davis obtained a patent for the first blue jeans in 1837. The trousers were original because Davis placed metal rivets at the points of strain-pocket corners and at the base of the fly. The original jeans, conceived as a working garment, were made in both indigo blue and brown cotton. The brown version didn't become soft and comfortable like the indigo blue jean so it was dropped from the line. Blue jeans continue to be fashionable and have become an American icon.



George Eastman - camera with roll-film

When photography was first invented in the early 1800s, materials were expensive and photography was complicated, limiting it to professionals. American photographer and manufacturer George Eastman, changed this by inventing the first dry, transparent and flexible roll-film (patented in 1884) and the first camera specifically designed for roll-film (patented in 1888). The handheld Kodak camera could be bought ready to use with pre-loaded film for 100 photos. Once the photos were taken, customers returned the camera to the Eastman Kodak Company. The company developed the film, printed the photos, reloaded the camera with more film and sent everything back to the customer. Unsurprisingly, Eastman Kodak's slogan was "You press the button, we do the rest".

Game – PCT Detective



(1-a) digital guitar:
WO 2004/064035



(2-a) two-legged locomotion:
WO 03/078110



(1-b) shoe with see-through sole for toddlers:
WO 00/47073



(2-b) foot, which allows it to walk on irregular surfaces:
WO 03/068455



(1-c) wireless keyboard invented in Turkey:
WO 02/027457



Qrio's ability to:
(2-c) recognize voice input:
WO 01/72478



(1-d) personalized postcard from New Zealand:
WO 2002/068209



(2-d) recognize a face:
WO 03/019475



(1-e) Russian puzzle:
WO 99/58213



(2-e) have a dialogue with a user:
WO 2004/051499



(1-f) sweet toy from Brazil:
WO 03/086095



(2-f) display emotion:
WO 02/076687



(1-g) anti-theft sack from the Republic of Korea: WO 01/10261



(1-h) energy-saving lamp from Germany: WO 03/034466

GLOSSARY

Commercialize - To produce, distribute and sell a product or process for profit.

Copyright - Rights given to creators of literary and artistic works.

Discovery - Something that existed but was not previously known.

Industrial Property - Part of intellectual property which includes patents, trademarks and industrial designs.

Innovation - A commercially successful invention that changes a way of doing something.

Intellectual Property - A branch of law that protects the creations of the human mind, divided into Industrial Property and Copyright.

International Search Report - A report, provided to those who file international patent applications under the PCT, detailing all the relevant prior art of a specific invention.

Invention - Generally speaking, a new product or process which solves a technical problem.

Inventive Step - A new characteristic in an invention that could not have been deduced by a person with average knowledge of the relevant technical field.

Licensee - Person to whom a license is granted.

Patent - A government document which generally protects an invention from being copied, used, distributed or sold without the agreement of its owner.

Patent Depository Library - A library that contains all patent documents from a specific country and makes them freely available to the public.

Patent Infringement - Unauthorized use, sale, production or distribution of a patented invention in the country where that patent is registered.

Patent License - An official permission to produce, sell and/or distribute a patented invention.

Patent Search - A search of patent documents to learn about the latest technological developments.

Patentee - The owner of a patent.

PCT - The Patent Cooperation Treaty, which provides a simple way to apply for patents in more than 140 countries with just one application.

Prototype - The original working model of an invention which can later be reproduced.

Public Domain - Inventions, signs, designs and artistic works which can be freely used by anyone since they are not protected by patents, trademarks, industrial designs and copyright.

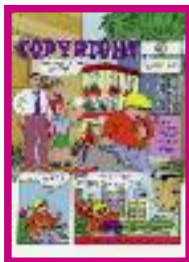
Technology - The practical use of science in industry.

WIPO - The World Intellectual Property Organization, a United Nations specialized agency based in Geneva, dedicated to promoting the intellectual property rights of artists and inventors.

FURTHER READING

The following free booklets published by WIPO provide further information about patents and other forms of intellectual property. You can download them at www.wipo.int/publications. You can also request a paper copy by sending an e-mail to publications.mail@wipo.int.

Copyright



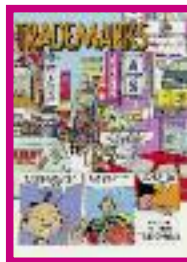
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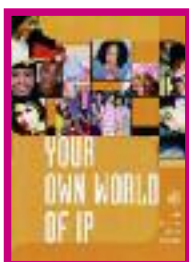
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Learn from the Past,
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The Arts and Copyright



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Windelspecht, Michael. *Groundbreaking Scientific Experiments, Inventions & Discoveries of the 19th Century.* Westport, Connecticut: Greenwood Press, 2003.

ONLINE SOURCES

About, Inc: <<http://inventors.about.com>>

By Kids For Kids: <<http://www.bkfk.com>>

Enchanted Learning: <<http://www.enchantedlearning.com/inventors/>>

The Lemelson Center for the Study of Invention and Innovation:
<<http://invention.smithsonian.org/home/>>

Lemelson-MIT Program: Inventor of the Week Archive:
<<http://web.mit.edu/invent/i-archive.html>>

Smith College History of Science: Museum of Ancient Inventions
<http://www.smith.edu/hsc/museum/ancient_inventions/>

NOTE TO TEACHERS

This publication can be used to supplement science curricula, especially in relation to science fair projects. The “Think about it” sections can be a starting point for class discussions on the subject of inventions and patents, while the “Patent Journey” game was designed as a fun way for groups of students to review what they have learned.

Teachers may also complement the information in this publication by discussing with students the scientific principles behind some of the highlighted inventions (for example: the combination of concave and convex glasses in the telescope, and the laws of thermodynamics in the pot-in-pot refrigeration system).

Students could also be asked to research and write about inventors from their country.

Finally, teachers can use this publication to encourage their students to enter science fair competitions and to use their creativity to invent.

This publication may be photocopied for classroom use.

For any comments, questions and requests please contact www.wipo.int/contact.

For more information contact WIPO at www.wipo.int

World Intellectual Property Organization

34, chemin des Colombettes

P.O. Box 18

CH-1211 Geneva 20

Switzerland

Telephone:

+41 22 338 91 11

Fax:

+41 22 733 54 28