

Testing radon levels in schools

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Question

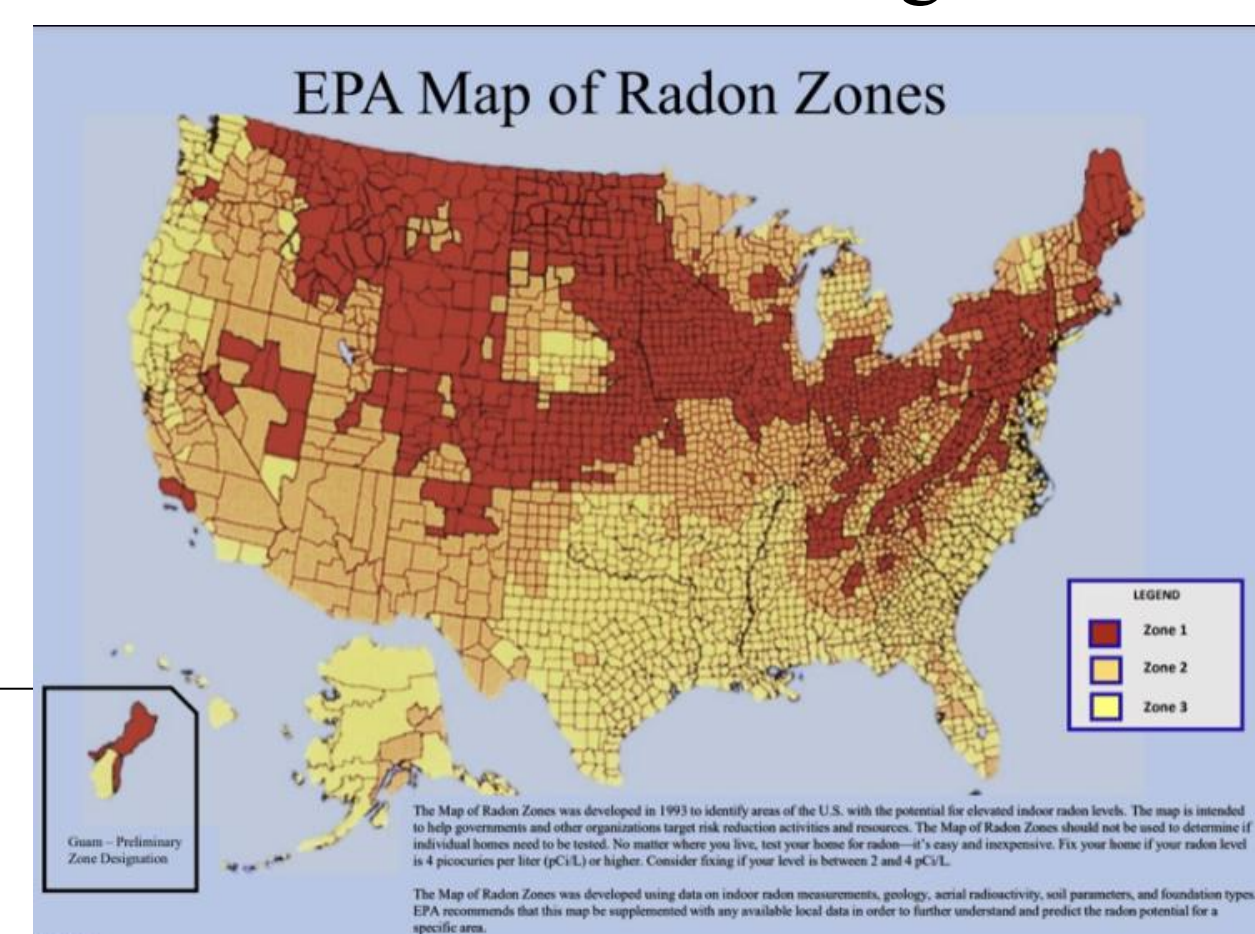
Are Anaconda Schools radon levels below the EPA standards?

