



Paper and Sustainability Class Presentation Notes

Geography Studies 11-18

These notes accompany the PaperWorks Pack 3 whiteboard presentation:
<https://www.paperworks.school/slides/geo.html>
and are free to use within the classroom.

Introduction

These notes accompany the online whiteboard presentation for Geography Studies.

They provide the essential information needed to use the presentation in-class. Further background information and details of the recommended student project can be downloaded from www.paper.org.uk/paperworks.

Students wishing to research information for the challenge can use the online study area at <https://www.paperworks.school/study-area/> where they will find background information and facts & figures about the modern papermaking industry and links to the websites of many paper-related organisations.

You will need:

- ♻️ A computer
- ♻️ An audio system
- ♻️ An Interactive Whiteboard to gain full value from this resource

Presentation Notes

Slide 1



Paper Production

Over 70% of the paper manufactured in the UK is made using fibres from recovered paper recycled by households and businesses. The rest comes mainly from virgin wood fibre from trees grown in sustainably managed forests.

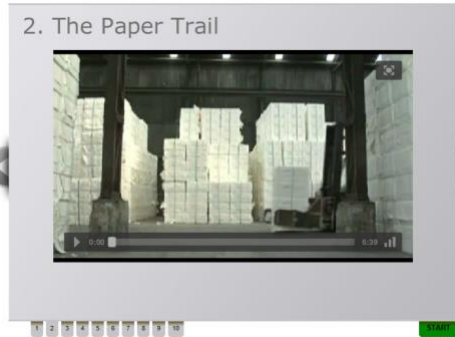
The fibres are mixed with water to make a pulp. The water is then removed by draining, squeezing and drying to leave a fine mat. That mat is what we call paper.

The paper mill we are going to see in the next video recycles recovered paper collected from the local area. It makes brown paper which is then used to manufacture cardboard. The cardboard is then used to make boxes to transport foods and retail goods – before being recycled again.

This system is extremely sustainable and a good example of recycling in practice.

Before you show the video we suggest you ask students to consider the importance of paper and board in their lives – simply look around the classroom and identify what would be missed if we did not have paper.

Slide 2



The Paper Trail

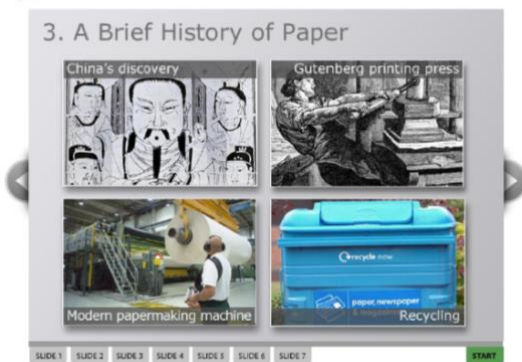
In this short video clip Paul Freeman, Operations Director of Smurfit Westrock takes students on a tour of the Birmingham paper mill. The mill takes recovered paper and board, mixes it with water to make a pulp, which is then dried into a fine mat. That mat is what we call paper. The paper produced at this mill is used to make cardboard boxes and packaging. These boxes protect and transport food and retail goods.

Once the box or packaging is used it enters the recycling chain again and eventually turns up at this mill, or another, to make more paper.

During the video students will see the papermaking process including:

- ♻️ Recycling
- ♻️ Pulping
- ♻️ Drying
- ♻️ Rolling

Slide 3



A Brief History of Paper

Here you'll see various ways paper has influenced society (images of T'sai Lun, Gutenberg Printing Press, Modern papermaking and Recycling paper).

Paper was discovered in China by T'sai Lun in 105AD, although the Egyptians were the first known paper users. They made paper by hand using grass-like plants.

The Gutenberg Printing Press was invented by Johannes Gutenberg in 1440. This was revolutionary to society as it could produce paper books on a large scale.

Slide 4



Do You Know?

Teabags are made from paper, and so are disposable coffee cups. Packaging protects fragile products and foods, so substantially reducing food waste. Designers are always finding novel uses for paper like this vacuum cleaner.

Can students think of other uses?

Slide 5



The Paper Game

This interactive description of the papermaking process can be used to assess students' understanding of what they have seen so far.

You can ask students to complete the stages of the 'closed-loop' process which forms the foundation of most papermaking today – and check their understanding of where the concept of sustainable development should apply, before watching the next two videos about energy and water use.

Slide 6



Sustainable Papermaking

In this video Martin Ferrari, Sustainability Director for Smurfit Kappa, joins Paul Freeman, Operations Director, to describe the importance of sustainability in the papermaking industry.

