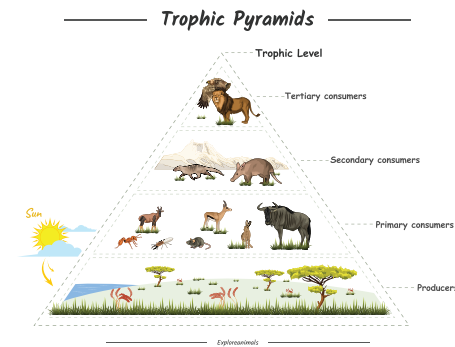
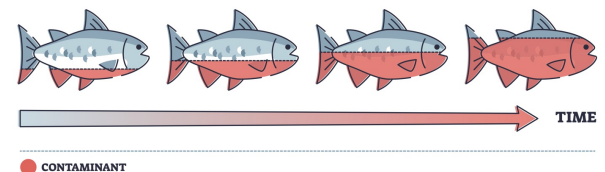


Bioaccumulation and Biomagnification – Middle School Lesson

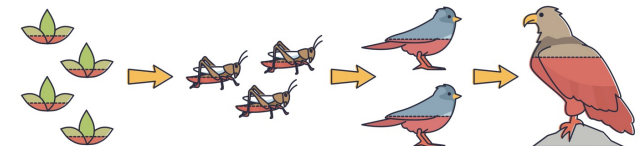
- DDT
- Bioaccumulation
- Biomagnification
- Impacts of Bioaccumulation and Biomagnification
- Case Study – Mercury in Fish and Minamata Disease
- Case Study – PCBs in the Hudson River



BIOACCUMULATION



BIOMAGNIFICATION



Preview File

Please enjoy this preview of your Student Version of the presentation. Please note within this sample file:

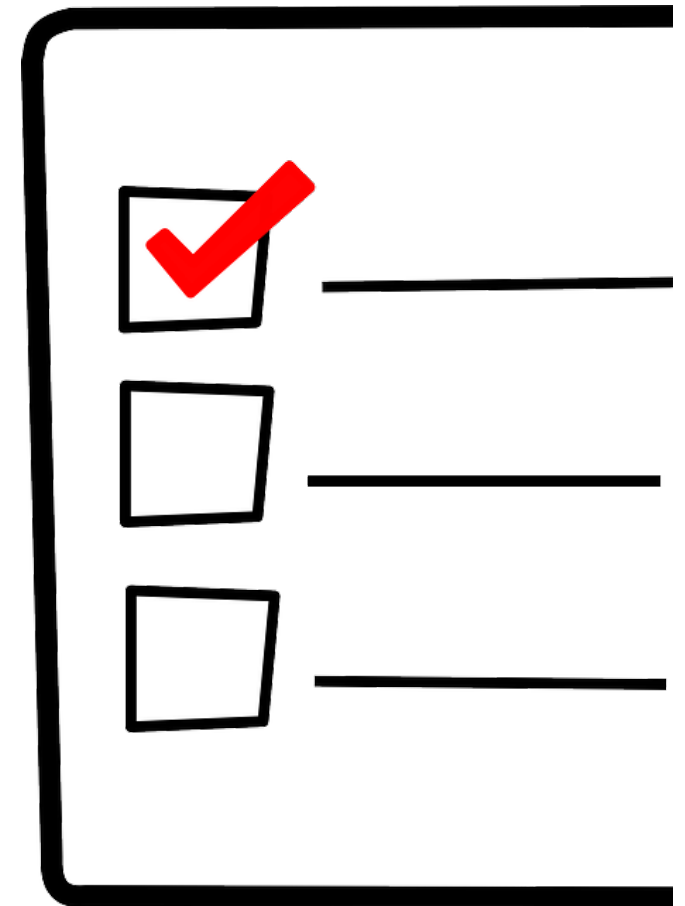
- Some slides appear blank because they have been removed
- Student versions have portions of the text removed which is given in the teacher version and appear as _____ which the students are to fill in
- Other slides may have on them, this represents writing that has been removed on this sample

**The paid full version of your resource includes
both Google Slides and PowerPoint and is
Google Classroom Ready**



Lesson Objectives

1. To understand the concepts of bioaccumulation and biomagnification.
2. To recognize the impacts of pollutants on ecosystems and human health.