Background Information

- EPA standard indoor level for Radon: 4 pCi/L
- Average radon level in American homes: 1.3 pCi/L
- Found most commonly in basements or floors in contact with the ground.
- Odorless and colorless
- Radon is responsible for 21,000 lung cancer deaths every year in the United States.
- In the United States Alaska comes at Number 1 with an average radon level at 10 pCi/L in homes.
- Average Montana homes comes in at 5.9pCi/L
- The EPA recommends that homes and buildings get tested every two years
- Radon is typically overlooked and does not get the attention it deserves.

Hypothesis

We hypothesize that the radon levels in Anaconda schools will be higher than the average indoor Montana building.



Method

- Our method consisted of using radon testers in school classrooms with the permission of the principals. We would leave the radon testers in the classroom for 48 hours at a time to get the reading of the area.
- The radon testers are small and have long cords so they are easy to use but you must have them at certain places such as 20 inches from a wall 20 inches from a ceiling and 20 inches off of the floor
- Having things such as windows open can increase or decrease the reading to make it inaccurate on the tester. You also want to keep the testers away from ventilating systems as they can also affect the reading in short term tests.
- Having people touch and move the radon tester can affect the reading, so place the tester somewhere where it will not be touched
- We tested three different schools between February and April, with 14 tests completed between the three schools on nine different floors.
- Things we could control were the amount of time of the radon testers testing, placing testers in strategic places where ventilation systems, kids, wind would not affect the testing result.
- Things we could not control were airflow(doors, windows, AC, ect.) coming in and out of the rooms, children or adults touching or moving testers. We could not control the temperatures although we did look at temperatures of every room and they read from 68 to 74 degrees fahrenheit.
- Figure A and B show the Radon tester we used in a proper location running. Figure C shows the radon tester with the options of test on it.

Figure A.



Figure B.



Figure C.



Results

- Average: 1.77 pCi/L
- National average radon level in buildings: 1.3 pCi/L
- Average radon levels in Montana buildings: 5.9pCi/L 1.9 pCi/L above the EPA's standard levels
- The Average radon levels in the Anaconda High School was 1.6 pCi/L
- The Average radon levels Fred Moody Intermediate School read 1.95 pCi/L
- The Lincoln primary schools Average was 1.7 pCi/L
- Overall the basements in all the schools we tested consisted of an average radon level of 1.75 pCi/L
- Overall the ground levels in the schools we tested read 1.96 pCi/L
- The second story floors had an average reading of 1.5 pCi/L
- The third story floor of Fred moody was the highest radon level average with 2.3 pCi/L
- Figure 1 shows the average Radon levels in each school we tested compared to the national indoor average.
- Figure 2 shows the average off all tested classrooms compared to the national indoor/home and Montana home average.
- Figure 3 shows the average between the floor levels compared to the national indoor average, basement(in contact at point below the ground) ground floor(above basement level or on ground level), second story, third story.



Figure 1.

