

Oil and Gas Drilling Workers – What Do They Do?

Activity Summary

- In this activity, students will:
- ♦ Identify the correct **Essential Skill** for all tasks given (Part 1)
 - ♦ Complete a personal response form (Part 2)

Prior Knowledge

- **Essential Skills**
- Technologies used in the oil and natural gas industry

Teaching Planning Notes

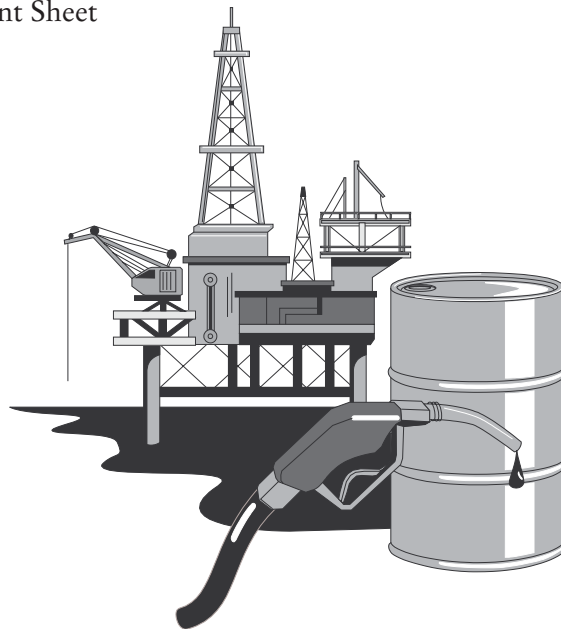
- Review assignment including prior knowledge and assessment required

Assessment of Student Achievement

Task	Tool / Type
Part 1 Assignment	It's a Gas Working in the Petroleum Industry Part 1 Activity Sheet (Formative)*
Part 2 Assignment	It's a Gas Working in the Petroleum Industry Part 2 Assignment Sheet (Formative)*

Activities

- Parts 1 and 2 Assignment Sheet
- Part 1 Activity Sheet



* Formatively assess students' demonstration of learning skills and their ability to meet career awareness competencies as outlined in Choices into Action.



FOCUS ON LEARNING

Essential Skills:

Writing

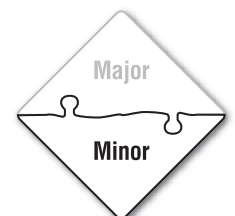
Parts 1 and 2

Thinking Skills

Part 1

Reading Text

Parts 1 and 2



Curriculum Linkages For Ontario Educators

Essential Skills truly are everywhere and as teachers we are always teaching students the **Essential Skills!** As subject teachers and specialists, we know that many of the curriculum expectations we are accountable to teach and assess, also address the **Essential Skills** and while the linkages are not always readily apparent, the linkages exist nonetheless.

While this activity connects to a variety of courses it is most closely aligned to the following course(s):

- Grade 7 and 8 Science and Technology
- Choices into Action

To assist you, the teacher, in making more transparent linkages, we have identified the following curriculum linkages for this activity.

Grade 7 and 8 Science and Technology

No direct curriculum expectations linked to this activity

While there are no curriculum expectations that directly link to this activity, both the Grade 7 and 8 Science and Technology Curriculum include strands on *Matter and Materials and Energy and Control*. This activity provides teachers with an opportunity to make student learning more relevant and to assist students in beginning to explore a whole variety of career options specific to Science and Technology.

Choices into Action

This activity, given its career exploration focus, can be used as a delivery tool within a school's Choices into Action Program. "Students in Grades 7 to 12 are more concerned about their futures and how they will fit in at high school, university, or college, during apprenticeship, or in the world of work. Principals and teachers must ensure that students in these grades have access to a broad range of career exploration opportunities, including opportunities in areas not known to students. Teachers and students should take advantage of opportunities that exist in the local and where possible, the wider community. Teachers should be sure to include activities that are both for-profit and non-profit and in both the private and public sectors, including business, industry, government agencies, arts and culture, and volunteer organizations."

