



Material					
	Silicon	Carbon Fiber	Titanium	Aluminum	Steel

Solve the Puzzle, Learn about Materials!

Use the hints to identify which material is which in this logic puzzle.

Material Description	1. This material is an element on the Periodic Table of the Elements - it is not a composite material or metal alloy (combination of metals). It is as strong as steel, and twice as strong as aluminum. It is 45 percent lighter than steel; but it is 60 percent heavier than aluminum.				
	2. This material is a combination of two materials from the Periodic Table of the Elements (and sometimes has some additional materials added to prevent rust). It is a very strong material, a good heat conductor, but rusts easily unless treated or painted. This material is very commonly used in structures. According to sciencewithkids.com, in 2012 alone, more than 6.4 million tons of this material was used in structures – that is equivalent to more than 40 pounds of it per person in the United States.				
	3. This material is an element on the Periodic Table of the Elements. It is known for its electrical conductivity, which is in between good conductors and non-conductors. It can conduct electricity but not easily. It is known for its use in computers, but you likely have seen it as a compound in grains of sand.				
	4. This material is a composite material, which means that it is made from multiple materials combined together. It is made from human hair sized strands of carbon, combined with epoxy, and then cured in a mold to make it into a particular shape. It is four times stronger than steel and eight times stronger than aluminum, and stiffer than both of those, and very lightweight for its strength.				
	5. This material is an element on the Periodic Table of the Elements. You probably have seen it in things like foil and cans. It is easy to recycle, and it is cheaper to recycle it than to create it. It is the most abundant metal in the earth's crust. The pure form of this element is soft and ductile and not very strong, but it can be made stronger with the addition of other metals. It is a better heat conductor than steel, a good electrical conductor, and does not rust easily.				

Hints:

1. Silicon is element number 14 on the Periodic Table of the Elements.
2. Steel is made from Iron (element number 26 on the Periodic Table), with just a little bit of Carbon (element number 6).
3. Adding other ingredients and changing the ratio of ingredients can make different types of steel. For example Zinc (element #30) could be added to prevent the steel from rusting.
4. Carbon Fiber is both stronger and stiffer than both Steel and Aluminum, but it is also quite lightweight.
5. Aluminum is the most abundant metal in the earth's crust.
6. Titanium is stronger than Aluminum, but it is also heavier.