The Magic Suitcase

Version
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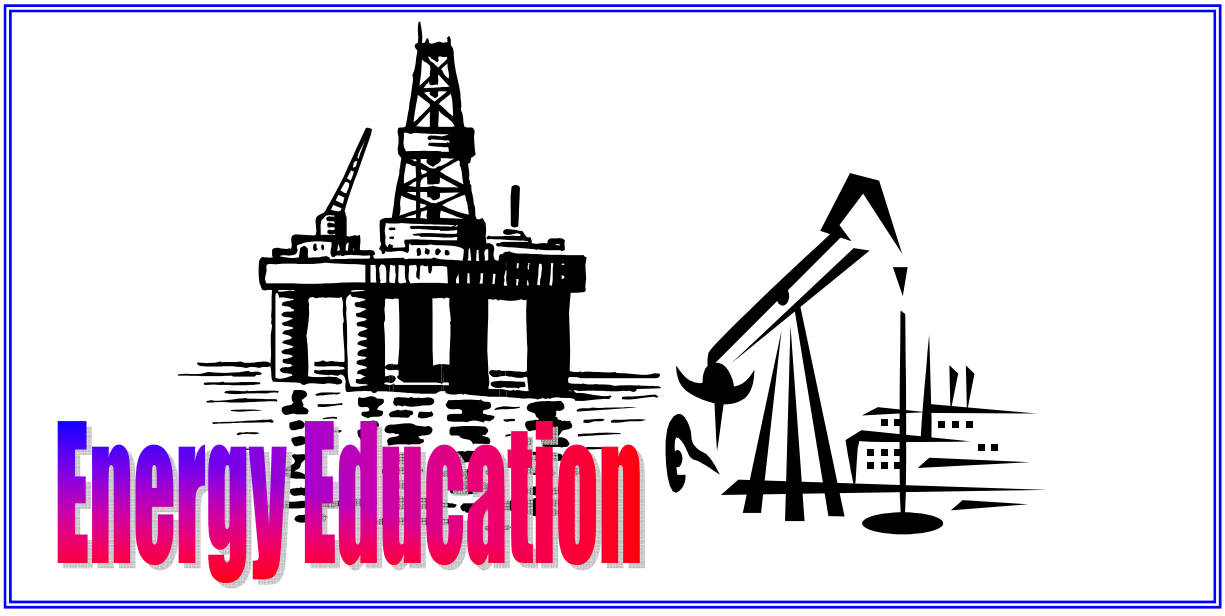

Acknowledgements

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Table of Contents

The Magic Suitcase: Introduction

The Magic Suitcase was designed by the Society of Petroleum Engineers Educational Resources Task Force to provide anyone interested in giving a general presentation about the oil industry with a complete set of materials and an organized program for demonstration and instruction. The SPE Career Guidance/ Student Development Committee provides ongoing management of the Magic Suitcase Program to continue to offer this educational experience.

The mission of the Magic Suitcase Program is to enable and encourage SPE members to speak to groups of student and adults about the oil business, thereby increasing public understanding of the science and engineering involved in our industry. The Magic Suitcase was developed to be a useful tool for speakers at career day, scouting, National Engineers Week, or civic club presentations.

Everything you might need has been assembled and organized into this portable suitcase. Using the modular program in this script book, select whichever modules are appropriate for the age group, the presentation length, and the audiovisual equipment available. One hour of preparation should be sufficient—on with the show.

Thank you for using the SPE Magic Suitcase to educate the public about exploring for and producing oil. Feel free to contact the members of the SPE Magic Suitcase Committee with your suggestions for improving this useful presentation package.

http://www.spe.org/web/suitcase/default.html

SPE Magic Suitcase Contents

Instruction Guide

Envelope of 7 overhead transparencies
Deposition of sediments
Seismic trucks
Log examples
Traps
Water Drive
Gas Drive
Geologic Cross Section

Quantity	Laboratory Supplies
1	500ml Beaker
1	1000ml Beaker
1	Erlenmeyer Flask
1	Large Funnel
1	Small Funnel
2	Plastic mesh discs
1	Plastic bottle with mixed red dye and vegetable oil
1	Container of coarse sized glass beads
1	Container of fine sized glass beads
1	Sponge
1	Vial of Oil Soluble D&C Red 17 Dye
1	Copper tubing (pre-assembled for experiment)
1	Plastic tubing (pre-assembled for experiment)
2	60ml syringes
2	Wirescreens
2	Containers of sand (two mesh sizes)
2	Core samples (donated by Core Labs)
1	Carpet Samples
1	Hole #9 Stoppers (pre-assembled for experiment)
5+	1.25” diameter paper filters (Filters cut from coffee filters)

Presenter will also need to bring the following:

1. A supply of water in a container
2. A strainer or colander
3. A bottle of salad oil (for Demo #3 and Demo #4)
4. Various items made from petroleum

Some Examples:

Waxed Paper	Candles	Fabric
Plastic Bags	Plastic toys or dishes	Pantyhose
Soaps	Cosmetics	Detergents
Shoe	Styrofoam	Elastic

5. Consumer Products (for Module VI)

Suggested Modules for Various Presentations

Allowable Time	Module
10 minutes	Module I – Slide Show: "The Energy Story"
20 minutes	Module II with Demo #1 and Demo #2 Module IV without Demo #4 Module VI
30 minutes	Module II withy Demo #1 and Demo #2 Module IV with Demo #4 Module VI Module VII – for students
40 minutes	Modules II-IV Module VI Module VII—for students
50-60 minutes	Modules I-VII

Module Outline

I. General Overview
Slide Presentation—"The Energy Story"

II. Where is Oil Found?
- Porous rock: Core samples, Demo #1
- Permeable rocks : Demo #2
- Oil traps : Transparency #4, Demo #3

III. How do we find oil and gas
- Seismic and stratigraphy: Transparencies #1, #2, and #7
- Logging: Transparency #3

IV. How do we get it out of the ground?
- Drilling
- Producing: Transparencies #5 and #6, Demo #4
- Types of oil: Oil samples

V. Where does the oil go after it comes out of the well?
- Tankers, Pipelines
- Refineries
- Chemical Plants

VI. How do we as consumers use oil?
- Fuels: Gasoline, Diesel, Natural Gas, Heating Oil
- Plastics: Plastic Wrap to auto tires
- Fibers: Panty hose, Nylon thread, polyester, carpet

VII. What careers are available in the oil business?
- Education requirements
- Universities and scholarships
- Job opportunities and pay

MODULE 1: Slide Show Script "The Energy Story"

Slide descriptions

- **Geologists in the Field**
  The search for oil and gas begins with geologist searching in remote regions for clues. The search may lead to rugged mountains or…

- **Ice Breaker**
  To the cold Arctic Ocean or…

- **Desert Seismic Trucks**
  To the hot, sandy desert or…

- **Jungle Seismic Trucks**
  To steamy jungles. The search can take us any place on earth.

- **Seismic Trucks**
  The geologists are joined by the geophysicists who use seismic trucks to bounce sound waves off the formations deep in the earth that may hold oil and gas.

- **Wyoming Drilling Rig**
  Once the decision is made to drill, the drilling rig and crew move into place and drill the well. On land, this may require building new roads to reach the drill site.

- **Arctic Drill Ship**
  Offshore, a drill ship or a drilling platform is required.

- **Log Traces**
  Electronic equipment called logging tools is used evaluate the well. These squiggly lines can tell us the type of rock we drilled through and whether oil and gas may be there

- **Platform with Drill Stem test**
  If we are lucky, the well may have enough oil or gas under pressure to show us that our search had been dramatically successful. Here, a well is being tested. The oil or gas is burned as it escapes to prevent pollution.

