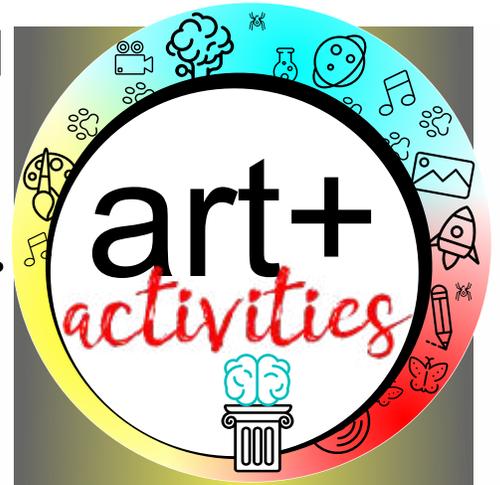


WORCESTER ART MUSEUM

Art + Science *Magnificent Metals!*



As humans, we interact with many types of materials in our everyday lives. Looking around, you can probably see items made out of wood, fiber, glass, stone, metal and plastic. **Metal** is a material that has been used for many things over the years - but what is it?

Metals are a category of **element** along with non-metals and metalloids. Metals are usually (but not always) **solid** at room temperature, **lustrous**, or shiny, and very **conductive** of heat and electricity. To conduct means to pass or move along. For example, if you were to put hot water into a metal cup, you would be able to feel the heat through the cup quickly and strongly. That is conduction of heat. The opposite is when a material is not as conductive, like when you pour hot water into a thick plastic cup. The plastic does not pass the heat along as well as the metal does.

Additional properties of metal are being **malleable** and **ductile**, and many have a high melting point. Malleability means that the element has the ability to be hammered or banged into a new shape and that it stays in that shape. Ductile indicates that a material can be drawn out into wires.

Casting is a method often used when creating with metals. As most metals are solid at room temperature and many have a high melting point, they can be melted, poured into a mold, and once cooled will retain that shape unless re-melted or hammered. These are qualities that artisans, artists, and armorers have used for centuries to create every day objects, art, arms, and armor!



[Bowl, British, about 1818, 1907.243](#)



[Obol \(coin\), Phistelia, Italy, Campania, Greek, 4th Century BCE, 1912.136](#)

Vocabulary

Element - One of over 100 substances that are the building blocks of matter and cannot be broken down into smaller or simpler substances.

Metal - A type of element that are often solid at room temperature, lustrous, malleable, ductile, and conductive.

Malleability - The ability to be hammered or pushed into a different shape and keep that new shape.

Lustrous - To be shiny or reflective, especially when polished.

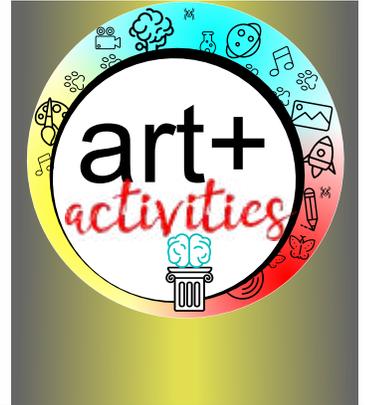
Conductive - The ability of an element for heat or electricity to pass along or move through it.

Ductile - The ability to be drawn out into a wire.

Casting - To make an object by pouring a liquid material (such as a hot metal) into a mold, letting it firm or cool, and removing it.

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Hands On Activity: Aluminum Sculpture



Metal has been used in many ways for thousands of years. It has been used in pots and pans for cooking use, for nails and tools for building, for swords and chain mail and for art.

Metal's ability to be bent, hammered, melted, and cast has made it a wonderful material to work with. The horse tot he left, by William Zorach is made of bronze by the casting method. Today we will be exploring the malleability or ability to bend-and-stay by working with an every-day metal - aluminum foil!

Supplies

- Aluminum Foil
- Dull Pencil
- Extra papers or magazine for padding
- Optional: Scissors

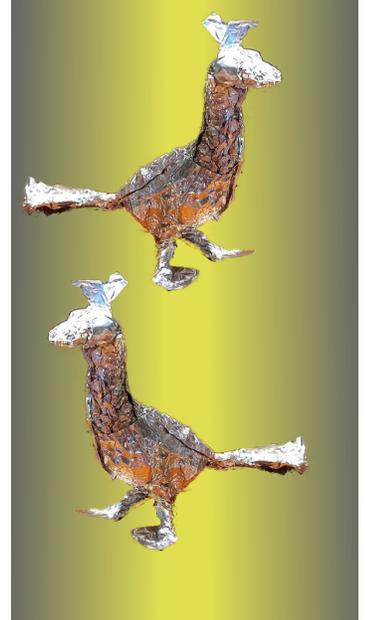


[Horse Grazing.](#)
[William Zorach, cast after](#)
[about 1944, bronze, 1981.15](#)

Create!

