**Water Emergency: Nano to the Rescue!**

**Imagine that you’re lost in the forest and ran out of clean water.  
All you can find is dirty river water! What would you do?**

**Objective:** Purify the contaminated water!

**Materials:**

* Petri dishes
* Dropper bottles
* **Dirty water (blue dye)**
* **Titanium dioxide nanoparticles**
* **Ultraviolet light** (nail salon lamp – or the SUN works too!)

**Procedure:**

1. **Prepare three petri dishes:**
   1. 5 full droppers of water + 2 drops of dye 🡪 Place under the light
   2. 5 full droppers of nanoparticles + 2 drops of dye 🡪 Place under the light
   3. 5 full droppers of nanoparticles + 2 drops of dye 🡪 Keep out of light

**What color is each sample?**

1. **Turn on the UV lamp**. Wait 2 minutes. **Compare** the three dishes.

**What color is each sample now? Which one is clean (not blue)?**

**What happened?**

**Have you heard of “nano” before? “Nano”** means ***very small***. “**Nanoparticles”** are bigger than atoms but smaller than a cell – so small you can’t even see them! Even though nanoparticles are tiny, they can do amazing things!

The **titanium dioxide nanoparticles** in this experiment are activated by **ultraviolet light** and even **sunlight**. When the light hits the nanoparticle, it starts a **chain reaction:** an electron from the nanoparticle reacts with oxygen or water to form **reactive oxygen species**.The reactive oxygen species can **destroy contaminants** like the blue dye or germs in the water that could make you sick. This technology can be used to clean water and make it safe to drink!