6th Grade: There Is No Point to this Pollution

Students learn about water quality and the cumulative impacts of nonpoint source pollution.

Science

Str/std/bch	Performance Standard
II.II.I	6.1. Understand how organisms interact with their physical environments to meet their needs (i.e., food, water, air) and how the water cycle is essential to most living systems.
III.I.I.	6.1. Examine the role of scientific knowledge in decisions (e.g., space exploration, what to eat, preventive medicine and medical treatment). *What we should not put in our landfills or our water.*

Social Studies

Str/std/bch	Performance Standard
Geog.II.II-B	6.1 Explain how places change due to human activity.
Geog.II.II-F	6.1 Describe how human modifications to physical environments and use of resources in one place often lead to changes in other places.

Extension I – Present students with the following scenario.

The fish in Loop Lake are dying because of low oxygen levels. It is known that the low oxygen levels are caused by high levels of fertilizers/nutrients in the lake. The fertilizers cause algae to thrive, and when they die, the bacteria that decompose the algae use up all of the oxygen. Current levels of oxygen at Loop Lake are 3.1 mg/L, but fish need 5 mg/L or more to survive.

In order to fix the problem, they have to find out who is putting so much fertilizer into the lake. Water runs into Loop Lake from 6 creeks that run through the developments listed. Measurements are taken where each of the creeks runs into Loop Lake. The law states that no development may increase fertilizer/nutrient levels above 0.5 mg/L. Who is breaking the law?

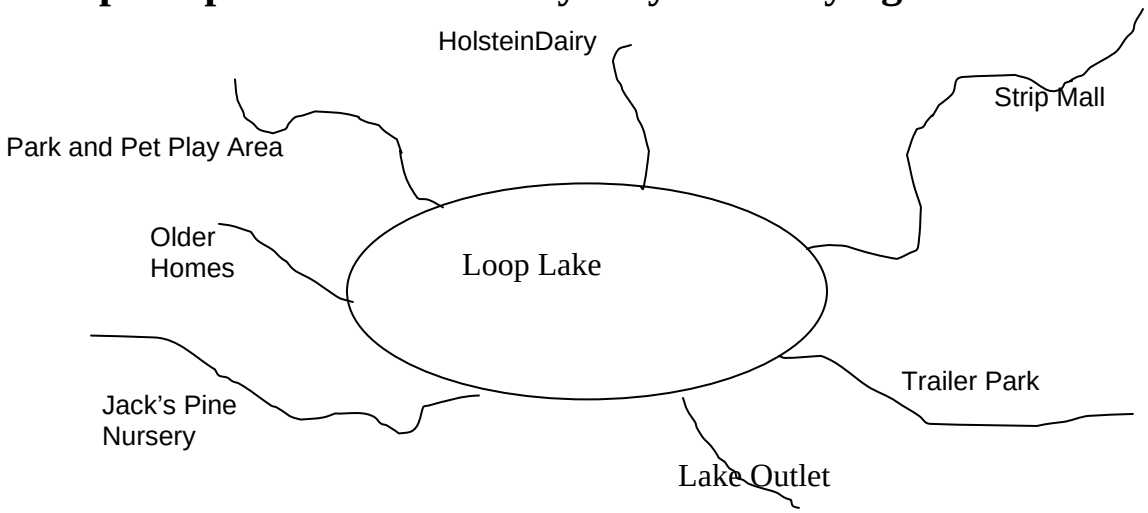
Given the information in the table below, ask students to think fill out the table. They will have to think about

- where the fertilizer/nutrients are coming from
- which creek is causing the problem (Note: They will find that nobody is putting in too much fertilizer, but the combined amount of fertilizer is too much.)

Ask students to finish filling out the sheet by explaining what is causing the problem, and how they might fix it.

Name _____

Help Loop Lake Solve the Mystery of the Dying Fish



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I. Fill in the following table:

Remember, it is against the law to add more than 0.5 mg/L of fertilizer/nutrients into the water.

Source	**Fertilizer/Nutrient Levels (mg/L)**	**Where are fertilizer/nutrients coming from?**
Jack's Pine Nursery	**0.3**	
Older Homes	**0.48**	
Park & Pet Play Area	**0.45**	
Holstein Dairy	**0.3**	
Strip Mall	**0.1**	
Trailer Park	**0.3**	

II. Who is putting in too much fertilizer? How could you fix this problem?

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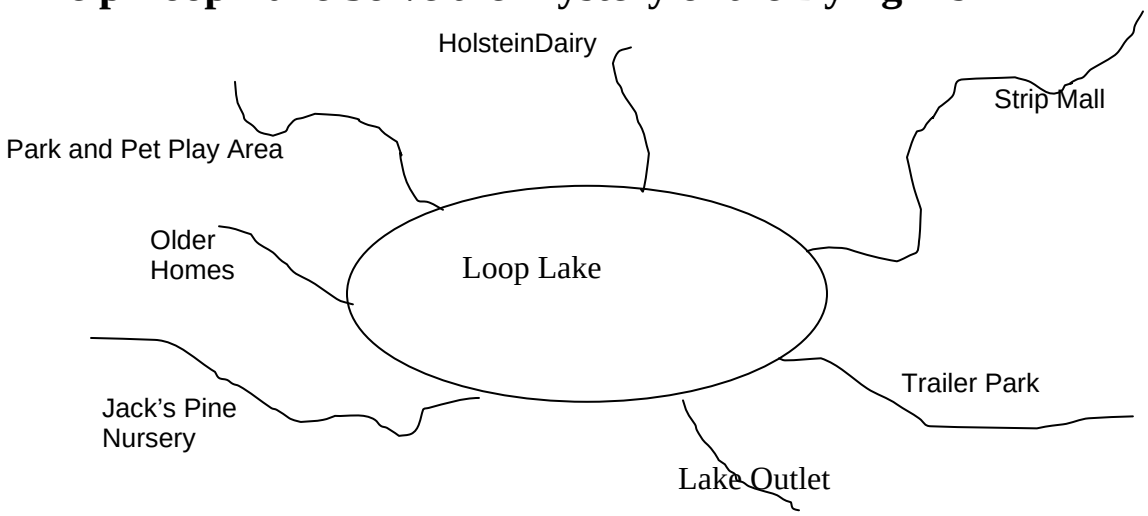
TEACHER ANSWER SHEET

Help Loop Lake Solve the Mystery of the Dying Fish



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I. Fill in the following table:

Remember, it is against the law to add more than 0.5 mg/L of fertilizer/nutrients into the water.

Source	Fertilizer/Nutrient Levels (mg/L)	Where are fertilizer/nutrients coming from?
Jack's Pine Nursery	**0.3**	**Fertilizer for trees**
Older Homes	**0.48**	**Fertilizer for landscaping**
Park & Pet Play Area	**0.45**	**Fertilizer for landscaping and pet feces**
Holstein Dairy	**0.3**	**Manure from cows**
Strip Mall	**0.1**	**Little bit of fertilizer**
Trailer Park	**0.3**	**Septic Tank leaks, fertilizer for landscaping**

II. Who is putting in too much fertilizer? How could you fix this problem?

No one person is responsible for the fertilizer. Everyone is putting fertilizer into the lake and when the water slows as it hits the lake, the fertilizer settles out and stays in the lake. There are many possible solutions, but they need to use less fertilizer or make sure that they don't fertilize when it the weather is rainy. Everyone needs to be vigilant about picking up pet feces.