Here's the calculation for diamond: Density = mass/volume Diamond density = 10 g (mass of a 1 cm^3 sample of diamond) / 2.83 cm^3 (volume of a 1 cm^3 sample of diamond) Diamond density = 3.51 g/cm^3

And for graphite: Graphite density = 8 g (mass of a 1 cm^3 sample of graphite) / 3.53 cm^3 (volume of a 1 cm^3 sample of graphite) Graphite density = 2.26 g/cm^3

Here's a quote from Richard Smalley, one of the discoverers of fullerene: "Carbon is the most extraordinary element. It has the capacity to form an infinite variety of structures and compounds."

An anecdote: Did you know that graphite was used in the first nuclear reactors to control the nuclear chain reaction? This is because graphite is a good neutron moderator, meaning it can slow down neutrons and increase their chances of causing a nuclear reaction.

In conclusion, allotropes of carbon have unique structures and properties that make them useful in a variety of applications. Diamond is hard and thermally conductive, graphite is soft and slippery, and fullerene has unique electrical and mechanical properties. These allotropes can be used in everything from cutting tools to medical imaging and drug delivery.

Here's a code sample to calculate the density of diamond and graphite:

```
# Diamond density calculation
mass_diamond = 10  # mass of a 1 cm³ sample of diamond
volume_diamond = 2.83  # volume of a 1 cm³ sample of diamond
```