



Lessons from the Salvadori Classrooms
LESSON TITLE: Design Writes
PREPARED BY: Janny Gédéon and Kubi Ackerman (revised by Michael Bettencourt)
TOPIC: School
SSLAM: School / Language Arts / Go Beyond
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Design Writes

Content Focus: Language Arts

- Reading: Comprehension
- Writing: Technical







Content Focus: Built Environment

- Ergonomics

Performance Outcome(s)

- Write a proposal for the patent of your ergonomic chair.

Standards/Interdisciplinary Connections

					
S	S	L	A	M	T
Science	Social Studies	Language Arts	Art - Visual	Math	Technology

How To Read The Symbols: The symbols in **bold** indicate the subject standards that this lesson satisfies.

Lesson Outline (multiple-lesson project)

1. Motivation
2. The Challenge
3. Research The Patenting Process
4. Write A Patent Application
5. Review A Patent Application
6. Reflection
7. Extensions And Variations
8. Middle School Standards

Salvadori Prerequisites

- LESSON(S): "Sit Right" (School / Science / Go Beyond)
- Internet research skills



CONCEPTS

- Patents are legal devices that protect inventions, designs, and ideas from being copied without permission.
- Patent protection can encourage innovation by ensuring that those who develop innovations are duly rewarded.
- Patent specifications must be as descriptive and detailed as possible so that an invention is protected from imitations while not stopping others from developing similar designs.

RESOURCES

On-Line

- www.uspto.gov - United State Patent and Trademark Office
- <http://www.uspto.gov/go/kids/kidprimer.html> - Answers to frequently asked questions about patents, written in child-friendly language (United State Patent and Trademark Office)

MATERIALS

Facilitator

- ●: Q&A
- ●: Teacher Tips

Students

- ●: Patent Application Guide
- ●: Utility Patent Applications Review Guide
- ●: Design Patent Applications Review Guide
- Internet access, writing paper, pencil/pen

MOTIVATION

Note: If students have completed “Sit Right” (School / Science / Go Beyond), maintain the groups from that lesson.)

Have you ever had a great idea for an invention that would make your life much better? Try to think of one now. It can be an idea for a device, a game, an article of clothing, a type of food, a sports accessory, or anything else that does not exist but that, in your opinion, should exist.

Each student writes a description of how the invention might work.



Call on a few students to read their descriptions to the rest of the class.

Choose one of the ideas and state that you think it is a really good idea. Tell the class that you think it is so good that you think you could make some money off the idea. Ask the student who came up with the invention if he or she minds that you make money off the idea without passing any of it along. If he or she protests, tell the student that since the idea has already been shared with the class, there is no way to prove who came up with it first.

- *What do you think about this situation?*
- *Is there anything that could be done to avoid it?*
- *How can people who invent things for a living make sure others don't steal what they have invented?*
- *What is a patent?* ● Q&A
- *How do you think you can get one?* ● Q&A
- *Do you know of any cases in which one person invented something and someone else took, or received, credit for it?* ● Q&A
- *Do you think that having a patent system in which ideas are protected by the law is a good idea? Why or why not?* ● Q&A
- *Can you think of a situation in which the patent system might be harmful?* ● Q&A

THE CHALLENGE

*You have designed an ergonomic chair [in the **Sit Right** lesson] and want to make sure that no one copies your ideas. Your challenge is to write a patent application for your chair in which you describe the chair in detail and explain what makes it unique or innovative.*

RESEARCH THE PATENTING PROCESS

If possible, students log on to the United States Patent Office website: www.uspto.gov, and research the three different types of patents that are available.

Distribute the Patent Application Guide. Using the website, students list and describe the different patent types. If internet access is unavailable, provide the information to the class as a whole. ●: Patent Application Guide

Students review the application process described in the ●: Patent Application Guide.

- *What are the three different types of patents?* ●:Q&A



- *What is the difference between a utility patent and a design patent?* ●: Q&A
- *Why do you think there needs to be a distinction between the two?* ●: Q&A
- *Why do think there is a special patent that applies only to plants?* ●: Q&A
- *Look at each item that needs to be included in the application for a utility or design patent. Why do you think so much information is necessary?*
- *Why do you think there needs to be a government agency responsible for patents?*

WRITE A PATENT APPLICATION

Students consider the ergonomic chairs that they designed and built with the following questions in mind:

- What are the most distinctive features of your chair?
- What aspect or aspects of it do you like the best?
- What are the original design or construction ideas that you used?