- **Pumping rigs**
  Frequently, we have to give Mother Nature a hand. These pumping rigs are used to pump the oil out of pore spaces of the reservoir rocks.

- **Pipeline to facility**
  Once the oil or gas is out of the ground, we transport it to gas processing facilities or oil refineries. One way to transport it is through pipelines.

- **Transport Ship**
  Or, we load the oil into a tanker and ship the oil form its production site to the refinery.

- **Gas Processing Plant**
  A the gas processing facility, harmful gasses such as hydrogen sulfide are removed before the gas is sent to homes and factories to be burned for heat or energy.

- **Refinery**
  The refinery uses complicated equipment to separate crude oil into a variety of useful products such as gasoline, jet fuel, and asphalt. Some of the oil goes to chemical factories which transform oil into plastics and fibers.

- **Transport Trucks**
  From the refinery, gasoline and other fuels are shipped by truck to gas stations and airports.

- **Gas Station**
  At the gas station, we fill our cars and trucks with this product of crude oil.

- **Jet Plane**
  Jets and other airplanes use another part of the crude oil for fuel.

- **Asphalt**
  Part of the crude, called the heavy ends, winds up on our roads and on parking lots as asphalt.

- **Plastic Dishes**
  You probably knew that gasoline comes from oil and that much of the oil we find is used to provide energy for vehicles. But did you know that oil has many other uses? For example, every piece of plastic in your house is a product of crude oil. Plastic dishes are only one example.

- **Foam Containers**
  Styrofoam products are widely used to package food to keep it warm. This material not only has good insulating properties but can be recycled into other useful plastic items.

- **Fibers**
  Many of the clothes you wear and carpets you walk on started out as oil in the bottom of a well. Oil is chemical companies' primary feedstock for making polymers, which becomes the fibers used to make cloth and rags.

- **Cloth**

So, the next time you put on that poly-cotton t-shirt, remember that you are wearing a product of crude oil. Let's give thanks to the many scientists and engineers who found it, produced it, and processed it.

Note to Presenter

Feel free to elaborate upon or explain in more detail what these slides portray. If you have some of your own slides you would like to show, please do so.

MODULE II: Where is Oil Found?

What is Oil?

Crude oil, or petroleum, is an organic substance derived from the remains of prehistoric plant and animal remains. It is a mixture of hydrocarbons, that is, molecules containing hydrogen and carbon that exists sometimes as a liquid (crude oil) and sometimes as a vapor (natural gas).

How was Oil Formed?

Millions of years ago, rains washed prehistoric plan and animal remains into the seas along with sand and silt, and layer upon layer piled up on the sea bottom. The layers of organic material were compressed under the weight of these sediments, and the increasing pressure and temperature changed the mud, sand, slit into rock and the organic matter into petroleum. This rock is referred to as source rock.

Where is Oil Found?

Because oil and gas are lighter than water, they float on top of water. Oil and gas that formed in the source rock deep within the earth floated up through tiny pores spaces in the rock. Some seeped out at the surface of the earth. Some was trapped by dense, non-porous rock, called shale. These underground traps of oil and gas are called reservoirs. Reservoirs contain porous rocks that allow fluids to flow through the pores spaces, that is, that are permeable.

Core Samples

When oil wells are drilled, sometimes a coring tool is used to obtain samples of the reservoir rock for study. Here are two cores samples (pass around the core samples), both are sandstone (explain that oil is found in sandstone). The tiny holes you see are the pores which contained oil and gas when these rocks were deep in the earth. They have since been cleaned out for this demonstration. Geologists study these core samples to learn about the reservoir and help decide how to produce the oil and gas from it.

Transparency

Several different types of traps are shown on the Transparency #4, including a fault, salt dome, and a stratigraphic trap.

Demonstration #1 – Porosity

Materials Needed:

1 400 ml Beaker
4 Glass Beads

Optional:

Red Oil-Soluble Dye
Vegetable Oil

Illustration

Figure 1. Pour beads into a beaker or container.

Procedure

1. Pour glass beads into beaker
2. Ask the audience, “Is the beaker full?”
3. Pour enough water into the beaker of glass beads to just cover the beads.
4. Ask the audience, “How much water did I add?”

5. Point out that this pore space is where oil, gas, and water are found in the earth, between the particles that make up the rock. The porosity of reservoir rock is measured using core samples, and usually ranges form 5% to 30% pore space. (Since you've just "poured", explain the difference between "pour" and "pore".)

Optional

1. Dissolve a few crystal of the red oil-soluble dye in some salad oil.

2. Mix this with an equal amount of water and add to the beaker full of glass beads.

3. Let the two phases separate, and explain that this is how oil and water separate in the reservoirs, with the oil floating on top of the water due to its lower density.

Clean-Up

Dry everything thoroughly before returning to suitcase. If salad oil is used, wash everything is soapy water, rinse clean, and dry thoroughly. Glass beads may be swirled in soapy water and decanted several times, then swirled in clean water. To rinse, use a strainer or colander to remove excess water. To dry glass beads, pour into fluffy towel, pat dry, then replace in container in suitcase.

Safety Tip

Don't' drip any glass beads on the floor—fall hazard.

Demonstration #2 – Permeability

Materials Needed

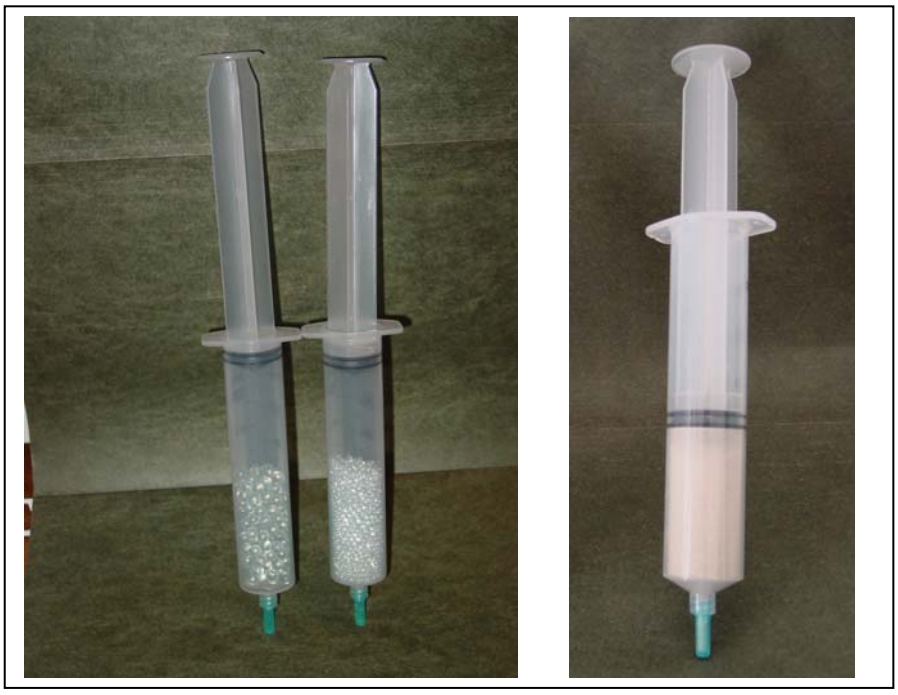
2 Syringes – 60cc
2 Wire Screens
2 Containers of Sand (Two mesh sizes)
2 1.25” diameter paper filters
(If more filters needed, take a coffee filter and use the wire screen for a template. Cut 1/16” around wire screen.)
1 Container of Water

Alternative

1 Container of fine sized glass beads
1 Container of coarse sized glass beads

Illustration

Figure 2. Left picture demonstrates experiment with glass beads as an alternative approach to two different sized sands. The second picture on the right demonstrates the syringe with fine sand.

