Name _____

Water Quality

I. Water Quality Indicators

1. Define the term water quality.

Water Quality - chemical, physical, biological, + radiological characteristics of water (relative to human needs or purpose)

2. Identify what each indicator examines and the acceptable range for drinking water.

A. Biological Indicators

1. Coliform Bacteria : Bacteria found in fecal contaminants
   Acceptable Range : 0 per 100 mL

B. Chemical Indicators

1. Dissolved O_2 (DO) : Amount of oxygen found in water
   Acceptable Range : (5.0 mg/L = stressful) (1-2 mg/L = fish kill)
2. Nitrates : Amount of NO_3^- in water ("blue baby" syndrome) (methemoglobinemia)
   Acceptable Range : Less than 10.0 mg/L
3. Pesticides : Chemicals to control pests (plants, insects, etc.)
   Acceptable Range : Less than 0.04 mg/L
4. pH : Amount of H^+ ions (pH=7=neutral >7 = base <7 = acid)
   Acceptable Range : 6.5 - 8.5

C. Physical Indicators

1. Color : Clear = few samples / Blue = pure water
   Acceptable Range : Not a good quality indicator (tannins = harmless)
2. Odor : Indicator of polluted, organic water
   Acceptable Range : Depends on odor
3. Temperature : Indicator of water quality + DO levels
   Acceptable Range : Lower = ↑ DO levels; Too high = fish kills
4. Turbidity : Cloudiness or haziness of water
   Acceptable Range : Measured in JTU (Jackson Turbidity units)

II. Forms Of Freshwater Pollution

1. What percentage of the Earth is covered with water?

71 % Saltwater 97 % (of the 71%) Freshwater 3 %

Name _____

2. Match each water pollution term with the correct definitions.

1.	E	Acid Precipitation	A. Increased temperature of a lake or stream
2.	B	Biomagnification	B. Build-up of pollutants at successive food chain levels
3.	F	Eutrophication	C. Draining away of water from the surface of land
4.	D	Groundwater Pollution	D. Pollutants released contaminate groundwater sources
5.	C	Runoff	E. Rain, sleet, or snow that contains high amounts of acid
6.	A	Thermal Pollution	F. Excessive richness of nutrients due to runoff

3. List three adverse effects of <u>each</u> type of freshwater pollution.

<u>A. Acid Precipitation</u>

1. Strip nutrients from foliage (dead leaves + needles)
2. Cause aluminum leaching from soils = acidification
3. Harmful to fish + wildlife

<u>B. Biomagnification</u>

1. Pollutants persist + consumed at unhealthy levels
2. ↑ Pollutant Build-Up = less functional organism
3. Organisms at top food levels at greatest risk

<u>C. Eutrophication</u>

1. Algal blooms - block water sunlight
2. Bacteria levels increase
3. Oxygen levels depleted → fish kills

<u>D. Groundwater Contamination</u>

1. Contamination of drinking water wells
2. Toxic water in lakes, rivers, swamps, ponds
3. Caused by storage tanks, septic systems, hazardous waste, landfills, chemical + road salts

<u>E. Runoff</u>

1. Erosion of sediments → microinvertebrates !!
2. Eutrophication
3. Threat to downstream ecosystems (agricultural chemicals)

<u>F. Thermal Pollution</u>

1. Amount of dissolved oxygen in water
2. Metabolism, growth + reproduction affected
3. Biodiversity loss; migratory disruptions