It's a Gas Working in the Petroleum Industry



Part 1

Based on our discussions about technologies used to extract and secure oil and natural gas, let's take a look at the tasks associated with a job in this industry. Oil and gas well drilling workers and service operators run specialized hydraulic pumping systems to place cement in wells or to treat wells with chemicals, sand mixtures or gases to stimulate production. Workers in this group are employed by drilling and well service contractors and by petroleum producing companies.

Based on the tasks described on the Part 1 Activity Sheet, decide for yourself which of the nine **Essential Skills** are related to each of these tasks. For some tasks, more than one skill may be used in combination. Read carefully and record your answers in the space provided.

Part 2

Once you have completed Part 1, answer the following questions to the best of your ability.

1. Why is numeracy such an important skill in this job?

2. What might happen if the worker didn't have solid numeracy skills?

3. Why is working with others an important skill in this job?

4. Do you think reading is an important skill for this job? Why or why not?

5. What surprised you most about the skills required in this job?

It's a Gas Working in the Petroleum Industry Part 1 Activity Sheet

TASK	<i>Essential Skill(s)</i> REQUIRED TO COMPLETE THE TASK
Read manuals when studying for tickets on subjects such as the Workplace Hazardous Materials Information System (WHMIS), the transportation of dangerous goods (TDG) and first aid. (identify 2 skills)	
May complete a job hazards analysis form that lists who was at safety meetings, the kind of job to be done that day and hazards and concerns. They also read such forms prepared by others to be aware of safety concerns.	
May measure and tally the lengths of pipes being tripped down the well to tell the driller the depth they have reached.	
May receive instructions from a consultant about how much additive to add to water to produce the correct density of fluid to maintain adequate pressures and keep oil or gas from coming up the well.	
Complete treatment reports throughout the day, recording what is being done, times of changes, pressures, weights, temperatures, and flow rates. The reports are on paper or entered in laptop computers. They also read treatment reports to know activity status and to note stress points and times.	
May complete a job hazards analysis form at safety meetings listing participants, the kind of job to be done that day and hazards and concerns.	
May calculate the volume in a 5-inch casing at a depth of 2150 metres using a chart that gives the volume in cubic metres per 1000 metres of depth. (measurement and calculation math)	
May participate in pre-job safety meetings to discuss job outlines, procedures, hazards, potential problems and tools and materials needed. Listening and questioning are important for clarifying instructions and avoiding confusion.	
May complete treatment reports throughout the day, recording activities, times of changes, pressures, weights, temperatures and flow rates.	
Read and write, round off, add or subtract decimals, multiply or divide by a decimal, multiply or divide decimals. For example, calculating the number of pump strokes needed to pump a given volume of water by dividing the given volume by the volume per pump stroke (e.g., .0062 cubic metres per stroke).	
May read training and operation manuals to learn and review procedures, such as blowout prevention and well control procedures; the manuals contain text supplemented by diagrams, charts and schematics	
May find that a pump is frozen. They warm up the frozen pump by using steam. Operating a pump while frozen could crack the head on a costly piece of equipment.	

It's a Gas Working in the Petroleum Industry Part 1 Activity Sheet

TASK	<i>Essential Skill(s)</i> REQUIRED TO COMPLETE THE TASK
May instruct roughnecks and new workers about mud mixture procedures and quantities, and answer their questions.	
Complete a tally sheet recording the amount of nitrogen used at a well, or complete an invoice ticket showing the amount of cement used.	
May monitor gauges and analyze the relationships between pressures, weights and rates of flow to make sure levels are according to the prescribed program and to watch for unexpected changes which may mean shutting a system down	
May deal with pump malfunction, for example, when it loses pressure or stops drawing fluid. They report the problem and are also involved in solving it because they know the pump better than others do	
Use statistics and probability. For example, recording data on drill engine hours and performance (as well as reading graphs and analyzing the performance of the well) to predict when drills will need maintenance.	
Participate in formal discussions about work processes or product improvement.	
Use a database. For example, they may enter particular pressures and rates for an acid treatment job, using a customized program.	
Attend off-site training during working hours at no cost to the employee.	
May decide to shut down the nitrogen pumping operation when a pressure changes rapidly.	

Other Interesting Facts about this Job!