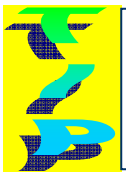


Assembly:

1. Remove plungers from syringes.

2. Place a wire screen in the bottom of each syringe.

3. Place 1.25” diameter paper filters on top of the wire screen. If performing experiment with glass beads, the paper filters are not required.



Push filter to bottom with a pencil or pen. Wet filter with water and verify that filter is contacting wire screen. If the paper filter is not used, fine sand will go through wire screen.

4. Fill each syringe half way with sand, one mesh of sand for each syringe. Alternative: Use fine sized glass beads in one syringe and coarse sized glass beads in the other syringe.

Procedure:

1. Hold one finger under hole of syringe with large mesh sand and pour some water in the top.

2. Release your finger, allowing water to flow out into the container. Have audience note the rate of flow.

3. Repeat with the second syringe containing the small mesh sand or alternative approach with glass beads. You will probably have to force the water out of this syringe with the plunger, since the finer sand is less permeable.

4. Explain that the permeability of reservoir rock depends not only on grain size, but also on the interconnectedness of the pores and the diameter of pore throats.

Clean-Up:

You may leave the syringes assembled in the suitcase, but try to remove as much water as possible by repeatedly using the plunger to expel water from the sand. Store in airtight plastic bag in suitcase.

Demonstration #3 – Oil Source and Trap

Materials Needed:

Quantity	Item
	1000 mL Beaker
150 mL	Salad Oil –*
	Large Funnel
	Red Oil-Soluble Dye
	Glass Beads
	Water – 450 mL
	Sponge
2	Plastic Disks

*** Supplied by Presenter**

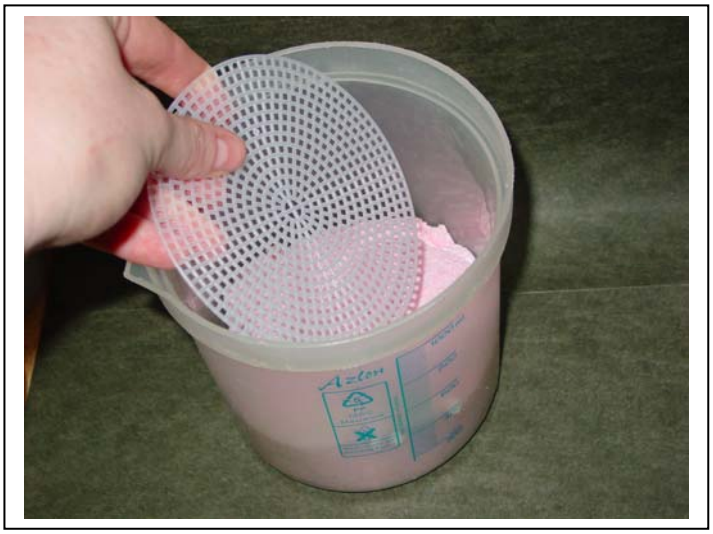
Assembly:

1. Dissolve a few crystals of red dye in salad oil in beaker.

Figure 3. Oil Soluble dye can be used to make the presentation easier to visualize.

2. Place sponge in beaker and cover with one plastic mesh disk.

Figure 4. Place the plastic mesh disk on the sponge.



3. Press down on plastic disk with large funnel several times until sponge soaks up the oil.

4. Pour in glass beads and pour in enough water to cover the beads plus at least 100 mL above the beads. (It's better to have too much water than not enough.)

5. Place the second plastic mesh disk on top of the glass beads.

6. Use the large funnel to press down on the perforated disk, expelling oil from the sponge. Oil will rise through the glass beads and be trapped in the funnel. The tip of the funnel will act as the "well".

Figure 5. View of assembled apparatus.

Explanation

The sponge simulates the source rock filled with organic material that has been buried for millions of years under sediments. As pressure and temperature increase, the organic matter turns into oil and gas, which float up (migrate) through the porous, permeable rocks (glass beads) until they are trapped by a reservoir seal or shale (funnel). There, the oil and gas gather above the oil-water contact until a well is drilled (funnel top) to produce it. Any oil leakage around the sides of the plastic disks illustrates that much of the oil generated inside the earth has already leaked to the surface (tar pits, seeps).

Clean-Up:

Dry everything thoroughly before returning to suitcase. If salad oil is used, wash everything in soapy water, rinse clean, and dry thoroughly. Glass beads may be swirled in soapy water and decanted several times, then swirled in clean water. To

rinse use a strainer or colander to remove excess water. To dry glass beads, pour into fluffy towel, pat dry, then replace in container in suitcase.

Safety Tip:

Don’t drop any glass beads on the floor – fall hazard!

MODULE III: How Do We Find Oil and Gas?

Note to Presenter:

Transparencies of seismic trucks and well logs are included in the Transparency Envelope. Appropriate slides from "The Story of Oil" include #5 (seismic trucks), and #8 (well log traces). Non-proprietary seismic sections or well logs of your own may be brought along as examples. If no log or seismic samples or audiovisual facilities are available, you may choose to minimize or skip this module.

History

Initial prospecting for oil was centered around oil seeps or tar pits on the earth's surface. The first recorded incidence of oil discovered by drilling a water well was in 1829 in Kentucky. Oil overflowed into the Cumberland River and caught fire, resulting in a 50-mile long torch. It was not until 30 years later in 1859 that Colonel Edwin L. Drake discovered oil by drilling a well in Titusville, New York, thereby initiating a new era of abundant energy and launching the oil industry.

Geology

Oil prospecting developed from art and accident to the sciences of geology and geophysics. Geology is the study of the composition of the earth's crust, which consists of many layers of sediments deposited over millions of years. These layers have since been forced into various shapes or structures by the movement of continental plates, earthquakes, volcanic eruptions, and salt flows. By studying these sedimentary beds in outcrops and other surface features, geologists can infer where the underground porous reservoirs and impermeable traps might lie.

Geophysics

The science of geophysics was developed to understanding of the shapes of the sedimentary rock layers. Early geophysical methods involved gravity mapping, measuring the earth's gravity at a number of points and plotting the results on a map. Since oil has a density less than rock or water, gravity measurements were lower directly over oil reservoirs.

Seismic

The modern geophysical method for investigating the earth's layers is described as seismic. Sound waves are sent into the ground (Transparency #2) at one point. These waves are reflected off the layers of rock and are measured by lines of detectors on the surface. These detectors are called geophones. The data obtained are fed into massive computers for processing to yield a seismic section. Geophysicists interpret these results to gain an understanding of the shapes and sizes of the rock layers, or stratigraphy.

Well Logging

Once an exploratory well has been drilled in a location suggested by seismic interpretation, a logging tool is lowered down the well on electrical wire. Logging tools are special sensors that measure properties of the rock surrounding the borehole, with results recorded simultaneously on paper and on digital tape. These data are studied extensively to determine what kinds of rock are at which depths, how porous the rocks are, and whether there is oil and gas or water in the pore spaces.

Many different kinds of well logs have been developed. The Spontaneous Potential Gamma Ray tool shows rock layer boundaries and shale content. The Neutron Log was an early porosity measurement tool. Since the salty water found underground conducts electricity while oil and gas do not, electrical resistivity logs can be used to detect the presence of oil and gas in the pore spaces.

