

4.1 SWEET EXPLORATIONS

How does horizontal drilling access more crude oil and natural gas?

MATERIALS

Per small group of students:

- Cream cakes
- Flexible straws (or other clear plastic straw)
- One large-diameter straw
- Template/record sheet for measuring the filling collected (attached) or a ruler and record sheet.

DIRECTIONS

1. Unwrap the cream cake.
2. Drill a vertical hole in the middle of the cake using the large-diameter straw. Turn the straw as you are “drilling”. Alternative ideas:
 - a. Drill the vertical hole at one end of the cream cake, and then use just one flexible bent straw to drill the cake through to the opposite end.
 - b. Drill a number of vertical holes, allowing for one finger width spacing between each well bore and one finger width at both ends of the cream cake. After drilling, measure the quantity collected and compare the results with the horizontal well results.
3. Carefully remove the straw and measure the amount of filling collected by laying it along the grid. Mark in the squares to correspond to the filling collected.
4. Next, stretch the flexible straw to its full extent and bend it at a 90° angle. Insert the straw into the “surface hole” and gently guide it through the cream cake to the end.
5. Carefully withdraw the bent straw, then measure and record the amount of filling collected as above.
6. Stretch and bend the second flexible straw, then insert it in the hole going the opposite direction.
7. Repeat the withdrawal and measurement process.
8. Total the amount of filling collected by drilling horizontally and compare it to the amount collected in the vertical drilling.

REFLECTION

1. How does a driller rotate the drill bit 7,500 feet below ground?
2. Is it difficult to stay within the filling? How do you think a drilling rig would do it?
3. Which way was the most effective to collect filling: vertical or horizontal? How great was the difference?
4. How might you use well stimulation to get more cream from the cake?



