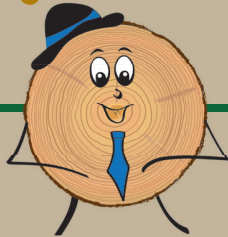


# Wood Facts

Discover your wood IQ





*Richmond Olympic Oval*

# Would you like to know more about WOOD?



Hello, my name is **Cookie**! I can't wait to tell you all about wood. I was made from a slice off the end of a log. If you look closely you can see how old I am by counting my growth rings. Every year a tree adds a new ring of wood around its circumference, just under the bark.

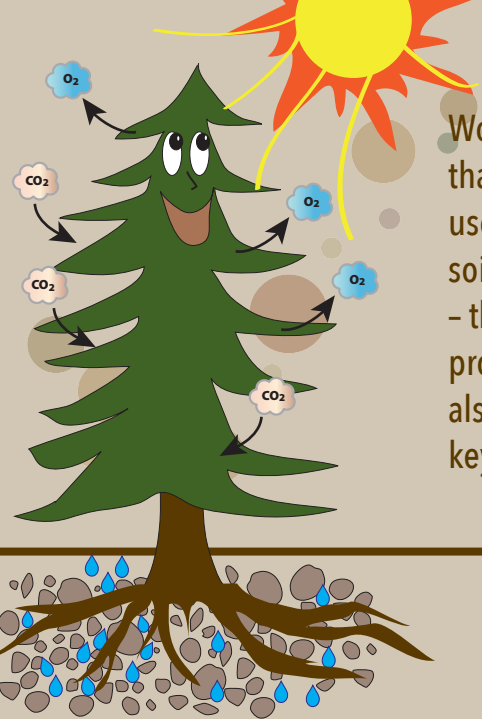
Hello, my name is **Spruce**! I want to help you increase your Wood IQ! I'm a 2x4 cut from a spruce log in a sawmill. Buildings made from wood are helping to reduce green house gases and combat climate change. How high is your Wood IQ? Let's find out!





What kind of  
factory makes  
wood?



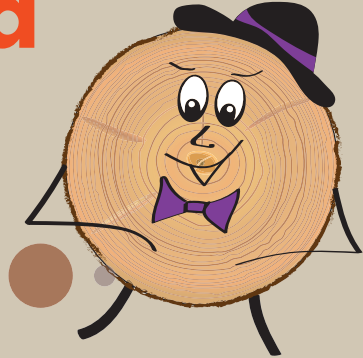
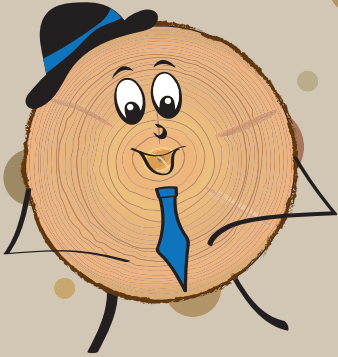


Wood is made in a factory called a forest! And the *machine* that makes wood is called a tree. What are the ingredients used to make wood? Trees use water and nutrients from soil, carbon dioxide from the air, and energy from the sun – that's all it takes to make a piece of wood! This magical process is called **photosynthesis**. Importantly, this process also makes sugar—a tree's favourite food—and oxygen, a key ingredient of life on earth!

## Photosynthesis



Is all wood  
the same?





No. There's a big difference between the wood of different tree species. Just like blue jays and eagles are birds—but are very different from each other—a maple tree has different wood from a pine tree. There is also **variation** in the wood within one species of tree. Two Douglas-fir trees can have wood of differing strength, grain and colour. And, guess what? There's even variation within a single tree! Wood at the top differs from the bottom, and the centre is different from the wood at the outside edge. This natural variation is part of wood's appeal, but it can also pose challenges.

## Variation

# Why does wood float?





$$\text{DENSITY} = \frac{\text{WEIGHT}}{\text{VOLUME}}$$



It's all about density. **Density** is a comparison of your weight to your size. Most wood has a lower density (weight) than water, that's why it floats! Different trees have wood with different densities depending on how porous the wood is. Trees move water and sap through tiny channels (pores) in their wood. Some trees have bigger channels than others—making their wood LESS dense and MORE floaty! In forestry, harvested logs are sometimes bundled into rafts which float along rivers from the forest to sawmills on the water's edge. These log booms are inexpensive transportation.



