1. Identify the chemicals found in antifreeze and the reasons they are part of the antifreeze product.

* Propylene glycol & Ethylene glycol are the most common types of antifreeze used. They both consist of hydrogen, oxygen, and carbon. The reasoning behind the composition of these elements is because they serve a purpose of lowering the freezing point and increase the boiling point of any water or water based substance in a car’s radiator and engine. The reason behind increasing the boiling point and lowering the freezing point is so any water or water based substance in a car’s engine is appropriately acclimated to the surrounding environment and not altering any of the engine functions, keeping the engine cool.

1. What are the formulas for these chemicals?

* Propylene glycol: C3H8O2
* Ethylene glycol: C2H6O2

1. State the chemical and physical properties of these substances.

* Propylene glycol & Ethylene glycol keep a car’s engine cool.

1. What are the benefits of antifreeze?

* Water running throughout the engine system doesn’t freeze up in cold temperatures, and in warmer temperatures the water doesn’t warm up and overheat the engine. Also helps with corrosion prevention, heat transfer, and scale buildup.

1. What are the risks to the environment with antifreeze?

* Ethylene glycol is a toxic substance whereas Propylene glycol is non-toxic, however after running through a car’s engine, the antifreeze is often contaminated with lead or fuel, to such an extent where it becomes hazardous waste. The improper disposal is harmful to all life, due to high toxicity affecting water sources and animals.
* Ethylene glycol tastes sweet yet is very toxic and poisonous. A common situation within the environment is a coolant leak in a car which drips on a road and a dog walking by licks it, becomes poisoned, and dies.

1. Are there opportunities to lessen its effects on the environment?

* The proper disposal of antifreeze that has been used is helpful to lessen effects, proper disposal primarily consists of recycling the antifreeze to the correct authority, where it is further processed and handled accordingly.

1. Are there any alternatives?

* A more environment friendly antifreeze is the use of Propylene glycol which is non-toxic, however depending on the wear and tear of an engine, it also is oftentimes contaminated with lead or fuel.