Module 2 - DESIGN
Lesson Plan for 3D printing

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IPin STEAM

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HEARTHANDS SOLUTIONS
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Empowering innovation in STE(A)M
through IP awareness
2020-1-UK01-KA201-078934

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REVISION HISTORY

Version	Date	Author	Description	Action	Pages
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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

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1.   Design

1.1 General Information

Background, needs analysis, etc.

Intellectual property laws protect original works against unauthorised use. However, the emerging 3D technology and its popularity call for scrutiny when determining what can and what cannot be protected and under which circumstances an act is deemed legal or illegal. In the case of designs, owners can protect their creations either fully –as Registered Community Designs (RCD), or partially – as Unregistered Designs (UCD). Gaps in IP awareness and misconceptions can lead to such mishaps as unintentional infringement. Therefore, students need to learn the basics of IP and, during this module, the specifics of design rights.

1.1.1   Brief Description

This educational activity will introduce the concept of design in 3D printing, all the while repeating general IP issues. Through projections, comics, and tangible examples, students will initially get acquainted with the theoretical framework and, then, through dialogue, fun activities and analysis, they will understand the practical implications of **Registered Community Designs (RCD)**, **Unregistered Designs (UCD)** and **Infringement**.

1.1.2   Learning Objectives – Intellectual Property in STEAM topics

This lesson plan aims at clarifying the concept of design and its implementation in 3D printing. Learning objectives include (but are not limited to):

* basic theoretical knowledge of **IP rights**
* the clear theoretical and practical distinction between **Registered** and **Unregistered Protection**
* initiation to the differences between **Registered Community design (RCD)** and **Unregistered Community Design (UCD)**

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1.1.3 Links to curriculum

This educational activity will encourage children to explore and question contemporary technological advancements and applications with a specific interest in 3D printing. It promotes **cognitive** learning (thinking) and **affective** learning (social/emotional) and is linked to:

- Science
- Technology
- Engineering
- Arts
- Mathematics

1.1.4 Duration

Give an estimate of how much time (in hours) is needed to complete this lesson plan e.g. in classroom of 20-25 students

2 hours

1.1.5 Extra materials required

List here all materials required (per student or per classroom) for the lesson plan or educational activity.

- Beamer or digiboard to project materials.
- Internet-connected computers (preferably: 1 computer per 5 students)
- Productivity and presentation tools like Microsoft Office and Google G Suite for Education.
- Digital creation tools

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1.2   Step-by-step instructions

Image title: Car
Source: pixabay.com

This lesson is about **design** and its implementation in **3D printing**. The first phase will introduce the **theoretical framework** of **Intellectual Property** notions and rights. The teacher will ask questions and advise students to find the answers in groups of five (please allow time for inter-group discussions). When all questions are answered, they will be discussed in the classroom based on **specific cases**. Projected material during the whole activity will help students visualise the topic, all the while being entertained by fun comics and slides.

1.2.1   Introduction or orientation

Through projected materials, students will be encouraged to:

- express their proper ideas and/or prior knowledge regarding intellectual property
- discuss the concept of novelty/originality

Then, they will be encouraged to:

- distinguish ideas from tangible objects and

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- navigate limitations and requirements for IP protection

This can occur by commenting on the following comic strip:

https://www.ipd.gov.hk/eng/promotion_edu/educational_corner/comics/image/02.htm

Next, students will study the concept of **design** and its applications in **3D printing**.

a) When given the following comic strip, students will be asked to express their comments and think of examples of designs:

https://www.ipd.gov.hk/eng/promotion_edu/educational_corner/comics/image/28.htm

b) When given the following comic strip, students will become familiar with registration processes and requirements, time limits etc.

https://www.ipd.gov.hk/eng/promotion_edu/educational_corner/comics/image/29.htm

Image title: Superwoman
Source: pixabay.com

1.2.2 Preparation or conceptualization

In this phase, students will be presented with examples that will help them distinguish between functional and aesthetic/ornamental features of an object.

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The following pictures can be used:

Image 1: Clock
Source: pixabay.com

- The **shape** and **form** of this clock refer to its design.

The students may be encouraged to describe the clock and its distinctive features/ appearance.