# Density

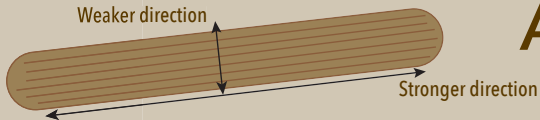


**How do  
trees grow  
so tall?**

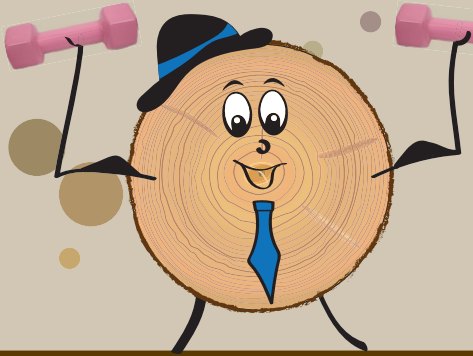




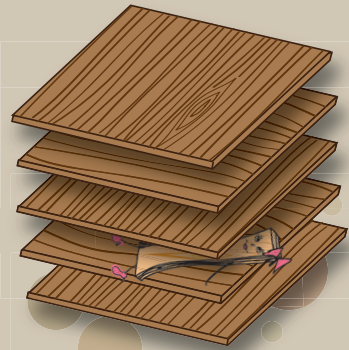
Wood is made from long cellulose fibres fused together by a tree-glue called lignin. Billions of fibres line up side-by-side and end-to-end creating trunks and branches. Together they become the lightweight, strong, yet flexible material we call wood. To stay upright, wood is stronger in the upward direction with the flexibility to bend in the wind. This makes wood **anisotropic** - stronger in one direction than the other. *Try this:* hold a wooden popsicle stick like a bridge and try to snap it—not that easy is it? Instead of breaking, the wood fibres bend. Now hold the stick and try snapping it in half lengthwise. WOW! That was easy, it snaps in an almost perfect straight line! Why? Because you have severed the bonds that align down the length of the fibres (in wood's weaker direction).



# Anisotropy



**Wood can be  
made even  
stronger!**



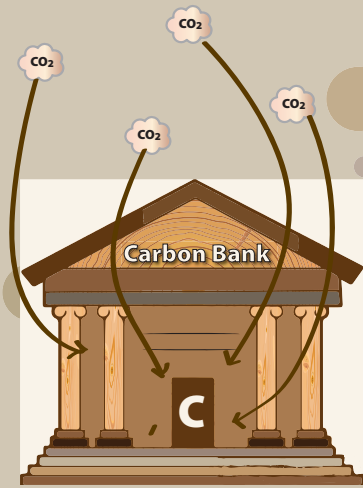
We've learned that not all wood is the same and it has greater strength parallel to the grain than across it. We can make wood stronger by taking advantage of this directional property – it's how we make **plywood**. Here's the secret: mills stack thin sheets of wood in perpendicular orientation, crisscrossing the grain, equalizing the strength in both directions across the board. Pretty smart! The ancient Egyptians first discovered this more than 3,500 years ago. Today, we can combine smaller pieces of wood into large engineered wood products, decreasing any weak points in the wood and creating a more valuable final product.



# Plywood



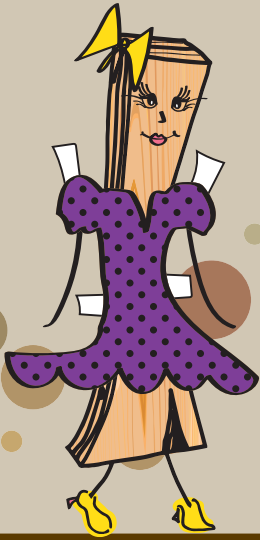
**Wood helps  
tackle climate  
change!**



Forests and wood products play a major role in reducing the impact of **climate change**. Most people know that forests help clean the air by removing pollutants, absorbing carbon dioxide and releasing oxygen. But did you know that trees incorporate the carbon they absorb into their wood? (Remember photosynthesis?) Products made from that wood, such as lumber and furniture, continue to store the carbon indefinitely. In addition, innovations in biomass energy and tall wood buildings are creating opportunities to further reduce greenhouse gases. Think of wood as a bank account for carbon—the more you use, the more you save!

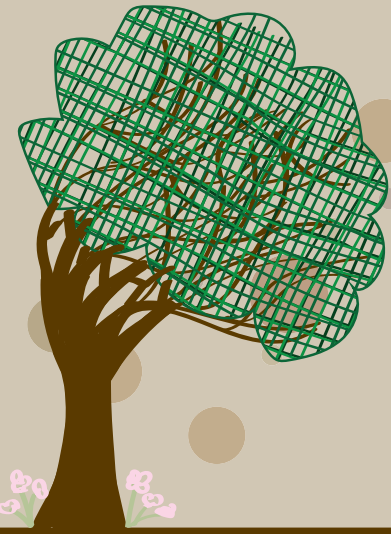


# Climate Change



**Are your clothes  
made from  
wood?**





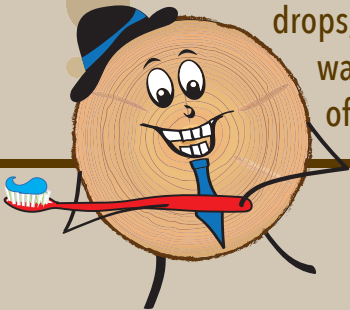
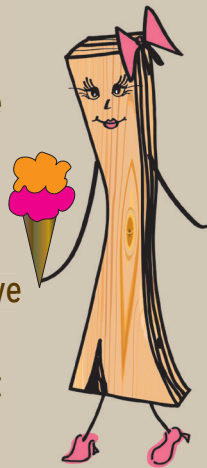
They might be! Remember we said that wood fibres are made from cellulose? Over 100 years ago a French chemist discovered that he could use chemicals to dissolve away lignin (wood glue) and spin the cellulose into threads for weaving fabric. His "*artificial silk*" was the first man-made fibre. It's still sold today, under names like **rayon**, **viscose** and **acetate**. This was once a slow, expensive and dangerous process but has become safe and efficient with modern engineering technology. These fabrics are soft and luxurious and—because they're made from wood—they're renewable and biodegradable!

