

Part 1 Fracking

A. Open Wikipedia - in search box type "fracking". Read the introductory paragraph

1. The full name of the process known as "fracking" is _____
2. Why has it been banned in some countries?

B. Teacher web site. Open **Fracking.pdf** file from Sci American Nov 2011

Read the introduction and study the figures

Study Figure 1 1. How deep is a typical well?

2. Where is the tainted wastewater stored ?

Study Figure 2 3. Explain the 3 possible sources of groundwater contamination detailed in figure 2

a)

b)

c)

4. On the front page read the IN BRIEF box . What do you think about proposals to increase the scale of fracking operations in the USA?

C Back to Wikipedia fracking . Go down to **Environmental Concerns**

1. Name 3 states where fracking has been blamed for water contamination.

Down to **Chemicals**

2. A single well could use up to _____ water

3. Are the additional chemicals all non-toxic?

4. What did the 2011 study recommend?

Down to **Greenhouse Gas Emissions**

5. Was is Natural Gas preferred as a fuel to coal?

6. Why does this article consider "fracked" gas overall worse than coal or oil? Explain in detail (2 points)

D. You tube videos

1. Home video of water believed contaminated by "fracking"

<http://www.youtube.com/watch?v=d6G6Ap-mF0k&feature=fvwrel>

What happens?

2. "fracking song" http://www.youtube.com/watch?v=timfvNgr_Q4

how does this compare with the scientific american and wikipedia details above

E. <http://www.bloomberg.com/news/2011-12-08/gas-fracking-chemicals-detected-in-wyoming-aquifer-epa-says.html>

1. What was the EPA's conclusion?
2. Why was this significant ?
3. What did the industry say?

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Tar Sands

A. 12 min video Apr 27 2011 <http://www.youtube.com/watch?v=YkwoRivP17A>

1. 120 b dollars has been invested in _____
2. The project uses enough natural gas to heat _____ and puts out as much GHG as _____
3. The toxic lakes can be seen from _____
4. Arsenic and other chemicals combine to be _____
5. The tailings volume is 1.8 billion L per _____
6. The leakage rate of 1L out of _____ is not OK because of the _____
7. The main habitat affected is Canada's _____, home to _____
8. A former Suncor employee is now a minister in charge of _____.

B. Keystone Project <http://youtu.be/UJjnaYct1mk>

1. Name 4 of the toxic compounds released _____
2. People downstream are experiencing increased _____
3. The Keystone project was planned to bring _____ / day from Canada to _____
4. The corrosive oil weakens _____
5. The route planned crosses the _____ aquifer
6. Pollution will probably cause more _____

C. Current Status - Read and answer

<http://www.nytimes.com/2011/11/11/us/politics/administration-to-delay-pipeline-decision-past-12-election.html>

1. The Obama administration announced the _____ until after _____
2. The also ordered a review of possible _____
3. Why is the Sand Hills area especially sensitive ? _____
4. Does this article have any reference to environmental problems in Canada? _____

Alternatives

Explain three ways americans could avoid the need to fracking or Tar Sands Oil