INTRODUCTION

How to use this teaching pack

This pack contains everything required to start teaching students about Intellectual Property (IP):

- Curriculum map
- Worksheets
- Activities
- Answers
- Glossary of terms

The curriculum map (p. 4) shows how IP is relevant to the subjects taught in schools. There are photocopiable worksheets with Activities for each of the forms of IP, which can be issued as classwork or homework. They are designed to take **less than 2 hours in total** to complete, and the answers are included in the Appendix. The worksheets all follow the same format of Background, Examples, Process and Activities.

What is Intellectual Property?

Creative processes generate new ideas, whether in the field of product design, music, art, or elsewhere. These ideas, which may have commercial value, are the Intellectual Property (IP) of the creator, whether they are an individual or a company organisation. IP can have enormous commercial value, and can be traded as a commodity. However, commercially valuable ideas can be at risk if not carefully protected, and others may gain commercial advantage as a result. Over the last three hundred years five different forms of IP protection have been developed, over and above the first type ever used: confidentiality. These five types of protection are: **Trademark**, **Patent**, **Registered Design**, **Copyright** and **Design Right**.

Why is IP important?

IP is important because it brings economic benefits to those who know how to take advantage of it. The two main ways in which this is achieved are:

1. Ideas can be protected from exploitation by other parties.
2. Much research work becomes public and is thus a valuable resource.

Since the end of the Second World War, Britain has developed one third of all worldwide patents. Despite this strong showing of creative research, Britain's position in global economic rankings has steadily declined, as many ideas are developed commercially overseas. Better understanding of IP rights, otherwise known as IPR, would help reduce this wastage. One aspect of the patenting process that many are unaware of is that whilst the patent gives its owner the exclusive rights to that idea, as part of the process the patent is published and thus the idea is made public for any interested parties, including competitors, to see. This has two results: firstly, competitors can keep an eye on what the opposition are working on and see which way the market may be going; and secondly, 65% of research and development (R+D) work has been done before and is already publicly available in the Patents Library. Visiting the Patent Library can save vast sums of money in R+D budgets. The primary aim of the Patenting process is to encourage innovation.

Curriculum map

The table below shows examples of how IP relates to each subject. Perhaps the most obvious form of IP relevant to schools is copyright. This has implications for the running of departments, especially with reference to reprographics, and it is also relevant to students and staff who produce written work of value, e.g. teaching packs.

	Copyright	**Design Right**	**Registered Design**	**Patent**	**Trademark**	**Confidentiality**
Craft and Design	Design documents	Design documents, products	Products	Products, tools and processes	Commercialisation, merchandising	Processes; designs in early stages
Graphic Communication	Any graphic matter	Graphics, models	Packaging	Patent document drawings	Graphic images	Designs in early stages
Technological Studies	Printed Circuit Boards (PCB)	Design documents	Eye appeal of products, e.g. mobile phones	New technology	Names of new products, e.g. RADAR, SCUBA	Research and development (R&D)
Art and Design	Any graphic matter	Design documents, products	Products		Graphic images	Designs in early stages
English	Written or published material				Creating new names, e.g. Brasso	
Modern Languages	Written or published material			Translation of Patent documents		
Music	Copying, sampling, composing				Jingles	
Computing	Programs, licensing			Programs	Names of software	Programming codes
Physics	PCB designs	Circuits	Appearance of equipment	New technology		R&D
Chemistry	Written or published material			Chemical compounds, e.g. drugs	Smells of perfumes, etc.; drug names	R&D
Biology	Written or published material			Genetics, Bio-technology		R&D
Home Economics	Recipes	Packaging	Packaging, e.g. shampoo bottle shape	Process of manufacture	Nearly all foods have TMs	Secret recipes
Physical Education	Written or published material	Equipment designs	Equipment designs, e.g. shape of training shoes	Equipment designs	Company logos, sponsorship, merchandise	Training programs
Business Studies	Management of company's IP. Due to IP's potential value it must be treated as an asset.					
Social Subjects	Written or published material			Inventions with social impact e.g. TV, radio	Crime associated with TMs, e.g. counterfeiting	Official Secrets, etc.

