

# OIL SPILL JEOPARDY

## CHEMISTRY

**What is petroleum?** Also known as crude oil, this substance is a naturally occurring, toxic, flammable liquid that is found in geologic formations beneath the Earth's surface.

**What are hydrocarbons?** These chemical compounds consist entirely of carbon and hydrogen.

**What is methane?** This colorless, odorless, flammable gas is the main component of natural gas. This compound's structure is CH<sub>4</sub>.

**What is a dispersant?** This chemical causes crude oil to break up into small droplets and is sometimes used after a spill to speed up the degrading process.

**What are aromatic hydrocarbons?** This class of chemicals often contains benzene rings and is highly volatile. The name refers to their strong smell.

**What is natural gas?** This fossil fuel is colorless, shapeless, and odorless in its pure form. Unlike other fossil fuels, it is clean-burning and emits lower levels of potentially harmful byproducts into the air.

## PHYSICAL PROCESSES

**What is weathering?** This natural action involves several different physical processes that break down oil once it is spilled in the ocean.

**What are currents and wind?** These two physical processes cause an oil slick to move away from its source or to other areas.

**What are waves?** This physical process, constantly occurring on the ocean's surface, mixes oil and water together.

**What is a tar ball?** These weathered blobs of oil float in the ocean and wash up on beaches and in marshes.

**What is mousse? or What is an emulsion?** This water/oil mixture is created by wave action and may have a "fluffy" appearance.

**What is evaporation?** Within a few days after an oil spill, this natural process quickly rids the spilled oil of aromatic compounds by dispersing them in the air. Hmm the compounds break down too don't they?

## CLEAN UP

**What is a skimmer?** Boats that suck spilled oil from the water's surface. Are these boats or equipment?

**What is boom?** This long floating line is used to contain oil in a small area or to act as a barrier to prevent floating oil from reaching a **section of land**.

**What are absorbents?** This material is made into booms and pads to soak up oil in the water.

**What is manual cleanup?** This method of clean up is labor-intensive and consists of placing workers on the coast, armed with shovels, rakes, and gloves, to collect oil that has landed onshore.

**What is bioremediation?** Through this process, microorganisms decompose or break down contaminants into simple less-toxic compounds.

**What is in-situ burning?** This method of early response to a spill involves the deliberate, controlled igniting of oil at the spill location. When conducted properly, it significantly reduces the amount of oil on the water and minimizes the adverse effects of oil on the environment.

## **WHO OR WHAT IS AFFECTED?**

**What is a crab?** This tasty animal has a hard shell, powerful pinchers, walks sideways and can be affected by oil. This crustacean's Latin name translates into "beautiful swimmer."

### **What are shrimp?**

This commercially important crustacean is south Louisiana's largest cash crop. Its name is often synonymous with the word "small." Small??

**What is hypothermia?** This condition can harm birds once their feathers are oiled and no longer provide insulation, causing affected birds to lose body heat.

**What is the oyster?** Called a bivalve because it has two hard shells, this commercially important seafood species is vulnerable to accumulating hydrocarbons in its tissues because it is a filter feeder and lacks the ability to flee from a contaminated area.

**What are larval fish?** These newly hatched fish are in an early life stage, have yolk sacs, and are vulnerable to oil.

## **IMPACTS**

**What is a barrier island?** These long, relatively narrow strips of sand run parallel to the mainland, are usually completely surrounded by water, and serve to protect the coast from erosion and oil inundation.

**What is habitat loss?** This term describes the problem that arises when natural disasters and human destruction cause animals to lose their homes.

**What is loss of nesting areas?** This is one of the leading causes of declining bird populations worldwide because the animals have fewer places to breed and raise their young.

**What is a job?** Following a large oil spill, individual people who make their living from the land like fishermen, oil rig workers, hotels workers, and lifeguards may lose this.

**What are economic impacts?** This occurs when human or natural events cause negative financial effects on industries and businesses in an area.

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## **RESPONSE**

**What is the U.S. Coast Guard?** This federal military and law enforcement agency responsible for various activities at sea takes over large oil spills that occur in state and federal waters.

**What is the Louisiana Department of Wildlife and Fisheries (LDWF)?** This state agency works to protect fish and wildlife resources along the state's coastline following oil spills.

**What is Natural Resources Damage Assessment (NRDA)?** This program of the National Oceanic and Atmospheric Administration (NOAA) is charged with evaluating the natural resources injured as a result of oil spills or hazardous substance releases into the environment and implementing restoration.

**What is animal rescue?** State agencies and private organization work together to protect wildlife during spills by assessing the viability of animals in the field. Those animals that are severely affected are cared for and released back into the wild.

**What is a drilling moratorium?** This phrase refers to the suspension of drilling activity declared by the president after the BP spill.

