Section 3.2 Changing the Concentration of Harmful Chemicals

The best way to keep the environment safe is to prevent potentially harmful substances from entering it…

…this however, isn’t going to work because we humans engage in activities that introduce harmful chemicals to the environment.

***BACKGROUND***: Concentration refers to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

There are 5 ways to change the concentration of chemicals in the environment:

**1) Dispersion** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*For example:*

**2) Dilution** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*For example:*



Dispersion ad dilution may not always leave an environment clean enough to meet government standards. There are 3 other methods to remove or eliminate harmful chemicals from the environment:

1. Biodegradation
2. Phytoremediation
3. Photolysis

**3) Biodegradation**

“degrade” means \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

“bio” means \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_-\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that live in or on the soil and water can be important in the biodegradation of pollutants.

Name the following micro-organisms that are involved in biodegradation:



\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Bacteria

Some bacteria grow and reproduce only when oxygen is present. They use oxygen for the process of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ biodegradation.

Some bacteria thrive where there is little or no oxygen. This environment is known as an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ environment.

*Provide an example of anaerobic bacteria involved in biodegradation:*

Factors that affect Biodegradation

* Temperature: The colder it is, the \_\_\_\_\_\_\_\_\_\_ biodegradation occurs.

Bioreactor technology is developing based on knowledge of the effects of the above factors. Explain how bioreactor technology is used in landfills to promote biodegradation:

4) **Phytoremediation**

“remediation” means \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

“phyto” means \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Phytoremediation is a technique that reduces the concentration of harmful chemicals in \_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

How do plants work to “cure” the soil around them?



**5) Photolysis**

“lysis” means \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

“photo” means \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

The formation of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_ is an example of photolysis.



Nitrogen dioxide in the presence of light breaks down to form \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ atom. This oxygen atom then combines with an oxygen molecule to form \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_..

Another example of photolysis is **photodegradable plastic.** Explain how this works in your own words.

Section 3.3 Hazardous Chemicals affect all Living Things

Chemicals can enter into the environment in a variety of ways, and are often difficult to remove, or even to reduce the concentrations of them.

**Biomagnification** is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_A good example of this is **mercury**. *Explain why mercury is a good example of biomagnification.*

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**Case Study: Oil Spills around the World**

Step 1: View the power point and answer the questions at the end with a classmate

Step 2: Watch the video “Exxon Valdez”

*Fill out the “While you Watch” form distributed by Miss. Campbell*

Step 3: Read page 250 – 252

Imagine you are a reporter for a global newspaper. Write a news story summarizing the Exxon Valdez oil spill or any other major oil spill you research. Consider the following in your report:

* what happened
* the results
* the clean-up
* the after-effects

The following websites will allow you to generate a newsclipping of your article should you choose:

<http://www.fodey.com/generators/newspaper/snippet.asp>

<http://www.homemade-gifts-made-easy.com/newspaper-generator.html>

Other methods to present the material must be approved by Miss. Campbell