Worksheet 1: Confidentiality

Background

Confidentiality is the big name for secrets. Secrets have been around for a very long time, and are therefore the oldest form of Intellectual Property (IP) protection. Secrets are very cheap to keep as long as all the people who know the secret can be trusted. In general the fewer people who know a secret, the safer the secret is. Some companies use confidentiality rather than patents because applying for a patent results in the application becoming public. Not too handy if you are designing a top-secret new weapon! Secrets are not of much use for some people though, for example protecting a new tune with a confidentiality agreement would mean that the composer would never be able to earn any money, as no one would hear it. If a company wants to use confidentiality it is very common to have a confidentiality agreement drawn up and signed which makes the arrangement formal.

Example

Only three people in the whole world know the exact recipe for Barr's Irn Bru. Until recently all three belonged to the Barr family, but now one of the employees of the company 'has the know-how'. The reason that the recipe is kept secret is that competitors would have to guess how to copy it, whereas if it was patented they would be able to go to the Patent Library and find out exactly how it is made and then change it only a little so as not to infringe the patent. Some agreements prohibit those in the know from travelling together in case the secret is lost due to an accident.

Process

A confidentiality agreement is usually drawn up by a solicitor, and is then signed by those in the know. The agreement is then binding in law, and any breaches could result in legal action. It is also possible for Implied Confidentiality to exist, for example between teachers and students, where it is not necessary to have formal or signed agreements. A Patent Agent is formally required to act in confidence at all times as

part of their job, so that inventors do not have to worry about telling the Agent about their idea. After all the agent can't help if the inventor won't tell them what they want to protect!

Activities

1. Can you find any other examples of well known secret recipes?

2. Explain why Barr's Irn Bru recipe is kept secret and not patented.

Worksheet 2: Copyright

Background

Copyright is a form of IP protection that has existed since 567 AD, when Finnian accused St Columba of copying a manuscript. However, it really became important with the introduction of printing presses in the m Middle Ages, and the first law was introduced in 1709. Copyright is used mainly to protect written, printed or broadcast materials, and is relatively simple to use. It actually exists on any written piece, the copyright usually belonging to the author automatically, although it can belong to the company employing the author if that has been agreed. Look on page ii to see who owns the Copyright in this publication. The copyright can be bought and sold in the same way as any commodity.

Examples

The most obvious examples are books and other printed materials, where the copyright usually belongs to the author, although it may be sold to the publisher. Films, TV programmes, songs and music are nearly all protected by copyright. Pop groups often copy other groups' songs; this is called making a 'cover version'. The second band to record the song have to pay royalties to the writer of the song and so do not make as much money.

Process

The simplest method to ensure that the copyright is known to belong to the author is for the author to mark the item with the © mark, and then proving that it was produced on that date. This proof can easily be provided by the author posting a copy of the item to himself, and not opening the package on its return. The postmark on the stamp is proof of the date of posting and therefore shows that the work was done on or before that date. This can then be used as evidence if someone else is found to be infringing the idea. This process only costs the price of postage. A more formal method that some authors use is to send a copy to a lawyer or bank for safekeeping. A copyright registry exists for music and this does charge a fee.

Copyright once claimed belongs to the author for the rest of their life plus seventy years. This means that the author's family, or the owner can continue to benefit from the work for several generations.

Activities

1. Make a list of five items that you can find with the copyright mark on them.

2. Design a logo which uses your own surname, and copyright it using the postal method outlined above. Remember that copyright only protects the appearance of your design, and not the actual word.

Worksheet 3: Trademark

Background

Trademarks are all around us now, indeed you may be displaying some on your clothing as you read this. Most logos that you see on anything from advertisements to clothing are Trademarks. They identify the product with a company, and the company hopes that its image will help to sell the product. Trademarks have been registered since 1876, at the Patent Office. Trademarks are usually words, although it is becoming more common for other items to be protected in this way too, for example tunes and aromas. Companies protect their products' names to prevent other competitors from copying or 'passing off' their products. It is common practice not to trademark the company's own name, but only the 'brands' that they produce. They may wish to protect their company logo in some cases and this can be done, for example Nike.

