



Grade 8 Science

Unit 3: Fluids



Oil

What is oil?

Surprisingly, explaining what oil is is not as straight forward as one may think. Many different liquids are referred to as oil. The commonality amongst these fluids seems to be that all oils are viscous, yet slippery, liquids at room temperature, that are insoluble in water, but highly attracted to other oils. Oils have a high carbon and hydrogen content, and most are flammable. Oils also contain a lot of stored energy.

Where do we get oil?

Much of what we think about when we think "oil" comes from petroleum, the left-over remains of organisms that died millions of years ago. However, oils can be produced from any form of life, most commonly is vegetable oil, an oil extracted from the seeds of many plants.

Oil

Why is oil important?

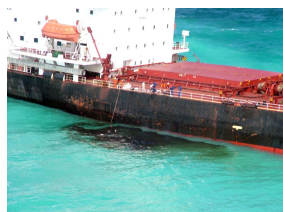
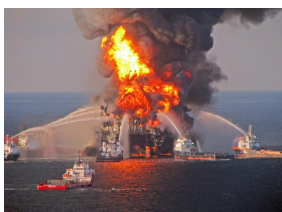
- Crude oil is the fluid from which we get gasoline for cars/planes/ etc
- It powers factories/machinery
- Oil produces heat
- It can be used as a lubricant
- We use oil in cooking
- Oil is a key component in makeup
- Oil is used to make plastic
- It is a key component of detergents
- Many food products contain oil products



Oil

What are some down sides to the use and extraction of oil?

- The burning of oils creates pollution and greenhouse gases
- Oil is hazardous to wildlife, it sticks to their bodies, and can be deadly if consumed
- To obtain petroleum we have to dig up the earth, destroying habitats
- It requires a lot of equipment to obtain the oil, creating even more pollution
- We are not always in full control, things can go wrong and the oil can spill into the environment.



Deepwater Horizon Oil Spill

On April 20th 2010 there was a mechanical failure of a shut off valve on the Deepwater Horizon oil rig. The failure of this shut off valve led to, possibly, the worst man made environmental catastrophe of all time.

The following article explains what happened:

Deepwater Horizon oil spill of 2010

Oil spill, Gulf of Mexico

Written by: Richard Paltardy

Deepwater Horizon oil spill of 2010, also called **Gulf of Mexico oil spill of 2010**, largest marine oil spill in history, caused by an April 20, 2010, explosion on the Deepwater Horizon oil rig—located in the Gulf of Mexico, approximately 41 miles (66 km) off the coast of Louisiana—and its subsequent sinking on April 22.



The explosion



The Deepwater Horizon rig, owned and operated by offshore-oil-drilling company Transocean and leased by oil company BP, was situated in the Macondo oil prospect in the Mississippi Canyon, a valley in the continental shelf. The oil well over which it was positioned was located on the seabed 4,993 feet (1,522 metres) below the surface and extended approximately 18,000 feet (5,486 metres) into the rock. On the night of April 20 a surge of natural gas blasted through a concrete core recently installed by contractor Halliburton in order to seal the well for later use. It later emerged through documents released by Wikileaks that a similar incident had occurred on a BP-owned rig in the Caspian Sea in September 2008. Both cores were likely too weak to withstand the pressure because they were composed of a concrete mixture that used nitrogen gas to accelerate curing.

Once released by the fracture of the core, the natural gas traveled up the Deepwater rig's riser to the platform, where it ignited, killing 11 workers and injuring 17. The rig capsized and sank on the morning of April 22, rupturing the riser, through which drilling mud had been injected in order to counteract the upward pressure of oil and natural gas. Without any opposing force, oil began to discharge into the gulf. The volume of oil escaping the damaged well—originally estimated by BP to be about 1,000 barrels per day—was thought by U.S. government officials to have peaked at more than 60,000 barrels per day.

*Read to end of 4th paragraph in "Leaking Oil" section

Deepwater Horizon Oil Spill

Following the worst marine oil spill in history, was the attempt to contain and clean the damaging oil. The following video discuss some of the methods used in this attempt:



Youtube Link

Deepwater Horizon Oil Spill

Although there were thousands of people helping to contain and clean this disaster, their efforts were not able to stop the oil spill from having disastrous consequences to the environment. The following video shows just how bad some areas were hit:



[Youtube Link](#)

Deepwater Horizon Oil Spill

It has been over 6 years since the explosion on the Deepwater Horizon oil rig. However, the effects of the oil spill are not gone.

In a group of ~4 I would like you to get a computer and do some quick research into the overall and lingering effects of the oil spill in the Gulf of Mexico. Look up things, such as:

- How much oil was spilled
- How much oil was recovered
- What was the cost of clean up
- What were the areas affected
- Who were the people involved
- How is the environment still affected
- How are the animals still affected
- How are the locals still affected



At this point, please number your selves 1 through 4. You will sit with a new group to discuss what you have discovered.

Fluids End of Unit Test

You may use any remaining time to work on your end of unit review. Please recall that we will be taking up the answers next class.



Name _____ Date _____

FLUIDS END OF UNIT REVIEW

Complete each of the following tasks. Check the boxes for completion.

Review all of the definitions provided for fluids in chapter 14.

Complete the preparation of a liquid from a solid.

Review your Fluids End of Unit Review and the answer key provided online.

Answer each of the questions in 15 minutes or less. Do not use a calculator. Do not use a ruler. Do not use a protractor. Do not use a compass. Do not use a straightedge. Do not use a pencil.

1. What are the three states of matter? The relative densities in different states of matter are: a solid is _____, a liquid is _____, and a gas is _____.
2. What are the three states of matter? The relative densities of matter in different states are: a solid is _____, a liquid is _____, and a gas is _____.
3. Explain in your own words how matter changes from one state to another. Use the terms "solid", "liquid", "gas", "melt", "freeze", "boil", "condense", "evaporate", "sublimate", and "de sublimate".
4. Name an industry in which viscosity is important. The relative viscosity of water (from least viscous) and engine oil is _____.
5. How does temperature affect the viscosity of a gas? Of a liquid?
6. Explain in your own words how density in the gas state changes when the fluid, air, is heated by a fan and when it is cooled.
7. Explain the relationship between density and the states of matter.
8. What is pressure? What is the SI unit of pressure? Explain.
9. What is the SI unit of pressure? Explain how the relative density of a liquid can be determined from its pressure. Explain how the relative density of a liquid can be determined from its pressure. Explain how the relative density of a liquid can be determined from its pressure. Explain.
10. What is the SI unit of pressure? Explain how the relative density of a liquid can be determined from its pressure. Explain.
11. In a hydraulic system, the area and height of the fluid are the same in both cylinders. Explain how the pressure is the same in both cylinders.
12. In a hydraulic system, the area and height of the fluid are the same in both cylinders. Explain how the pressure is the same in both cylinders.
13. What is Pascal's Law? Explain how it relates to hydraulic systems.
14. Compare the compressibility of liquids and gases. Do you have any examples to provide?
15. How does the pressure in a gas change with temperature and pressure? Explain.
16. Explain the relationship between pressure and temperature and pressure. Explain.
17. Name an example of a process that occurs from fluid related behavior.

The student has completed the following questions. Do you have any of the questions that you have not completed? If you have any questions, please contact your teacher.

The student has _____

Attachments

3-20 End of Unit Review.pdf