

Objective: Students will learn where the fuels their homes need for energy come from. Students will be educated on what fossil fuels are and how they are used to create energy.

Knowledge Testing: Each student will be provided worksheets to test their knowledge of manufactured energy. For further testing, visit our Kahoot! account for fun, interactive quizzes.

Kahoot!



Materials

Manufacturing, Summary

Manufacturing, Petroleum

Manufacturing, Word Choice

Manufacturing, Supply Chain

Free materials are provided on our website at www.growingagriculturetogether.com

Checklist

- Watch "What is Energy? Manufacturing"
- Manufacturing, Power Point
- Manufacturing, Summary
- Manufacturing, Petroleum
- Manufacturing, Word Choice
- Manufacturing, Supply Chain

For more information visit www.growingagriculturetogether.com or check us out on...

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MANUFACTURING

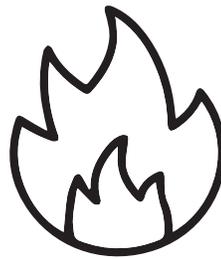
The fuels we need for energy are not just found in nature. They must be created or manufactured. And it all starts with a natural resource called fossil fuel. Fossil fuels are formed from buried remains of plants and animals that lived long ago.

Three examples of fossil fuels are coal, natural gas, and crude oil.



COAL

A combustible black or brownish-black sedimentary rock



NATURAL GAS

A fossil energy source that formed deep beneath the earth's surface



CRUDE OIL

A mixture of hydrocarbons that formed from plants and animals.

CRUDE OIL

When crude oil is extracted, it is transported through a pipeline to a refinery, or an industrial factory, where it is then stored in large tanks until it is ready to be processed. Once processed, it is shipped to terminals by rail, trucks, or pipeline. Then it can be purchased by retail stations and resold to end-users.

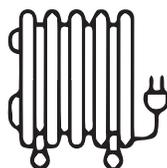


PETROLEUM

Petroleum products are fuels made from crude oil and other hydrocarbons contained in natural gas. Petroleum products can also be made from coal, natural gas, and biomass. Some petroleum products include transportation fuels, fuel oils for heating and electricity generation, asphalt and road oil, and feedstocks for making the chemicals, plastics, and synthetic materials.



FUEL



FUEL OIL



ASPHALT



FEEDSTOCKS



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MANUFACTURING

Petroleum products include transportation fuels, fuel oils for heating and electricity generation, asphalt and road oil, and feedstocks for making the chemicals, plastics and synthetic materials that are in nearly everything we use. Of the approximately 7.21 billion barrels of total U.S. petroleum consumption in 2016, 47% was motor gasoline (includes ethanol), 20% was distillate fuel (heating oil and diesel fuel), and 8% was jet fuel.

DOES THIS PRODUCT CONTAIN PETROLEUM?

(Petroleum is either oil or natural gas.) Write **YES** or **NO** below each item.

Bicycle Tires _____	Soap _____	Soft Contact Lenses _____	Gasoline _____
Surf Boards _____	Motor Oil _____	Diesel Fuels _____	Golf Bags _____
Rubbing Alcohol _____	Crayons _____	Electric Blankets _____	Ink _____
Artificial Turf _____	Heart Valves _____	Nail Polish _____	Detergents _____
Aspirin _____	Roller Skates _____	Yarn _____	Perfumes _____

DID YOU KNOW? One 42-gallon barrel of oil creates 19.4 gallons of gasoline. The rest (over half) is used to make more than 6,000 raw materials used to create millions of products we rely on every day!



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Rubbing Alcohol <u> YES </u>	Crayons <u> YES </u>	Electric Blankets <u> YES </u>	Ink <u> YES </u>
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WHAT IS CRUDE OIL?

In the United States alone, over 12 million barrels of crude are produced each day. But what is crude oil? And what are petroleum products? Fill in the blanks below using the word choices at the bottom to complete the explanation about crude oil and petroleum products. Each choice may be used once.

Crude oil is a mixture of _____ that formed from _____ and _____ that lived long ago. Crude oil is a fossil _____. When crude oil is extracted, it is transported through a pipeline to a _____, or an industrial factory. Once processed, it is shipped to terminals by rail, trucks, or _____.

Petroleum products are _____ made from _____ and other hydrocarbons contained in _____. Petroleum products can also be made from _____, _____, and _____.

WORD CHOICE

natural gas

coal

refinery

pipeline

hydrocarbons

biomass

fuel

natural gas

animals

fuels

plants

crude oil



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Crude oil is a mixture of **hydrocarbons** that formed from **plants** and **animals** that lived long ago. Crude oil is a fossil **fuel**. When crude oil is extracted, it is transported through a pipeline to a **refinery**, or an industrial factory. Once processed, it is shipped to terminals by rail, trucks, or **pipeline**.

Petroleum products are **fuels** made from **crude oil** and other hydrocarbons contained in **natural gas**. Petroleum products can also be made from **coal**, **natural gas**, and **biomass**.

WORD CHOICE

natural gas	coal	refinery	pipeline
hydrocarbons	biomass	fuel	natural gas
animals	fuels	plants	crude oil



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MANUFACTURING

When crude oil is extracted, it is transported to a refinery, or an industrial factory, to be processed. Once processing is complete, the gasoline and other products are shipped to various terminals across the United States by rail, trucks, and underground pipelines. Once the fuel is received at the terminals, it can be purchased by truck stops, gas stations, and fuel suppliers such as a co-op to then be resold to end-users or customers. Trace the lines showing the supply chain.