☒	_____
☐	_____
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DDT

-

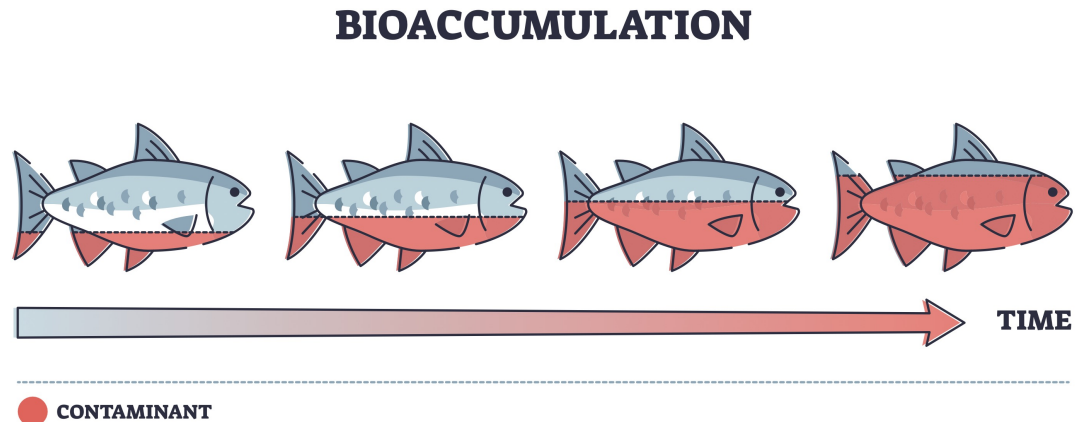
- Since it worked well and was inexpensive, many people used it



Bioaccumulation

- Bioaccumulation is when toxic substances (such as DDTs or mercury) build up in living organisms over time

- _____



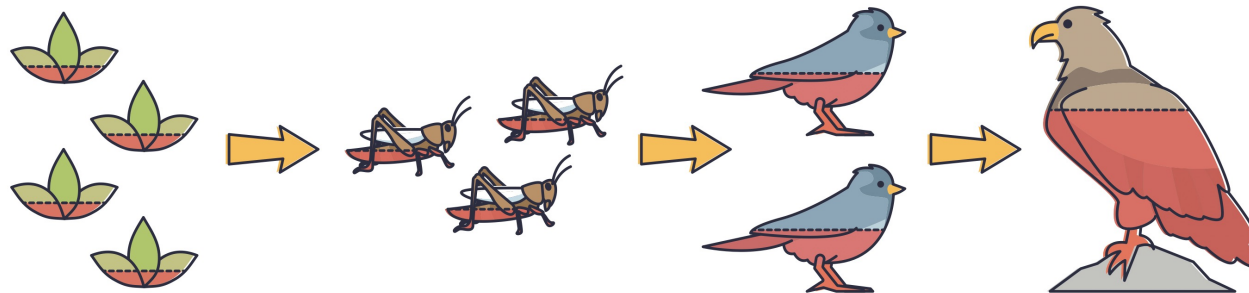
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Biomagnification

- _____
- Organisms higher on the food chain accumulate higher levels of the toxin compared to organisms at lower levels → higher percentage of their cells have the toxin in them

● CONTAMINANT

BIOMAGNIFICATION

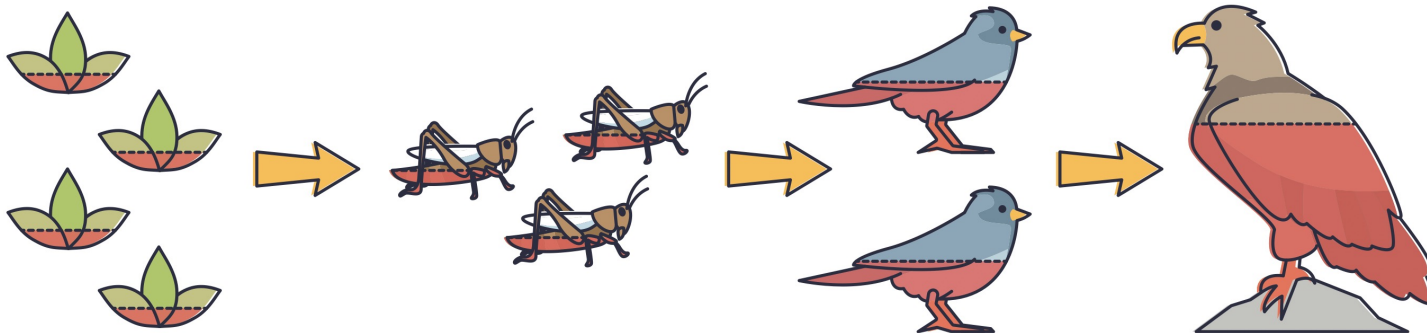


Biomagnification

- For example, birds, such as bald eagles, are at the top of the food chain
- When bald eagles eat fish with DDT, they bring in a high concentration of the pesticide
- _____

 CONTAMINANT

BIOMAGNIFICATION



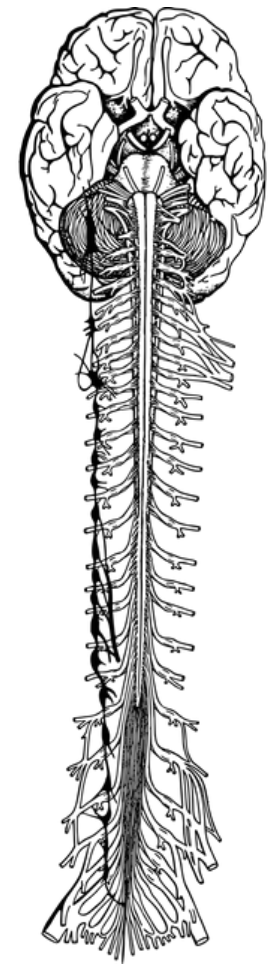
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Impacts of Bioaccumulation and Biomagnification on Human Health

Eating organisms that have experienced bioaccumulation and biomagnification can have significant health implications for humans.

