Non-point Source Pollution—It Begins at Home

Tips:

- Give each group a different case study to analyze and present.
- Consider pollutants, their sources, ecological impacts, and realistic solutions.
- Relate these to their own community or school's watershed where possible.

Case Study 1: "Greenside Subdivision"

Background:
Residents in Greenside Subdivision report scummy green water in their local stream, especially after heavy rain. Over the past year, fish and dragonflies have become rare, and fish kills have been reported.

Local Observations:

- Lawns are treated monthly with fertilizer.
- Many residents wash cars in driveways, allowing water to flow to storm drains.
- Ducks and geese are fed bread at the public pond.
- Few trees or shrubs remain at the stream edge (riparian zone).

Questions:

1. Identify three likely non-point source pollutants entering the stream.

2. How do household actions contribute to these problems?

3. Suggest three changes neighbors could make to reduce stream pollution.

4. Discuss why wildlife (fish, dragonflies) has decreased.

Case Study 2: “Edge of the Field—Runoff in Farm Country”

Background:
In the rural outskirts of a Texas town, a creek runs next to several large agricultural fields. After spring rains, the creek water turns cloudy with sediment and occasionally appears to have a faint green tint and an odor. Water quality tests show elevated nitrate, phosphate, and low dissolved oxygen, especially after rainfall events.

Local Observations:

- Fields are tilled up to the very edge of the creek.
- Livestock sometimes wade into the water for drinking.
- Typical crops include corn, grain sorghum, and cotton which require significant amounts of fertilizer, particularly nitrogen, to achieve optimal yields in Texas soils.
- Algae blooms are visible mid-summer.

Questions:

1. What are the likely sources of non-point source pollution in this case?

2. How does farm management affect the creek’s water quality?

3. What are two Best Management Practices (BMPs) that could help in this situation?

4. Predict how low dissolved oxygen might impact aquatic organisms in the creek.

Case Study 3: “Urban Jungle—Stormwater Issues in a Metro City”

Background:
In Metro City, a heavily populated Texas urban area, the city creek receives runoff from busy streets, parking lots, and business rooftops. After rain, litter, oil slicks, and a soapy residue are often seen in the creek. Local news reports have shown increased fish kills and poor water clarity.

Local Observations:

- The majority of land is concrete or asphalt (impervious surfaces).
- Most waterways have been channelized and hardened.
- Many business and industrial sites have large parking lots where worker’s cars are parked on weekdays.
- Catch basins often have large amounts of trash.

Questions:

1. List the types of non-point source pollution likely found here.

2. Why does urban development increase stormwater problems?

3. Suggest two community projects that could help reduce pollution in the creek.

4. How do impervious surfaces change the way water moves and what does this mean for the creek?

Case Study 4: “The Suburban Lake—Homeowners’ Choices Matter”

Background:
A suburban neighborhood surrounds a small lake that is used for fishing, small boats, and swimming. Over several months, the lake has experienced murky water, increased aquatic weeds, and periodic fish kills, particularly after summer rainstorms.

Local Observations:

- Most houses have lawns that extend to the lake’s edge.
- Some residents dispose of leaves and grass clippings in the water.
- Several lakeside homes have septic systems; some are older or uninspected.
- Most houses have pet dogs and/or cats.

Questions:

1. Identify at least three sources of non-point source pollution for this lake.

2. How can yard care practices affect the lake’s health?

3. What problems can old or poorly maintained septic systems cause?

4. What would you recommend to the homeowners association for improving the lake’s water quality?