**What is the National Environmental Policy Act (NEPA) of 1969?** This 1969 federal legislation mandated that the environment be protected from harm during the development of public projects.

**What is a fishery closure?** Because seafood can be contaminated by oil, this precautionary action is taken by the Department of Wildlife and Fisheries in certain waters to ensure that seafood will remain safe for consumers.

**What is the Department of Environmental Quality (DEQ)?** This state agency has worked to develop appropriate management plans and to address water quality and other environmental problems concerning the Gulf of Mexico and the Mississippi River.

**What is Louisiana Office of Coastal Restoration (LOCR)?** This agency undertakes programs to offset the catastrophic loss of coastal wetlands and manages the Wetland Trust Fund, which provides revenues derived from oil and gas activities to construct wetland restoration projects in Louisiana.

**What is animal rehabilitation?** This effort to save wildlife injured after a spill follows these steps: Search and Collection, Intake, Pre-Wash Stabilization, Cleaning, Pre-Release Conditioning, Release, Post-Release Assessment

## CAUSES OF SPILLS OR OIL IN THE MARINE ENVIRONMENT

**What is a blowout?** This dangerous event is an uncontrolled release of crude oil and/or natural gas from a well after pressure control systems have failed.

**What is a pipeline?** A break or a leak in this stationary part of the oil and gas infrastructure is a common cause of oil spills.

**What is a tanker?** These vessels move large quantities of unrefined crude oil over water from its point of extraction to refineries and have been involved in several damaging and high-profile oil spills.

**What is storm drainage?** Oil from leaking cars and improperly disposed of motor oil gets on roads and washes into our water systems after rainfall events in this common source of oil pollution.

## MISCELLANEOUS

**What is a blowout preventer (BOP)?** This important piece of equipment on a wellhead controls pressure and the flow of oil and natural gas.

Is an arrangement of valves at the wellhead to control the flow of oil or natural gas? Were developed to cope with extreme erratic pressures and uncontrolled flow emanating from a well reservoir during drilling.

**What is deepwater drilling?** This phrase describes the process of oil and gas exploration and production far from the coastline at extreme depths.

**What is BP?** Headquartered in London, England, this energy company is one of the world's largest and is the owner of the Macondo prospect.

**What is transportation?** This use accounts for the greatest consumption of petroleum in the United States.

## HISTORICAL SPILLS

**What is Ixtoc?** This exploratory oil well blowout off the coast of Mexico in the Bay of Campeche in 1979 once held the record for the largest accidental marine oil spill, spewing at least 3 million barrels of crude into the Gulf of Mexico.

**What is the Santa Barbara spill?**

This 1969 oil spill was the largest oil spill in United States waters at the time, and now ranks third after the 2010 Deepwater Horizon and 1989 Exxon Valdez spills.

**What is the Exxon Valdez?** This tanker spilled nearly 11 million gallons of crude oil into Alaska's Prince William Sound when it ran aground on March 24, 1989.

## ALTERNATIVE QUESTIONS TO USE OR FOR SECOND SET

### CHEMISTRY 2

**What is gasoline?** This volatile flammable liquid is made from petroleum and is used primarily as fuel for transportation.

**What is crude oil or petroleum?** This naturally occurring, flammable liquid consisting of hydrocarbons is found in geologic formations beneath the Earth's surface.

### CLEAN UP 2

**What are absorbents or sorbents?** These materials soak up oil.

**What is phytoremediation?** This natural process uses vegetation to remove or degrade contaminants in soils, sediments, surface water and groundwater.

**What is containment and recovery?** This is the primary line of defense against oil spills in the United States. It uses a variety of booms, barriers, and skimmers, as well as natural and synthetic absorbent materials.

**What is a boom?** Used to corral spilled oil on the water, this object minimizes the spread of oil and prevents it from hitting land.

**What is oleophilic bacteria? or What are oil-loving bacteria?** These tiny organisms use oil as food and break down oil into its basic components.

**What is a sand berm?** If properly constructed, this human-made mound of earth or sand can sometimes be used as a barrier to protect wetlands from erosion or spreading of oil following a spill.

**What is a sorbent (or absorbent) boom?** These floating barriers not only corral spilled oil but also absorb it.

### WHO OR WHAT IS AFFECTED? 2

**What are nesting sea birds?** These winged creatures have adapted to life within the marine environment. Most species nest in colonies, which can vary in size from a few dozen to millions. Many species are famous for undertaking long annual migrations, crossing the equator or circumnavigating the Earth in some cases. They feed both at the ocean's surface and below it, and even feed on each other. Can be highly pelagic, coastal, or in some cases spend a part of the year away from the sea entirely.

**Most of these winged species nest in colonies ranging from a few dozen to thousands and feed along the coast and in open waters.**