

The Green Clean

Objective: To introduce students to some chemicals used for cleaning and potential alternatives.

Introduction: Often chemicals are used for cleaning / maintenance in the home without further thought given to the implications on human and environmental health. This lesson aims to introduce students to the chemistry behind 2 alternative drain de-clogging agents and have them consider the challenges and benefits of using alternative cleaners.

Curriculum Connections:

Unit A – 2, 3

Supplies / Materials:

- Ingredient List for Drano (see **resources**)
- Periodic Table of the elements

Hook: Have the ingredient list for Drano on the board. Have students discuss what they know about the product and any ingredients listed.

Intro Activity: Have students write out the chemical formulas for the compounds listed using their periodic tables. Define what a surfactant is and how it works.

Main Activity: Compare ingredients of a green alternative (baking soda and white vinegar) to Drano. Show the chemical formula on the board. Have students work



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Lesson Subject

Science 10

Topic

Environmental Chemistry

Location

Classroom

Length

50 – 60 mins



in small groups to determine which compounds are acidic and which are basic. Have them predict reactions and categorize them. Have them discuss some of the pros and cons of each product.

Independent Student Work: Have students work out an experiment to test the efficacy of each of the alternatives.

Conclusion / Review: What do the students predict about the efficacy of the products? When might it be beneficial to use one over the other? What are the environmental consequences of the choices?

Homework: Have students compare other cleaners and green alternatives chemically.

Resources:

1. Drano list: <http://www.whatsinsidescjohnson.com/us/en/brands/drano/drano-liquid-clog-remover>
2. Description of chemical reactions: <http://home.howstuffworks.com/home-improvement/plumbing/drain-cleaner2.htm>; <https://en.wikipedia.org/wiki/Drano>
3. Cleaning acids and bases: <https://van.physics.illinois.edu/qa/listing.php?id=491>
4. Vinegar and Baking soda chemistry:
<http://www.middleschoolchemistry.com/multimedia/chapter6/lesson2>

Extensions:

1. In the lab test the efficacy of Drano vs the green alternative against dissolving a clot of organic matter in a piece of PVC pipe. Have them assess water solubility of the compounds and discuss how this can influence the body of water where these compounds may end up.