1. Neurological and Developmental Effects: Many bioaccumulative pollutants can harm the nervous system which can lead to cognitive (thinking) impairments, learning disabilities, developmental delays, and behavioral problems.



Brain and Spinal
Cord

Impacts of Bioaccumulation and Biomagnification on Human Health

2. Hormonal Disruption:

Some toxins can disrupt the normal functioning of hormones in the body. This can lead to reproductive disorders, hormonal imbalances, altered sexual development, and decrease a person's overall reproductive health.

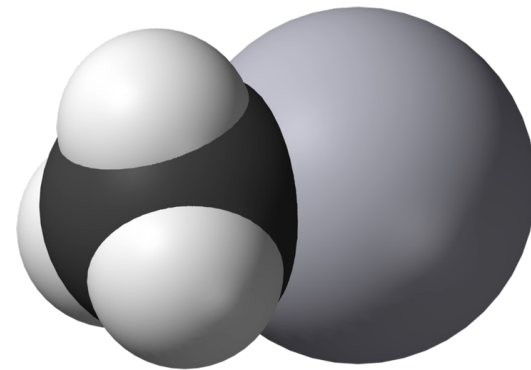


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Case Study: Mercury in Fish and Minamata Disease

- Minamata Disease is a neurological disorder caused by the bioaccumulation of methylmercury in the food chain, primarily affecting humans

- _____



Methylmercury

Case Study: Mercury in Fish and Minamata Disease

- _____
- As larger fish eat them, mercury accumulated inside them, leading to high levels of mercury in predatory fish like tuna and swordfish



Case Study: Mercury in Fish and Minamata Disease

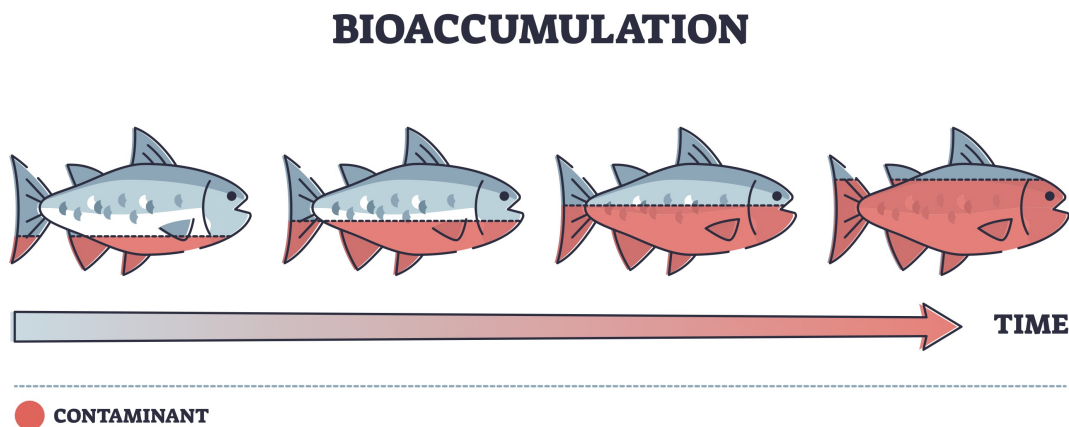
- Humans who ate contaminated fish from Minamata Bay experienced high levels of mercury accumulation in their bodies
- The methylmercury biomagnified as it moved up the food chain, resulting in severe neurological effects in individuals who ate the contaminated fish
- _____



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Case Study: PCBs in the Hudson River

- _____
- As predatory fish ate the smaller fish, the PCBs biomagnified, leading to elevated levels in their bodies
- This led to toxic effects on the nervous, reproductive, and immune systems



Striped bass

Bioaccumulation and Biomagnification Review

- Bioaccumulation refers to the buildup of toxins in the tissues of living organisms over time
- _____
- Bioaccumulation and biomagnification can have ecological impacts as food webs become disrupted
- Human health implications of eating contaminated organisms include neurological and developmental effects, hormonal disruption, and increased cancer risk

Think – Pair – Share

Take a moment to think about the potential risks and impacts of bioaccumulation and biomagnification in your local environment. Research the toxins that might be present in your area, the organisms that could be affected, and the potential consequences for ecosystems and human health.



Think – Pair - Share

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Think – Pair - Share

As a pair, share your findings and insights with another pair or two. Each pair can take turns presenting their findings. Encourage the group to engage in a collective discussion, highlighting common themes and differences among the various local examples.