Make an At-Home Excavation Unit

Estimated Time: 60 minutes

SUMMARY
Why do archaeologists dig, or excavate, in squares? What can an archaeologist learn when testing an archaeological site? In this activity students will learn about how archaeologists sample an archaeological site and use the Pythagorean Theorem.

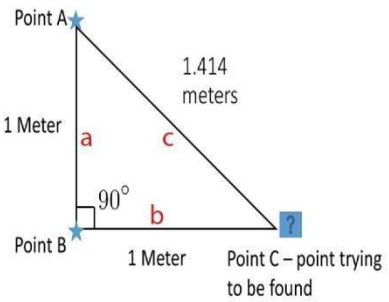
WHAT YOU'LL LEARN

- How to make a 1 m by 1 m excavation unit using the Pythagorean Theorem
- How to make observations of a sampled area and make interpretations

Materials Used	Resources Used (all optional)
• Paper (Graph paper if possible) • Pen or pencil • Tape (painter's tape or masking tape) • Measuring tape (with metric units preferred) • A right angle (any square corner will do to guide your measurements)	• https://youtu.be/uaj0XcLtN5c • https://en.wikipedia.org/wiki/Pythagorean_theorem • https://www.saa.org/about-archaeology/what-do-archaeologists-do

WHAT TO DO

1. Archaeologists use excavation units to test what types of things may be buried underground that would indicate past human activity. Excavation units are the areas where archaeologists excavate, or dig, to look for evidence that people once lived in the spot archaeologists are sampling. In many cases, archaeologists start excavations with an area defined by a 1 meter by 1 meter square: what archaeologists refer to as a 1 m by 1 m excavation unit.
2. You are going to see how much you can learn about people from a 1 m by 1 m excavation unit. What can an excavation unit ($1m^2$) of your home tell you about who lives there?
3. Tape out your excavation unit. Use a visible type of tape that's easy to remove from the floor (like painter's tape), a measuring tape, a right angle, and the Pythagorean Theorem ($a^2+b^2=c^2$). Set a point (Point A) and measure out 1m of tape to set Point B (Figure 1). Tape it down. Using your right angle, measure slightly longer than 1 meter of tape to the right (Fig. 2).



4. Now find Point C. Using the Pythagorean Theorem, we find out that the distance between Point A and Point C should be 1.414m or 141.4 centimeters (cm) (Fig. 3). On your tape measure find 141cm (as close as possible). Then measure from Point A to the taped line from Point B. Mark where the measuring tape crosses the line (Fig. 4).

5. Finally, using your right angle to finish the square up to a new Point D (Fig. 5) and then left, back to Point A. Double check your grid by measuring between Point B and Point D (Fig. 6). If it is 141cm then you have your 1m square (Fig. 7). You can also measure all the sides of your square. They should all be 1 m! Make sure to point out that two right triangles make one square!
6. Now, examine ONLY what falls within that square meter of space. What do you see? Write it down in detail. If you want to, get some paper and sketch out what you find in that square. With that small amount of information, what can you tell about this part of your home? For instance, does the type of flooring change at all in this space? Does the type of flooring suggest anything about the use of space?
7. Look closely. Are there toys? Bits of food? Cat or dog hair? Trash? (I hope not, but artifacts are mostly other people's trash!) What does this tell you about the people living here? You will see that you can get some information from this little area of your home. But more information is ALWAYS better.
8. Sampling: Where would you put another test unit to tell you more about the space you live in? Right next to the previous test? Upstairs? Downstairs? Nearby or far away? The more information you can record the clearer interpretation you can make about the space you are testing.
9. Now think about how archaeologists may interpret the 1 m by 1 m excavation units they study. How much information, or evidence, do you think they recover from such a small space?

TIPS

- Use areas of transition (i.e., playroom to bedroom, bedroom to bathroom, kitchen to dining room) to see what is different about the spaces.
- Don't clean up! Most of what archaeologists find is what someone left behind. Leaving toys, books, and other objects on the floor may help you make a better interpretation about what you and your family do in that room.
- Archaeologists excavate in squares because it helps them more easily map things they uncover during excavations. And they can use one of the corners of the square as a common point for mapping where things of interest are and how far down in the excavation unit they were uncovered.
- Obviously, you will know what part of your house you are observing which will bias the observations, but ask questions like: Can we KNOW that this is a kitchen floor based just on what we see in the square? Archaeologists are confronted by that question in their research all the time!
- Archaeologists typically use compasses to lay out their excavation units. A single point (Point A) is decided upon. Then, the archaeologists will use string and a compass to make the first side of their square. They might pull that string north (0°), south (180°), east (90°), or west (270°) depending on their plans for excavation. If you have a compass handy or a compass app on your phone, you can try this method. Just hold the tape under the compass so the compass cross hairs lay over and align with the tape.

- Younger children can do this project as well, though less emphasis needs to be put on getting a perfect square in this case. Use the steps above to create the square, then call in the young students to investigate the area.
- You might be tempted to take this activity outside, but please do not! We've written this activity to be done inside so that kids are not tempted to excavate in their yards and to find artifacts. Excavating in your own yard can be dangerous. Utility lines are often buried underground. It is also important for students to know that archaeologists learn a lot of information from the location where artifacts are recovered. It is important to leave artifacts in the location where they are found so archaeologists can learn as much as possible from that artifact. By digging up artifacts, kids could potentially destroy important scientific information. **If you want to report an archaeological site and live in Illinois, call the Illinois State Historic Preservation Office at 217-785-1279, in Missouri call 573-751-4827.**