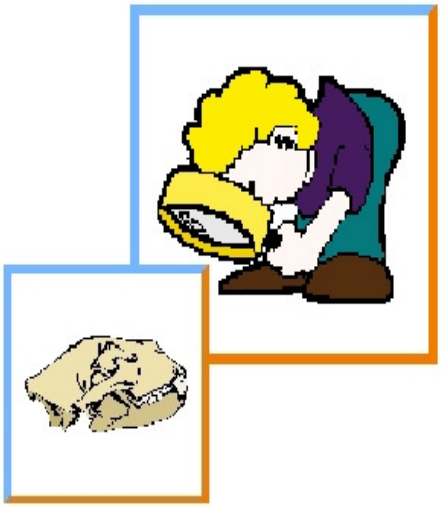
Dig This!

YOUNG ARCHAEOLOGIST KIT



Developed and Presented by the
Plymouth Archaeological Rediscovery
Project and PARP4KIDS

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How to lay out a 1 x 1 m square in 10 (relatively) easy steps

An essential skill of any archaeologist is the ability to quickly and accurately lay out an excavation unit. Much archaeological work begins on a small scale with the initial excavation of test units, often times measuring 1 x 1 meters square. Many archaeologists use the metric system because of its ease in conversion to different scales:

10 millimeters (mm)= 1 centimeter (cm)
10 centimeters (cm)= 1 decimeter (dm)
100 cm = 1 meter (m)
10 dm = 1 m
1000 m = 1 kilometer

The best way to get a good handle on this is to look at the tape measure in your field pack. The large dark number 1 on the left side of the tape means 1 cm. The small lines to the left of the one are all millimeter lines. Count them, there should be 10. Pull out the tape until you have 100 cm. You should be at the 1 meter mark. Look above it and you can get an idea of how a meter compares to a yard (3 feet). Is it less than a yard or more?

Back to laying out a meter square:

Step 1- Place a stake in the ground where you want one corner to be
Step 2- Place the tape measure against that stake and measure out 1 meter away from the stake
Step 3- Place a second stake at the 1 meter mark- now you have one side of your square, three more to go (that was the easy one unfortunately)
Step 4- Tie a string to the first stake and stretch the line to the second stake
Step 5- Bring the string in front of the second stake and wrap it once counterclockwise around the second stake (this way the stake is actually outside of the square and thus will not fall into the pit as you dig it- try wrapping it behind the stake and wrapping clockwise and then digging the pit and you will see what I mean)
Step 6- Measure exactly one meter at roughly a right angle from the second stake. Stretch the string to that point
Step 7- Measure from the first stake exactly 1.41 meters towards that string that you stretch from the second stake, when they meet, that is the location of you third stake.
Step 8-Wrap the string around the inside of the third stake and stretch it towards where you imagine the fourth stake will be
Step 9- Measure one meter from the first stake towards the string that you just strung from the third stake. This is the location of your fourth and final stake.

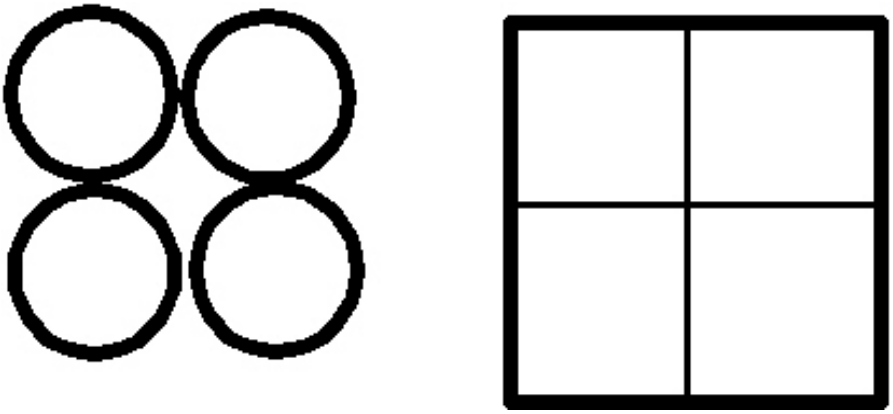
How to lay out a 1 x 1 m square in 10 (relatively) easy steps

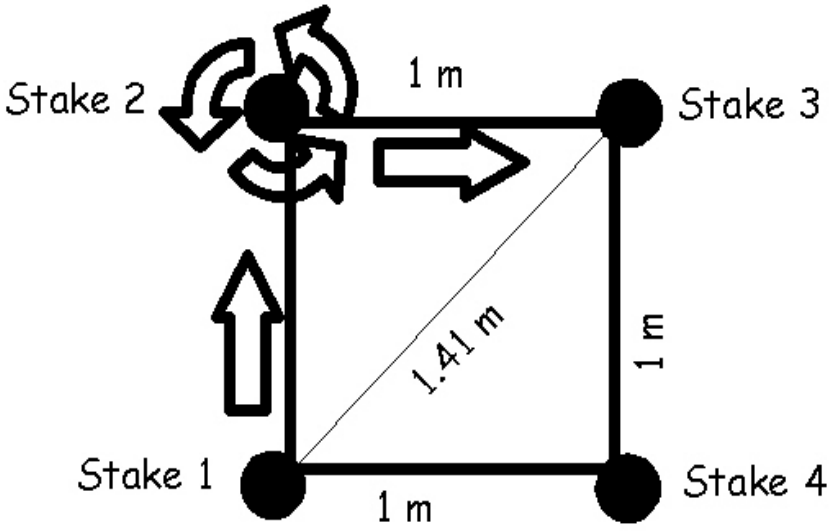
Step 10- Wrap the string in the usual way around the fourth stake and back to the first. All done!

