

Understanding Flint's Water Crisis

Resources:

<https://www.youtube.com/watch?v=k18vbGwPxz4>

<http://cen.acs.org/articles/94/i7/Lead-Ended-Flints-Tap-Water.html>

1. What level of lead has the EPA set as the threshold for when water utilities must act? How much higher was the level in Flint?
 - a. **15 ppb is the threshold for when water utilities must act but Flint had 13, 200 ppb in their water.**
2. The C&E News article said that even after flushing the pipes for 20 minutes the level never got below 300 ppb. Why would you expect the level to go down after flushing the pipes?
 - a. **I would expect the level to go down after flushing the pipes because all the water would be drained and then refilled.**
3. Prior to 2014 the water in Flint was safe, what caused the water quality to change? Why did they make this change?
 - a. **They used the Flint River as a water source because it was cheaper.**
4. Why is lead particularly problematic for children?
 - a. **The brain has not be fully developed and once it is in a child's body it will stay there forever.**
5. Pipes often contain a "mineral crust" on the inside. Is this good or bad? What purpose does it serve? How did the mineral crust in the pipes in Flint change?
 - a. **It is good and it protects the pipes from oxidation. In Flint the "mineral crust" was not treated so it broke down allowing iron and lead to get into the water and pipes.**
6. The author lists several factors that should be monitored when switching water sources. Name two of them.
 - a. **Minerals in the pipes and the amount of minerals in the water.**
 - b. **pH**
7. What is an oxidant? How did oxidants in the water contribute to lead in the water?
 - a. **Oxidant is something that causes another atom to lose electrons and it contributed to the lead in the water by oxidizing the lead in the pipes that wasn't protected by the "mineral crust".**
8. Write the oxidation half-reaction that is responsible for the high levels of lead in the water in Flint.
 - a. **$\text{Pb} \rightarrow \text{Pb}^{2+} + 2\text{e}^-$**
9. The water sample shown in the video is brown. Why?
 - a. **Because of the iron from the pipes.**
10. Write the oxidation half-reaction that is responsible for the brown color in the water in Flint.
 - a. **$\text{Fe} \rightarrow \text{Fe}^{2+} + 2\text{e}^-$**
 - b. **$\text{Fe} \rightarrow \text{Fe}^{3+} + 3\text{e}^-$**