Attitudes

The oil and gas well drilling workers and service operators interviewed felt that oil and gas well drilling workers and service operators should be patient with equipment and co-operative with other workers, focused on dangerous and fast-paced work, adaptable, willing to work long hours and willing to learn and to obey instructions.

Future Trends



In the future, oil and gas well drilling workers and service operators will likely use more computerized equipment and do more record keeping on paper and by computer. New technology and new environmental regulations will involve the workers in further training and the use of more textual reading, document use and computer skills.

Source: <http://www15.hrdc-drhc.gc.ca/English/profiles/118.asp>

It's a Gas Working in the Petroleum Industry Part 1 Activity Sheet (Answer Key)

TASK	<i>Essential Skill(s)</i> REQUIRED TO COMPLETE THE TASK
Read manuals when studying for tickets on subjects such as the Workplace Hazardous Materials Information System (WHMIS), the transportation of dangerous goods (TDG) and first aid.	Reading Text Document Use
May complete a job hazards analysis form that lists who was at safety meetings, the kind of job to be done that day and hazards and concerns. They also read such forms prepared by others to be aware of safety concerns.	Document Use
May measure and tally the lengths of pipes being tripped down the well to tell the driller the depth they have reached.	Numeracy
May receive instructions from a consultant about how much additive to add to water to produce the correct density of fluid to maintain adequate pressures and keep oil or gas from coming up the well.	Oral Communication Thinking Skills and Numeracy (to determine if the instruction makes sense)
Complete treatment reports throughout the day, recording what is being done, times of changes, pressures, weights, temperatures, and flow rates. The reports are on paper or entered in laptop computers. They also read treatment reports to know activity status and to note stress points and times.	Document Use Computer Use
May complete a job hazards analysis form at safety meetings listing participants, the kind of job to be done that day and hazards and concerns.	Writing
May calculate the volume in a 5-inch casing at a depth of 2150 metres using a chart that gives the volume in cubic metres per 1000 metres of depth.	Numeracy
May participate in pre-job safety meetings to discuss job outlines, procedures, hazards, potential problems and tools and materials needed. Listening and questioning are important for clarifying instructions and avoiding confusion.	Oral Communication Working with Others
May complete treatment reports throughout the day, recording activities, times of changes, pressures, weights, temperatures and flow rates.	Writing Document Use (depending on nature of report form)
Read and write, round off, add or subtract decimals, multiply or divide by a decimal, multiply or divide decimals. For example, calculating the number of pump strokes needed to pump a given volume of water by dividing the given volume by the volume per pump stroke (e.g., .0062 cubic metres per stroke).	Numeracy
May read training and operation manuals to learn and review procedures, such as blowout prevention and well control procedures; the manuals contain text supplemented by diagrams, charts and schematics.	Reading Text Document Use (depending on nature of manual)

It's a Gas Working in the Petroleum Industry Part 1 Activity Sheet (Answer Key)

TASK	<i>Essential Skill(s)</i> REQUIRED TO COMPLETE THE TASK
May find that a pump is frozen. They warm up the frozen pump by using steam. Operating a pump while frozen could crack the head on a costly piece of equipment.	Thinking Skills
May instruct roughnecks and new workers about mud mixture procedures and quantities, and answer their questions.	Oral Communication Working with Others
Complete a tally sheet recording the amount of nitrogen used at a well, or complete an invoice ticket showing the amount of cement used.	Document use
May monitor gauges and analyze the relationships between pressures, weights and rates of flow to make sure levels are according to the prescribed program and to watch for unexpected changes which may mean shutting a system down	Numeracy
May deal with pump malfunction, for example when it loses pressure or stops drawing fluid. They report the problem and are also involved in solving it because they know the pump better than others do	Thinking Skills Oral Communication
Use statistics and probability. For example, recording data on drill engine hours and performance (as well as reading graphs and analyzing the performance of the well) to predict when drills will need maintenance.	Numeracy
Participate in formal discussions about work processes or product improvement.	Working with Others Oral Communication Thinking Skills
Use a database. For example, they may enter particular pressures and rates for an acid treatment job, using a customized program.	Computer Use
Attend off-site training during working hours at no cost to the employee.	Continuous Learning
May decide to shut down the nitrogen pumping operation when a pressure changes rapidly.	Thinking Skills