Examples

There are thousands of different trademarks in existence at present, and many more whose protection has expired. Every time you go shopping the shelves are stacked with examples of them. Trademarks have become a fashion accessory, particularly in the clothing industry, where clothing manufacturers use their Trademarks to create very strong brand images, which the public finds desirable and stylish. Trademarks are applied to products in groups, each group representing a different range of products. For example the name Mazda is trademarked by three different companies: the car manufacturer, the light bulb manufacturer and the cooking oil manufacturer. The reason this can happen is that each company is in a different group and thus will not be competing against the others. There are forty-two different groups, and as it costs money to register for each group, most companies only register in the group that directly affects their business. History has shown that made up names that do not describe the product are actually the most effective as trademarks.

Process

Companies do not have to trademark their names, but it can be very worthwhile to do so. Even if a name is not registered, after some time it will begin to be associated with the product and rights will be established: these names have ™ beside them. However, registering the Trademark is much more clear cut and has distinct advantages. Trademarks are best applied for early in a product's life to prevent

problems. When a company applies to the Patent Office for a Trademark a search is carried out to find if other companies are using the same or similar names. If there are but in a different group then permission may be sought to use the name. Certain words cannot be used in trademarks, for example words associated with Royalty, or offensive words. If a Trademark is granted it can last forever as long as the company keeps paying the renewal fees every seven years, and the letters RTM or the symbol ® can be used alongside the name. The first ever Trademark registered was by Bass, the brewers, and it is still registered.

Activities

1. Make up a trademark for an imaginary product you have invented.

2. If internet access to the Patent Office website (www.patent.gov.uk) is possible, conduct a search in the Trademark register for your invented name to see if anyone else is already using it and if so, what for.

3. What is the difference between the meaning of the two symbols, ® and ™?

4. Sketch from memory five different Trademarks, and then compare them to the originals. Observe how recognisable the best designs are, and try to explain what it is about the designs that makes them so effective.

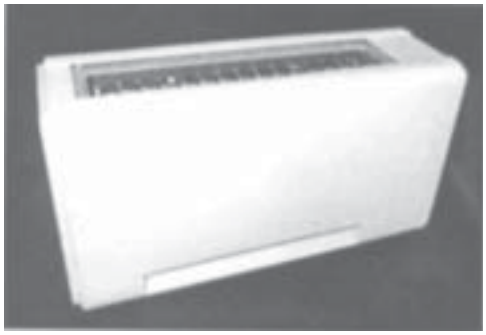
Worksheet 4: Design Right

Background

Design Right is a new form of Intellectual Property (IP) that was introduced in the UK in 1988 and which is very similar to Copyright, although there are some important differences. Design Right's main similarity with Copyright is that it exists automatically, i.e. there is no application process involved. However, this in turn means that it offers less protection, and is really only suitable for protecting items that fall outwith the other forms of IP protection. Due to its simple nature it is also a cheap form of protection.

Examples

Design Right is particularly useful for protecting the way things look; shape, form and appearances of new products that are different from before but not sufficiently so to allow for Patenting. For example, the appearance of a new toaster may be protected by Design Right because underneath the stylish case is the same mechanism as the previous model's.



Process

As there is no formal registration system for Design Right, all that an inventor need do to protect their invention is to mark it 'Design Right' and date it. However, it is a good idea to keep the idea secret until this has been done and an original has been lodged somewhere secure with proof of the date when this was done. Design Right only protects the idea in that specific form, and it is easy for competitors to copy with minor changes so as to avoid infringement of the Design Right.

Design Right has a short lifespan of only ten years from first sales, and during the last five of these anyone is entitled to copy the design provided they pay a licence fee to the owner of the IP. The fee would be set by mutual agreement.