This all has to do with a Greek guy named Pythagoras and his 3000 year old theorem. If you want to learn more, check out this website:

http://www.scribd.com/doc/406160/Survey-Basics-Laying-out-a-Trench-and-Levelling

BTW- We, as archaeologists, dig in squares because it is easier to connect multiple squares together without overlapping as a circular pit would need to get full coverage. And, with a square it is also easier to measure in from the sides to record exactly where an artifact was found.





What's in that dirt?!

What is dirt and who cares? Dirt is the matrix that holds and preserves the artifacts (the physical clues) that we, as archaeologist, search for. Dirt is made of silt, rock, and organic matter in varying amounts. Live in a desert and there is less organic matter. Live in the woods there is more. The composition of soil affects the archaeology of an area because people tend to prefer to live on well-drained, sandier soils without many large pointy rocks. Think about it, would you like to live in the swamp or the knoll above the swamp? There are always exceptions to the rule and sometimes what is now swamp was once dry land, but generally the higher drier areas near water are the best camp and settlement sites.

What you can do to study what the soil of your yard or neighborhood is like is to make a soil column. To do this you will need the following:

-a clear plastic (or glass) bottle, jug or jar with a screw on cap
-a trowel
-dirt from you yard or neighborhood
-water

Step 1- Take the bottle, jug or jar and go outside
Step 2- Using the trowel, dig up some of the topsoil outside and place it in the container. Fill it about ¼ to half way up)
Step 3- Add water to about ¾ of the way up
Step 4- Tightly screw on the top
Step 5- Vigorously shake the container to really mix up the sample
Step 6- Set the container down somewhere it will not be disturbed and let it settle for about 5 minutes or so until the water is clear (or mostly clear)
Step 7- Observe that as the soil settles, it does so in layers ~heaviest material (generally rocks and sand) settle first at the bottom with lighter materials settling higher up in the column
Step 8- Measure the thicknesses of the layers using your tape measure and record this in your notebook along with a sketch of the overall soil stratigraphy (soil layers), profile (a side view), and your overall observations
Step 9- Repeat the test with soil from a different location or, if you can, dig your original hole deeper until you hit a soil layer of a different color. Test the new soil

What layer is thickest in your soil profile, the upper or lower one? If the lower layer (layers) is the thickest, you have sandy to rocky soil, if the upper layer is thicker, you have silty soil. Aside from studying the composition of the soil, this exercise also is a good introduction to the theory of stratigraphy and stratigraphic dating. When we excavate an archaeological site we dig from the top to the bottom, essentially traveling back in time as we dig from the present ground surface back to the older soils. It took archaeologists (and geologists) awhile to realize that the deeper you go, the older the levels are. Simple to us now but when it was first realized it was a major discovery in the field of archaeology and one which we still use today.

These are the rocks in your neighborhood:
Neighborhood Geology

Rocks are very important and some archaeologists spend their entire careers studying them. Rocks formed the earliest surviving evidence of tool making by people. While tools made from bone or other organics will rot away fairly quickly, tools made from rocks will last in the ground indefinitely. Different rocks have different properties as well: some are really hard, some are really soft, some are very rough, some are (or can be made) very smooth and rocks come in a wide variety of colors. You can easily make a cutting tool by simply hitting the right rock once or twice. They are also (in most areas) readily available and provide an inexhaustible supply of raw materials for construction and tool making.

The importance of rocks is not just for people from the past, but its for you too!

How many things can you see around you right now that are made of or that have been made from the processing of rocks? Here are some hints: think metal (it all started as ore that was mined from the ground and processed), think brick and pottery (started as clay- fine grained minerals). Go outside and look around and see what sort of stone you see out there. If you live in the city, many older buildings were made from granite, limestone, brownstone or marble- all rocks. The sidewalk out there- concrete, the road asphalt (tar and rocks), the cars- metal ore. Rocks are all around us, in fact the United States own currency is based on a specific type of precious metal.

Where did all of these rocks come from? There are three main types of rocks: Igneous, metamorphic and sedimentary.

Igneous rocks come from volcanic activity and include stones such as granite, rhyolite and basalt. Igneous rocks are generally hard rocks and are good for stone tools like hammerstones, pestles, arrowheads and scrapers. Historically, igneous rocks make good foundation and building stones (granite is especially good for this)

Check out http://en.wikipedia.org/wiki/Igneous for good maps of igneous rocks in the US.

Sedimentary rocks are formed through the breaking down of rocks by things such as wind and rain into smaller pieces or sediments. Sediment means things that drift down like dust or coffee grounds in a cup of coffee- both are sediment. These sediments then travel down rivers and streams or through the air and are deposited in layers creating stones such as sandstone, chalk, limestone, and shale. These

stones are generally soft and are used for grinding stones and historically as facing stones (they were the ones that covered the pyramids of Giza making it sparkling white) and more decorative elements on buildings (they are soft so they can be easily shaped).

Finally, metamorphic rocks change like a caterpillar into a butterfly. They start as one type of rock, usually a sedimentary rock, and, through pressure and heat, change to something else (think coal to a diamond). Examples of metamorphic rocks include slate, schist, and marble.

Go outside and look around, use some online sources and try to identify what some of the structural stones you see in your neighborhood are. Look especially for granite, marble, limestone, and slate. Another good place to find just those sorts of stones, is a cemetery which has been in use for centuries- very old headstones were often slate, then people started using nice white limestone, and more recently granite and marble. Another activity is to visit the library, get some books on the rocks of your area, and start your own rock collection.

That's Not Trash...
That's Treasure (well, maybe someday)

Archaeology is all about trash. Think about it...archaeologists often dig up the materials that were discarded by someone hundreds or thousands of years ago. We love trash because it often tells us things about people that they did not record in their histories. What did Thomas Jefferson's toothbrushes look like? He never thought it was important enough to write down, but archaeologists have actually found tooth brushes from where he lived with his name engraved on them. What did the people who built the pyramids eat- one of the main ways we can answer that question is though an analysis of the trash that they left behind in the communities where they lived.

