Earth Facts

* Metals obtained from ores by reduction with C or electrolysis
  + Fe, Cu, Zn, Sn, Pb obtained by heating with C
  + K, Na, Ca, Mg, Al, Si obtained from electrolysis
  + C cheaper than electrolysis
* Glass made from melted sand
  + Windows made as “float glass” by floating melted glass on melted tin
  + Shaped glass made by “glassblowing” and molding
  + Additives give glass different properties
    - Color: Se red, Co blue, Cr green, Mn purple, C brown
    - Pyrex: boron trioxide added to make borosilicate glass
    - Photochromic glass: AgCl and CuCl added
* Concrete made from Portland cement, gravel or sand, rebar, and water
  + Portland cement: limestone + diatomaceous earth (DE) + heat
    - Heat removes CO2 from limestone (CaCO3) leaving CaO
    - Heat combines DE (SiO2) and CaO producing Ca2SiO4
* Rebar is long iron rods tied together in crosshatched pattern
* Water turns calcium silicate (Ca2SiO4) powder into rock-hard hydrate
* Wood paper and cardboard made from trees
  + Wood produced from trees cut up in sawmills
  + Paper made from ground up wood treated with strong acid, pressed, rolled, bleached, and dried
  + Cardboard made from unbleached paper and glue
* Asphalt (black road tar) made from leftover bottoms after cracking and distilling petroleum (crude oil)
* Brick, dinnerware, porcelain (sink, bathtub surface) made from wet clay, shaped and then heated in kilns
* Sheetrock (drywall) from gypsum deposits (CaSO4), paper, and glue
* Clothing is cotton, wool, synthetics, leather, rubber, plastics, fur, and/or metal
  + Cotton from cotton plants (agriculture)
  + Wool from sheep
  + Synthetics from distilled cracked petroleum fractions and coal (feedstocks) reacted with various mineral-based chemicals to make organic chemicals
    - Petroleum feedstocks: ethylene, propylene, butylene, acetylene
    - Coal feedstocks: benzene, toluene, xylene
    - Alternative to feedstocks is methanol (wood alcohol) which can be made from coal via synthesis gas (CO + H2) and turned into any organic chemical (more expensive process)
* Leather from animal skins. Synthetic leather from organic chemicals (originally from feedstocks).
* Rubber from rubber trees or butadiene (an organic chemical)
* Plastics made from organic chemicals
* Fur from animals or organic chemicals
* Gases O2, He, N2, Ar
  + He obtained from natural gas (CH4 and trace He) by refrigeration (condensation) and distillation
  + O2, N2, Ar obtained from air by refrigeration and distillation
* Food: animal, mineral, and vegetable with added organic chemicals and minerals
  + Animal from factory farms and free-range cattle farms
  + Mineral from chemicals mined from earth (ie salt from salt domes and salt water)
  + Vegetable from plants harvested and grown on farms (agriculture)
* Water from rivers, lakes, aquifers, water table, rain, and oceans
  + River and lake water need to be purified
  + Water table water needs less purification
  + Artesian aquifer water has to be obtained by drilling through rock; normally requires the least amount of purification
  + Rain water sometimes requires no purification
  + Ocean water can be purified (desalinated or desalted) using reverse osmosis; this forces water through a filter through which salt is unable to pass
* Pollution
  + Land pollution was once considered a water problem because rain washes chemicals into rivers, lakes, and the ocean (ie. plastics and garbage in the oceans)
  + After it was proven that hazardous waste landfills were leaching toxins into the soil which could be picked up by food crops EPA set up several subagencies to deal with soil pollution