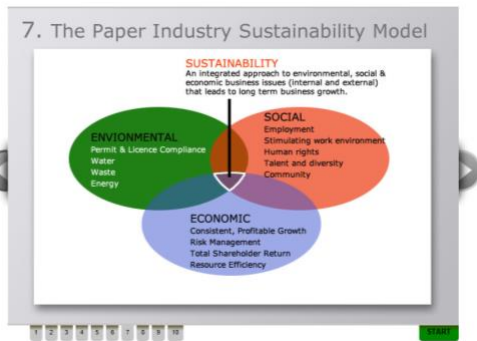
Papermaking requires large amounts of electricity and water and in this video we can see how the modern industry uses them as sustainably as possible.

The video ends with a brief description of the sustainability issues around the use of wood fibre. Of the fibres used to make paper in the UK, over 70% comes from recovered paper recycled by households and businesses. The rest comes mainly from virgin wood fibre from trees grown in sustainably

managed forests.

Having watched this video we suggest you hand out the Paper and Sustainable Business Background Information sheet available from www.paper.org.uk/paperworks.

Slide 7



The Paper Industry Sustainability Model

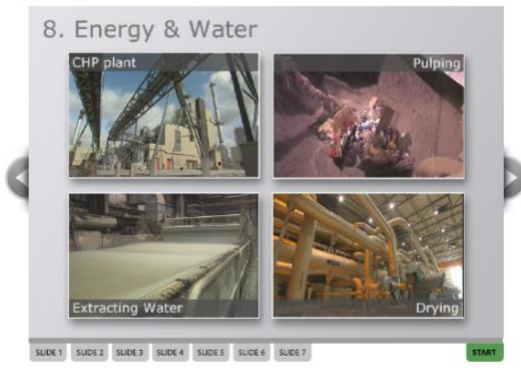
This slide shows the sustainability model employed by Smurfit Westrock in its planning and management of the papermaking industry.

It shows the three main legs of sustainability - environmental, social and economic - introduced by Martin Ferrari in the previous video slide.

This is a useful slide to use in stimulating class discussion about the role of sustainability in other industries, the global view of sustainability so often discussed in the news media, and the viability of this model in developing countries.

You can print out this slide from www.paper.org.uk/paperworks and add to the student portfolio ready for the assignment challenge at the end of this presentation.

Slide 8



Energy and Water

This slide shows some of the ways energy and water are used in papermaking. Recovered paper is recycled by mixing with large quantities of water during the pulping stage of the process. Most of the water is then removed in the papermaking process.

The vast majority of water is 'borrowed' i.e. it is used, cleaned and returned to environment or recycled in the papermaking process. Some water is

turned into steam as part of the drying process and is lost in the atmosphere.

As the old water-using industries have gone from the area, the extraction of water by the paper mill seen in the video helps to control the water table in Birmingham. Smurfit Westrock work with the Environment Agency to manage water levels in the city.

Making paper is intrinsically energy intensive, with electricity used to drive machinery and heat to dry the paper once it's made.

Between 1990 and 2010, the UK Papermaking Industry reduced energy use by 42% per tonne of paper, and emissions of fossil carbon dioxide by 1.6m tonnes.

Some mills will buy their electricity from the national grid and have boilers powered by gas to provide heat – very similar to houses.

Re-using paper of course makes common sense as well as being energy efficient – it's much more resource efficient and requires less energy to prepare the fibre as well as helping pay for recycling collections! Some paper mills only use recovered paper to make new paper – complete 'closed-loop' recycling in action.

Slide 9

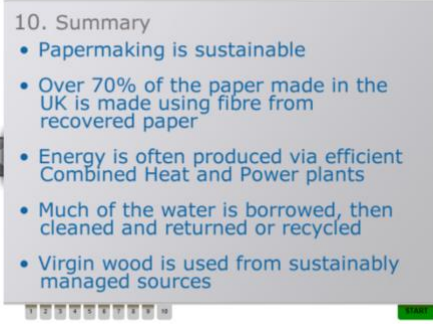


The Business Cycle

This slide shows the entire papermaking and marketing cycle for the paper mill we have been following in this presentation.

It's a useful slide to sum up what has been studied so far in this presentation and to get students thinking about the application of the sustainability model to other industries – particularly those in the developing world where industrialisation is happening very quickly.

Slide 10



10. Summary

- Papermaking is sustainable
- Over 70% of the paper made in the UK is made using fibre from recovered paper
- Energy is often produced via efficient Combined Heat and Power plants
- Much of the water is borrowed, then cleaned and returned or recycled
- Virgin wood is used from sustainably managed sources

Navigation bar with 11 icons, the 10th icon is highlighted in green.

Summary

UK papermaking is undoubtedly one of the UKs most sustainable industries, which is good news for society in general.

Around 70% of paper made in the UK is made from recovered paper fibre.

Energy is being produced via efficient Combined Heat and Power plants.

The majority of water is 'borrowed' i.e. it is used, cleaned and returned to the environment or recycled in the papermaking process.

Virgin wood fibres are used from trees grown in sustainably managed forests.

Credits

The CPI wishes to thank the following for their invaluable contribution to these resources:

- ♻️ Smurfit Westrock
<https://www.smurfitwestrock.com/>