Someday your trash will be excavated, collected, cataloged and possibly displayed in a museum. Maybe that won't be for 1000 years or so, but so what, its just kind of cool to think that someday someone may be trying to learn about you from something you threw away.

Here an exercise that will both help you think about what archaeologist can learn from artifacts (a.k.a. trash) and help clean up your neighborhood.

Step 1- Using a pair of gloves, go out in your yard or onto your street and find and collect a piece of trash. If you are collecting it in your yard, try to find something that you are pretty sure was not thrown out by anyone you know- the more unfamiliar the trash the better.
Step 2- Record in your notebook what the trash is and where you found it. You could even draw a basic map showing where you found your trash.
Step 3- Record what the piece is made of, what color it is, what condition it is in (is it torn or faded, wet or dirty), and what it is.
Step 4- Come up with a reasonable story about how that artifact (artifact just means something made by people) got there. Write the story in your notebook.
Step 5- Use your imagination to come up with a really creative story of how that piece got there, the more creative the better. Write that story down.
Step 6- Take those two stories and have someone else read them and see which one they think is the most likely explanation for how that artifact arrived at the site (a site is a place where people did something)
Step 7- Now ask them which story is the more interesting or intriguing.

Most people will say that the second story is the more interesting story-that's because you used your imagination more than you did for the more practical and reasonable story, and therein lies an important lesson: generally people like to hear and are more interested in an imaginative story than a practical one. Who wants a plain white pencil when you could have a colorful one with a mouse on top? Unfortunately, sometimes people take things that have rational but unexciting explanations, and disregard those for the more fantastic claims. Pyramids made by a large number of people working together in a coordinated fashion for decades or space aliens coming down and building them in a day- which is more interesting and exciting? Crystal skulls with potentially magical and mysterious properties or crystal skulls which tests have proven were made as hoaxes in the 20th century- which is more interesting and captures your imagination? Stone walls made by colonial farmers or sight lines made by ancient Native Americans/ Vikings/ Celts/ Irish Monks for making astronomical observations- which is more interesting or exciting?

Archaeobotany:
Oh the stories that plants tell!

Ever think that plants were important to archaeologists as clues to interpreting the story of a site? Well they are! Think about all the plant stuff that you eat and use each day:

Breakfast- cereal (made from wheat or corn or oats), orange juice, or cranberry juice or apple juice (or coffee or tea for adults), toast (from wheat) with jelly (grapes, strawberries, and sugar cane)

Lunch- Sandwich (wheat for flour again, maybe some lettuce and tomatoes), Soup (noodles from flour, vegetables)

Supper- Pizza (vegetables for sauce, flour for dough, corn or olive oil)

You use paper (from trees), pencils (from trees), your house may be made at least partially from wood and the same goes for some of your furniture. Maybe your clothes are made from cotton. Plants and their products are all around us.

Make a list of all the plants that you use and eat over the course of one day.

Now, think about how plants were used by Native Americans. How about by Pilgrims? When was your town or city settled? Do some library or Internet research and find out how plants were used by the people who founded your town. Maybe your hometown once had many farms, or maybe they made cloth- these are both things that, of course, involve plants.

When archaeologists are very lucky, they can find evidence of the plants that people hundreds or thousands of years ago used at a site. Often this evidence takes the form of burned seeds found in trash deposits or hearths, other times it may take the form of impressions left on pottery of strings or cloth that was pressed against the pottery for decoration. Specialists can also recover and analyze pollen (the little tiny grains that help plants reproduce) that is trapped in the soil at a site and actually create an inventory of the types of plants that grew at a site and how those types changed over time. This helps archaeologists understand how the environment changed over time and how people, though agriculture and development, helped to change it.

Now, how about around your yard and neighborhood. What sorts of plants do you have in your yard? How about in your immediate neighborhood? Here is a simple activity to help you learn about your homesite's plant population.

Archaeobotany:
Oh the stories that plants tell!

Step 1- Make a map of your yard, neighborhood or wherever you are going to collect plant samples from.
Step 2- Go out and collect leaves from a variety of plants in your yard or neighborhood. Place each separate leaf sample in a separate brown paper bag and give it a number ~ starting with 1 and going as high as you need.
Step 3- Mark on your map with the same number, where you collected the sample from.
Step 4- Once you have collected all the samples you want, go in your house and find a good thick, heavy book.
Step 5- Cut rectangles of newspaper the size of two open pages of your book. Put the leaves between two pieces of paper and place them in the book.
Step 6- Place all your samples between newspaper in your book and then let the samples stay in a dry, sunny place for a few days.
Step 7- After a few days open the papers and check to see if the leaves are dry. When they are, seal them between two pieces of clear packing tape to permanently preserve them. Write their sample number on the tape and keep an inventory in your notebook of the leaves and where they were from.
Step 8- Look online or in a library for a book to help you identify the plants that the leaves came from.

Different types of plants live in different areas. Some plants like bright sun, others like shade. Some plants grow in waste areas, like deserted lots, others grow in flower beds or gardens. Record what the habitat was for each sample collected- Was it sunny or shady? Was it a garden or flower bed? Was it from the sidewalk? What can the habitats that the plants like tell you about where they were collected? How might an archaeologist interpret a collection of plants like yours? What could they tell the archaeologist about the area where they were collected?

Archaeologists collect soil samples from features (stains left in the soil where it was disturbed by people digging holes or making fires) and investigate these samples using a process called flotation. Flotation allows samples of seeds and small material often missed in the field to be collected and analyzed in the lab. This often leads to exciting, but small, finds that tell us a lot about what went on at a site.

Another exercise is to collect the seeds and organic material that is hidden in samples of dirt.

Step 1- Collect a sample of dirt from your yard or neighborhood.