Encourage students to consider:

- The overall design
- What makes the chair comfortable
- How it supports weight
- Construction techniques (how was it built?) including templates
- Methods used to attach the various parts
- Aesthetics and ornamentation

Students in each group choose an aspect of their chair they would like to patent. This can be the chair itself, if they feel its overall design is original and innovative, a technique they developed to construct the chair, a structural element, or a purely aesthetic feature.

Using the Patent Application Guide, students decide whether to apply for a utility or a design patent. ●: Patent Application Guide

Students use the Patent Application Guide to complete the necessary documents to apply for a patent. ●: Teacher Tips

REVIEW A PATENT APPLICATION

- *How do you think the Patent Office evaluates the applications that are submitted to them?* ●: Q&A



- *What do you think are the main reasons that the Patent Office might turn down a patent application?* ●: Q&A

Once all groups have completed their applications, each group “submits” its application to another group for review.

Students use the Review Guides to review the patent application of another group. ●: Utility Patent Application Review Guide; ●: Design Patent Application Review Guide

Each group comes to a democratic decision to accept or reject the application they have reviewed.

Groups present the application they have reviewed to the rest of the class, explaining what the invention or design was, whether they accepted or rejected the application, and their reasoning behind their decision.

REFLECTION

- *Do you think that it is important to patent an invention? Why?*
- *What did you learn about the patent process?*
- *Do you think your patent application would be accepted or rejected if you actually submitted it to the U.S. Patent Office? Why?*
- *What are some challenges you faced describing your invention or design in words? Do you think someone could recreate it using only your written description?*
- *How well did you meet your challenge? What would you do differently next time?*

EXTENSIONS AND VARIATIONS

- Students write a detailed description of an existing object to familiarize themselves with the process of descriptive writing. They then share their work and note the different ways that people can describe the same object.
- Students obtain all the information they need to complete the patent application from the U.S. patent office website without the aid of the student guides.
- Students research several items of their interest and their patent history.
- Students research the online database of existing patents (<http://www.uspto.gov/patft/index.html>) as part of the patent review process to determine whether there a similar invention or design has already been patented.
- Students write a patent application for an existing object that they believe to be a particularly important invention.



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MIDDLE SCHOOL STANDARDS

Language Arts

- Reading (E1c, d, e)
- Writing (E2a, d)
- Speaking, Listening, and Viewing (E3a, b, c)
- Conventions, Grammar, and Usage of the English Language (E4a, b)

Technology

- Abilities for a Technological World (11, 12, 13)
- The Designed World (17, 19)

Design Writes

MOTIVATION

- *What is a patent?*

A patent is a government-issued grant for the protection of a piece of intellectual property, which the government recognizes as an asset, just as it would a home, car, or bank account. It is a means for inventors and others who develop new ideas, designs, and products to protect their innovations from being copied. A patent lasts for 20 years, after which others are free to use, develop, or produce the invention at will.

A patent is not a guarantee of financial success – the inventor is still responsible for producing and marketing the product. In fact, a large percentage of patented ideas never make it to the market, and given that the fees associated with patent application and maintenance add up to a minimum of \$4000 over the life of the patent, patents can be quite unprofitable.

Other interesting patent facts:

- Patents cannot be obtained on the laws of nature, physical phenomena, abstract ideas, new minerals or plants found in the wild, inventions useful only for atomic energy for weapons, useless machines, printed matter, or human beings.
 - The youngest person to be granted a patent is a four-year-old girl, who applied for a patent for an aid for grasping round knobs.
- *How do you think you can get one?*
- To get a patent on an invention or idea, you must apply for one from the United States Patent Office. If your application is complete, no one else has applied for a patent for the same thing, and the Patent Office decides that your invention is useful, it will grant a patent. It takes an average of 22 months for the application to be processed, which is why one often sees the label “patent pending” on products. This label informs people that a patent has been applied for.
- *Do you know of any cases in which one person invented something and someone else took, or received, credit for it?*

Those accused of patent infringement, or using a patented idea or marketing a patented product without the permission of the patent holder, can be sued in federal court by the patent holder. If the original inventor did not patent the idea, however, there is not much s/he can do if someone else decided to appropriate it. Perhaps the best-known instance of this happening is the case of the telephone, which is widely believed to have been invented by Alexander Graham Bell. In fact, Bell relied on a prototype developed earlier by the inventor Antonio Meucci, an Italian immigrant to the United States who invented a telephone in 1849. Meucci never patented his invention, and his wife sold his prototype because of financial difficulties. Although Meucci filed a lawsuit against Bell, he died in 1896 never having regained the rights to his invention.