## Rayon, Viscose and Acetate



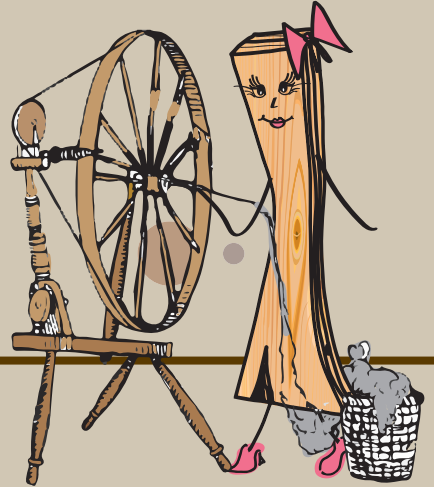
**Wood is where  
you least  
expect it!**

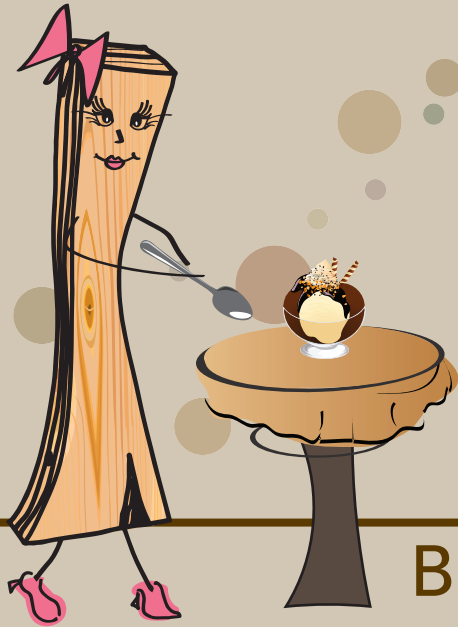
Peek into your tube of toothpaste, sniff your Aunt Jemima pancake syrup, stick your tongue in some ice-cream – can you find the wood? It's there. These products and more are improved by adding cellulose that comes from wood. You can find it on many product labels under names like xylitol and xanthan gum. These high viscosity (thick), non-toxic, compounds make your toothpaste bubblier, your syrup thicker, and your ice-cream creamier! Thicker milkshakes, soothing eye drops, longer lasting chewing gum and even paints and washing detergents benefit from the addition of a bit of wood.



# Cellulose

# A modern day Rumpelstiltskin!



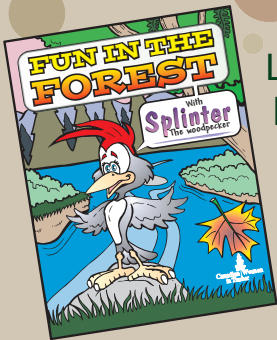


Rumpelstiltskin, the grumpy fairytale character who saved the miller's daughter by spinning straw into gold would be surprised to see how scientists today can convert wood into a material that looks and feels like plastic. This eco-friendly material is called **bioplastic** or **liquid-wood**. Scientists can extract lignin (tree glue) and *spin* it with natural resins into plastic! This liquid-wood is injected into molds to make cutlery, pens, bicycle helmets and ping-pong balls. Made from renewable materials and biodegradable, these products take pressure off our landfills.

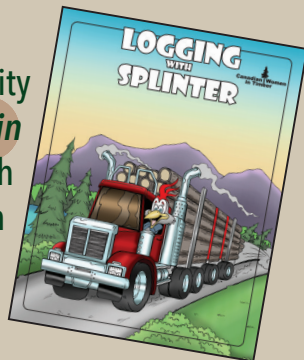
## Bioplastic & Liquid-wood

# Meet our friend Splinter!

Want more facts? Our friend Splinter the Pileated Woodpecker knows a lot about forests and is excited to take you on a knowledge quest. Visit our website to get your copy of **Forestry Facts**.



Looking for more forestry fun for kids? Try our activity books. Join Splinter to learn more about "*Fun in the Forest*" and "*Logging with Splinter*". Both books are loaded with different activities. You can see them on our website.



[www.CanadianWomenInTimber.com](http://www.CanadianWomenInTimber.com)

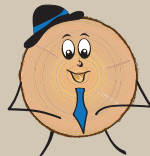


# Forest Awareness through Education

We are dedicated to informing the public about BC's forests and forest industry by promoting Forest Awareness Through Education.

The Canadian Women in Timber would like to thank our print sponsors:  
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*We'd like to thank Sandy McKellar for writing and illustrating the Wood Facts book and Dr. Simon Ellis for his support.*

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