Activities

1. If you have made any project material, mark it with Design Right, your name and date.

2. Design a symbol to represent Design Right, in the same way that © represents Copyright.

3. IP is not suitable for protecting the symbol you have just designed. Explain why the symbol should not be protected.

Worksheet 5: Registered Design

Background

Registered Design is a form of Intellectual Property (IP) protection that was first used in 1787, in response to the demands of textile manufacturers who were concerned about competitors using their patterns. It is still much used by industry today as this form of protection covers the appearance of a product, but not how it works. If the way it works is new then a Patent may be applied for, in addition to using Registered Design to protect its appearance. It is important to understand that one product may involve several or even all of the forms of IP protection.

Examples

Car body shapes are good examples of Registered Designs, as manufacturers want to stop other companies copying successfully styled cars, yet the technology inside the car is too similar to previous models to be able to Patent. Distinctive features such as radiator grilles can be protected as well as the overall body shape.

Process

The process for registering a design is similar to that for obtaining a Patent, and is also controlled by the Patent Office. The design has to be kept confidential before the application is filed, and then a search is carried out to see if there is previous work that is similar. If the search does not show up any possible conflicts, the design is granted its Registration. Once granted, the registration can be kept for twenty-five years, as long as renewal fees are paid at the various renewal dates. If the company does not feel it is worth spending the money as the product's life cycle is nearing its end, they may allow its registration to lapse. This enables competitors to begin copying, and no action can be taken against them. By keeping an eye on competitors' Registrations, it is possible for other companies to see what they are doing without indulging in illegal tactics.

Activities

1. Find one example of a product that is protected by Registered Design, and write down its registration number.

2. Why does Registered Design offer more protection than Design Right?

3. Design a symbol to signify that a product is protected by Registered Design, in the same way that ® means that a name is protected by Trademark law.

Worksheet 6: Patent

Background

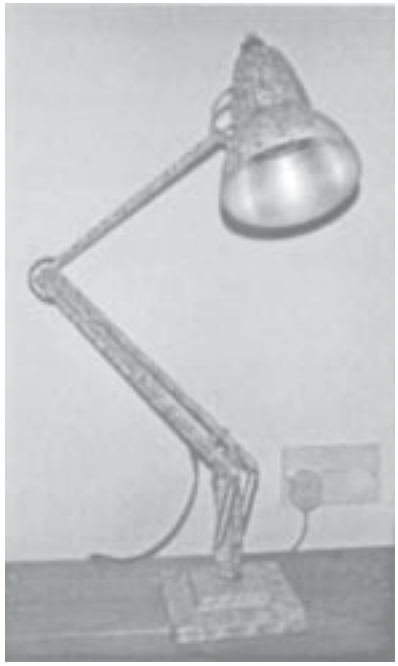
The first Patent was granted in 1449, to John of Utynam, who wanted to protect his method for making stained glass. He was granted a monopoly on the process for twenty years by the king, in the form of an open letter. The word Patent is derived from the Latin name for an open letter, and this form of protection continued to be granted by royal approval until 1852 when the first Patent Office was opened in London. Since then the number of Patents applied for and issued has increased enormously, to the point today when over thirty thousand applications are filed each year.

What is a Patent?

A Patent is a licence which gives the owner of an invention the right to use the invention for his own commercial gain, and to prevent others from copying the invention, for up to twenty years. The Patent is made public as part of the process, so even though the invention was previously secret everybody can then find out about it. This enables competitors to keep track of what is going on in their field of work, and can save much research and development. The owner of a Patent may sell or licence the idea to other companies. The main idea of the whole process is to encourage innovation.

Examples

Tracks: Tanks and diggers are fitted with tracks, which enable them to travel over soft ground without sinking and getting stuck. The first use of tanks was at the Battle of Cambrai in 1916, during the First World War, and most people think that this was the first time that tracks had ever been used. In fact the first Patent for such devices was issued in 1770!

