Fracturing with Gelatin

INSTRUCTIONS

1. You have a cup of gelatin

2. Fill the syringe with small amount of green fracking fluid. Make sure syringe has blue tip on it.

3. Insert the syringe into the gelatin.

4. Inject the green fracking fluid into the gelatin and observe the fracturing pattern of the gelatin.

5. Pull the syringe back out of the gelatin block.

Questions:

1. Why did you have to apply pressure to fracking fluid to create fracture patterns?

2. How does this model represent hydraulic fracturing?

3. How does this model NOT represent hydraulic fracturing?

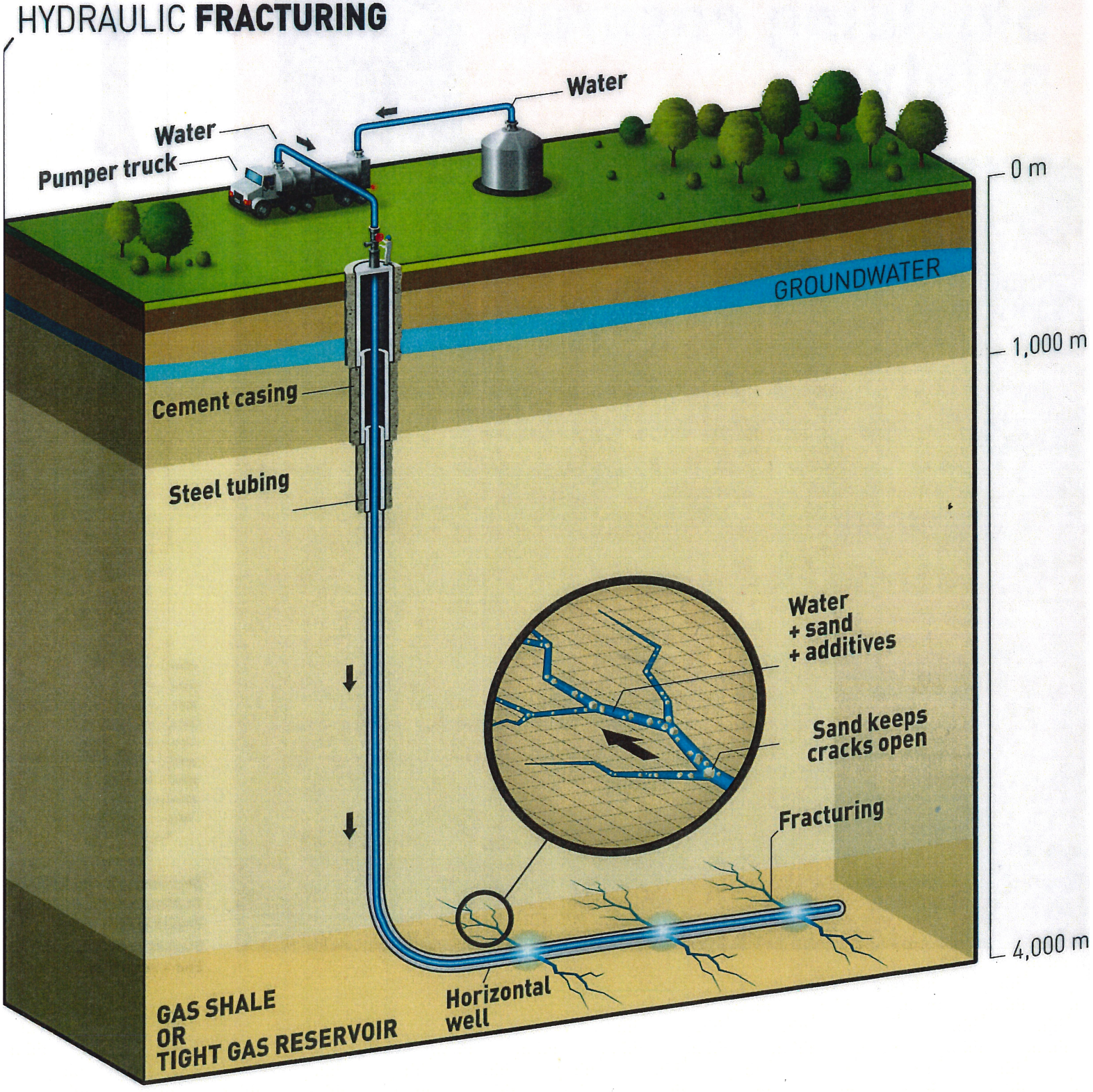
4. What improvements could be made to the model to make it more accurate and realistic?

5. How does the water simulate fracking fluid?

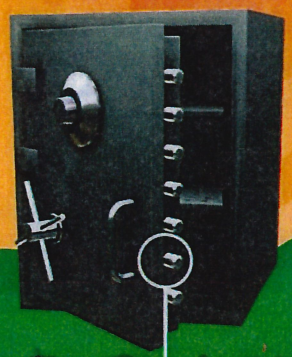
6. How does the water NOT simulate fracking fluid?

7. Do you think if you changed the density of the fluid, would the fracture patterns be the same?

8. Why do hydraulically fracture wells?


HYDRAULIC FRACTURING
Water
Water
Pumper truck
0 m
GROUNDWATER
1,000 m
Cement casing
Steel tubing
Water
+ sand
+ additives
Sand keeps
cracks open
Fracturing
4,000 m
GAS SHALE
OR
TIGHT GAS RESERVOIR
Horizontal
well

Shielding ensures safety



In the hydraulic fracturing process, there are about

10 inches of steel and concrete **SHIELDING** underground aquifers.

That's comparable to an armored door on a bank vault.

Hydraulic fracturing wells go **far below** underground aquifers.

2000ft

3000ft

4000ft

5000ft

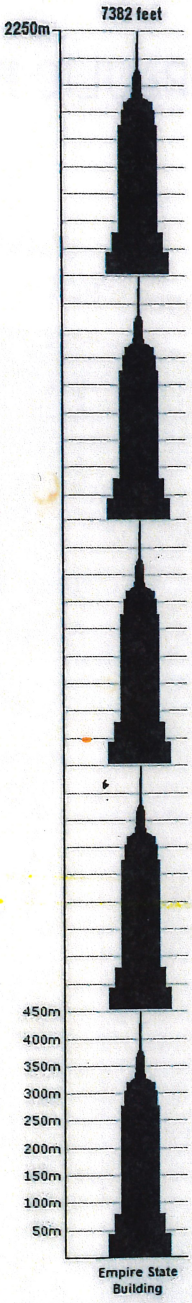
6000ft

They reach approximately **6,000 feet** or more under the earth's surface - almost the distance of **4** Empire State buildings stacked on top of each other.

Ten inches of steel and concrete; that's the shield protecting Mother Nature as rigs extract much-needed clean-burning natural gas from deep beneath shale formations from Pennsylvania to Texas.

This vault-thick armor isn't just on a few of the natural gas wells, it's the industry standard. Hydraulically fractured wells have multiple layers of steel and concrete to protect underground aquifers and isolate the wellbore. On top of this protection, state regulators and the industry are also making sure that well construction meets an additional host of rigorous safety standards.

How Far Under-ground Does Fracking Take Place?



Between 5,000 and 8,000 Ft, Or About The Depth Of The Empire State Building Stacked On Itself End to End 4 to 5 Times.