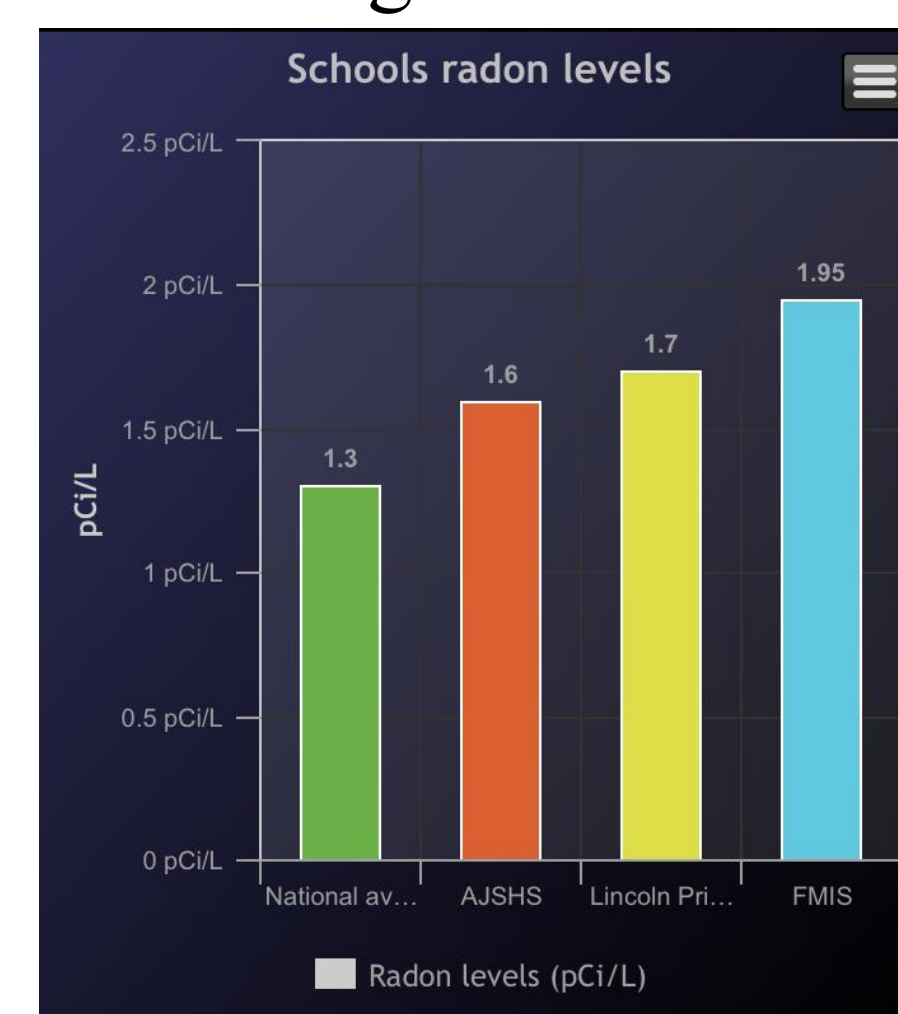


Figure 2.