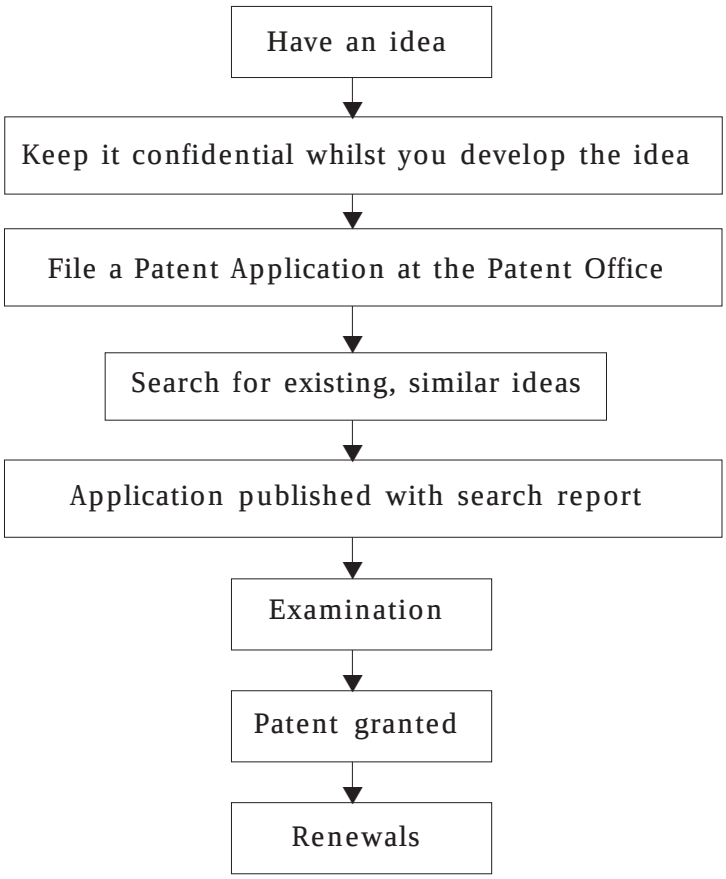


In order to be granted a Patent, the product must involve an inventive step that makes it different from any other similar product made before, and it must not have been shown in public before. The giant computer company IBM filed over two thousand Patents in 1999 alone.

A famous example of a successful Patent is the Anglepoise lamp. This was developed in the 1930s, and is still used worldwide today.

Process

The flowchart below shows the main stages in obtaining a Patent.



Patents do not have to be kept going for twenty years. They can be allowed to lapse by not paying renewal fees that arise annually after the fourth year. If the Patent lapses your competitors can now start using your idea.

Activities

1. Find one product in your kitchen at home that is Patented.

2. What do new products have marked on them if sold before a Patent is finally granted?

3. Find one example of the above.

4. Try to find out the approximate cost of a Patent being granted for twenty years.

5. (a) Conduct an internet search to find Espacenet (www.espacenet), and then search for patents on products that interest you, or relate to current project work.
   (b) Could you improve any of the products that you have found during your search? If so, how?

6. Some examples of famous inventions that have been Patented are shown in the table below. Try to fill in the gaps:

Product	Inventor	Year
Cat's Eye road stud		
Workmate folding bench		
Electric light bulb		
Anglepoise lamp		
Pneumatic tyre		

APPENDIX

Answers to Activities

Worksheet 1: Confidentiality

1. Other examples of secret recipes include Drambuie, Heather Ale.
2. The recipe of Irn Bru is kept secret so as to make copying it more difficult for competitors.

Worksheet 2: Copyright

1. Five suitable examples of copyright work, such as books, sheet music, CDs, photographs, maps, etc.
2. Suitable standard of design work for student concerned.

Worksheet 3: Trademark

1. A suitable new word is created.
2. Search conducted and any 'hits' recorded.
3. ® means that the symbol is actually legally registered, whereas ™ means that it is not formally registered.
4. The recognition activity shows how recognisable most Trademarks are.

Worksheet 4: Design Right

1. Design work marked appropriately.
2. A suitable symbol is designed.
3. No protection is required because people should feel free to use the symbol wherever necessary.

Worksheet 5: Registered Design

1. One suitable example with a registration number.
2. Because it is formally registered with the Patent Office.
2. A suitable symbol is designed.

Worksheet 6: Patents

1. One suitable example.
2. Patent pending, or Patent Applied For.
3. One suitable example.
4. In the region of £20,000.
5. (a) search conducted
   (b) suitable suggestions made.

