

How have petroleum products influenced American culture?

Oil Fields—How have petroleum products influenced American culture?

1. *Make a list of products that you think come from petroleum.*
2. *Look at the timeline below. All of the products below are derived from petroleum.*

Petroleum – More Than Oil

1850

1853

Abraham Gesner produces a liquid fuel from petroleum. This new fuel, he calls **kerosene** is cheap to produce, burns brighter and produces less soot. it replaces whale oil in household lamps and is used today for heating and cooking.

1870

1870

New York chemist Robert Chesebrough perfects the purification of rod wax, a waste product from oil rigs. He calls this product ‘petroleum jelly’. He sells it as **Vaseline**, a water-repellant salve for burns, scrapes and chapped lips.

1900

1903

Edwin Binney and C. Harold Smith used discarded oil field paraffin wax and mix it with color pigments to create a line of paper-wrapped, brightly colored markers that they call **‘Crayola crayons’**.

1915

1915

Mabel Williams sings her eyebrows in a kitchen cooking accident. She mixes coal dust with Vaseline and creates instant mascara. Her brother Tom develops a better formula and sells his product as **Maybelline** after his sister.

1933

1933

A laboratory accident leads scientists to a new petroleum-based acrylic plastic that is transparent, lightweight, and shatter-resistant. Named **‘plexiglass’**, it replaces traditional glass in submarine periscopes and airplane windows.

1950

1961

Otto Wichterle, a Czechoslovakian chemist, invents a new type of plastic that absorbs water and becomes soft and pliable. Called **‘hydrogel’**, he finds a use for it by making **soft contact lenses**. Today, hydrogels are used in many biomedical applications like tissue engineering and drug delivery systems.

1980s

1980s

Polycarbonate plastic use becomes a leading raw material in many industries because of its high impact resistance and transparency. Products that use this type of plastic includes lenses in eyewear, medical devices, automotive components, packaging, protective sports gear, and in media components like CDs and DVDs.

2000

2023

What do you think could be the next big use for a petroleum product?

3. *Which of the petroleum-based products above do you think influenced American culture the most? Why?*

4. What do you think could be the next big use for a petroleum product?

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Image Information: The poster image shows a pumpjack, a reciprocating piston pump in an oil field. This type of oil rig uses an engine to rotate a counterweight that moves the pivoting beam up and down. This motion operates a simple valve mechanism and allows for the removal of oil (or in some cases water) from the well. The repetitive motion of the pump has given rise to other names for the pumpjack such as nodding donkey, thirsty bird, or rocking horse pump.

Question: *How have petroleum products influenced American culture?*

Possible student answers:
Students may only think of oil and/or fuel (such as gasoline, diesel, or home heating oil) as petroleum products. Therefore, they may only focus on petroleum’s influence on transportation, comfort or on its environmental impact. Students may not be aware that over 6,000 everyday products and devices are made from petroleum products. Have students share their ideas and then look at the timeline for some additional information.

Interesting Info: Petroleum is a general term for crude oil or fossil fuel. It is a naturally occurring yellowish-black mixture of hydrocarbons (substances made of carbon and hydrogen molecules). Petroleum by-products have permeated many different layers of the American household. Petroleum and petroleum-based chemicals are important in the manufacturing of plastics, furniture, fertilizers, lubricants, cosmetics, paints, clothing, and many other synthetic materials. Thus, petroleum is an important part of many human activities.

Support the Phenomena:

NGSS Science and Engineering Practice #8 – Obtaining, Evaluating and Communicating Information: In K-2, students **use their observations and prior experiences to communicate new information**. In 3-5, students **obtain and combine information to explain solutions to design problems**; In 6-8, students **integrate quantitative scientific/technical information to clarify claims or findings**; In 9-12, students **compare, integrate, and evaluate sources of information to address a scientific question**.

Materials: 4 different types of water bottles: 1) single-use disposable plastic; 2) reusable, acrylic plastic; 3) metal, reusable; 4) glass bottle

- In K-2, have students compare the different bottles and discuss the PROS and CONS of using each type of water bottle. Focus on active listening and respectful discussions. Chart their ideas and have them make a graph comparing which type of bottle they think is best to use.
- In 3-5, have students compare the different bottles and discuss ideas about what problem each type of bottle was designed to solve. Have them research and compare how each type of water bottle impacts society.
- In 6-8, students should research the different types of water bottles and discuss the benefits (PROS) and consequences (CONS) of using each type. Their research should include quantitative information (i.e. the relative costs of manufacturing; annual disposal costs; or quantity discarded each year) to support an argument as to which type of bottle is best to use.
- In 9-12, students should discuss their perceived benefits (PROS) and consequences (CONS) of using each type of water bottle. They should select one type of water bottle and conduct research across multiple media types to support an argument as to why this type of water bottle is best to use.

More information: To learn more about petroleum, visit the **American Oil and Gas Historical Society...** or visit **sciencehistory.org** to learn more about the history of plastics.