

Peak Oil Game Teacher Guide

Game Goal

This game simulates the production challenges experienced during the life of a well and processing and transportation challenges when refining and shipping product. Teams are told that the team that recovers and processes the most oil in the 10 year period is the winner. This will motivate them to try hard and makes the activity fun, but this goal doesn't have much to do with the real educational goals, as the students will see later.

The jars contain black beans (oil), pinto beans (dirt, contaminate), and rocks or marbles. These jars are their 'oil field.' They can mine the oil from any jar in any order. The 'oil' gets more and more diluted toward the bottom of the jars, so they produce less and have to do more processing as they go deeper. Also, there may be obstacles in bottoms of jars, like rocks. They cannot move the jars, pick up the jars, lean the jars over, use their fingers to extract beans, or pull out the rocks. They are limited to using their spoons to scoop beans out of the jars and transport them between each location.

Each round of the timer (30 seconds to 90 seconds) is one 'year.' During each 'year,' the goal is to get as much clean oil as possible into the team's 'refined oil' container and then transported to the consumer in the 'usable product' container. Penalties are charged for contaminated oil and for beans (of any kind) spilled outside the containers. Each team also has a bag, box, or tub that they can use as a 'processing plant' in which to separate the beans. The processing must take place along with the drilling and stop after the timer goes off. Processing and storage facilities should also not be moved, picked up, or modified unless directed by the teacher.

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When the timer goes off, all activity stops immediately and the following things happen (in order):

1. Penalties are assessed.
 - Dirt in the clean, refined oil container: For each pinto bean in the refined oil container, remove two black beans. Also remove the pinto beans.
 - Spilled oil: For each black bean or pinto bean spilled outside any of the containers, remove two black beans from the refined oil container (these amounts can be estimated rather than having to make exact 'bean counts'). Groups should aim to have zero beans spilled.
 - Obstacles, like rocks and marbles, may *not* be removed from the jars.
2. Discard all spilled and unprocessed oil into the communal waste container.
3. Measure the year's production. Weigh, or count, the beans that remain in the clean container after the penalties and record that year's production in the team's notebook. Also record any penalties assessed in this year.
4. Place the current year's harvest into the team's accumulated oil storage container. They will use this stored oil to purchase tools and labor (employees).
5. Buy better tools and hire more staff. Teams use their accumulated inventory of oil as cash to buy new equipment and hire people. Set prices for either a new state-of-the-art tool or hiring a new employee. After each round, the instructor announces any changes in prices, the latest technology and its current price, which should rise or fall as the technology changes.

The game should continue for about '10 years'—depending on the interest level of students. It's important to play enough rounds or 'years' so that each team's production has started to decline.

NOTE: If scales are not available, students may count the beans. The purpose of weighing is to account for the potential variance in bean size.

Objectives

- Students will be able to describe possible production challenges faced over the life of a well.
- Students will be able to identify the peak production period for a well.

Time

- 1-2 class periods



Materials *PER GROUP*

- ¼ Teaspoons
- ½ Teaspoons
- Teaspoons
- Tablespoons
- Long-handled spoons
- Serving spoons
- Bags of black beans
- Bags of pinto beans
- Jars (Qt. sized mason or jelly jars or plastic containers)
- Rocks or marbles

- Digital balances
- Paper
- Notebooks
- Timer with alarm
- 3 Small tubs or paper bags per team
- 2 Large tubs per class

NOTE: Substitute items may easily be used. You should aim to have several different sizes of spoons, as well as 2-3 different colored beans or jar fillers.

Materials *PER STUDENT*

- *Peak Oil Game* worksheet, page

Preparation

- Prepare a set of jars (two or three per group) for each student team. Glass mason or jelly jars or plastic variations of these work well. Layer or mix black beans with pinto beans, and add a few obstacles like rocks or marbles. Vary the thickness and order of the layers in the jars. If you wish, make sure that each student team has approximately the same difficulty level represented by their jars. However, this is not necessary and may not be authentic.
- Gather the other materials students will need.
- Make a copy of the worksheet for each student.
- If you wish, assign students to groups of 3-5 students each before conducting the activity.

OPTIONAL:

- Download the Peak Oil PowerPoint for use in explaining the procedure and modify as needed. The PowerPoint is available at www.NEED.org/oilandgasmaterials.
- Depending on the level of your students, you may choose to make nametags for the processor, driller, transponder, etc. Students can purchase extra nametags each year for their team members to demonstrate hiring additional staff to increase production.
- You may also wish to place the jars inside a shoe box or cover the jars with paper. This will make the activity more challenging, but more closely mimic the challenges faced during drilling and production of a well. Students can also buy the opportunity to do further 'exploration'.
- Depending on the number of students, it may be appropriate to designate student inspectors or assessors that monitor the other groups and their drilling sites and assess penalties.

Procedure

1. Explain the game to the students, making clear the rules of the game, and the time span of each 'year'.
2. Indicate to the students which containers are to be used for processing and where clean oil should go.
3. When everyone is ready, begin the first round of play. This is year one.
4. Continue to play the game, with 30 seconds to 1 minute representing one year of production for as long as time will permit. Make sure the game is played long enough so production begins to decline.
5. Discuss with the class the obstacles each group faced and how their oil production varied as a result. Connect their difficulties to oil retrieval in the field. Also discuss how the penalties played a part in the game. How might industry professionals and assessors have to work together. How might student views towards regulations faced in the industry change after the game? Discuss the amount of waste created in the game, and make sure students understand that processing facilities can now continually reprocess the waste materials until the desired result is achieved.
6. Have each team graph their annual oil production.

Extension

- After students have gotten a good grasp of the activity through several rounds, introduce the option to purchase a re-processing facility (bag or container) that allows students to process waste items rather than discarding them between rounds.