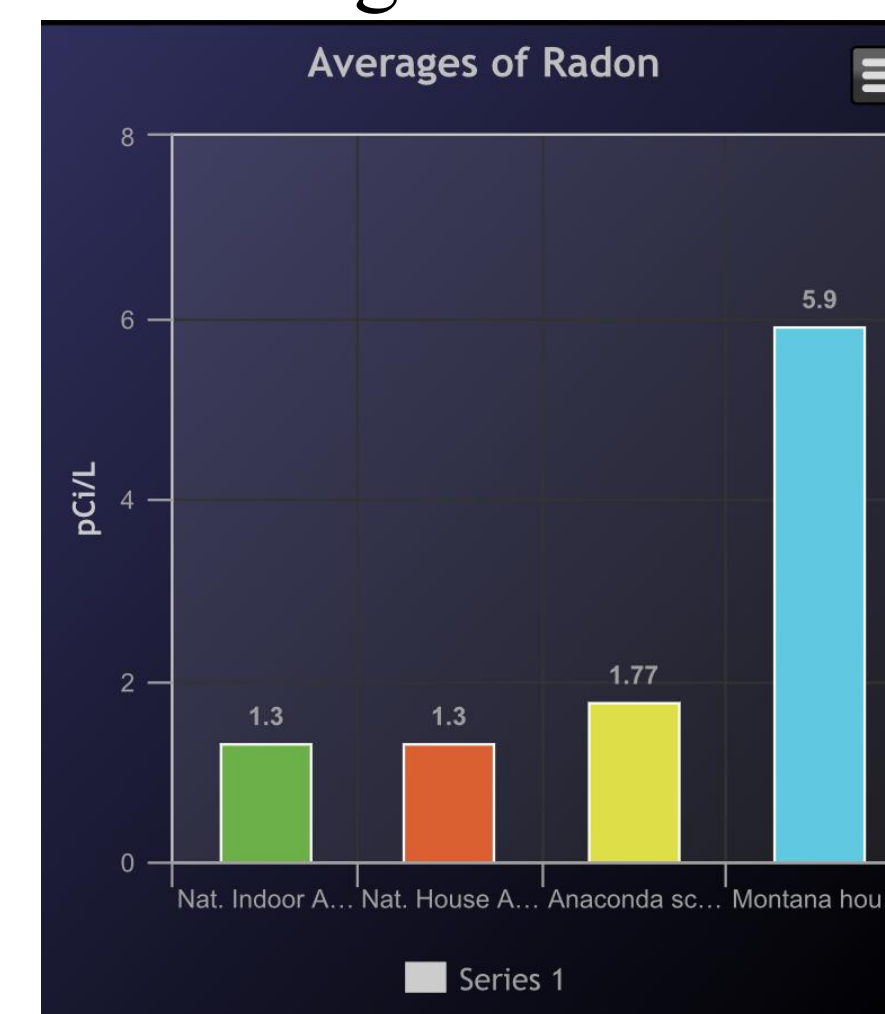
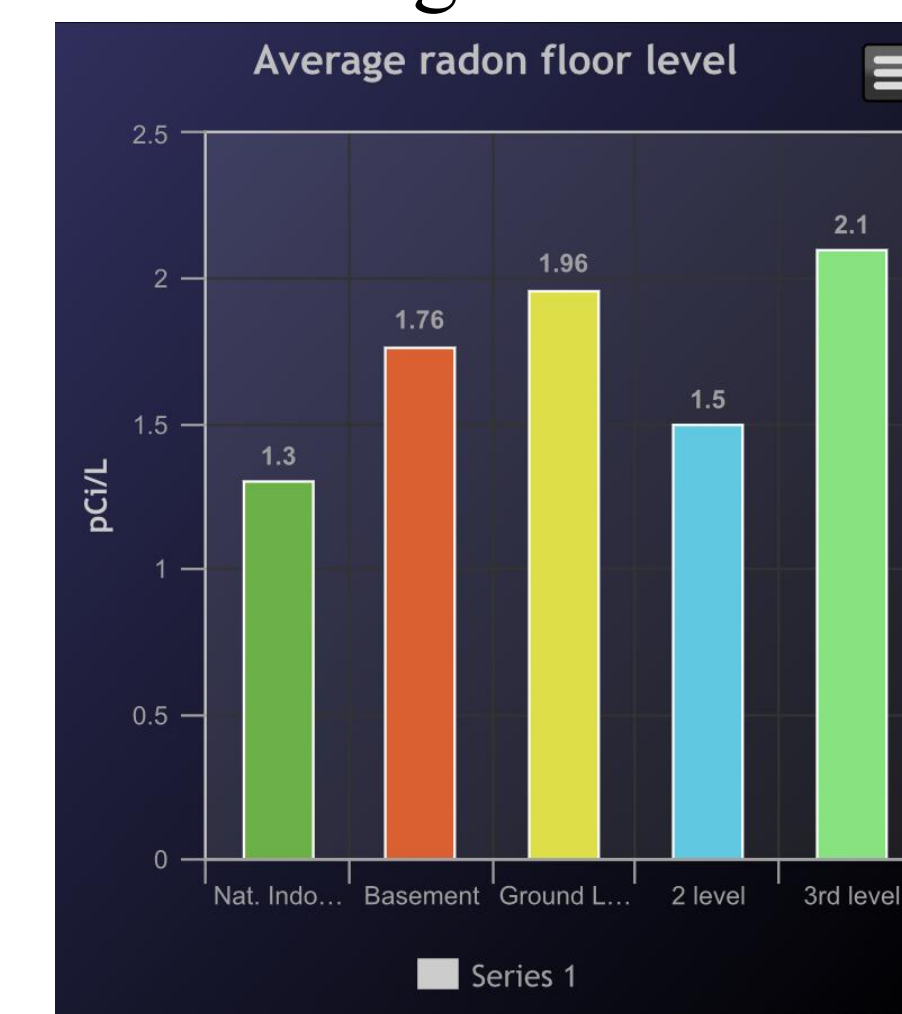


Figure 3.



Conclusions

- We have concurred that our districts schools are safe for radon levels. The average was not far ahead of the national average and is well below the EPAs standard.
- The highest radon reading was 2.3pCi/L and the lowest was 1.2pCi/L.
- Our hypothesis is incorrect because Anaconda schools had lower radon levels than the average Montana building.
- Looking at data from our tests we have learned that with such a high average in Montana homes that more people should test their homes for radon as it is the second leading cause of lung cancer second to cigarettes.
- Radon should have more attention brought to it with how many deaths it causes every year and it being easy to test and detect.
- If we did this research again we would do more tests and try to control every little thing we could, we would also try to do long term testing to see if the results would come back different.
- It is important to test for Radon because it can prevent lung cancer, it is easy to get rid of after it is detected.

References

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