Step 2- Place your sample in a wide mouthed container of water. Because the seeds and organics are lighter than the sand and silt of the soil, they will float.

Step 3- Mix the water and soil sample up and then let it settle for a few minutes.

Step 4- Carefully pour the water with the material that is floating through some fine screening or cloth so that you can collect the floating organics. Be careful not to dump the sunken dirt onto the screen or cloth (you only want to collect the organics).

Step 5- Let the organics dry and then look at them under a microscope or with a magnifying glass. What do you see? Do you see any small seeds?

Step 6- Take a sample of those organics (if you see seeds) and plant it in a large pot with commercially purchased potting soil. Tend the planted sample and see if anything grows. Let it grow larger and try to identify any of the plants that have sprouted.

Bone Up on Skeletons

Bones can tell an archaeologist an awful lot. Most of us nowadays do not live on farms or have to butcher our own animals (there may be some people who think that hamburgers actually grow in that shape and that chickens are born without feathers, heads and feet). As a result, we come in contact with bones a lot less often than people did 100, 500 or 1000 years ago. Think about how bones fit into your daily life. Need a hint... how about Thanksgiving? Or chicken wings? Spare ribs? T-bone steak? (Do you know what bone the "T bone" is in T-bone steak?-think shoulder). Pork chops.

Archaeologist look at bones to determine how people at a site utilized and interacted with wild and domestic animals. If you find a lot of deer bones but few cow bones at a site, it may mean that the people at the site lived off wild animals versus domestic ones. If you find a lot of fish, maybe they fished or visited a fish market regularly. What about if you find a lot of bird bones, bones from bird that are only in your area during certain times of the year? What could that tell you?

Archaeologist try to determine the following things from bones:

- the type of animal-mammal, bird, fish, reptile, other (few hints- bird bones are thin, light with hollow long bones, fish bones are thin and fragile, except for the backbones which are round and hard, mammal bones are denser, thicker and generally more heavy duty)
- the species- cow, deer, pig, gerbil- this can be tougher but you can make some educated guesses by trying to determine what size the animal was- small bones with small animals, big bones with big ones.
- was it old or young- younger animals are generally tastier, whereas
  if you find a lot of older animal bones it may mean that people were raising sheep for wool or milk or cows for milk-thus they would keep the animals around longer than if they were just raising them to eat.
- what bones are present- this may help to determine if the animals were raised on site or purchased already butchered- think about your freezer- how many heads and feet do you have in there- probably not many, those generally remain with whoever butchered the animal.
- Was it burned?
- Are there any cut, saw or butchery marks?
- Any chew marks from rodents (generally small parallel lines) or carnivore (generally puncture marks (holes) or pitted areas)

Here is an exercise-
Exercise 1:
Inventory the bones in your freezer. You may be surprised how many you find.

Exercise 2:
Step 1-Go out and walk around your yard or neighborhood and find some bones. Beaches are also good places to find bones. You might want to wear gloves when collecting bones- they tend to attract lots of bacteria.
Step 2- Bring the bones home and, using disinfectant soap and an old brush, give the bones a good scrubbing with warm water.
Step 3- Try to identify the bones yourself. If you get stuck, look online for pictures of the bones you think it might be.
Step 4- Email Past4kids (past4kids@hotmail.com)with a closeup photo of your bone and we will try to identify it for you. Photos can be taken with a digital camera or flatbed scanner.

There's one lost every minute:
Progress and Site Destruction

Context, its all about context!! In archaeology, you can claim anything you want (Druids in New England, Viking in Michigan, space aliens in Peru) but you have to have two things: artifacts (data/ proof/ facts) and context. It doesn't matter that you found a 11th century English knight's helmet in a Hopi Pueblo, if you do not know how it fits into the history of a site. If you do not record exactly where and how it was found (photo and written documentation) then its association can't be proved and it is worthless (not that most of the stuff we find is worth any money anyway).

Archaeology is all about destruction. Unfortunately, as we investigate an archaeological site we are, at the same time, destroying it through excavation. That is why we are so meticulous about notes and photos, we only get one chance to record what we found, one chance to record that 10,000 year old spear point in the ground (*in situ* as we say) before we are the first person to lift it and hold it in as many years. And while as cool as it is to be the first to hold it after so many centuries, the act of doing so rips it from the context that it was in. In the big scheme of things, no matter how hard we try, we can't put it back in place afterwards.

Our world, our cities, our neighborhoods are always changing, always moving forward, it is the nature of our society, and it is important to see how moving forward too rapidly can seriously destroy the undiscovered archaeology and its context right in your own town. When someone builds a new superstore, or housing development or even put in a new sewer line, they are inadvertently (accidentally) destroying the archaeology and the context of the evidence of the past that is present there. Backhoes aren't picky and thus as archaeologists we tend to use them only in certain circumstances (stripping off asphalt or sterile topsoil), but construction work uses them all the time. There is nothing wrong with progress, but progress has to be tempered with an appreciation and a realization that it has the potential to irreparably destroy evidence of the past- your past, our past, everyone's past.

Why? When construction or any hole digging happens, it mixes up the story of the past. It takes all those layers, all that stratigraphy that built up over the centuries and puts them in a blender. Think of making a cake- you take a bunch or separate ingredients (eggs, flour, sugar, chocolate) and mix them together so that they form something that doesn't resemble those individual pieces but which has all the original parts still there. The same thing happens when someone digs a hole without thinking about the evidence of the past that may exist there. They take all those arrowheads, pottery, bones, that originally occurred in different layers, and mixes them up into

one new confusing layer. As a result, if you tried to just interpret what you found (remember its all the same layer and then in theory, if you didn't know better, all the same context) you may come up with a theory that ancient Native Americans hunted mammoths with cannons while drinking soda and wearing Victorian clothing!! To be able to really understand the past and to accurately interpret what happened, you really need to be able to carefully look at what you find within its original context.

