**S90 Topic 6: Waste: There’s no “Away” in Throwing**

**With the huge population growth of humans there is a tremendous growth in waste. People want wastes NIMBY (not in my backyard!). So where does it go?**

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| **It disperses around the world with wind and ocean currents** |

**Airborne pollutants include:**

• carbon, nitrogen and sulfur oxides;

• soot from combustion of fossil fuels;

• dust from wind erosion from agricultural practices;

• heavy metals such as lead, nickel, copper from industrial processes.

These pollutants are eventually washed out of the atmosphere by rain and snow and then can fall in the ocean and travel around the world with ocean currents.

 **Check out this site to see global wind and ocean currents**

[**https://www.pbslearningmedia.org/resource/buac17-912-sci-ess-globalwinds/global-winds/ - .WegMUopryRs**](https://www.pbslearningmedia.org/resource/buac17-912-sci-ess-globalwinds/global-winds/#.WegMUopryRs)

[**https://www.pbslearningmedia.org/resource/nves.sci.earth.oceancirc/global-ocean-circulation/ - .WegNGopryRs**](https://www.pbslearningmedia.org/resource/nves.sci.earth.oceancirc/global-ocean-circulation/#.WegNGopryRs)

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| **CFCs (chlorofluorocarbons) and the ozone holes over the arctic and Antarctic** |

**Chlorofluorocarbons (CFCs) are cheap, non-toxic and stable** and were used

 • to make Styrofoam

 • as propellants in aerosol cans

 • coolants in air conditioners and refrigerators

But CFCs thinned the ozone in our stratosphere and caused an ozone hole the size of the US in the stratosphere over Antarctica. Although 81 countries have stopped producing and using CFCs, like DDT they do not breakdown for many years so they are a problem.

 **Check out this site to learn about CFCs and ozone**

[**http://www.pbslearningmedia.org/asset/ess05\_vid\_ozonehole/**](http://www.pbslearningmedia.org/asset/ess05_vid_ozonehole/)

 **Why is ozone in our stratosphere so important?**

 **How do CFCs break down our protective ozone?**

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| **Pollutants enter and disperse in our surface (above ground) water (lakes, rivers. oceans) and our ground water** |

**1. Pollutants can be dumped directly into our surface water (point source) or be washed into our rivers and lakes from the soil and atmosphere (non point source).**

**Wastewater (sewage):** Wastes from bathrooms, kitchens, washing machines, watering lawns end up in our sewage or storm sewers. This water must be cleaned up before entering our lakes, rivers, and oceans –

**• phosphates and nitrates** from household detergents and other cleansers must be removed

**• organic material and bacteria and viruses** must be removed from sewage

**How is this wastewater treated?**

 **Check out these sites about water treatment**

[**http://www.pbslearningmedia.org/asset/ess05\_vid\_h2otreatment/**](http://www.pbslearningmedia.org/asset/ess05_vid_h2otreatment/)

[**http://www.pbslearningmedia.org/asset/envh10\_vid\_chemwater/**](http://www.pbslearningmedia.org/asset/envh10_vid_chemwater/)

 **Check out this site about sewage treatment**

<http://www.youtube.com/watch?NR=1&feature=endscreen&v=GV-DoisLwm0>

**2. Pollutants can enter our ground water. Ground water is water that filters down through soil and fills the spaces between particles of rock and soil, and through cracks in the underlying rocks.**

When this water reaches an **impermeable layer** of rock it forms an **aquifer**. Wells tap into this water.

**26% of Canadians rely on ground water rather than city/town treated water. What about pollutants in this water?** Pollutants in aquifers are tough to clean up so we have to prevent pollutants from getting there in the first place.

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| **Green Products** |

**Using “green” products decreases ground and surface water contamination.**

**• Biodegradable substances:** organic substances (natural or synthetic) that can be broken down by bacteria and fungi into CO2 and H20.

• Biodegradable substances need **water, oxygen, soil microorganisms, and heat** to decompose properly. Often, these conditions are not present in landfills, so biodegradable substances put there do not degrade.

**Fill in this table using pg. 242 in your book**

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| **MATERIAL** | **TIME TO BIODEGRADE** |
| **PAPER** |  |
| **ORANGE PEELS** |  |
| **CIGARETTE BUTTS** |  |
| **MILK CARTONS** |  |
| **PLASTIC SHOPPING BAGS** |  |
| **NYLON** |  |
| **ALUMINUM CANS** |  |
| **PLASTIC 6-PACK HOLDERS** |  |
| **DISPOSABLE DIAPERS** |  |

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| **Hazardous Wastes** |

**Hazardous wastes are any discarded material that contains substances that are know to be poisonous, toxic, corrosive, flammable or explosive. Some of these wastes are too toxic to be put in landfills so they are burned in incinerators.**

 **Complete this table (see pg. 244)**

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| **KITCHEN** | **BATHROOM** | **GARAGE/STOREROOM** |
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Many hazardous wastes are **solvents.**

 **What is a solvent? Give 5 examples of hazardous solvents found in your home (see pg. 244)**

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| **Solid wastes: Landfills** |

**Solid waste** is garbage from households, industry, construction and demolition sites. The material is dumped undergoround in landfills. Now plastic liners and clay are used to in landfills to prevent chemicals from this waste from leaching into the soil and ground water below.

 **Check out these websites** [**http://www.youtube.com/watch?v=pC1u6rJkyzA&feature=related**](http://www.youtube.com/watch?v=pC1u6rJkyzA&feature=related)

[**http://www.youtube.com/watch?v=co3gbbpvvxw&feature=related**](http://www.youtube.com/watch?v=co3gbbpvvxw&feature=related)

**and read p. 249 and 250 to learn about landfills.**

 **What is a secure landfill used for? Why do we need these?**

 **If we put biodegradable substances in landfills will they degrade? What do you think?**

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| **What Can We do To Help?** |

 **Describe the 4Rs in your own words (read pg. 247):**

 **Watch this video and read pg. 252 to learn about BIOREMEDIATON**

[**http://www.youtube.com/watch?v=w99mGLfb4\_g**](http://www.youtube.com/watch?v=w99mGLfb4_g)

 **Give an example of bioremediation by a plant:**

 **Give an example of bioremediation by a bacteria:**

**ASSIGNMENT:**

 **QUESTIONS 1 – 5 pg. . 252**

 **Do online quiz Topic 6**

 **Complete your vocab for Topic 6.**

Why is this chapter’s title: **There’s no “Away” in Throwing? What does this mean to you now that you know the information in this chapter?**

 **Go to Quest a Plus and take the Environmental Chemistry Test**