Reading About Recycling:

Ferrous Metal

ISRI
Voice of the Recycling Industry

JASON Learning

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Do you have a magnetic personality? Your car does, too. More than 2/3 of the mass of most cars is made of iron and steel--metals that are magnetic. Iron (Fe) is the most common metal (by mass) on our planet. You can find it in the ground, in rocks (even meteoroids) and in soils on Earth and Mars.

The symbol for iron on the periodic table is Fe, from the Latin adjective ferrous. In the heat of stars iron is made from the decay of another element, nickel (Ni). On the periodic table, you can see that iron has two fewer protons than nickel. Its properties are similar to Ruthenium and Osmium. In the center of our planet, molten iron creates our planet's magnetic field. On the surface, iron combines easily with oxygen in many forms. So iron ore often looks red or rusty.

26 2 8 14 2 **Fe** Iron 55.845	27 2 8 15 2 **Co** Cobalt 58.933195	28 2 8 16 2 **Ni** Nickel 58.6934
44 2 8 18 15 1 **Ru** Ruthenium 101.07	45 2 8 18 16 1 **Rh** Rhodium 102.90550	46 2 8 18 18 0 **Pd** Palladium 106.42
76 2 8 18 32 14 2 **Os** Osmium 190.23	77 2 8 18 32 15 2 **Ir** Iridium 192.217	78 2 8 18 32 17 1 **Pt** Platinum 195.084
108 2 8 18 32 32 14 2 **Hs** Hassium (277)	109 2 8 18 32 32 15 2 **Mt** Meitnerium (268)	110 2 8 18 32 32 17 1 **Ds** Darmstadtium (271)

Iron has been used for tools since prehistoric times. But in its original form this dense metal is brittle and isn't as useful as iron alloys. When iron is mixed with other elements like carbon, it can become much harder and less brittle. The carbon holds the iron molecules in their crystal structure. We call an iron alloy steel. Other elements are often added to iron to make steels with different properties like nickel, chromium, or manganese. These alloys increase steel's hardness, ductility (ability to be stretched), and strength.

Because iron and steel are magnetic, it is easy to separate them in the recycling process. When a car is shredded, the small bits are run through a machine with strong magnetic coils. The ferrous metals are sorted into one pile, and the remaining components of the car into others.

Like most metals, iron can be used again and again. Recycling saves money, energy, and reduces our need to mine for more deep in the Earth.

Comprehension Questions:

1. Name two properties of iron:_____
   _____
2. Why does iron need special processing before we use it?
   _____
   _____
3. What is an alloy?_____
   _____
4. What properties of iron alloys make them more valuable?
   _____
   _____
5. Use the diagram to the right to describe a cycle where the iron and steel in your car can be used and then recycled to be used again.