

# Module – Patents in Environmental Engineering

## Lesson Plan

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## REVISION HISTORY

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(\*) Action: C = Creation, I = Insert, U = Update, R = Replace, D = Delete

## REFERENCED DOCUMENTS

ID	Reference	Title
1	2020-1-UK01-KA201-078934	IPinSTEAM Proposal
2		

## APPLICABLE DOCUMENTS

ID	Reference	Title
1		
2		

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# 1. Patents in Environmental Engineering

## 1.1 General Information

In this lesson plan, the main topic will be patents in Environmental Engineering topic, using exclusive right, Intellectual Property. Patents are a type of Intellectual Property that specifically protects inventions. Patents give the owner the right to take legal action against anyone who makes, uses, sells or imports it without their permission.

Students will learn about Patents as a type of Intellectual Property that specifically protects inventions, why patents are particularly important to use for successful businesses.

### 1.1.1 Brief Description

The following lesson plan will involve a small exercise to teach about patent rights, within the context of Engineering field.

In this lesson plan, students will work in pairs or in small groups to decide whether a new technology or invention should be protected by one or more patents and, if so, how to do so.

### 1.1.2 Learning Objectives

The following lesson plan has the objective of teaching about patents. Students will know how the grant of a patent over an invention or technology helps them to prevent or have an upper hand in legal disputes that may arise later. They will understand why a patent management strategy is important for the survival and competitiveness of a company and how to develop and implement one.

### 1.1.3 Links to curriculum

The following lesson plan links to the STEAM subjects, specifically to Environmental Engineering. This lesson plan will be linked to Engineering Patents Through Environmental Projects, motivating student achievement in STEM disciplines, computer science, and other fields of study such as innovation and entrepreneurship.

### 1.1.4 Duration

The following lesson plan can last from 1 hours in a classroom of about 25 to 30 students.

### 1.1.5 Extra materials required

- Internet connection
- Video - <https://www.slideshare.net/gderasse/a-comic-introduction-to-intellectual-property>

## 1.2 Step-by-step instructions

The lesson plan created to teach more deeply about patent rights and how they work in Environmental Engineering. The teacher will explain the context for students to be familiar with the topic treated. Students to understand how patent rights work, presenting the IP.

Activity 1 – Concept of Patent, linked to the STEAM subject – What benefits does patents bring?

Teacher will invite students to explain the concept of patent. *A patent is a legal intellectual right granted by an authorized government entity (patent office) to exclusively protect an invention from unauthorized use for a certain period of time.* To register a patent, the invention must be something that can be made or used and inventive - not just a simple modification to something that already exists.

Patent benefits:

- A monopoly right that stops others from working an invention without permission from Patent holder
- Monopoly granted for up to 20 years
- Statutory legal sanctions available for breach of monopoly
- Monopoly right is granted by state in exchange for the public disclosure of information regarding the invention; this information is made freely available to the public; this information is also freely available after the expiry of the patent.

Teacher will invite students to work in small groups to create their presentation about definition and rules of patents in engineering. In a modern commercial world full of technical innovations, holding a patent for a technology can give an engineering company or individual alike a significant commercial advantage in the marketplace.

Students will be able to explain the effect of a patent and to analyze the video message - [https://www.youtube.com/watch?v=avZ\\_Dn-yQ4w](https://www.youtube.com/watch?v=avZ_Dn-yQ4w), *Patents For Beginners: A Practical Introduction* from youtube.



(Source - <https://www.slideshare.net/gderasse/an-introduction-to-patent-data>)

Activity 2 – STUDY CASE – Requirements for Patentability - Patenting for Cleaner Air

Teacher will present the case of a company called *EnviroScrub Technologies* that developed and patented various inventions and made remarkable progress in the development of clean-air technology. Its most remarkable development is the *Pahlman Process* technology, which was acquired by the company at an early stage of development.

*EnviroScrub Technologies* has entered and completed the national phase under the PCT system in a number of countries, including through the European Patent Office and the Eurasian Patent Office. It was granted its first patents covering countries within the Eurasian region, in October 2003. This patent grants *EnviroScrub Technologies* protection in the Russian Federation, the world's fifth largest coal-consuming nation. Through PCT applications, *EnviroScrub Technologies* secured international protection for its innovative technology, which in turn enabled it to safely start looking for markets and partners in order to commercialize the *Pahlman Process* technology on a global scale. (Source - <https://www.wipo.int/ipadvantage/en/details.jsp?id=910>)

First of all, students are provided with the material and presented with the topic of the activity. Teacher should also prepare some questions for the rest of the students to set up a debate and keep their audience engaged.