Here's an activity for you:
Look around your yard or your neighborhood for signs of disturbance to the archaeological record- it could take the form of a post for a fence, an in-ground pool, a dog (or child) digging a big hole, or city workers putting in a new sewer line, to give a few examples.

Try to imagine what sorts of disturbance this may cause to the evidence that is below ground.

Now, keep your eyes open as you travel around your town or city. What kinds of large scale disturbance do you see?

Site-Seeing

There are archaeological and historical sites all around you right now. If you look out your window there is a good chance that you may be staring right at a site and not even know it. Where do you think people liked to live in the past? Let's say in the past before the year 1800? Its pretty easy to predict where people may have lived if you just think about it. What are the four things that people need in order to survive? Give up? They are food, air, water, and shelter. People, no matter when they lived, determined where they would live based on these four basic needs. Water is the most basic need. What do we use waster for today? Let's see, we:

-drink it
-cook with it
-bathe with it
-use it for recreation
-use it to clean things that we own (the artifacts of our lives)
-we use it for transportation
-we get food from it
-we use it for creating energy and powering some of the industries we have
-we mix it with other things (like gelatin dessert, or paints)
-we use it to dispose of waste products

Well, you know what, people in the past used water for all these uses as well. So if we are looking to see if our house or neighborhood would be a likely spot where people lived in the past, you first have to find the water. You can do this by walking or riding your bike around your neighborhood (what we as archaeologists call a "walkover") and looking for any signs of water (streams, rivers, ponds, swamps, springs, etc). You can also look on a topographic map (a "topo" as we call them), a city map , or even "Google Earth" and see if you can spot the water. Try to measure how far away from your home the nearest water is. The closer one gets to fresh water, the more likely it is that people in the past were living there as well.

Now that we have located some water, let's see where people's houses or camps may have been. Go outside and look at your home (you may have to stand back a ways to do this). Does your house sit on a rise (a little hill) or is it in a hollow (a depression)? People in the past (and now) liked to live on higher spots as opposed to in valleys. This way they would be "high and dry", they could defend higher land and they could use it as a look-out spot for finding animals they hunted or to look out for enemies. Look at the maps again. Topo maps show lines that make the contours of the land- where the hills and valleys are.

You can also look at maps from places not even near where you live, and predict where sites may be based on the high, dry, near fresh water principle. Take a look at a map of your town. Can you see somewhere where people may have lived, somewhere high and dry near fresh water? Check out this website: www.historical.maptech.com . You can go there and look at old topographic maps of several states, some that date back to the 1890s and the early to middle nineteenth century. Try to find the map that shows your neighborhood. How much has it changed since that map was made?

Another great source to learn about the archaeological and historical sites in your town is the town's local historical commission (not historical society, but commission, they are different in important ways). The historical commission is usually a volunteer town office that helps protect the historical and archaeological resources of your town. Historical commissions are made up of people in the town who really care about the town's past. You can also learn more about your town at your local library. Most towns and cities have histories that have been compiled about them. It is likely that your neighborhood will be mentioned somewhere in the town history. It may be nothing more than a statement that where your neighborhood is was farmland until a few years ago, but even that is interesting. Local histories usually have copies of historic maps in them as well. Try to find your house on those maps.

Another activity is to find a local historic site and visit it, then write about your visit in your journal. Interview the people who work there and try to find out why they think that the site is important. You can then go and look at local histories and see if you can discover anything that the people at the site didn't know.

There are lots of sites out there, basically because people have been living here in the U.S. for a long time. One things archaeologists try to do is to protect the locations of important sites. Unfortunately, there are some people out there who don't see sites as anything but places for them to destroy to find arrowheads for their own personal collections or to sell. The past belongs to everyone and people shouldn't think that they have a specific right to do whatever they want with a site just because they can get away with it. So, as a result, archaeologists keep the locations of some sites secret, to protect them. Each state has a State Archaeologist whose job it is to help protect the archaeological heritage of their state. If you look online, you can probably find the Office of the State Archaeologist. Many State Archaeologist offices also have very informative websites that help people to better understand and appreciate their state's history and archaeology.

Mapping Your Past

Maps are very important to archaeologists. We use maps to determine what the likelihood is that there will be an archaeological site within a project area, we look at old maps to see how the project area changed through time, we create maps when we are excavating so that we can record where things are found and how they relate to each other, and most importantly, we use maps to find out how to actually get to a project area from our homes or offices! As a result of our reliance on maps, we have all had a lot of practice at creating and using them. When have you ever used a map? Here's you chance to brush up on your map (and map making) skills.

Maps have certain parts to them and all maps should contain the basic parts we're discussing here. Those parts are:

-a north arrow or compass rose
-a scale (to show how big things are or how far away from each other they are)
-a key (not like a house key, but a list of what all the symbols we use on the map mean)
-stuff that we are mapping

How about we create a map of something familiar to you in just a few easy steps. For this exercise you will need a compass, your notebook, and, if you want, the tape measure.

Step 1- Pick some place in or around your house that you want to map, it can be your bedroom, living room, your yard, playground, where ever you want.
Step 2- Take a clean sheet of paper and hold it sideways.
Step 3- Pick a side of whatever you are mapping and make that the bottom edge of your map. Hold your paper so that you are facing out the same way that you are holding the map.
Step 4-Pick a scale for your map that fits you paper. For example- one inch on your map corresponds to one foot in the real world. Or it could be one half inch equals one foot. Experiment to find a scale that works for you.
Step 5- Use your tape measure or your feet to measure out a square or rectangular area that you are going to map out. Don't make it too big or you could be mapping for a while. Write the measurements of the sides of that rectangle on your map page (write the measurements along the corresponding edge of your map).