6. Table completed as follows:

Product	**Inventor**	**Year**
Cat's Eye road stud	Percy Shaw	1933
Workmate folding bench	Ronald Hickman	1961
Electric light bulb	Joseph Swan (UK) or Thomas Edison (USA)	1878 1879
Anglepoise lamp	George Cowardine	1934
Pneumatic tyre	John Dunlop, or Robert Thompson	Oct 1888 Dec 1945

Glossary of terms

Agreement
When two or more individuals or companies sign contracts, usually to do with Confidentiality or Licensing.

CIPA
Chartered Institute of Patent Agents.

Client
The person or company who wishes to protect their idea is the client of the Patent Agent.

Confidentiality
Knowledge that is only available to a very small number of people, sometimes only one.

Copyright ©
Form of IP for printed and published material.

CPA
Chartered Patent Agent.

Creativity
The mental process that leads to the generation of new ideas.

Design Right
A form of IP which covers the external appearance of objects. It does not require any application process or registration, but exists automatically, in a similar way to Copyright.

Disclosure
Allowing members of the public to see, or telling them about an invention before filing the Patent application is called Disclosure. It means that a Patent cannot be granted if disclosure is proven. This is why it is important to have Confidentiality Agreements, or to keep ideas secret.

Entrepreneur
A business person who develops new ideas rather than running established enterprises.

EPA / I / O
European Patent Agency/Institute/Office.

Fee
The price charged by a company to the client.

Flowchart
A diagram showing a schematic sequence of events or choices.

Innovation
The development of new methods and technologies.

Intellectual Property (IP) and **Intellectual Property Rights (IPR)**
The ownership of ideas, which may be bought and sold like any other product.

Know-how
The knowledge of how to do, or make something that most others cannot.

Licensing
The owner of an idea or design may license another company to use or make the product, and in return will receive a fee or royalty, or a combination of both.

Logo
A motif or recognisable symbol that represents a company or a product.

Marquesa
A CD-ROM available at some specialist sources which keeps an up-to-date record of existing Trademarks.

Modesta
A publication that is a handbook to IP, aimed at industry.

Monopoly
The exclusive right to do, use or make something.

Patent
A document which grants the owner the exclusive right to the design described by the Patent.

Patent Agent
A company or individual who specialises in the business of helping clients to protect their IP.

Patent Office
The location of the records and the staff who perform the work required to grant Patents, Registered Designs and Trademarks.

Patent Pending
This can be marked on products that are built in the period between filing a Patent and the granting of a Patent. It warns other companies that they would risk court action if they copied the design.

Priority
When a Patent is filed, it gains priority over any similar ideas that may be filed after that date. When several companies are working on the same research there can be a race to establish priority.

Prosecution
This is the stage when the Patent is in the process of being granted, and the Patent Office conducts searches to check that the idea is new.

RAPID
An on-line database of existing Patents (Remote Access Patent Information Database).

Registered Design
A form of IP which protects the appearance of a product, but not the way it works. There is an application process, which if successful enables the product to be Registered for up to twenty-five years.

Royalties
The fees paid to the owner of the IPR by a user, usually per copy.

Slogan
A short sentence often used for advertising purposes.

Theros
A publication about IP which is aimed at Further and Higher Education.

Trademark
A form of IP protection used by companies to protect their products' names and identities.

Venture Capital
When an entrepreneur wants to start a new company or develop a new product, funding to finance this can often be sought from sources of Venture Capital

WIPO
World Institute of Patent Offices. The worldwide governing body on IP law, based in Geneva.

Acknowledgements

I would like to thank the following for their assistance in this project:

Stewart Brymer, Thorntons WS, Dundee
Gillian Lang, Glasgow Science Centre, Glasgow
William Mitchell, AISM, Glasgow
Keith Turner, Murgitroyd & Co, Glasgow
Caroline Wright, IEATS Co-ordinator, Highland
The staff, Plockton High School, Highland

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Useful websites

www.Nesta.co.uk
www.design-council.org.uk
www.dyson.com
www.european-patent-office.org/espacenet/info/index.htm
www.patent.gov.uk