By studying the rocks (either outcrops or core samples from the wells), and by interpreting the seismic data and well log data, scientists and engineers can reasonably predict how big the reservoir is and how much oil it contains, and how easy or difficult it will be to produce the oil. Economic studies are then done to assess production methods and the equipment needed to develop the oil field.

MODULE IV: How Do We Get Oil Out Of The Ground?

Note to Presenter:

There are no transparencies of drilling rigs, drill bits, or sucker rod pumps supplied in the SPE Magic Suitcase, so you may want to bring some of your own or draw on a blackboard or flip chart. Of the slides in Module I, Slide #6 shows a drilling rig, Slide #7 shows a drill ship, and Slide #10 shows a pumping rig. In the Drilling section below, concentrate on introducing the new vocabulary words in boldface type.

A. Drilling

Once the geoscientists have analyzed a prospective oil field and the land has been leased, a wildcat well is drilled to obtain more information about the reservoir.

In the second half of the 1800's, oil wells were drilled by hammering steel pipe into the rock. Today, rotary drilling rigs are used, where a drill bit turned around and around, deeper and deeper, to cut the rock.

Drilling fluid, also called drilling mud, is used to lubricate the bit so it doesn't get stuck and to flush the rock pieces to the surface. These cuttings are examined by a mud logger, who looks for signs of oil and gas.

Not all wells are straight and vertical. Horizontal drilling has become a very profitable way to increase production by having the wellbore contacting more of the formation.

When the drilling is finished, drilling rigs can be broken down for assembly at another drill site. Some rigs are on ships and barges for drilling offshore.

After drilling, steel pipe called casing is set in the hole and is cemented into place. A heavy-duty system of valves called a Christmas tree is set into place at the wellhead to control the flow of the oil, gas and water and prevent a blowout. Then the well casing is perforated at the right depths to make holes for the oil and gas to flow into the wellbore and up to the surface.

B. Producing

Because oil, gas and water underground are under a lot of pressure at first, these fluids flow up a wellbore all by themselves, much like a soft drink that has been shaken up. When oil and gas are produced this way, it is called primary recovery.

When the initial pressure is spent, sucker rod pumps are used to pull the oil out of the reservoir rock and up the well. Sometimes gas is injected at the bottom of the well, and as it expands, it lifts the oil up to the surface. This is called gas lift.
Opening up new channels in the rock for the oil and gas to flow through is called stimulation. Three stimulation treatments are commonly used: explosives to break up

the rock, injection of acid to partially dissolve the rock, and hydraulic fracturing to split the rock and prop it open with proppants.

After primary recovery, only a portion of the oil and gas has been produced, so secondary recovery, or waterflooding is done. Water and oil do not mix; oil is generally lighter than water and floats on top of it in the reservoir. During a waterflood, water is injected into the water zone of some of the wells to push the oil and gas up the other wells (Transparency #5).

Gas is even lighter that the oil and can float on top of the oil as a gas cap. Sometimes produced gas is reinjected into the gas cap to push the oil to other wells that have been perforated in the oil zone. This is called a gas drive (Transparency #6).

When secondary oil recovery declines so that it is no longer economical, tertiary recovery, also called enhanced oil recovery or EOR, is sometimes used to recover the oil that is left behind in the pores of the rock. Various chemicals such as surfactants (soaps), polymers, carbon dioxide, or steam can recover significantly more oil after the waterflood. These chemicals are more expensive than water, of course, so careful economic analyses must be done to justify their use.

Demonstration #4 - Water Drive and Gas Drive

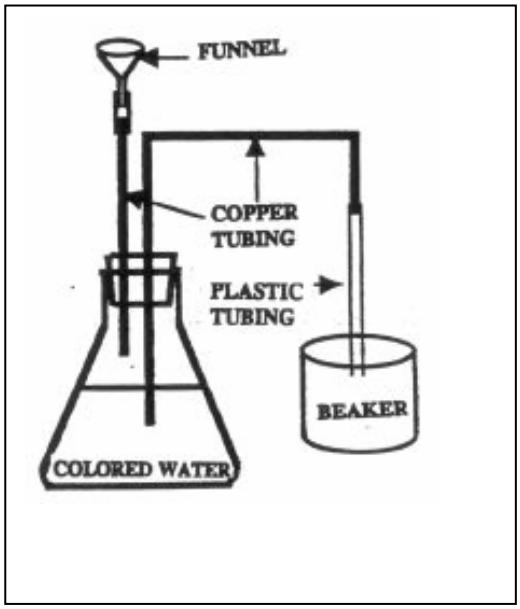
Materials Needed:

1000 mL Flask
2-hole #9 Stopper
400 mL Beaker
10” Long Copper Tubing – Straight
20” Long Copper Tubing – Bent into uneven U shape
Plastic Tubing: Two Short (2.5”)
Long (7”) Small Funnel
Salad Oil – 150 mL
Red Oil-Soluble Dye – Several Crystals
Only Water – 300 mL

***Supplied by Presenter**

Illustration

Figure 6. Illustration of the gas drive apparatus



Gas Drive Assembly:

1. Pour water into flask

2. Mix a few crystals of red dye with the salad oil and pour on top of water, showing how oil is less dense and floats.

3. Insert stopper, and with fingers covering the holes, shake vigorously. Allow to settle and explain how emulsions may need heat or chemicals to help them separate quickly.

4. Insert both copper tubes into stopper, with the long end of the U-shaped copper tube reaching deep into the oil layer and the short straight tube in the air (gas phase).

5. Cover short end of U-shaped copper tubing with plastic tubing and place into beaker.

Gas Drive Procedure

1. Blow into straight copper tube slowly to displace oil through tubing into beaker until gas breakthrough.

2. Explain that the straight copper tube is the gas injection well and the U-shaped tube is the production well.

Figure 7. The results of the procedure are demonstrated.

Water Drive Assembly:

1. Pour oil from beaker into flask and allow separation.

2. Adjust long end of the U-shaped copper tube so that it reaches into the oil phase near the top of the oil.

3. Place straight copper tube so that it reaches deep into the water phase.

4. Connect funnel to straight copper tubing with a short piece of plastic tubing.

Water Drive Procedure:

1. Have a member of the audience hold a finger over the short end of the U-shaped copper tube while you use the beaker to pour water into the funnel.

2. Replace the beaker under U-shaped copper tube and remove finger from production well. Oil will be displaced into beaker.

3. Emphasize that the fluids are in tiny pore spaces of the rock deep within the earth, making them much more difficult to produce than this demonstration shows.

Clean-Up:

Water, salad oil, and dye may all be disposed of down the sink. Wash all containers and tubing with warm, soapy water, rinse thoroughly and dry. Blowing air through the copper tubing to dry the inside will help prevent corrosion. Replace items securely in suitcase.

C. Types of Oil (Show slide #30 with 3 oil samples)

Not all oil is black. Some light oils are almost clear. Others are yellow, orange, light brown, even green. Different oils from different locations vary in price and value. Therefore, the oil has to be tested by both the oil producer and the person buying the oil.

One test measures the API gravity of the oil, which is a measure of its density at a standard temperature. Oils with API gravity of 30 and above are light oils, which are worth more money in the marketplace. Oils with API gravity of 10-20 are usually heavy, black oils that aren't worth as much because they contain fewer gasoline components and more asphalt components, and are harder to refine.

Many times there are impurities in the produced oil and gas that have to be removed before they can be sold.