A demonstration unit built on a 48' semi-trailer that can be transported virtually anywhere in the U.S. or Canada gives potential customers an on-site demonstration of the dry Pahlman Process technology  
(Photo: EnviroScrub)

(Source - <https://www.wipo.int/ipadvantage/en/details.jsp?id=910>)

Teacher will invite students are to debate all aspects of IP protection and patent rights:

- To be patentable, an invention must be new, involve an inventive step, be capable of industrial application, not lie within a list of exclusions. Invention must be inventive and non-obvious development of technology

### Use of Patent

- Like the owner of any other private property, a patent owner has the right to prevent others from using it, abandon it, sell it, that is, assign it for a fee or free (gift), and allow one or many others to use it, while retaining its ownership, by 'licensing out' the patent for one or more specified purposes, during a specified time period, in one or more specified jurisdictions. Licensing is always done for a valid consideration that may be in cash or kind, as may be mutually agreed and specified in a written and formally signed license agreement.

Students will follow teacher presentation and will debate the case and the patent process.

This case highlights the importance of conducting an appropriate patent search before presenting a new product in the market, in order to minimize the risk of their product infringing any patent.

### 1.2.1 Introduction or orientation

In this phase the topic to be studied or investigated is presented to the students by their teacher. In this case, the topic is Engineering Patent. The teacher's role in this phase is to encourage students to express ideas, prior knowledge and questions about the topic, while promoting interaction and communication between them.

### 1.2.2 Preparation or conceptualization

In this phase the teacher can answer potential questions or clarify any doubts, presenting the theoretical material about the topic which includes concept definitions, theoretical knowledge and other prerequisite background information. Students can ask questions and get any clarification from their teacher before starting the exercise. They will debate videos presented from youtube, for eg at link <https://www.youtube.com/watch?v=oTJ4L0XAYE>, analysing the process of IP patents.

### 1.2.3 Investigation

In this phase the teacher invites students to debate patent data, offering the material and a case study for students to work on, such as instructions, before starting the main exercise.

### 1.2.4 Conclusion

In the conclusion phase, main points, answers, results and steps are summarized. In this phase students may have discussion, communication and reflection to wrap-up key topics addressed in the lesson plan. Students are encouraged to express their views and their opinions.

## 1.3 Key questions for knowledge testing

A short quiz of about 10 key questions that can be used to check the learners' knowledge acquisition. Correct answers can be marked in bold.

Question 1: A patent is granted by a notional office or regional office and has no effect beyond the national or regional boundary of the country or countries concerned.

**True/ False**

Question 2: A patent is valid for a maximum period of 20 years, counting from the filing date of the application or from the date of an earlier related application.

**True/ False**

Question 3: A patent application must provide detailed technical information about the features of the claimed invention;

**True/ False**

Question 4: A patent confers on its owner the rights to make, use, offer for sale, sell, license and import a claimed invention.

True/ **False**

Question 5: A patent application must indicate how the invention may be applied in industry or commerce.

**True/ False**

Question 6: An applicant must not disclose in a patent application how the invention can be made or carried out;

True/ **False**

Question 7: By reading a patent application a person with ordinary skills in that field of technology must be able to practice, use or reproduce the invention without having to do undue experimentation.

**True/ False**

Question 8: A patent is an exclusive right to prohibit third parties to use commercially in the territory where a protection is granted.

True/ **False**

Question 9: The invention is disclosed in the patent application.

**True/ False**

Question 10: All inventions are patentable.

True/ **False**

## 2. Additional resources

### 2.1 Further reading

<https://www.wipo.int/ipadvantage/en/details.jsp?id=2593>

[https://www.youtube.com/watch?v=\\_oTJ4L0XAYE](https://www.youtube.com/watch?v=_oTJ4L0XAYE)

### 2.2 Appendix

Attach or include here any additional items such as student worksheets, hand-outs that accompany this lesson plan

## References

[https://www.youtube.com/watch?v=\\_oTJ4L0XAYE](https://www.youtube.com/watch?v=_oTJ4L0XAYE)

<https://www.slideshare.net/gderasse/a-comic-introduction-to-intellectual-property>

[https://www.youtube.com/watch?v=iV-\\_aTj-bow](https://www.youtube.com/watch?v=iV-_aTj-bow)



[Zero-Energy Housing - Activity - TeachEngineering](#)

[Environment Lessons, Worksheets and Activities \(teacherplanet.com\)](#)

[A Violation of Privacy - Markkula Center for Applied Ethics \(scu.edu\)](#)

[https://internationalipcooperation.eu/sites/default/files/arise-docs/2020/carlPI\\_jan2020\\_27-4-2020-](https://internationalipcooperation.eu/sites/default/files/arise-docs/2020/carlPI_jan2020_27-4-2020-)

[RCD-Overview-BARBADOS.pdf](#)

[cub\\_housing\\_lesson05\\_activity1\\_designchallengehandout\\_draft2\\_tedl\\_dwc.pdf \(teachengineering.org\)](#)

<https://www.slideshare.net/gderasse/a-comic-introduction-to-intellectual-property>

<http://www.enviroscrub.com/>