

STEM in the lab

.....● Inspiring Idaho's future STEM workforce

POPCORN PERCENT INCREASE



MISSION

Use popcorn to understand how volume yields energy.



GRADE LEVELS

This activity is appropriate for students in grades 5-9.



MATERIALS

- » Kernels for popcorn
- » Measuring cups
- » Measuring tape

ABOUT THIS ACTIVITY

Ratios, direct variation, percentages, and related rates are important concepts in math and science. One of the attractive features of nuclear energy is the ratio of fuel consumed to energy output. A very small volume of fuel yields a lot of energy compared to other fuels like natural gas or coal. A fun activity to model this involves popping popcorn. A small volume of kernels makes a tasty treat with a much higher volume than the input of kernels. Idaho National Laboratory is the nation's leading center for nuclear energy research and development.



DIRECTIONS

- 1 Use kitchen measuring cups to measure the volume of the kernels you will pop.
- 2 Make the popcorn.
- 3 Before you eat the popcorn, measure the volume of popcorn you made.
- 4 While you enjoy the popcorn, ask your student(s) to work in teams to calculate what volume of popcorn kernels one would need in order to fill an entire room in your house with popped popcorn. Make sure to do the math on paper. This is where every science activity should end, with some quantitative analysis.
- 5 You will need a measuring tape to calculate the volume of the room. The volume of the room is length times width times height. If you measure in inches, you will get a volume in cubic inches. The conversion to the same units you used to measure the popcorn might be challenging. Feel free to use Google to convert, but you get extra points if you can convert from cubic feet to kitchen measuring cups without Google.
- 6
$$\frac{\text{Volume of kernels for your snack}}{\text{Volume of popcorn you made}} = \frac{\text{Volume of kernels to fill room}}{\text{Volume of room}}$$
- 7 To solve this equation, you will need to cross multiply and divide. Feel free to look up the technique online. Also, note that you will need to use all the same units. In other words, you will need the volume of the room you wish to fill in cups.

LEARN MORE

Students + Parents + Educators

For information on grants, training and student opportunities, curriculum ideas, and other resources, please visit ***stem.inl.gov***.