MODULE V: Where Does the Oil Go After It Comes Out of the Well?

Note to Presenter:
The only audiovisuals available for this Module are Slides #11 through #15 from Module I. If no slide projector is available, either skip or minimize this Module.

A. Transportation

Once produced, oil and gas must be transported from the oil field to the refineries for processing. One method of transporting millions of barrels of crude oil and billions of cubic feet of natural gas is through underground pipelines. Gas transmission pipelines use compressors to move the gas through the pipe and pressure is measured along the way. Oil pipelines use pumps to move the liquid through the pipe and measure flow rate. Pipelines can also be laid or buried offshore using barges. To ship large volumes of oil overseas, a tanker is used (Slide #12).

B. Refining and Processing

Because oil is made up of many different components, oil is refined to separate the various useful products it contains. Fractionation is usually done by distillation, where the oil is heated until the lighter components boil off. Vapors are then collected, condensed and sold as feedstocks. Larger molecules are broken into smaller, more valuable molecules by thermal cracking (using heat) or catalytic cracking (using a catalyst powder to help the conversation). Other chemical processes are used to remove sulfur – containing compounds, salt, water, and other impurities.

Natural gas must be processed before selling it as fuel. Processing plants remove poisonous hydrogen sulfide gas (which smells like rotten eggs), carbon dioxide, water, and other impurities. The gas is then fractioned into its separate components, including methane, propane and butane.

C. Chemical Plants

Many petroleum feedstocks produced at the refinery are used in the manufacture of petrochemicals. By performing chemical reactions like oxidation, aromatization and polymerization, thousands of different petrochemicals such as ethanol, xylene and polyethylene are made.

MODULE VI: How Do We As Consumers Use Oil?

A. Fuels

Fuel from produced oil and gas is used in homes and industries all over the world. Gasoline for cars, jet fuel, kerosene, propane gas for cooking, butane for cigarette lighters and torches, heating oils for home furnaces, diesel fuels for trucks and buses and trains, industrial fuels for boilers in factories and ships, and solid coke for burning - all originated from an oil field. Many electricity generating plants are also run on oil or natural gas.

B. Plastics, Rubber and Other Products

Many plastics and polymers are made from petroleum feedstocks. These are used to manufacture things like food wrap, toys, containers, and automobile tires. Other products include lubricating oils for machinery, grease, wax for candles, asphalt for roads and roofs, agriculture pesticides and fertilizers, and white oils and petrolatum for medicinal purposes.

C. Fibers

Polyester and nylon are petrochemicals that are made into thousands of consumer products like panty hose, nylon thread, polyester clothing and carpets.

Note to Presenter:

Have the audience participate in finding objects in the room that are made from petroleum, or you can bring some samples of your own.

MODULE VII: What Careers Are Available in the Oil Business?

Note to Presenter:

SPE has brochures about the petroleum engineering profession available through the SPE Book Order Department. One is entitled Global Opportunities – Global Responsibilities, and contains supplemental information for serious student inquiries. Call SPE Headquarters at (972) 952-9393.

There are many careers in the oil industry. Nearly every variety of engineer can be found upstream or downstream, including chemical engineers, industrial engineers, mechanical engineers, civil engineers, electrical engineers, bioengineers, and of course, petroleum engineers.

Natural and earth sciences are also prevalent in the oil business. Chemists, biologists, physicists, geologists, geophysicists and computer scientists work together on multi-disciplinary teams with engineers to research and optimize oil field and refinery operations.

There are also other professional and support careers, as in any business. These include business administration, accounting, law and tax, advertising, sales and marketing, secretarial and library functions, trucking, public and employee relations, and a host of other positions to keep things running smoothly.

The Society of Petroleum Engineers can provide additional detail about obtaining a petroleum engineering degree.

A. Educational Requirements

To prepare for a university degree in petroleum engineering, high school students are encouraged to take earth science, chemistry, physics, algebra, trigonometry and calculus. English composition and government are usually required. Because the oil industry is becoming more international in scope, foreign languages are encouraged. Computer and typing courses are also valuable.

B. Universities and Scholarships

SPE publishes the Petroleum Engineering Schools Books annually. This book is an international listing of colleges and universities that offer curricula in petroleum engineering and technology. Accreditation, faculty, enrollment, statistical information and courses offered are listed for most schools.

Some major universities that have SPE Student Sections are:

California Polytechnic University
Colorado School of Mines
Indian School of Mines, India
Institut Teknologic Bandung, Indonesia
Kuwait University, Kuwait
Louisiana State University
Montana Tech
New Mexico Tech
Pennsylvania State University
Texas A & M
Texas Tech
Universidad Nacional del Comahue, Argentina
University of Alberta, Canada
University of Bologna, Italy
University of Oklahoma
University of Texas
University of Tulsa

Scholarships are available through many local SPE Sections, and university petroleum engineering departments often have information about available scholarships. The Society of Women Engineers and the Society for Professional Women in Petroleum have scholarships available to encourage young women to enter this field.

C. Job Opportunities and Pay

Each year the Society of Petroleum Engineers publishes a salary survey, which is also available from the Book Order Department at SPE headquarters. Data are available by industry sector, job classifications, geographic region, years of experience and gender.

According to the survey published in May, 1994, SPE members with less than one year of experience averaged $3,030 per month, or $36,360 per year. Managers with 31 to 35 years of experience averaged $9,958 per month, or $119,496 annually.

Although there have been many early retirements and lay-offs in the upstream oil industry in the late 1980's and early 1990's, there are still opportunities for entry-level petroleum engineers. The environmental area will continue to need more qualified people to comply with new regulations, and international, arctic and deepwater frontier applications will require trained employees.

Table I. Historical Salary Statistics for corresponding years of experience (all figures in thousands of dollars)

Year	0-2 Years	3-5 years	6-9 years	10-14 years	15-19 years	20+ years
1989	34	41.3	52.8	66.8	79.3	95.1
1990	40	43.2	54.6	63.2	70.6	92
1991	40.6	46.3	56.5	63.6	80.1	96.7
1993	45.2	55.2	64.4	76.3	81.0	97.5
1994	46	56	64.7	73	83.8	100.8
1995	47.9	52.7	63.8	75.5	85.1	105.2
1996	47.6	58.3	66.6	76.7	85.4	99.5
1997	48.2	55.3	63.2	73.6	82.9	97
1998	49.6	58.1	68.7	76.7	89.3	102.8
2004*	72.4			89.5	109.2	118.7

*2004 numbers based on US based employees with bachelors or less for a degree. Actual numbers are 0-10 years= 72.4; 11-15 years= 89.5; 16-20 years= 109.2; 21-25 years=118.7; 26+ years= 119.7.

Note to Presenter:
Now is the time to share your own educational and career path with your audience. Explain the parts of the job you like best and why. Open up discussion with a question-and-answer session.

The SPE Career Guidance/Student Development Committee thanks you for your efforts to educate the public about our profession. Please tell others about the SPE Magic Suitcase and encourage its use.

FOR SAFETY'S SAKE

Note to Presenter:

Certain conditions and equipment used in petroleum technology provide attractive nuisances for the natural curiosity of young people. For this reason, it is recommended that you include a safety section in your presentation alerting students to the possible dangers involved in and around industrial equipment. A list of dangerous situations and potential hazards is presented below.

