Radon on the Move
Experiment Worksheet

Gather your experiment supplies.

You will need per person:

- Safety goggles
- Piece of paper 22cm x 14cm (A4 cut in half) to make paper straws
- Tape

You will need per group:

- 2 beakers
- Gravel or small rocks (enough to fill the beaker)
- Sand (enough to fill the beaker)
- Water in small jug
- "B.C. Radon Map" or access to internet on a device to view an interactive radon map http://www.bccdc.ca/health-info/prevention-public-health/radon.

As a group discuss if you think you live in an area where radon levels could be high? Remember from the video that radon levels in buildings should not be higher than 200 Bq/m3 (Bq/m3 = becquerel per cubic metre). A becquerel is the unit of radioactivity.

STEP 1

Take a look at the "B.C. Radon Map", showing levels of radon or go to: http://www.bccdc.ca/health-info/prevention-public-health/radon to view an interactive map. The map reflects areas where testing of radon has been done. The areas in red indicate that over 30% of the homes tested were above 200 Bq/m3. The data is not conclusive and testing is recommended in all homes, even in areas where only 1% of the homes tested were above 200 Bq/m3.

DID YOU KNOW?

Uranium exists in nearly all rock and soil and the movement of radon can vary greatly based on the formation of the earth or the presence of cracks and fissures below individuals' homes.

Answer the following questions:

a. Which areas of BC are estimated to have the highest concentrations of radon in homes?

_____.

b. Which areas have the lowest?

_____.

c. Find your community on the map and record what percentage of homes tested were above 200 Bq/m3.

_____.

STEP 2

Some areas of British Columbia have naturally higher levels of radon than others. This is due to the local geology, how much uranium there is in the area, as well as the types of soil in the ground. We will be testing 2 types of soil: sand and gravel (small rocks), to determine which types of soil allow more radon to escape from the ground.

Make the following predictions:

a. Which soil type: sand or gravel would allow radon to escape more easily from the ground?

_____.

b. Why?

_____.

c. Would clay soil make the escape of radon harder or easier?

_____.

c. If you added water to the soil would that make the escape of radon harder or easier?

_____.

STEP 3

- Each person make a paper straw by rolling your piece of paper to 1.5cm diameter and 22cm long. Tape to secure.
- Put on safety glasses.
- Start with the sand soil. Taking turns, fill one beaker with about 2cm of sand. Next place your straw in the middle of the beaker touching the sand, then pack sand around the straw to within 2 cm of the top of the beaker. Blow into the straw and assess how easy it was to move air. Take out the straw.
- The next student now places their straw in the sand sample, repacks the sand tight, repeats the experiment and makes their assessment.
- Repeat this process to test the gravel soil.
- Record your findings below.

a. Was it harder to move air in the sand sample or the gravel one?

_____.

b. Did this answer support your prediction?

_____.

c. After doing this experiment would you conclude that clay soil would be even harder to move air through?

_____.

STEP 4

- Choose a student in your group to repeat the sand experiment with water. Place your straw into the sand sample and add water till the water reaches at least 1cm above the sand level. Blow into the straw and access how easy it was to move air, comparing it to the test in the dry sand.
- Record your findings below.

a. Was it easier or harder to move air in the sand and gravel samples with water added?

_____.

STEP 5

Deduction and Conclusion

a. Drawing from your predictions on various soil types and your experiment write your conclusion on the type of soil that **would reduce the movement of radon gas out of the ground** and comment on what might change if water was present.

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_____.