Step 6- Now that you have the area mapped in, go though the area and draw in on your map where things are within that rectangle (a tree in this corner, a swing in that corner, a doghouse over here, a bed over there, you get the idea). You can use symbols or letters to represent things instead of drawing them- a T could be used for trees and a smiley face could be used for toys- use whatever symbols you want)

Step 7- Each time you make a symbol for something in the area being mapped, pick a corner of your map and box it off. This will be your key. Draw one example of each symbol here and then write next to it what it symbolizes.

Step 8- Anything missing? Oh that's right, the north arrow! Use your compass to determine where north is relative to where you are standing. The red part of the compass arrow will always point north (unless you run a magnet over it then you may reverse it).

And there you have it, a map. Be sure to label the map somewhere so that you will remember when you made it and what it is a map of.

I need a needle, a magnet, and a Styrofoam plate:
Making your own compass

Another important tool for the archaeologist is the compass. Compasses tell us which way is north and guide us when laying out test pits, excavation units or test trenches. We try to orient all these testing units to magnetic north (which is different than true north- because the Earth's axis is tilted slightly on its side, magnetic north points towards the Earth's magnetic pole, not the geographic North Pole). By orienting all our testing towards magnetic north, we can easily map in our units. If everyone agrees to map them towards magnetic north, then we get a bit of consistency in orientation between different sites.

Why does a compass work though? Is it something you ever considered? Basically the Earth is like a big magnet with a north pole and a south pole (a positive and a negative just like a small magnet). Have you ever tried to put two magnets together but they just keep pushing each other apart? That is because you are trying to put two poles that are the same together- opposites attract, likes repel. Try flipping one of the magnets next time and they should attract each other. So, the Earth has this big magnetic field, just like a magnet. A compass's needle is magnetized as well so the ends are attracted to the poles of the earth. WE say that a compass always points north, but in fact it always points south too, we have just arbitrarily said it points north versus it points south.

To make your own compass, this is what you will need:
-a needle or all metal pin
-a magnet
-a piece of Styrofoam plate
-a bowl of water
-a real compass

And this is how you do it:
Step 1- Take your needle or pin and carefully hold it by the non-pointy (some would call it the blunt)end.
Step 2- Hold your magnet (rectangular bar magnets work best but with experimentation any one will work).
Step 3- Take the needle or pin and rub it in one direction only, along the face of the magnet. Rub it about 50 times. Don't rub it backs and forth, that just confuses the needle and you don't want to do that, do you. What you are doing is making all the electrons (the little teeny tiny particles outside the core of the atoms) all line up in one direction within the steel of the needle. This magnetizes it.
Step 4-Take the piece of Styrofoam plate and cut it into a circle about the size of a dime.

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Step 5- Carefully push the magnetized needle through the middle of the side of the Styrofoam so that it lies parallel with the top and bottom of the plate.

Step 6- Set the needle skewed Styrofoam into the bowl of water. It should spin a couple of times and then stop.

Step 7- Check with your real compass to see which end of your homemade compass points north. Use a pen or pencil to mark the Styrofoam so that you know which end it the north end.

Why are there no mummies in my Town?
An exercise in Preservation

Have there ever been any mummies found in your town or state? Unless you live in Alaska, Utah or Egypt, the answer is probably no. Why not? That is the question we are going to explore in this exercise. What is the difference between a rock and your sister? No, seriously. The correct answer is that a rock is not nor (unless it is a fossil or coal) was it ever alive- it is inorganic. Your sister is organic, made out of living cells. What happens to living cells when they are no longer living (think of smelly garbage or that mystery thing in the back of the fridge)? They decompose, they rot!! Right? Right! Things rot because their cells break down under attack by bacteria or enzymes. A rock, being inorganic does not rot. So why don't mummies rot?

Mummies will rot if the conditions that they were mummified in change. Put a dry Egyptian mummy in a wet place and it will rot, put a frozen Incan mummy someplace warm, it will rot. Mummification is all about either accidentally or purposefully slowing down and stopping the rot process. This is basically what our refrigerators and freezers do, they are slowing down the process of decomposition long enough so that we can eat the food before it rots. So what conditions can create mummies? Well, mummies can be dried out, like beef jerky, frozen, or tanned. Dried out mummies have been found in Utah and Egypt, frozen mummies have been found in Alaska, Peru and the Alps. Tanned mummies have been found in China and England. Some of these people who were mummified were done so purposefully and others had it happen accidentally as a result of where they died or were buried.

Here is an exercise to explore the world of mummies and rot. You will need the following:

-five grapes, five cups, water, clay, dirt, sand, tape and a marker, a light or (better yet) a heat lamp, a freezer, and understanding parents.

Here's what you do:
Step 1- Take each cup and mark them as follows Cup 1- Frozen, Cup 2- Wrapped in clay, Cup 3- Desert, Cup 4- Buried, Cup 5- Water,
Step 2-Take dirt or potting soil and fill four cups about halfway full. In the fifth cup fill it halfway with sand.
Step 2- Place a grape in three of the cups (three soil and the one sand cup).
Step 3-Cover them with soil or sand, as appropriate.
Step 4- In the fourth cup, place a grape that has been wrapped in clay.

Step 5- Fill one of the soil filled cups with water and put it in the freezer- this is the ice mummy.
Step 6- Place the cup with sand under a heat lamp or light- this is the desert mummy.
Step 7- Fill another soil cup with water and cover it with plastic wrap- this is a water mummy.
Step 8- Take the cup with the grape wrapped in clay and fill it with water then cover it with plastic wrap. Place the cups with water in a sunny spot.
Step 9-Leave one cup uncovered with no additional water (this is the control, it shows what happens when nothing is done to the grape

Let these cups stay where you placed them (one in the freezer, one under a lamp, three in a sunny place) for five days. On the fifth day, open the cups and examine what the grapes look like now. Which grape was the best preserved, which was the worst (and the stinkiest). Preservation occurs in three main ways- dessication (drying things out so that there is no moisture for bacteria to thrive); creation of an anaerobic environment (wrapping the grape in clay so that no oxygen can get to it); freezing (so that the environment is so cold that bacteria become inactive.