Potential Harm

Explosions	Electrical shock
Burns	Broken bones
Ingestion of gas fumes	Suffocation

Bodily harm from weight/force of moving equipment

Dangerous Situations

Ignoring "Danger" or any play activity near gas well or oil "No Trespassing" sign sites. Any use of matches, lighters, etc. Climbing on tank batteries/equipment, Inhalation of fumes, Touching electrical components or Siphoning gasoline by mouth

Dangerous Items

Pumping units – horse heads	Reserve pits
Poisonous gases especially hydrogen	Separators
Compressors sulfide	Open vents
Tank batteries/storage tanks	Heater treaters
Electrical panels/connectors	Well heads
Engines – gas powered or electrical	

FUN AND GAMES

Note to Presenter:
In order to generate enthusiasm among the children to whom, you are making your presentation, you may want to use one or all of the following suggestions.

Prior to Your Presentation

1. With the consent of the school, ask the local newspapers through the education or special features editor to announce your presentation. (It is important to get the school's permission for the publicity prior to inviting the press to cover the presentation.) Ask the press to provide coverage including photography to publicize this event.

   This same information could be publicized in the school district's newsletter.

2. When making arrangements for your presentation, ask the teacher to have the students prepare for the presentation by bringing to class items that are made from petroleum.

3. Solicit support from your organizations to provide small promotional items that contain your logo or slogan. The items such as pencils and note pads can be given to the students during your visit.

4. Create a certificate to leave with the class. This could be a certificate announcing the class as junior petroleum engineers or future petroleum engineers. Blank certificate forms are available at local office supply stores. (or see appendix)

At the Presentation

1. Take along small, colored adhesive dots and, at the beginning of the presentation, walk around the room and stick them on items that are petroleum products. (These sticker dots can be purchased in any office supply department or office supply store. They come in boxes of sheets and are available in many colors.) Don't tell the class what the dots are for until the presentation is finished. Let them guess, and let them suggest items the presenter may have missed.

2. Be prepared with salary information, not just what a beginning petroleum engineer can earn, but translate into what type of lifestyle it could represent.

A Final Note:

These ideas are just suggestions that may enhance your presentation. There are many others. Use your own experiences to share the exciting world of petroleum engineering with the students.
Demonstrating our industry is a more powerful tool that simply telling. You are part of a dynamic, colorful industry. Use that background to help get your message across.

The Career Role Play Game

Goals

Through the roles played by each of the participants in this game, various careers associated with the oil production industry will be revealed. The information about the various careers includes a description of the career, the educational path to reach the career, and some of the personal characteristics and perspectives of successful individuals in the identified career.

Procedure

1. The SPE presenter should introduce the overall nature of the game to the audience, explaining that the group will be acting as though they are attending a meeting at a major oil company convention. Depending upon the audience, the presenter may wish to explain more about professional meetings and conventions. Each of the selected players will be introducing him/ her and briefly describing a career.
2. Distribute the role cards to selected individuals. There are a total of thirteen roles: twelve career roles plus the role of Presider of the meeting.
3. While the participants are studying their roles and identifying the individual who will follow them in the role playing sequence, the audience should be provided with the Characteristics of Oil Production Related Career Table. Instruct the audience to record “Checks” and “details” in the table as the participants are presenting their careers.
4. Once a role card has been distributed to each of the players, the game is initiated by the Presider of the Meeting, who will set the stage for the rest of the short career statements to be read by the other participants. The final statement on each card leads to the next speaker. Preceding initiation of the game, each participant must identify the person designated to follow him/ her.

Instructions: When you are introduced to the group, act as though this is truly your career or job. Pretend that you are attending a special conference with many people who are in various oil production jobs. Before this meeting actually starts, the Preside has asked a group of people to introduce themselves. You will therefore describe yourself using the information on these cards. You will then direct the audience's attention to the next person to speak. In order to do this, you must know the name of the next person who ahs the job listed on your card. Therefore, you will need to identify this person before the introductions begin.

CAREER ROLE CARD

ROLE: Presider of the Meeting

Good day everyone. I would like to welcome all of you to the Gulf Coast Oil Production Conference. For those who came by plane, I hope your flight into our lovely city was pleasant.

We are here today to discuss oil production. First, I would like for all who are attending to introduce themselves and give a brief description of their position.

We will begin with _____ who is a roustabout.

CAREER ROLE CARD

ROLE: Roustabout

Hello, I am a roustabout working on the offshore drilling rigs. My job includes cleaning, scraping, and painting equipment, offloading supplies from boats, moving them to storage areas, and then shifting the supplies from storage areas to points of use. I also mix and condition drilling mud under the direction of a mud specialist. I am strong and can do the hard physical labor that is required of me.

My offshore company trained me which included safety training. My firm also has provided me with opportunities for additional training courses while I am on offshore leave. I had to be at least 18 years old to be hired for this job. Most of the workers are 21 and older.

My home life can be a bit odd, but the pay is good. My working hours are normally 12 hours on and 12 hours off continuously working for two weeks followed by a two week rest period onshore. I find the work exciting and challenging even though it is tough and demanding.

Now I would like to introduce you to _____ who is a roughneck.

Instructions: When you are introduced to the group, act as though this is truly your career or job. Pretend that you are attending a special conference with many people who are in various oil production jobs. Before this meeting actually starts, the Preside has asked a group of people to introduce themselves. You will therefore describe yourself using the information on these cards. You will then direct the audience's attention to the next person to speak. In order to do this, you must know the name of the next person who ahs the job listed on your card. Therefore, you will need to identify this person before the introductions begin.

CAREER ROLE CARD

ROLE: Roughneck

Hello, I am a roughneck. My job is to carry out the drilling operations under the directions of the driller. Training is provided by the offshore drilling company as the job requires a high degree of teamwork while performing hard physical labor. I love to be outdoors and work in all kinds of weather and conditions while on the rig. Working hours are normally 12 hours on and 12 hours off continuously fore two weeks followed by two weeks rest period onshore. My responsibilities include keeping the machines running all the time.

While my home life can be a bit different, the pay is good. Because I am the strong outdoors type, the job suits me well.

Now I would like to introduce you to _____ who is a geologist .

Instructions: When you are introduced to the group, act as though this is truly your career or job. Pretend that you are attending a special conference with many people who are in various oil production jobs. Before this meeting actually starts, the Preside has asked a group of people to introduce themselves. You will therefore describe yourself using the information on these cards. You will then direct the audience's attention to the next person to speak. In order to do this, you must know the name of the next person who ahs the job listed on your card. Therefore, you will need to identify this person before the introductions begin.

CAREER ROLE CARD

ROLE: Geologist

Hello, I am a geologist. I do surveying and map interpretation work. My task is to evaluate a given area offshore and decide of the site may contain sizable amounts of oil and gas. If it does, my company can set up to drill for oil and gas.

To become a geologist, I had to earn a college degree that includes chemistry, physics, engineering, mathematics, geology, geophysics, and petroleum engineering. As you can see, I had to study several science disciplines. Additional skills include computer technology that uses mathematical models and other computer programs. I also have found it helpful to speak other languages.

I sometimes work in the field gathering data but also spend considerable time in my office where I work on my computer. I have to use my knowledge of the sciences and math to analyze the data and try to put together the information into a model of the underground layers of rock. The pay is very good with travel expenses included. Depending upon the location we are analyzing, I sometimes travel to exotic sites and spend weeks or months away from home. I know my company depends upon my work to decide where to drill for oil. I like the challenge of discovering new oil and gas fields.

Now I would like to introduce you to _____ who is a systems application analyst.

