



Pest is any organism that man believes is undesirable, has a negative impact on the human environment, or is in competition with human use of a resource, either natural, or cultivated. Some examples of pest are dandelion, mosquito, mice...etc

Pesticide refers to a substance used for destroying insects or other organisms harmful to cultivated plants or to animals. Early pesticides included the use of toxic inorganic metallic salts such as copper sulfate, lead salts, arsenic, or mercury which was used to kill pest

Problems caused by pesticides:

- killed other beneficial organisms,
- Most early pesticides **were non-biodegradable** (meaning that they were not broken down within the ecosystem). As a result, these early pesticides began to accumulate in the environment, contaminating water and soil resources, eventually poisoning humans.

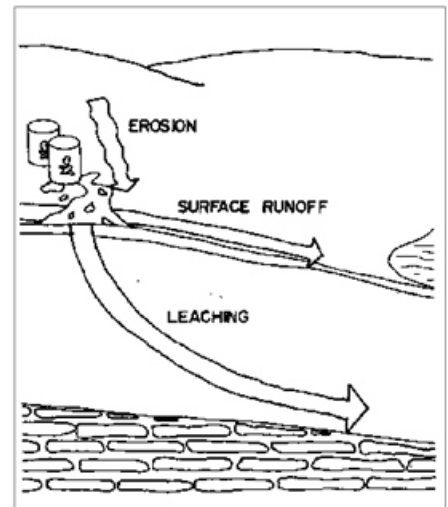


Figure 3. Pesticides can pollute water through either surface runoff or leaching.

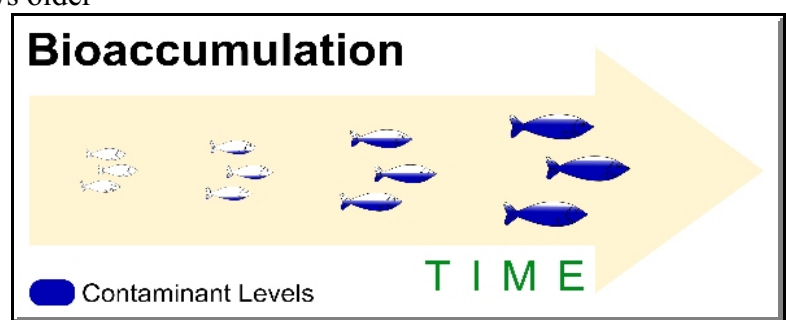
Classification of Pesticides:

Type of Pesticides	Target	Examples	Persistence
Insecticide	Insects	DDT	2-15 years
Herbicide	Weeds	Roundup	days to weeks
Fungicide	Moulds and other fungi	Captan	days
bactericide	Bacteria	Penicillin	days

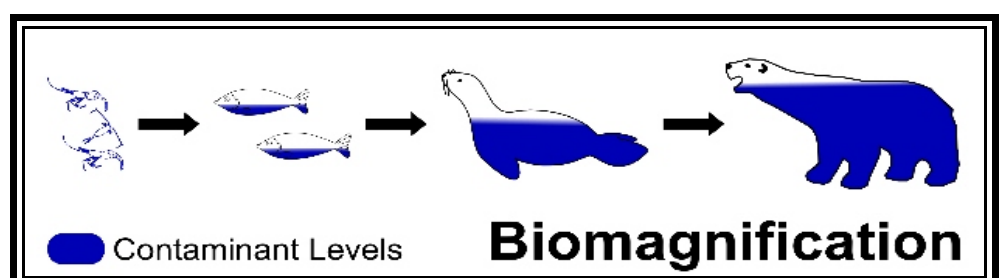
Bioaccumulation is the increase in contaminant concentrations in an animals' body over time, as the animal grows older

For example:

- PCBs are stored in fat.
- Cadmium is stored in kidneys.
- Mercury is stored in liver.



Biomagnification: refers to the increase in concentration of a contaminant at higher levels of the food chain. Which means that the higher up on the food chain you are the more contaminants you are likely to have stored in your body



Activity

Read 2.2 "Case Study: Pesticides" on pages 52 - 57. Answer questions 1 - 10 from "Understanding Concepts," "Making Connections," and "Reflecting" on page 58

PART A: MULTIPLE CHOICE

1. What is the most common problem associated with fat soluble pesticides?
 - (A) They tend to contaminate the ground water supply.
 - (B) They are highly specific to a single pest species.
 - (C) They are prone to biomagnification.
 - (D) They must be sprayed more often than water soluble pesticides
2. What is the main reason why a farmer would use water-soluble pesticides on their crops instead of fat soluble pesticides like DDT?
 - (A) Water soluble pesticides work more quickly.
 - (B) Water soluble pesticides last longer.
 - (C) Water soluble pesticides are easier and cheaper to use.
 - (D) Water soluble pesticides do not build up in the bodies of the top predators.
3. Which organisms would you expect to have the lowest concentration of DDT in its system?
 - (A) plankton
 - (B) sea birds
 - (C) fish
 - (D) small whale
4. The process of accumulating higher and higher doses through the food chain is called
 - (A) biofiltration.
 - (B) biomagnification.
 - (C) bioaccumulation.
 - (D) in-place pollutant
5. Which statement below best describes the ways that energy and pesticides are transferred between levels in food chains?
 - (A) Available energy increases and pesticide concentrations increase as you move up a food chain.
 - (B) Available energy decreases and pesticide concentrations decrease as you move up a food chain.
 - (C) Available energy increases and pesticide concentrations decrease as you move up a food chain.
 - (D) Available energy decreases and pesticide concentrations increase as you move up a food chain.
6. Pretend harmful forms of mercury are known to exist in the rivers, lakes, or oceans where you live. Assuming all the items below could serve as food for humans, which would probably be the food source with the lowest levels of mercury contamination?
 - (A) large carnivorous fish
 - (B) carnivorous crabs
 - (C) small carnivorous fish
 - (D) herbivorous crabs

7. DDT is a nondegradable pesticide that weakened the shells of bird eggs. Which of the following would be most affected by DDT?
- (A) turkeys and pheasants
 - (B) robins and blue jays
 - (C) eagles and osprey
 - (D) ducks and geese
8. Modern water-soluble pesticides have less effect on top predators because:
- (A) they act more quickly
 - (B) they last longer
 - (C) they accumulate only in the bodies of the pests for which they are intended
 - (D) they do not accumulate in the bodies of the top predator
9. Which statement regarding early pesticide use is false?
- (A) Early pesticides made use of heavy metals such as mercury.
 - (B) Early pesticides contaminated soil and water.
 - (C) Early pesticides were biodegradable.
 - (D) Early pesticides were toxic to humans.
10. What is the most common problem associated with fat soluble pesticides?
- (A) They tend to contaminate the ground water supply.
 - (B) They are highly specific to a single pest species.
 - (C) They are prone to biomagnification.
 - (D) They must be sprayed more often than water soluble pesticides.

PART B: WRITTEN RESPONSE

1. Explain how Integrated Pest Management represents a major paradigm shift in our attempts to control pest populations. (2 marks)

2. Describe what will happen with the release of DDT into the food chain below. In your description the name of the process should be included. (2 marks)