Design Writes

- *Do you think that having a patent system in which ideas are protected by the law is a good idea? Why or why not?*

The patent system is important because it protects the rights of people who come up with new inventions and ideas and rewards them for their effort. It therefore creates an incentive for innovation, and thus can encourage technological progress and the creation of new products to improve our quality of life. One of the problems with the patent system is that it can limit access to potentially helpful, or even life-saving, inventions, if the person or persons who hold the patent are unwilling or unable to make the inventions widely available. The patent system, some argue, can stifle competition and innovation by limiting who can produce and profit from patented products. See next question for an example.

- *Can you think of a situation in which the patent system might be harmful?*

One of the most contentious debates regarding patent law has to do with the patenting of pharmaceuticals, which require significant financial investment for their development and can therefore be prohibitively expensive. Drugs which alleviate the symptoms of HIV/AIDS, for example, are available in the United States but are too expensive for a large majority of those who have the disease in third world countries. Certain governments (most notably, Brazil) have decided to ignore patent laws and produce cheaper versions of the drugs to distribute to its population, arguing that patent law should not apply to innovations that have the potential to save or prolong millions of lives. Pharmaceutical companies counter that without the revenues they receive from patented products, they would not be able to fund research into new products. What do your students think?

RESEARCH THE PATENTING PROCESS

- *What are the three different types of patents?*

The three types of patents are utility patents, design patents, and plant patents.

- *What is the difference between a utility patent and a design patent?*

A utility patent protects products and ideas whose innovation is in their usefulness, such as processes, machines, etc. Design patents protect new, original, and ornamental designs for articles of manufacture. In simple terms, utility patents apply to the function of an item, while design patents apply to its looks.

- *Why do you think there needs to be a distinction between the two?*

It is important to distinguish between inventions, which have a function, and designs, which are applied to products that have a function. If a designer develops a new, innovative design for a basketball shoe, for example, s/he would not be able to protect it

Design Writes

as a utility patent because there are already many different types of basketball shoe, all with the same function. There therefore needs to be a different type of patent for innovative designs.

- *Why do think there is a special patent that applies only to plants?*

The plant patent applies to artificially, asexually produced plants. These are not strictly an invention, in that they are biological, living entities; however, they are developed by humans for human (primarily agricultural) purposes through methods impossible in the wild (primarily grafting). Therefore, a special patent was developed to address these innovations. New developments in the field of genetics, which are allowing scientists to manipulate not just plants but other organisms in ways unimaginable a few years ago, are challenging the capacity of existing patent laws to cope with the new advances. There has even a push to allow for the patenting of specific human genes (so far unsuccessful).

REVIEW A PATENT APPLICATION

- *How do you think the Patent Office evaluates the applications that are submitted to them?*

The Patent Office first makes sure that all the material necessary for the application has been submitted. They then look at the title and summary of the invention or design, and search their patent library for patents that have already been granted to similar items. If they decide that the invention or design differs significantly from anything else which is already patented, they will review the application in detail. Finally, they will decide whether the invention is truly useful, in the case of a utility patent, or has a distinctive design, in the case of a design patent. They award or do not award a patent on the basis of this decision.

- *What do you think are the main reasons that the Patent Office might turn down a patent application?*

The main reasons would likely be an incomplete or unclear application, an application for an invention or design which is similar or identical to one which has already been patented, and an application for an invention or design which the Patent Office believes to be of limited usefulness or distinctiveness.

WRITE A PATENT APPLICATION

- *Students use the Student Guide to Patents to complete the necessary documents to apply for a patent.*

Encourage groups to distribute the tasks evenly among members. There are many different steps to completing the application, many of which can be worked on simultaneously.

Patent Application Guide

What are the three types of patents issued by the United States Patent Office?

- 1.
- 2.
- 3.

Which of the three types is best suited for the aspect of your chair you would like to patent?