Instructions: When you are introduced to the group, act as though this is truly your career or job. Pretend that you are attending a special conference with many people who are in various oil production jobs. Before this meeting actually starts, the Preside has asked a group of people to introduce themselves. You will therefore describe yourself using the information on these cards. You will then direct the audience's attention to the next person to speak. In order to do this, you must know the name of the next person who ahs the job listed on your card. Therefore, you will need to identify this person before the introductions begin.

CAREER ROLE CARD

ROLE: Systems Application Analyst

Hello, I am a Systems Application Analyst. My responsibilities include providing technical software support for applications involving several hardware and software platforms, systems installations maintenance and enhancement activities. In other words, my company depends upon me to be a computer expert.

My job also requires that I work well with people. My responsibilities also include frequent customer and use support. I have to understand both the capabilities of the computer applications and the people's need for computer support. I must make sure that all the programs used meet the needs of everyone involved in the oil and gas industry. Let me tell you, sometimes I have to think very creatively to meet these responsibilities!

I like this position because I enjoy working with many kinds of people from many different levels in the industry. My outstanding quality is that I work well with people whether individually or in groups.

Before coming to work for this company, I attended four years of college. I earned my degree in Computer Science. Other people who work in this position have degrees in Computer Engineering or Management Information Systems. This career requires one to be able to problem solve many different ways using the computer.

Now I would like to introduce you to _____ who is a toolpusher.

Instructions: When you are introduced to the group, act as though this is truly your career or job. Pretend that you are attending a special conference with many people who are in various oil production jobs. Before this meeting actually starts, the Preside has asked a group of people to introduce themselves. You will therefore describe yourself using the information on these cards. You will then direct the audience's attention to the next person to speak. In order to do this, you must know the name of the next person who ahs the job listed on your card. Therefore, you will need to identify this person before the introductions begin.

CAREER ROLE CARD

ROLE: Toolpusher

Hello, I am a toolpusher. My responsibilities include overseeing the whole drilling operations and depending upon the size of the operation, I am generally responsible for the whole drilling rig. I have to make sure that everything runs smoothly by having all tools, materials, and equipment available at all times. To reach this position, I had to experience several of the other jobs such as roustabout and roughneck positions. In order to perform well, I must have also acquired a great deal of experience working on a rig.

Sometimes I am given an assistant. This person is generally a graduate trainee who is gaining experience in the overall drilling activity.

Like the others who have introduced themselves before me, I enjoy working in the outdoors, but also love the challenge of problem-solving and decision-making involved in this job.

Now I would like to introduce you to _____ who is a derrickman.

Instructions: When you are introduced to the group, act as though this is truly your career or job. Pretend that you are attending a special conference with many people who are in various oil production jobs. Before this meeting actually starts, the Preside has asked a group of people to introduce themselves. You will therefore describe yourself using the information on these cards. You will then direct the audience's attention to the next person to speak. In order to do this, you must know the name of the next person who ahs the job listed on your card. Therefore, you will need to identify this person before the introductions begin.

CAREER ROLE CARD

ROLE: Derrickman

Hello, I work as a derrickman. I work about 85 feet high up in the derrick above the rig floor. I handle drill pipe under the directions of the driller. I like working in the outdoors in all kinds of weather and keep in excellent physical condition since the labor can be pretty strenuous. When not working in the derrick, I have the special responsibility of maintaining the rig pumps and drilling mud systems. In addition, I supervise all the roughnecks on the rig. My earlier experience working as a roughneck has helped me earn this present position as a supervisor.

I generally work 12 hours on and 12 hours off during a two week work period followed by a two week rest period onshore. This job can take me to various parts of the country and the world. My home life can be irregular, but the pay is well worth it.

Now I would like to introduce you to _____ who is a mud logger.

Instructions: When you are introduced to the group, act as though this is truly your career or job. Pretend that you are attending a special conference with many people who are in various oil production jobs. Before this meeting actually starts, the Preside has asked a group of people to introduce themselves. You will therefore describe yourself using the information on these cards. You will then direct the audience's attention to the next person to speak. In order to do this, you must know the name of the next person who ahs the job listed on your card. Therefore, you will need to identify this person before the introductions begin.

CAREER ROLE CARD

ROLE: Mud Logger

Hello, I am a mud logger. This vitally important job is usually held by a Geologist. I am trained to identify what rock formations are being drilled through. I look for the presence of hydrocarbons in the rock cuttings. The rock cuttings are brought to the surface by returning drilling mud and separated on the shale shakers. The company depends upon my knowledge and skills to interpret the information brought up by the drilling operation. This then allows us to decide if the site really will give us oil or gas or if it is waste of time and money to continue drilling.

I earned a college degree in geology, but I received much of my experience working as a trainee on various drilling rigs. I generally like to work outdoors, but sometimes I have to do other tasks onshore. My company provides me with additional training needed when I travel to potential oil production sites in different parts of the country and the world. I may not be at home much, but the travel is exciting and pay is very good. My skills include reading, subsurface maps, seismic graphs, and working with other people as a team or individually.

Now I would like to introduce you to _____ who is a Production Operator.

Instructions: When you are introduced to the group, act as though this is truly your career or job. Pretend that you are attending a special conference with many people who are in various oil production jobs. Before this meeting actually starts, the Preside has asked a group of people to introduce themselves. You will therefore describe yourself using the information on these cards. You will then direct the audience's attention to the next person to speak. In order to do this, you must know the name of the next person who ahs the job listed on your card. Therefore, you will need to identify this person before the introductions begin.

CAREER ROLE CARD

ROLE: Production Operator

Hello, I am a production operator. My responsibilities include the management of hydrocarbons. That means that it is my job to make sure that the oil and gas that my company takes out of the ground gets to the customer. In oil company terms, this involves producing, processing, and delivering the correct quantity and quality of the oil product. As you might guess, this involves a very complex system that must run smoothly and efficiently.

The production system can be divided into small systems:

- First there is the subsurface system. This includes the work done at the wells. Needless to say, when the oil is produced at the well, we have to be ready to store it or transport it quickly so that they can continue the flow from the ground.
- The second system is called surface handling. This includes various types of processing systems. As you may know, oils are not all the same and many different products are made from oil. Many people are involved in the work at the process plants where the crude oil is analyzed and processed.
- Finally, there is a complicated system to supervise the storage and sales metering.

My training is extensive. Besides having experience working in the field, my company provides courses related to production management and safety procedures. I am suited to working with many different types of people from many different levels in the industry. I also like to be involved in the decision making process of the production operations.

Now I would like to introduce you to _____ who is a Petroleum Technician.

Instructions: When you are introduced to the group, act as though this is truly your career or job. Pretend that you are attending a special conference with many people who are in various oil production jobs. Before this meeting actually starts, the Preside has asked a group of people to introduce themselves. You will therefore describe yourself using the information on these cards. You will then direct the audience's attention to the next person to speak. In order to do this, you must know the name of the next person who ahs the job listed on your card. Therefore, you will need to identify this person before the introductions begin.

CAREER ROLE CARD

ROLE: Petroleum Technician

Hello, I am a petroleum technician. I play an important role in the information processing areas of the oil business. Various members of the team depend upon me to run the computer applications needed to analyze their data and produce science and business reports. Because I work with a wide range of people in our business, I must be knowledgeable about the petroleum industry as well as skilled in computers.

Although I did not need to have a degree in engineering or science to be hired in this job, I did need a two year college degree. While earning my degree, I took some business courses and of course learned a great deal about different computer applications such as Excel.

My work is done entirely in the office. I never go out in the oil fields and my work hours are fairly traditional. Although, I may not go the oil fields, I do have the opportunity to travel internationally.

Now I would like to introduce you to _____ who is a diver.

