# Geography & Science – "The Survivalist"

**Topic:** Separating Mixtures & Water Treatment **CAPS Grade:** Grade 6 (Water Pollution) & Grade 7 (Separating Mixtures) **Relevance:** Many rural communities rely on river water. This visualizes how municipal water treatment works physically (filtration). **Materials:**

- **The Vessel:** A 2L plastic bottle cut in half. Turn the top half upside down and place it into the bottom half (like a funnel).
- **Filter Layers:** Cotton wool (or a piece of clean cloth/t-shirt), fine sand, coarse sand, small stones/gravel.
- **The "Pollution":** A jug of water mixed with dirt, leaves, and bits of plastic.

## The "Frugal" Solution

A real water plant uses sedimentation and filtration tanks. We can build a vertical model of this using a Coke bottle.

## The Procedure

1. **Layering:** In the top half of the bottle (the funnel), pack the materials in this specific order (from bottom to top):
    - **Bottom:** Cotton wool/Cloth (to catch fine particles).
    - **Middle:** Fine Sand.
    - **Top:** Stones/Gravel.
2. **The Pour:** Slowly pour the muddy water onto the stones at the top.
3. **Observation:** Watch the water trickle down. The stones catch the big leaves; the sand catches the dirt; the cloth catches the mud.
4. **Result:** The water dripping into the bottom cup will be much clearer (though explain to students: *Clear does not mean sterile!* Bacteria are too small to be caught by rocks, so you would still need to boil it or add bleach).

## The Lesson Takeaway

Physical filtration separates insoluble solids from liquids. It connects directly to how wetlands naturally clean water.