Metal Embossing

1. Tear or cut off a piece of aluminum foil about 12" by 12" square.
2. Fold it in half one way, then the other until you have a smaller square. You can cut it into a square or other shape, if you wish.
3. Place this square on top of your extra papers or magazine for padding
4. Using your dull (not pointy) pencil, draw into the aluminum foil! You can create whatever image you wish. The image will be pushed or embossed into the metal, and can be seen on all the folded pieces! Try different textures and thicknesses to press with. The back of a paintbrush will make a thicker line!



Metal Sculpture

1. After you create your metal embossed piece, you can try sculpting with aluminum.
2. Come up with a simple shape, like a moon, star, bird, or even the letters of your name.
3. Then cut, squish, fold, pinch, and twist the aluminum into shape!

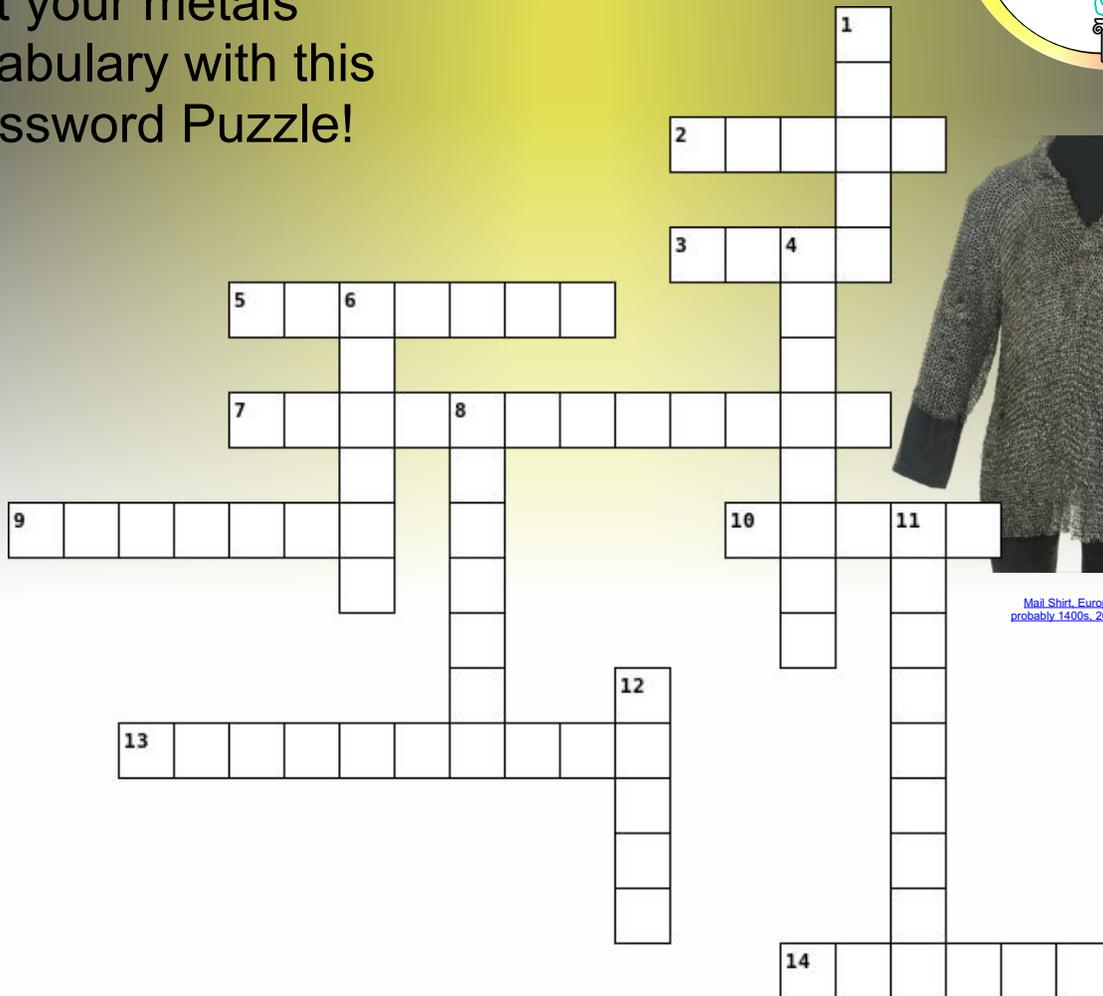


WORCESTER ART MUSEUM

Metals Crossword



Test your metals vocabulary with this Crossword Puzzle!



Across

2. A protective outer later a knight would wear
3. A precious metal that is shiny yellow
5. To make an object by pouring a liquid material into a mold, letting it firm or cool, and removing it
7. The ability to be hammered or pushed into a different shape and keep that new shape
9. The ability to be drawn out into a wire
10. The animal sculpted by William Zorach in the packet
13. The ability of an element for heat or electricity to pass along or move through it
14. Where the coin in this activity packet is from

Down

1. A long sharp tool a knight would use
4. To be shiny or reflective especially when polished
6. A precious metal that is shiny gray
8. One of over 100 substances that are the building blocks of matter and cannot be broken down into smaller or simpler substances
11. A type of art that has 3 dimensions
12. A type of element that are often solid at room temperature, lustrous, malleable, ductile, and conductive