

Home-made Science Take-Out Pollution Investigation Refill Kit

The stream samples A through D are just buffers of known pHs. To refill them you can buy ready-made buffer standards (usually sold for pH meter calibration), or try household products (basically they just need to be a clear solution of around the pH needed)

Buffer A: pH 4 Buffer (pure household vinegar works for most of the tests but since it's actually lower than pH 4 it will give a different color result for nitrate pH paper test, but if you want to use vinegar you can just see what your nitrate indicator paper colors would be and print out your own key)

Buffer B: pH 8 Buffer (1 g baking soda in 100 mL water)

Buffers C and D: pH 11 Buffer (household cleaners containing ammonia should be around pH 11, test before since they may not be very consistent. If you buy pure ammonia from the store, dilute it in water (1 mL in 100 mL of water) so the fumes don't bother the students- the pH will still be around 11.

Lead Indicator Solution: Saline solution with a drop of yellow food coloring (this reaction gives all negative results for all 4 stream samples)

E coli stain: Bromothymol Blue (0.04%)

Nitrate Indicator Paper: strips of pH paper (acid: yellow, neutral: green, basic: blue)- but you can replace with any pH indicator paper and just print out a new key on color paper with the results you want.

PCB Test Paper: I created a template of the test strips. You can print them out on card stock, drop one drop of phenolphthalein in each circle. Let dry. I have created these and stored for months and they were still good! Alternatively you can draw circles on card stock or even filter paper and drop the phenolphthalein onto them, but the template makes it look more professional.