Digging into local history:
A day at the cemetery

Where can you come face to face (sorta) with actual people from the past? The cemetery! Cemeteries and burial grounds are the best place to get personal with the people who lived in your town in the past. When we excavate a site, oftentimes, especially on pre-European Contact Native American sites, we will never know the names and ages of the people who lived there. Most often we excavate sites in sort of an ambiguous way-knowing people lived there and did things (just like we do) but never being able to directly associate things with people. This is less of a problem on historic sites, but it still does exist. Burial grounds and cemeteries are a whole different matter. Here you can walk up and look at the name of the person who is buried there, you can see when they were born, when they died, how old they were, who they were related to, and sometimes, you get an epitaph, a poem or saying written on the stone by the mourners of that person. Epithets especially give you a real personal sense of what people thought of that person.

Burial grounds and cemeteries are places where the past can almost come to life and becomes very personal and real. You can wander through the cemetery and come across someone with the same first name as you, the same last name, someone who was born on the same day as you-but maybe over 100 or 200 years before! These are the people who lived the local history that you may have come across in some of these other exercises you have done.

Try this: go to a local cemetery or burial ground and go on a respectful scavenger hunt
-find three different material that were used for headstones
-find five different headstone shapes
-find someone who was buried 100 years ago
-find someone who was buried 150 years ago
-find someone who was buried 200 years ago
-as a bonus-find someone who was buried over 200 years ago
-find a stone with a rose carved on it
-find a stone with a lamb carved on it
-find a stone with a willow tree on it
-find a stone with an angel carved on it

Digging into local history:
A day at the cemetery

Pick one person, write down all the information recorded on their stone, and then take a trip to the local history room at your library, or call the local historical commission, or look in one of the local history books and research that person. Try to find out the following:

-where in the town did they live
-what they did during their life
-when did their family move to your town
-what was happening in the rest of the country and the world when they were alive
-do any of their descendants still live in the town

GLOSSARY OF ARCHAEOLOGY TERMS

Absolute Dating: A dating process that results in a date in an absolute number such as days, months or years. Radiocarbon dating is an example of this.

Adze: A metal tool used to work wood consisting of a blade, sharpened on one end and fixed (hafted) horizontally on a handle.

Archaeobotany: The study of plant remains from an archaeological site. These remains usually take the form of seeds but may also be charred stalks or leaves.

Archaeology: The study of the past using the material remains left behind by people.

Arrowhead: A general term used to denote a stone, bone, shell or metal tip affixed to the end of an arrow. Archaeologists use the more general term projectile point as opposed to arrowhead.

Artifact: Any object manufactured by people.

Assemblage: A group of artifacts found within one stratum or deposit in an archaeological site.

Atlatl: The Aztec term for a spear thrower. This hunting and fighting too predates the bow and arrow. It consists of a wooden, bone or antler shaft to which a spear is attached. It functions as an extension of the arm and increases velocity, distance and accuracy when throwing a spear.

Awl: A metal, bone or stone tool tapered at one end used to make holes.

Biface: A stone tool flaked on both sides (front and rear).
Core: A piece of stone off of which other pieces are flaked to make stone tools.

Cortex: The weathering present on the exterior of a stone.

Cultural Resource Management (CRM): A type of archaeology that focuses on the identification and excavation of archaeological sites that may be impacted during
the construction projects. Often times the findings of such surveys remain in the "gray literature" of CRM reports and is rarely made public.

Culture: The nonbiological means of human adaptation.

Data: Information and observations made on objects and events that are then used to analyze a site, problem or culture.

GLOSSARY OF ARCHAEOLOGY TERMS

Data Recovery: An archaeological excavation of a site done during the course of CRM work where a certain percentage of the site, usually 15% or less, is excavated before the site is destroyed. Data recoveries mitigate or clear the project area for development.

Datum: A fixed reference point used by archaeologists for all measurements at a site. Ideally this should be a point that will not be moved. The grid used to test and excavate a site is tied into this point.

Ethnoarchaeology: The study of contemporary people in an attempt to understand the past.

Excavation Unit (EU): The square used during the course of archaeological work for the recovery of cultural materials and study of the stratigraphic soil profiles of a site. Excavation units vary in size depending on the needs of the project.

Experimental Archaeology: A means of studying archaeological processes and recovered material through the use of the do-it-yourself approach.

Faunal: Shell or bone remains recovered from an archaeological excavation.

Feature: A non-portable component of an archaeological site such as a hearth or post hole.

Flake: A lithic fragment struck from a larger piece during the course of the production of a stone tool.

Flintknapping: The process of reducing unmodified stone into a finished tool.

Grid: A two-dimensional intersecting network defining squares (excavation units) in which archaeologists dig.

Hammerstone: An unmodified cobble used in flint knapping for reducing a cobble.

Historical Archaeology: The study of the past through the material that is left behind which focuses on the period of time when written records exist.

Hypothesis: A statement developed in the course of archaeological work which must be tested on independent evidence.

In Situ: The position in which an artifact was found during the course of archaeological investigation.

GLOSSARY OF ARCHAEOLOGY TERMS

Intensive Survey: An archaeological survey conducted during the course of CRM work designed to locate any archaeological remains with a project area.

Locus: An archaeological site location.

Material Culture: The artifacts used by a group of people to cope with their physical and social environment.

Midden: A refuse deposit that has resulted from human activity often consisting of shell, bone and discarded broken artifacts.

Plan: A drawing made of an archaeological site or deposit from an overhead perspective.

