Module 2: Trademark and Mathematics.

LESSON PLAN

Deliverable: IO1.A3

30.05.2021

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Project Number: 2020-1-UK01-KA201-078934

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1. Trademark and mathematics.

1.1 General Information

Mathematics is a discipline almost as old as mankind itself. However, advances in research, big data and data analysis using algorithms mean that our needs are gradually changing. As a result of this completely natural evolution for society, many changes are proposed, such as, for example, the link between trademark and some methods of this discipline.

1.1.1 Brief description

This Lesson Plan aims to raise awareness of the importance of copyright and to learn about the unusual relationship between mathematics and trademark. By completing this lesson plan, you will be able to understand the links between these two disciplines and learn how to implement this knowledge through the following activities.

1.1.2 Learning objectives and IP topics

The learning objectives of this lesson plan are as follows:

- To understand the basic theory of intellectual property.
- To learn what is the function of trademark.
- How this part of intellectual property can be applied to mathematics, as well as to implement critical thinking about whether such implementation is the most appropriate

1.1.3 Links to curriculum

This instructional exercise can motivate youngsters actively investigate and examine current technology breakthroughs and uses, with a focus on Mathematics. It improves cognitive (thinking) and affective (social/emotional) learning and is related to:

- Science
- Technology
- Arts
- Mathematics

1.1.4 Duration

The estimated time to complete this lesson plan will be approximately two hours, in a classroom of 20-25 students.

1.1.5 Extra materials required

To carry out this lesson plan, you will not need any extra materials in addition to those you would normally find in a normal classroom. The use of a screen and a projector will be necessary in order to use presentations to explain the content and activities.

1.2 Step-by-step instructions

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First, in order to have defined activities, the class will be divided into groups of 5 people. The composition of the groups is fundamental for the development of the activities. The teacher must create the groups, which will carry out **three activities** related to critical thinking, the fundamental bases of **intellectual property**, the use of **trademark** in our days and its application, in this case, to **mathematics**.

Once the three activities have been completed, a whole class discussion will take place to engage students in reasoning and most importantly, to enhance their learning about this topic.

1.2.1 Introduction or orientation

In this Lesson Plan, three activities will be carried out on the chosen topic, which aim to:
- To develop critical thinking skills among the students.
- To argue about whether mathematics should or should not be patented.
- To take advice from experts in mathematics.
- To learn about the limits of intellectual property and trademark.

The three questions to be discussed in groups of 5 students will be as follows:
a) Why is intellectual property necessary? Here, the different aspects of intellectual property explained in the module will be explained and students will have to argue in their own reasoning whether mathematics is a tangible or intangible good.

b) Should certain mathematical procedures be protected by trademark in the future? In this question, students will have to argue for or against the latter question, based on the knowledge provided by the experts, as included in the Module.