Utility Patents

You will need:

1. A Title Of Invention

What is the chair or part of the chair called? Come up with a name that is short and specific. It should suggest what the feature is or does and should also be catchy, if possible.

2. A Utility Patent Specification

A specification is a technical document in which an object or design is described in detail. As you write your specification, use clear, precise language. If you don't know the name of something, such as tool or a device, make sure to find out before you describe it. The specification consists of:

- a. The background of the invention, in which you describe:
 - How the invention was originally developed.
 - How it is different from other inventions or invention features with a similar function. [You start off by being general by using, "the invention," so I think that it should remain general throughout.]
 - Why it is useful.
 - How it is an improvement on other or existing chairs or chair features.
- b. A brief summary of the invention, in which you summarize in 1-2 sentences what the invention is and how it works.
- c. Drawings or photographs of the invention (optional):

If you think that your invention is so complex or difficult to describe that a written description is not enough to fully communicate how it looks or functions, you may

Patent Application Guide

include drawings or photographs in your application. If you do, you must number the drawings or photographs and include a numbered list in which each is described. Example: **2a**: front view.

- d. A detailed description of the invention, in which you include:
 - A description of the shapes and sizes of each piece including measurements and material descriptions
 - How each piece is made
 - How they are attached or constructed
 - How the invention works

Design Patents

You will need:

1. A Title Of Invention

What is the chair or part of the chair called? Come up with a name that is short and specific. It should suggest what the feature is or does and should also be catchy, if possible.

2. A Design Patent Specification

A specification is a technical document in which an object or design is described in detail. As you write your specification, use clear, precise language. If you don't know the name of something, such as tool or a device, make sure to find out before you describe it. The specification consists of:

- a. The background of the design, in which you describe:
 - How the design was originally developed.
 - How it enhances the design of the invention in terms of aesthetics (looks) and/or utility (usefulness)
 - How it is an improvement on existing inventions or invention or features.
- b. A brief summary of the invention, in which you summarize in 1-2 sentences what the design is and how it works.
- c. Drawings or photographs of the design
For a design patent, you must include drawings or photographs in your application. Number the drawings or photographs and include a numbered list in which each is described. Example: **2a**: front view.

name(s)

date

Patent Application Guide

Student Guide

- d. A detailed description of the design, in which you include:
- A description of the shapes and sizes of all of each piece including measurements and material descriptions
 - How the design was made
 - What the design looks like



name(s)

date

Utility Patent Application Review Guide

Student Guide

Group Applying for patent:

	Yes	Some	No	N/A
Did the inventors select the appropriate patent type?				
Does the title give a good sense of what the invention is and does?				
Is it a catchy title?				
Did the inventors give a clear explanation of how the invention was originally developed?				
Did they explain how it is different from other chairs in the class?				
Did they explain why it is useful?				
Did they clearly summarize what the invention is and how it works?				
If they included drawings and/or photographs, do they communicate clearly?				
Did they include a description of the shapes and sizes of all the pieces including measurements?				
Did they clearly describe what the invention is made of?				
Did they clearly describe how the pieces are attached and constructed?				
Did they clearly describe how the invention works?				
Could you get a clear image of the invention in your mind from the written description?				
Do you think the invention is useful?				
Do you think the invention is innovative?				

Based on the results of the chart, decide whether the invention should be granted a patent. Make sure to discuss the answers thoroughly and make a group vote on your final decision. Do you grant the patent?



name(s)

date

Design Patent Application Review Guide

Student Guide

Group Applying for patent:

	Yes	Some	No
Did the inventors select the appropriate patent type?			
Does the title give a good sense of what the invention is and does?			
Is it a catchy title?			
Did the inventors give a clear explanation of how the invention was originally developed?			
Did they explain how it is different from other chairs in the class?			
Did they explain why it is useful?			
Did they clearly summarize what the invention is and how it works?			
If they included drawings and/or photographs, do they communicate clearly?			
Did they include a description of the shapes and sizes of all the pieces including measurements?			
Did they clearly describe what the invention is made of?			
Did they clearly describe how the pieces are attached and constructed?			
Did they clearly describe how the invention works?			
Could you get a clear image of the invention in your mind from the written description?			
Do you think the invention is useful?			
Do you think the invention is innovative?			

Based on the results of the chart, decide whether the invention should be granted a patent. Make sure to discuss the answers thoroughly and make a group vote on your final decision. Do you grant the patent?

