Oil & Gas Industry

Formation

The Beginning: Dead marine life

- Only a tiny amount (of died organisms) sinks into deep, _____ water

Source Rock Formation

- With little oxygen and no tidal currents, it does not fully _____.
- This turns into a black, organic-rich rock called _____

Diagenesis

- _____ is the process that turns loose sediments into sedimentary rock.
- It also alters buried organic matter to form _____

CATEGENESIS

- A process where heat and pressure transform kerogen into _____.
- Geothermal _____ break down kerogen as it is buried deep in the Earth.
- Kerogen turns into oil: 60 to 130°C /2000m - 3800m depth
- Kerogen turns into natural gas: 130°C/ 4000m depth

Migration & Accumulation

- Hydrocarbons move upward through _____ rocks because they are less dense
- Accumulates when oil and gas hit the cap rock, which is hard and _____

Identification of Oil and Gas

Geological indicators

This includes identifying

- _____ Rocks, _____ Rocks,_____ rocks and Structural Traps (anticlines, domes, salt domes, faults)

SEISMIC SURVEY

- Emmits _____ into the ground
- Records the _____ that are bounced back from subsurface rock layers

Oil Location

Western Canada Sedimentary Basin

- The _____ has perfect conditions: thick _____layers, organic-rich source rocks and traps that hold hydrocarbon

Alberta Oil Sands

- Only about 3 to 5 % of all oil deposits are _____ enough to the surface to be mined.
- In situ(in place) used to mile the rest: stream is injected _____ to metl the oil, which is then pumped to the surface

The age of primitive extraction

Process of modern oil extraction

- Use technology we discussed before to find the
- A drilling rig bores a _____ down to the reservoir!
- Natural pressure may push oil upward at first, but _____ or other pumping system are later needed.

Early Extraction

- Cable-Tool drilling (drop _____)
- Inefficient, _____ wells (less than 70m)

Early Refining

- Backyard-level _____ (like moonshine)
- Impure Kerosene - easily _____

Improved Extraction

- Built the world's first large-scale _____ network
- Used _____ for safe transport of oil

Improved Extraction

- Introduced _____ distillation.
- Developed _____ treatment

Temperature-Controlled Distillation

- The vapor enters a tall tower where the bottom is very _____ and the top is much cooler.
- Light molecules rise _____, and heavy molecules stay
- When the vapor reaches a place cooler than its bolling point, it turns back into _____

Acid Treatment

- Mixed kerosene with _____(H_2SO_4)
- Sludge settles at the bottom
- _____ Kerosene remains on top

Acid Treatment

- Rockefeller add _____ ($NaOH$) to neutralize leftover acid and remove remaining

Monopoly

- With technology, Rockefeller could sell cheaper kerosene while still earning high profits
- Competitors could not match his efficiency, so he _____ them out at fair prices before they went bankrupt

Near-National Monoply

- Controlled about _____% of U.S. refining capacity by 1880s
- This made Standard Oil the first nationwide _____ in the world

Controled the Politics

- He donoted money to _____ political parties, ensuring that whichever side won would support his business interests
- Through his huge economic power, Standard Oil became a "_____" in U.S. politics

Usage of Oil

Write down two interesting usage of oil or gas.

Interesting Usage (reword this)	What does it use?