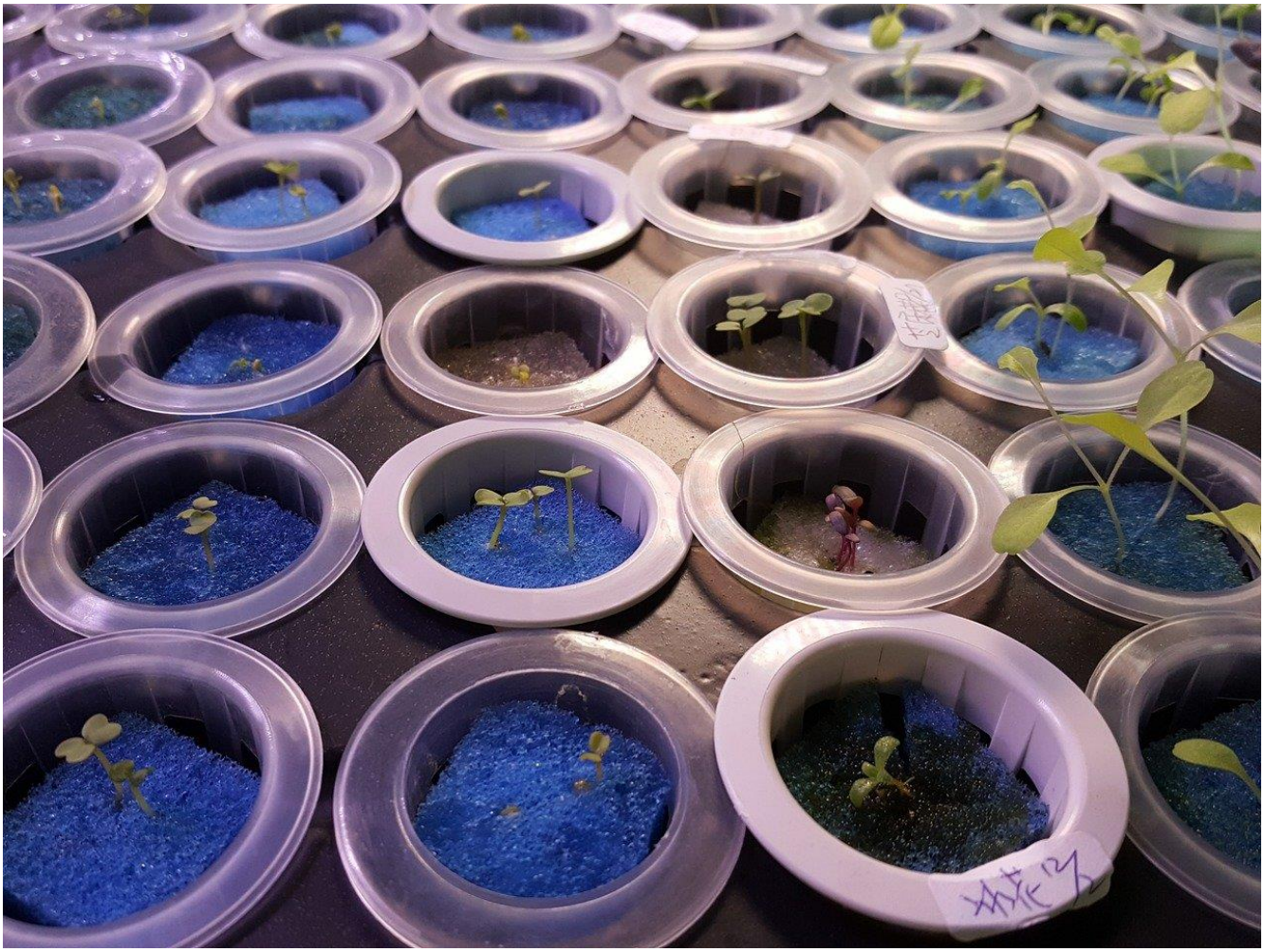
c) As this is a mathematics class, Do students really know what can and cannot be protected by trademark? Do students really know what can be protected by trademark and what cannot? Through this question, students should see that although the operations, problems or equations they solve day after day, belong to a more complex system in which their own mathematics books together with their content are protected from being reproduced.

1.2.2 Preparation or conceptualization

First of all, to put the students in context and as an introductory activity, they should watch the following video which tells us a bit more about how the trademark works in the European Union: https://www.youtube.com/watch?v=tHEwuO0-sXg

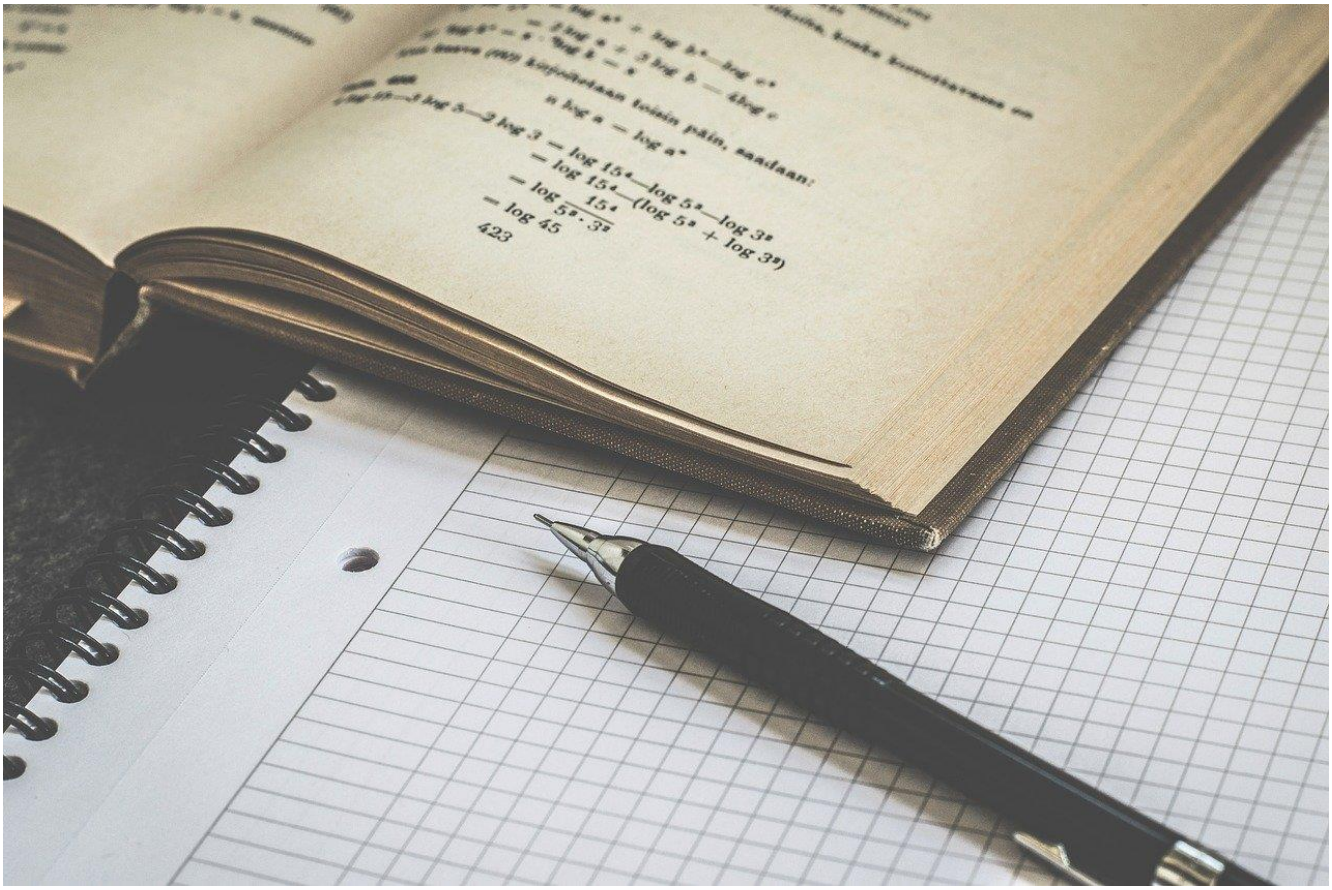
This video is in English, but it contains subtitles in all EU languages, so all the targets we have in mind can understand it.

