

## Passage 2

Glass is a remarkable substance made from the simplest raw materials. It can be colored or colorless, monochrome or polychrome, transparent, translucent, or opaque. It is lightweight impermeable to liquids, readily cleaned and reused, **durable** yet fragile, and often very beautiful. Glass can be decorated in multiple ways and its optical properties are exceptional. In all its myriad forms – as table ware, containers, in architecture and design – glass represents a major achievement in the history of technological developments.

Since the Bronze Age about 3,000 B.C., glass has been used for making various kinds of objects. It was first made from a mixture of silica, lime and an alkali such as soda or potash, and these remained the basic ingredients of glass until the development of lead glass in the seventeenth century. When heated, the mixture becomes soft and malleable and can be formed by various techniques into a vast array of shapes and sizes. The homogeneous mass thus formed by melting then cools to create glass, but in contrast to most materials formed in this way (metals, for instance), glass lacks the crystalline structure normally associated with solids, and instead retains the random molecular structure of a liquid. In effect, as molten glass cools, it progressively stiffens until rigid, but does so without setting up a network of interlocking crystals **customarily** associated with that process. This is why glass shatters so easily when dealt a blow. Why glass deteriorates over time, especially when **exposed to** moisture, and why glassware must be slowly reheated and uniformly cooled after manufacture to release internal stresses **induced** by uneven cooling.

Another unusual feature of glass is the manner in which its viscosity changes as **it** turns from a cold substance into a hot, ductile liquid. Unlike metals that flow or “freeze” at specific temperatures glass progressively softens as the temperature rises, going through varying stages of malleability until it flows like a thick syrup. Each stage of malleability allows the glass to be manipulated into various forms, by different

techniques, and if suddenly cooled the object retains the shape achieved at that point. Glass is thus amenable to a greater number of heat-forming techniques than most other materials

**11. Why does the author list the characteristics of glass in lines 1-5?**

- (A) To demonstrate how glass evolved
- (B) To show the versatility of glass
- (C) To explain glassmaking technology
- (D) To explain the purpose of each component of glass

**12. The word “durable” in line 3 is closest in meaning to**

- (A) lasting
- (B) delicate
- (C) heavy
- (D) Plain

**13. What does the author imply about the raw materials used to make glass?**

- (A) They were the same for centuries.
- (B) They are liquid
- (C) They are transparent
- (D) They are very heavy.

**14. According to the passage, how is glass that has cooled and become rigid different from most other rigid substances?**

- (A) It has an interlocking crystal network.
- (B) It has an unusually low melting temperature.
- (C) It has varying physical properties.
- (D) It has a random molecular structure.

**15. The word “customarily” in line 17 is closest in meaning to**

- (A) naturally
- (B) necessarily
- (C) usually
- (D) certainly

**16. The words “exposed to” in line 19 are closest in meaning to**

- (A) hardened by
- (B) chilled with
- (C) subjected to
- (D) deprived of

**17. What must be done to release the internal stresses that build up in glass products during manufacture?**

- (A) the glass must be reheated and evenly cooled.
- (B) the glass must be cooled quickly
- (C) The glass must be kept moist until cooled.
- (D) The glass must be shaped to its desired form immediately

**18. The word “induced” in line 21 is closest in meaning to**

- (A) joined
- (B) missed
- (C) caused
- (D) lost

**19. The word “it” in line 22 refers to**

- (A) feature
- (B) glass
- (C) manner
- (D) viscosity

**20. The word “substantial”, in the last paragraph, is closest in meaning to**

- (A) considerable
- (B) excusable
- (C) understandable
- (D) amicable