Instructions: When you are introduced to the group, act as though this is truly your career or job. Pretend that you are attending a special conference with many people who are in various oil production jobs. Before this meeting actually starts, the Preside has asked a group of people to introduce themselves. You will therefore describe yourself using the information on these cards. You will then direct the audience's attention to the next person to speak. In order to do this, you must know the name of the next person who ahs the job listed on your card. Therefore, you will need to identify this person before the introductions begin.

CAREER ROLE CARD

ROLE: Diver

Hello, I am a diver. Even though remotely operated vehicles are being used more and more, there is still a need for underwater divers to work at the platform or while building pipelines. My responsibilities include, while underwater, connecting and welding pipes that are used to transport the oil and water to onshore sites; in addition, I may be used to supervise underwater activity in shallow water. Just like any other diver, I have to be certified. This means I have to pass certain tests before I can dive to certain depths. Safety procedures are always stressed and reviewed at regular intervals. I have to know how my equipment operates and that it is in top operating condition at all times. My training includes specialist skills such as welding underwater and mechanical fitting. Because of my unique skills, I am on call to many different offshore platforms nationally and internationally.

Now I would like to introduce you to _____ who is a petroleum engineer.

Instructions: When you are introduced to the group, act as though this is truly your career or job. Pretend that you are attending a special conference with many people who are in various oil production jobs. Before this meeting actually starts, the Preside has asked a group of people to introduce themselves. You will therefore describe yourself using the information on these cards. You will then direct the audience's attention to the next person to speak. In order to do this, you must know the name of the next person who ahs the job listed on your card. Therefore, you will need to identify this person before the introductions begin.

CAREER ROLE CARD

ROLE: Petroleum Engineer

Hello, I am a petroleum engineer. My job involves the removal and processing of hydrocarbons from formations located underneath the earth's surface. As we try to maximize the amount of oil we can retrieve from each well, we have had to think creatively. As a result, we have developed a variety of new recovery techniques such as injection wells and horizontal drilling. In addition to science and engineering skills, my job also requires that I understand business and commercial decision making. I am a key player in the company's efforts to meet the challenges facing the oil industry today.

I began my career as a production engineer. My initial assignments were in the production organization office. Then I worked as a reservoir engineer. My responsibilities included estimating field reserves of oil and gas using mathematical models and computer programs. I had other experiences for a brief time as a drilling engineer during which time I analyzed the drilling performance and factors affecting cost and efficiency. Now, I am a full petroleum engineer.

I like to travel so I am happy that the company sends me to many areas worldwide, onshore and offshore to solve problems. I am gone from home many days at a time, but the pay is very well worth it as well as the benefits. Sometimes, when I am on location, I am able to explore what life is life in the area and meet new people. I find it very exciting. I feel that I am very good at problem solving and working with other people whether as a team or individually.

Now I would like to introduce you to _____ who is a graphics artist.

Instructions: When you are introduced to the group, act as though this is truly your career or job. Pretend that you are attending a special conference with many people who are in various oil production jobs. Before this meeting actually starts, the Preside has asked a group of people to introduce themselves. You will therefore describe yourself using the information on these cards. You will then direct the audience's attention to the next person to speak. In order to do this, you must know the name of the next person who ahs the job listed on your card. Therefore, you will need to identify this person before the introductions begin.

CAREER ROLE CARD

ROLE: Graphics Artist

Hello, I am a graphics artist. My responsibilities include working with a team to produce layouts that promote the oil and gas industry. I do not work offshore but remain on land, although I once took a helicopter ride out to photograph workers on an offshore rig. You may have seen those big signs at the service stations telling you that ours is the fuel to buy and has the best performance ratings. That's me. Working in a team situation, I help produce sketches to be used in a promotional product. I like the idea of promoting this industry through my artistry. I enjoy working with people who can work together and successfully put a product together.

My working hours are pretty normal and the benefits are very nice. Sometimes, I get to travel to places to learn about oil and gas from another point of view. I may take pictures to help me decide how to draw a certain layout.

I have always loved to sketch, draw, and paint. I competed during my schools years in many art contests. After high school, I attended art school for two years, learning the various styles of artistry and developing skills needed to compete in the commercial world. Working for this company, I can continue my artistry, learn about the industry, and make a nice income.

Well, I guess that I am the lat one in the line for introductions. As you can see, the oil business includes a great variety of careers. Now, I would like to return your attention to the speaker for today.

Instructions: Listen carefully as each of the people playing roles in the career game describes their jobs. As you hear the presentations, you will notice that they discuss the nature of their job as well as various types of training experiences needed to prepare them for that career. In some cases, the participants will describe other details important to performing successfully in their chosen career.

Your task is to place check marks in the appropriate boxes as the participants describe their careers. When you hear a participant describe some detail that is not in one of the category columns, you should write in the detail in the column labeled, "Other requirements."

Career	Requires college	No college	On the job training	Office work	Outdoors offshore work	Outdoors onshore work	Travel	Other Requirements
Roustabout								
Roughneck								
Geologist								
Systems Application Analyst								
Toolpusher								
Derrickman								
Mudlogger								
Production Operator								
Petroleum Technician								
Diver								
Petroleum Engineer								
Graphic Artist								

Magic Suitcase
Certificate of Achievement

This certificate recognizes that

_____

has successfully completed

Junior Petroleum Engineer Education

This date _____

Presented by: _____

Presenter Reporting Form

Presenter _____ Company _____

Phone Number _____ Fax _____ Email _____

Address: _____

Audience (group age) _____ Location _____

Date of Presentation _____ Duration (min) _____

Module Presented _____

Estimated number in audience _____

Was this your first Magic Suitcase Presentation? YES NO

How did the presentation go? What worked and what didn't?

Suggested improvements to the program?

Suggested improvements to the manual?

Does the suitcase or any of its contents need repair or replacement? YES NO

Please list components needing repair.

CARING FOR THE MAGIC SUITCASE

The items in the Magic Suitcase were designed to be relatively rugged; however, they are not indestructible. A little care in cleaning, packing, and moving your suitcase will increase its life and usefulness.

Cleaning

Items to bring to help with cleaning: Large plastic bags, paper towels.

The demonstration items such as beakers, funnels, and the flask can be cleaned with soap and water. They should be thoroughly washed after use and allowed to dry before being replaced in the suitcase.

If you are doing the demonstrations in an area where it will be inconvenient to clean the materials immediately after use, we recommend putting all the used equipment in a large plastic bag before returning them to the suitcase. This will help protect the inside of the suitcase and the other items in the suitcase.

To avoid major cleanups, the gas and water drive demonstration can be done using only water.

The oil soluble dye should be used only in very small quantities. It is probably better to add some dye to the vegetable oil at home and transport the dye vial as little as possible. The dye will clean up with soap and water, but you should avoid getting it on clothes. Keep the dye vial in a separate plastic bag to avoid getting dye on everything in the suitcase.

The sand in the permeability experiment should be spread out and allowed to dry between uses. The syringes can be rinsed out. They can break, so they should be packed carefully.

Packing and Moving:

When transporting the suitcase items should be packed with reasonable care to avoid spilling oil, water or the oil soluble dye.

If you plan to ship the suitcase to another location, the items in the suitcase should be cushioned with packing material (shredded paper, newspaper, or Styrofoam chips). The oil soluble dye should be packaged carefully to avoid breakage of the vial and getting dye on the other items in the suitcase.

The transparencies, slides, and paper items should be protected from getting wet, oily, or dyed. Again, a large plastic bag will help protect them.

SLIDES