Post Hole: The hole initially dug in which to seat a post. This hole is usually larger than the post itself.

Post Mold: The decomposed remains of the post. Post molds may occurred alone if the post was hammered into the ground, or may be located within a post hole.

Pothunting: The illegal and unethical disturbing of an archaeological site using no valid recovery strategy or techniques. Also known as idiot archaeology.

Primary Refuse: Archaeological material in the area where it was used and discarded.

Profile: A drawing or photograph showing the depositional strata within and archaeological site.

Provenience: The exact location where an artifact was recovered from in relation to an archaeological dig. Without provenience artifacts loose much of their informational value.

Radiocarbon Dating: A absolute dating technique which relies on the decomposition of carbon isotopes in organic matter.

Reconnaissance Survey: An archaeological literature survey which does not normally involve excavation. Reconnaissance surveys are often done survey the known archaeological resources and to identify areas of sensitivity within an area to be developed or a town.

Relative Dating: Dates expressed through relative terms such as earlier and later.

GLOSSARY OF ARCHAEOLOGY TERMS

Sample: Any subset of a larger group.

Scientific Method: A series of steps used by archaeologists and scientists alike where phenomena are examined and reasoned conclusions are reached.

Shatter: Pieces of randomly shaped stone debris that result from the hitting of a larger stone during the process of flint knapping.

Site Examination: An archaeological survey conducted during the course of CRM work designed to identify the extent, age and internal complexity of a site usually identified during an intensive survey.

Stratigraphy: The layers of soil encountered archaeologically.

Superposition: The notion that artifacts which occur higher in the stratigraphic profile were deposited after artifacts recovered from deeper layers. Basically, the stuff on top is not as old as the stuff below.

Temper: Foreign material mixed with clay to keep pottery from cracking when fired. In New England Native pottery, shell, gravel and crushed rock was often used.

Terminus ante quem: The date before which an archaeological deposit was formed.

Terminus post quem: The date after which an archaeological deposit was formed. This is determined by the latest dating artifact recovered.

Test pit: A small square excavated in the course of archaeological testing to determine if archaeological materials are present in a specific area. Test pits are often expanded into excavation units.

Tool Kit: A spatially and functionally patterned group of artifacts such as a sewing kit or flint knapping kit.

Uniface: A stone tool that has been flaked only on one side.

Utilized Flake: A stone flake used for cutting or slicing whose edge has been damaged through use and not deliberate flaking.

Zooarchaeology: The study of animal bones from archaeological sites.

Books

Out of the Past. David L. Webster, Susan Toby Evans, and Williams T. Sanders, Mayfield Publishing, Mountain View, California, 1993. Answers the question "What is archaeology?" using examples from Old and New World sites. Companion to an eight-hour video series.

Protecting the Past. George S. Smith and John E. Ehrenhard, editors, CRC Press, Boca Raton, Florida, 1991. Includes articles by 48 experts on protecting, preserving, and interpreting archaeological sites.

Secrets From the Past. Gene S. Stuart, National Geographic Society, Washington, D.C., 1979. An introduction to archaeology through the reconstruction of activities and events likely to have occurred at selected ancient sites.

Time Detectives: How Archaeologists Use Technology to Recapture the Past. Brian M. Fagan, Simon and Schuster, New York, 1995. Well-written summaries of a dozen modern archaeological investigations illustrating how contemporary archaeologists reconstruct what happened in the past.

In Pursuit of the Past: Decoding the Archaeological Record. Lewis R. Binford, Thames and Hudson, New York, 1983. A description of how archaeological data are interpreted using modern theories, methods, and techniques by an archaeologist who led in the development of new approaches during the 1960s.

Mound Builders of Ancient America: The Archeology of a Myth. Robert Silverberg, Ohio University Press, Athens, Ohio, 1968. A detailed yet very readable history of the discovery and changing interpretations of the ancient Indian mounds of the Midwest, Southeast, and Mississippi River Valley.

Mysteries of Mankind. National Geographic Society, Washington, D.C., 1992. An introduction to the scientific solutions of puzzles posed by famous ancient ruins.

The New Archaeology and the Ancient Maya. Jeremy A. Sabloff, Scientific American Library, distributed by W. H. Freeman, New York, 1990. A beautifully illustrated description of how recent advances in archaeological method and theory have led to the modern interpretation of the ancient Maya civilization.

Ethics and Values in Archaeology. Ernestene Green, editor, Free Press, New York, 1984. A series of articles by noted archaeologists on a variety of contemporary issues.

Fantastic Archaeology. Stephen Williams, University of Pennsylvania Press, Philadelphia, 1991. Chronicles the fantastic, nonscientific solutions to ancient mysteries proposed by so-called archaeologists with more imagination than scientific expertise.

Footsteps: Nine Archaeological Journeys of Romance and Discovery. Bruce Norman, Salem House, Topsfield, Massachusetts, 1988. A companion to the series on public television about historical archaeological discoveries and the development of early archaeological methods and techniques.

The Great Journey: The Peopling of Ancient America. Brian M. Fagan, Thames and Hudson, New York, 1987. The story of the first Americans and the archaeological search for them. The book provides a history of how interpretations have changed since the European discovery of America.

Archaeology Links for Kids

Plymouth Archaeological Rediscovery Project
www.plymoutharch.com

Kids Dig Reed Farm
http://www.kidsdigreed.com

Royal Ontario Museum
http://www.rom.on.ca/programs/activities/pieces/index.php

Colonial Williamsburg Archaeology
http://www.history.org/history/argy/index.cfm

Dig the Archaeology Magazine for Kids
http://www.digonsite.com/

Jamestown Rediscovery Project
http://www.apva.org/

Binghamton University
http://www.binghamton.edu/cap/kidsindex.html

American Museum of Natural History
http://www.amnh.org/ology/index.php?channel=archaeology