

WORCESTER ART MUSEUM



Earth Science *Under Our Feet*

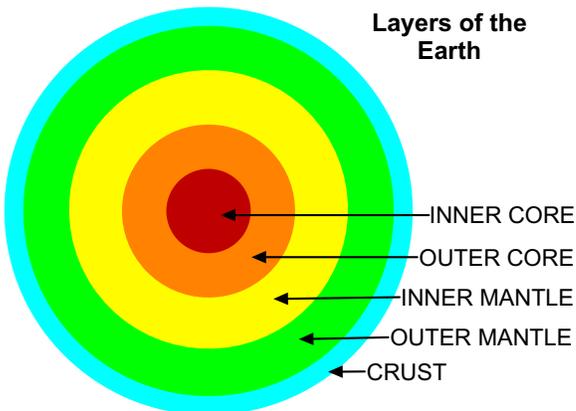


Let's look closer at what is right under our feet! What can we find deep underground, how does it get there, and how can it be used?

The dirt right below us is only a tiny bit of what makes up the Earth. There are layers that go all the way to the center of the planet! The earth's **crust** is the outer part of the Earth--it is the part we see when we stick our feet in the mud, and is made of soil and minerals*. A **rock** is a solid mix of minerals. One type of rock is marble, which is often white. Many ancient sculptures were carved from marble, like the example to the right.

If you dig toward the center of the Earth, you will find that as you dig deeper, the soil becomes less crumbly. Eventually you would find solid rock! Once you get through the the crust, you would find the **outer and the inner mantle**, which is made up of very hot rocks and **metal**. Metal is a natural material that is usually shiny and can be bent.

If you went further into the Earth you would find the liquid **outer core**



which is mostly made of **magma**. When magma exits the crust of the earth it is then called lava! Inside that, you find the solid **inner core**. The solid inner core has a lot of iron. Iron is a metal often used to make pans or armor. Iron is also found in every other layer of Earth.

To the left is a diagram of the layers of the Earth.



[Portrait of a Private Citizen](#)
[Roman](#)
[Early 3rd century, marble](#)

Vocabulary

Crust- The outer layer of the Earth, which we live on.

Gemstone- A piece of mineral crystal, valued for the ability to be cut and polished for decoration, adornment and other uses.

Inner Core - The solid center of the Earth.

Inner and Outer Mantles - Earth layers made of hot rocks and metal, found between the crust and the cores of the earth. The inner mantle is next to the core, the outer mantle is next to the crust.

Magma - Rock inside the earth that is so hot it has become liquid.

Malleability- A material's ability to be bent *and* hold its new shape.

Metal - A natural material that can be made shiny, is malleable, and conducts (moves) heat and electricity.

Mining - The process of digging deep into the Earth's crust to find rocks, metals, minerals, or gemstones.

Outer Core - A layer of magma between the inner mantle and the inner core.

Process - A way in which a living or non-living object or place is changed.

Rock- A solid mix of minerals.

*Learn more about soil and minerals in WAM's Earth Science lesson titled "Getting Muddy!"

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From Out of the Earth



Different kinds of rocks, metals, and **gemstones** need heat and intense pressure to form and deep inside the earth we can find both of these conditions! If these materials form deep inside the earth, how do they get close enough to the surface for us to find them, and how do we get to them?

The Earth's layers are in constant motion, but it is motion we rarely feel. That motion pushes things around, and materials that are very deep can be pushed closer to the surface. Then, we dig! **Mining** is the process of digging into the Earth's crust to find certain rocks, minerals, metals, or gems.

1.



Male Figure With Mask

2.



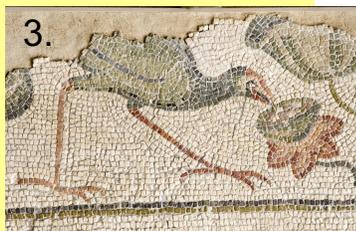
Gold Ring Set with Pink Stone

Examples from the WAM Collection!

Materials from Earth have always been important in artwork. Look at the artwork below, some of it very old. The first piece (1) is a sculpture carved from volcanic stone,

which is a rock made of cooled lava from a volcano! The second piece (2) is a ring made of gold and a pink gemstone. The third (3) is made of stone and is a mosaic, which is when an image is created by arranging small pieces of material. The fourth (4) piece is a decorated helmet made of iron, brass, gold and silver, which are all metals.

3.



Ktisis Floor Mosaic

4.



Horned Kulah Khud

When we find materials in the Earth, they don't come out clean and ready to use; we usually have to **process** (change) these materials to make them usable. These processes can be cleaning, re-melting, cutting, or polishing them with special tools and machines.

Here are some examples of what we create from Earth's materials: Shovels, scissors, and coins are made of metal. Minerals are used in paint, medicine, and food. Jewelry and clothing have gemstones in them. Rock is used to build houses, walkways, or roads. And all of these materials can be used to create ART!

Bend It! Mini Metals Activity

Malleability is a material's ability to be bent *and* hold it's new shape. What can you find in your home that is metal and can be bent? Do some things bend more than others? Do you think some things might* break before they bend at all? (*Don't break them!)

Gather 6 different items and try to bend them, then arrange them in order from the most malleable (bendable) to the least malleable (not bendable).

Suggestions for items to look for: aluminum foil, a soda can top, a spoon, a paper clip, a bobby pin, a metal bowl.

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Create : Mosaics



Today we are going to make a mosaic. A **mosaic** is an image made of small pieces of material laid next to each other. Here you can see a blown-up section of the [Ktisis Floor Mosaic](#) and you can see how the artist used stone of different colors to build an image.



Ktisis Floor Mosaic



Supplies

- Sketch Paper
- Pencil
- Colored Paper scraps
- Scissors
- Sturdy paper for base
- Glue

Directions

1. First, look at the colors of paper you have to work with today--your design might depend on the colors of paper you have. Sketch your idea for a mosaic in pencil on a piece of scrap paper. It is good to know that sometimes simpler designs are better when you are working on a mosaic.
2. On a piece of sturdy paper, lightly draw an outline of your idea. Don't color it in. You will fill in the shape with colored paper!
3. The next step is to cut your papers into small pieces for making your mosaic. These mosaic pieces are called **tesserae**. You can cut small squares, triangles, circles, or whatever shapes you would like. Don't cut them too small, though! If you have pieces smaller than a half an inch, they might be too small to keep track of.
4. Lay out the tesserae on your sturdy paper base. Don't glue yet! You may want to change something before you glue.
5. Leave a little bit of space between the pieces, leaving some of the sturdy paper showing through. Those spaces are a defining feature of a mosaic! In a stone or ceramic mosaic, grout would be added to fill in the cracks.
6. Once you have a lay-out you like, you can start gluing your paper tesserae to your paper. Dab a small amount of glue on the back of one piece and place it gently where you'd like it to go. Do this for each piece, and remember to leave a little space between them! Tip: You won't need a lot of glue if the pieces are very small.
7. Once your shape is filled in, you may want to add a background, or other designs. Get creative!



Feel free to use other materials such as glass gems, seashells, fabric and more that you may already have in your home to add to your mosaic. Keep in mind you may need a sturdier base and strong glue if using these bulkier materials.

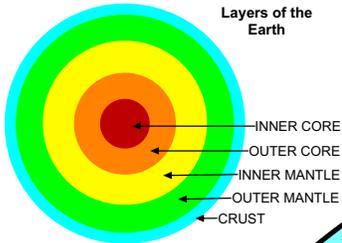


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Under Our Feet : Maze



Can you find your way to the inner core? How many turns does it take? How many layers do you pass through?



Start "digging" here!