Once you have watched the video, you should be able to solve the following ethical and moral questions. First of all, the question will be about the topic chosen in the video and then a more general question in the field of trademark will be reflected upon.



Source: Pixabay

- On the basis of the video shown above, students should consider whether the exclusivity granted by trademark registration really makes sense for a food product.



Source: Pixabay

- Secondly, the students should reflect on the following question: Their textbooks, i.e. the main material for their lessons, will almost certainly be protected as a trademark. However, any material they have downloaded from web portals or any other type of complementary content, runs the risk of being protected and therefore considered a criminal offence. Students should reflect on this scenario.

1.2.3 Investigation

During this phase:

1. Students should do some individual research on the concepts of trademark and intellectual propriety.

2. The teacher will divide the students into groups of 5. It is also possible for the students to agree among themselves to divide themselves into the different groups.

3. Once you have split up, you will have to focus on the three general questions in section 1.2.1 and come to common conclusions on the two proposed themes. One, is about the topic presented in the last video, and the other is about how the trademark can affect their daily study of mathematics as explained on second picture.

Against this background, we propose the following two scenarios:

3.1. Someone starts producing micro-vegetables of poorer quality but at a much lower price than those that, as we have seen in the video, are protected by trademark laws. The person who has protected his products as a trademark starts to have very important losses in his business, so he goes to court and wins the trial against his unfair competitor. Students should consider how fair these sanctions are and take a side, taking into account all the pros and cons.

3.2. One of his teachers hands out maths exercises without which it is impossible to pass an exam. This teacher has taken the exercises from an illegal website, and is therefore fined and must destroy all the material distributed. The students will have to decide whether such an example of piracy is really relevant or important in this type of legislation, applied to their mathematics subject.

4. After discussing the above scenarios, the students will have to answer the three initial questions and argue their answers in front of their classmates. At this stage, they should prepare a couple of slides to make their presentation more complete.

5. Once all the presentations of the classmates have been completed, a class discussion will be opened in which they will have to put all their ideas on the table. Afterwards, they will have to come up with a common idea or solution for each of the two scenarios proposed.

1.2.4 Conclusion

The aim of this activity is that through trademark and mathematics, students can learn more about the real world, implement creativity, make this subject more enjoyable and above all, use critical thinking and healthy debate to reach conclusions.

1.3 Key questions for knowledge testing

The lesson plan can be accompanied by a short quiz of about five key questions that can be used to check the learners' knowledge acquisition. Correct answers in multiple choice questions can be marked in bold.

Question 1: Trademark belongs to intellectual property
[True] [False]

Question 2: Mathematics is protected by trademark
[True] **[False]**

Question 3: There are many types of trademarks
[True] **[False]**

Question 4: Where there is fraud or counterfeiting, the European court is the judge.
[True] [False]

Question 5: ¿Por qué no se pueden proteger las matemáticas como ciencia bajo normas trademark?
[Because mathematics as a science is for universal use and should not belong to anyone as private property]

[This is not the case because mathematics can be protected]

1.4 References or additional resources

- https://tmdb.eu/trademark/US-88255342-maths.html
- https://www.patentes-y-marcas.com/en/trademark/maths-and-go-m3852230
- https://www.patentes-y-marcas.com/recursos-marcas/clasificacion-de-marcas