

Functional Ceramic: Glass

- Pure silica is harvested first, this is usually in the form of sand
- Since pure silica melts at 1713 degrees, sodium carbonate is added to it to lower its melting point
- However, this glass was unstable and dissolved in water, so calcium dioxide was added to prevent this
- This creates soda lime glass, which has a significantly lower melting point
- Once the melting point has been lowered, it can be melted into glass
- Then it can be formed into rods or sheets or various other forms
- It can then be blown into different forms, wound to make pottery, or distilled and made into fiber optic cables, to name a few applications
- Extra steps have to be taken to transport the glass, as it is fragile, so transportation has to be done in a way as not to break it
- When the glass breaks and needs to be disposed of, it is possible to recycle it into things like fiberglass, but people cannot recycle it like other waste, as it can be a hazard to recycling plant workers, so people must dispose of it separately

The step of melting the silica into glass has multiple contingencies, like the need for 2 other materials to make it able to be melted. The sodium carbonate helps lower the melting point by breaking the crystalline bonds in the silica, but it comes with its own drawback of being dissolved in water. So, calcium dioxide is added. So the solution to lower the melting point creates another problem that must be solved by adding something else. This series of additives further entangles the process of melting glass. Another contingency in this stage is the fact that people had to discover how to add these materials to silica to reduce its melting temperature, and without human interaction, soda lime glass would've never been invented.