

Science: What makes the bulb work? Predict: Design light bulbs for the future.



Dig A Little Deeper How Many Minerals and Metals Does It Take to Make A Light Bulb?

Bulb
Soft glass is generally used, made from *silica, trona (soda ash), lime, coal, and salt*. Hard glass, made from the same minerals, is used for some lamps to withstand higher temperatures and for protection against breakage.

Gas
Usually a mixture of *nitrogen* and *argon* to retard evaporation of the filament.

Support wires
Molybdenum wires support the filament.

Button & Button Rod
Glass, made from the same materials listed for the bulb (plus lead), is used to support and to hold the tie wires placed in it.

Filament
Usually is made of *tungsten*. The filament may be a straight wire, a coil, or a coiled-coil.

Heat Deflector
Used in higher wattage bulbs to reduce the circulation of hot gases into the neck of the bulb. It's made of *aluminum*.

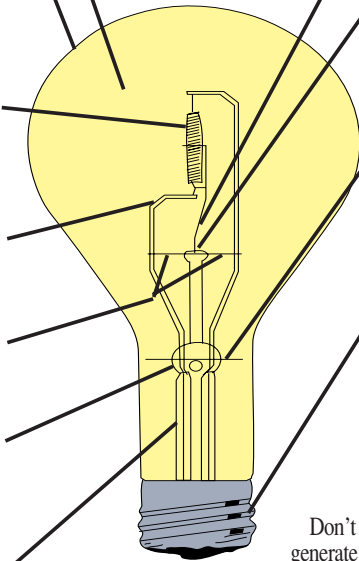
Lead-in-wires
Made of *copper* and *nickel* to carry the current to and from the filament.

Base
Made of *brass (copper and zinc)* or *aluminum*. One lead-in wire is soldered to the center contact and the other soldered to the base.

Tie Wires
Molybdenum wires support lead-in wires.

Stem Press
The wires in the glass are made of a combination of *nickel-iron* alloy core and a *copper* sleeve.

Fuse
Protects the lamp and circuit if the filament arcs. Made of *nickel, manganese, copper* and/or *silicon* alloys.



Don't forget the mineral fuels needed to generate the electricity to light up the bulb. In the U.S., these are the sources of our fuels

| Coal | Nuclear | Hydro | Natural Gas | Oil | Other |
|------|---------|-------|-------------|-----|-------|
| 52 % | 20 % | 7 % | 16% | 3% | 2 % |

For information about minerals in society, go to:
Mineral Information Institute, www.mii.org

Geography: Research & ID the states and countries producing these minerals.

Math/Art: Explore shapes & sizes. Light bulb picture collage.