Ceramics
Properties of Clay

There are three essential properties that make clay different from dirt. These are ***plasticity, porosity,*** and the ability to ***vitrify.***

PLASTICITY

Plasticity has to be our first consideration. You can't begin to make pottery without it. To be usable, clay has to have the ability to hold its form while at the same time be pliable enough to be moved by the potter's hands. This is plasticity, and it is determined by the size and shape of very fine grains or particles of clay called ***platelets***. When a potter is working the clay, the platelets slip and slide on each other and align themselves like bricks in a wall. If the platelets are very small and very smooth, obviously they will be easier to push into a specific form. It's interesting to carry this idea of smaller and smaller and smoother and smoother to the point where the platelets will not stop slipping and sliding. There is a clay that does just that. It's called ***bentonite***. Bentonite is too plastic; it;s like *Silly Putty* and cannot be used by itself to make pottery. Bentonite does have an important use, however. Because it is so slippery, the oil companies pump it into the ground to force out oil from wells that are going dry.

The ***water of plasticity*** is an essential past of a clay's ability to be plastic. Obviously, a dry substance isn't going to move around and stick together at the same time. Something has to be added to make clay both slippery and sticky. In this case it's H_2O (water), in just the right amount. Too much water and we have goo; too little water and we have powder. It's part of the potter's art learning to "feel" when just the right amount of this water of plasticity is present.

Organic material is another ingredient that makes clay slippery and adds plasticity. Material like decayed leaves, roots, and grasses have been ground up over the centuries and mixed with the clay particles. Acids formed by this organic material break down the particles.

POROSITY

Porosity is the second necessary property that clay must have. Clay has to dry without cracking. Remember, some clays are too plastic, like bentonite. The platelets are too fine and smooth and closely squeezes together to let the water of plasticity evaporate without cracking the pot. This is what happens when a mud puddle dries up. Instead of drying into a smooth, flat surface, most mud puddles when dry are covered with cracks in all directions. A clay, to be usable by the potter, must be porous (or coarse) enough to allow the water to escape evenly from all parts of the ware.

VITRIFICATION

Vitrification is the third important property of clay. Vitrification is the process of becoming glasslike. Although clay products never become absolutely vitrified or glasslike, it is necessary that the clay become hard (or almost vitrified) at a reasonable temperature. Any substance will melt at some temperature. Most materials tend to become soft and deform before they melt. The ability of clay to hold its shape and not sag or slump in the primary melting stages sets it apart from other materials. A sly pot will melt like a pancake if it's fired too high. Knowing when the clay particles have melted enough to be on the verge of distortion is as important as learning to use a potter's wheel of properly build ware by hand. The end is just as important as the beginning. Vitrification is not less important than plasticity or porosity. It is mentioned last only because it is the last stage in pottery construction.

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Properties of Clay - Reader's Quiz Name _____

Supply the missing word to complete the statement below.

1. There are three properties that make clay different from sand or dirt. These three essential properties are _____, _____, and _____.

2. The first essential property is _____, because to be usable, a clay has to have the ability to hold its _____ while at the same tine be plastic enough to be moved by the potter's hands.

3. Most plasticity is determined by the _____ and shape of the clay particles.

4. Clay particles are called _____.

5. The water of plasticity makes clay _____ and _____ at the same times.

6. Another ingredient that makes clay slippery and aids plasticity is _____ material.

7. The second necessary property a clay must possess is _____,

8, Clay has to be able to dry without _____.

9. If the platelets are too _____ and smooth or squeezed too close together to let the water _____, the pot will probably _____ when drying.

10. The third important property of a usable clay is the ability to _____, or become _____.

11. The ability of clay to hold its shape and not _____ in the primary melting stages sets it apart from other materials.