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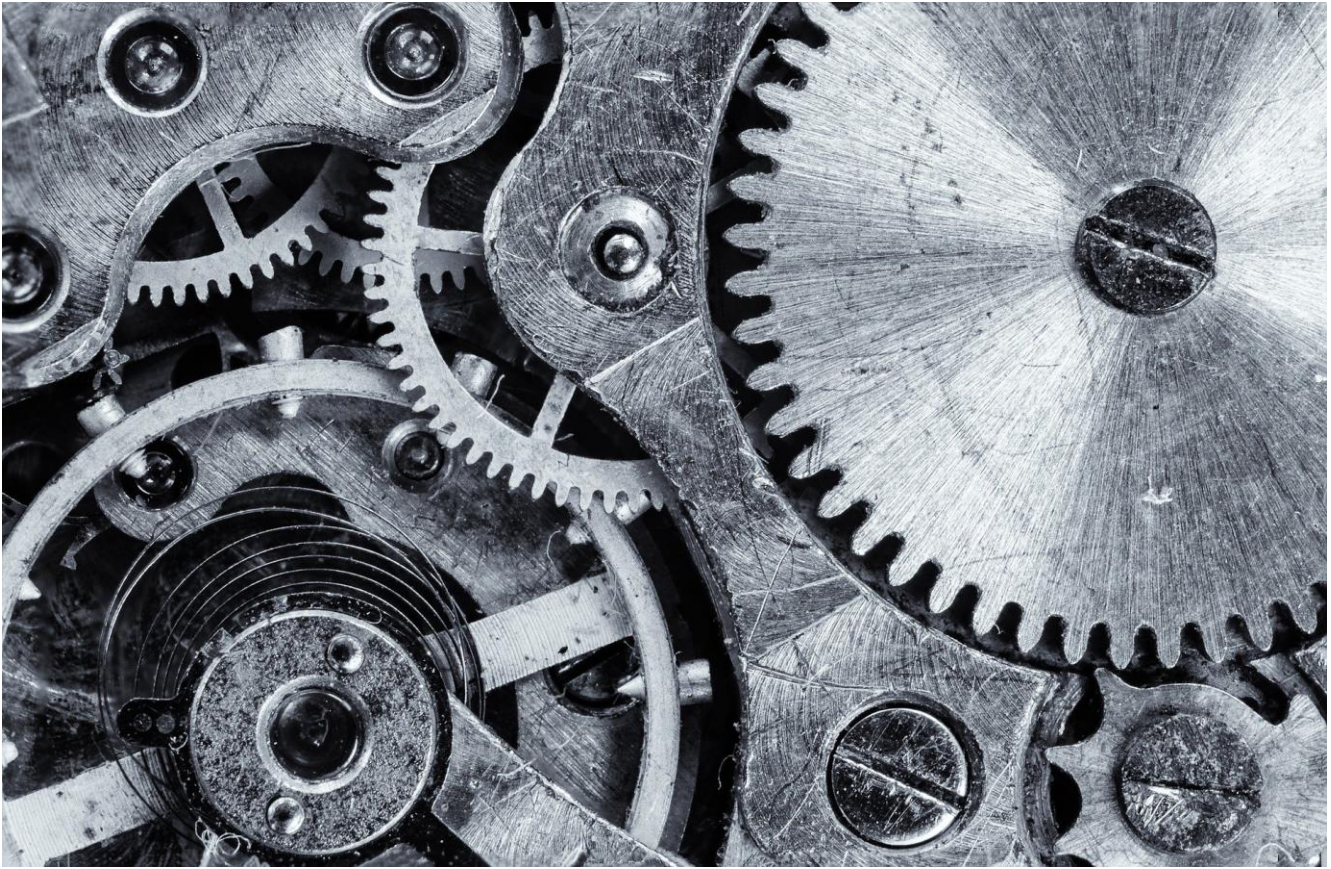through IP awareness
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Image 2: Cogwheel
Source: pixabay.com

- Cogwheels inside the clock of Image 1 are **non-visible parts** that relate to the clock's **function** (not its appearance!)

The students may be encouraged to talk about the function of cogwheels (mechanics, etc.).

Next, by comparing the two images and better grasping the essence of **design**, students will be encouraged to find examples of their own.

NOTE: Allow time for inter-group discussions

1.2.3 Investigation

During this phase:

1. Students will be encouraged to collect pictures of registered designs already available in the market, either found online or in magazines and newspapers.

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2. In groups of two, students will present their findings and discuss their choices.

3. After finishing activity 2, students can be encouraged to think of product designs that can be registered.

4a. For this step, students will be asked to design a smartphone or a toy and be as creative as possible!

4b. Students will be asked to think about their design and whether they consider their design to be novel or not.

NOTE: In Step 4.2., allow additional questions and/or comments on what constitutes a novelty.

5. Recapitulate all the misconceptions revealed during the previous steps

6. Role-playing activity:

- Student A has designed an original fashion piece (shirt, blouse, or whatever else the students choose)

- Student B secretly saw A's work and reproduced it intending to sell it to the market

- A and B are now in classroom-court defending their rights!

While A and B present their cases, the rest of the class prepares posters to defend one or the other. The posters can include lists of justifications and/or personal opinions on why they think A or B is right, or a graph showing the pros and cons of each student's argument.

7. Discuss what constitutes **bad practice** and analyse consequences (ethical, practical, emotional, legal, financial, and so on).

1.2.4 Conclusion

The teacher will recapitulate the key topics addressed in the lesson plan.
Then, the students will be asked to summarise the basics of IP with a particular focus on the concept of design and its implementation in 3D printing.

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: What is design?

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[the materials used to make a product 1] [the invisible parts of a product 2] **[an object's appearance 3]**

Question 2: What is IP infringement?

[your right to reproduce someone else's work 1] **[the unauthorised use of someone else's work 2]** [laws that protect ownership 3]

Question 3: What qualifies for a design registration?

[**a product's appearance** 1] [a product's cost of production 2] [a product's name 3]

Question 4: When is it illegal for you to use someone else's RCD?

[never 1] [when you get consent from its owner 2] **[before its disclosure 3] [after its disclosure 4]**

Question 5: When is it illegal for you to use someone else's UCD?

[never 1] [when you use it to produce an object in the privacy of your room, just for fun 2] [when you use it to produce an object that you plan on selling in the market 3]

2. Additional resources

2.1 Further reading

Mention here any references or additional resources related to this lesson plan or activity

https://www.ipd.gov.hk/eng/pub_press/publications/learning_guidebook_en.pdf Learning Guidebook

https://www.youtube.com/watch?v=dH1EW_Qem9s Intellectual Property

2.2 Appendix

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

"Comics on Intellectual Property"
https://www.ipd.gov.hk/eng/promotion_edu/educational_corner/comics/index.htm
Cute and funny scripts to help students learn about IP rights, understand their importance in everyday life and build up awareness per IP protection.

https://www.thingiverse.com/
Navigation on this platform will show students when and how they can download a CAD file and further customise it or print out a copy of the original.

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References

Please remember to use APA style for your references. You can add references by clicking on the relevant tab (references) in the tool bar and insert citation.

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