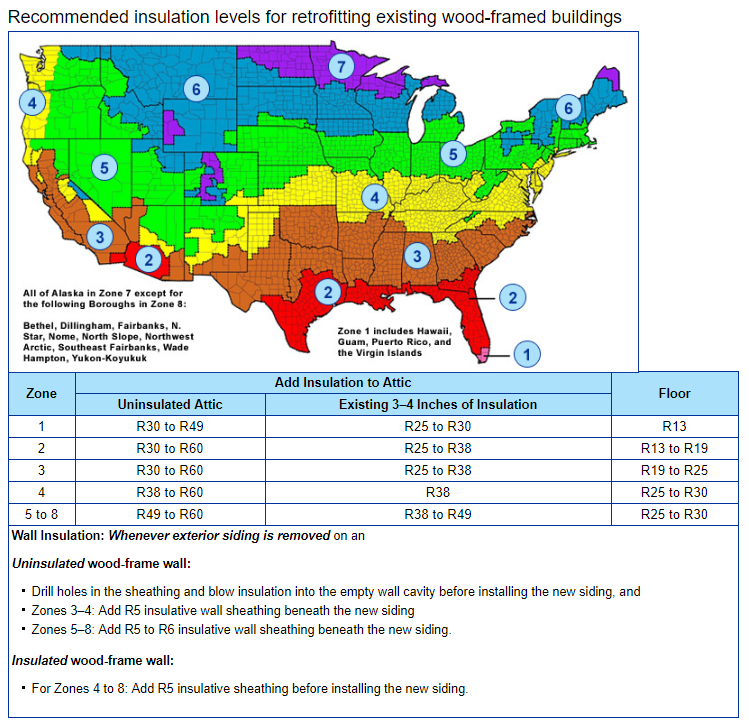
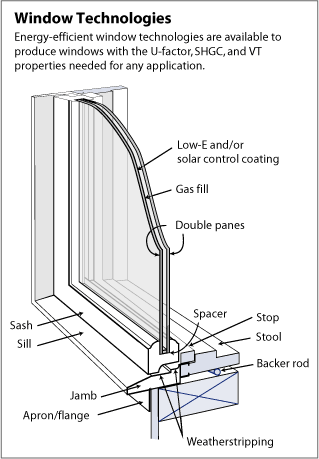
# Home Energy Savings:

* **Energy efficient windows**
  + Windows are rated for efficiency based on their thermal transmittance (noted as the U-value).
  + Characteristics of EE windows includes:
    - Double or triple pane.
      * Can be filled with a gas, such as Argon, to decrease the thermal transmittance (retain more heat).
    - Low- E coating: a coating that helps reflect heat back into the house in the winter and sunlight back to the outside in the summer.
* **Insulation**
  + Home insulation levels are rated based on their thermal resistance (noted as the R-value; this is the opposite of U-value).
  + Appropriate levels of insulation depend on the area of the country one lives in (see map).
  + The R-value provided is dependent on the type of insulation as well the heating type of the home (furnace, electric baseboards, etc.).
    - Common types of insulation include:
      * Loose fill fiberglass
      * Fiberglass bats
      * Spray foam insulation
      * Cellulose (blown-in or spray)
* **Lighting:**
  + Here’s a quick comparison of lighting types:
  + Incandescent:
    - This is the standard Edison bulb with the glowing filament.
    - 90% of the energy consumed by incandescent bulbs is actually given off as heat!
    - Typically only last 3-4 years.
    - Cost less initially, but because they must be replaced more often, they end up costing more in the end.
  + CFLs (Compact Fluorescent Lighting):
    - CFLs are a form of efficient lighting.
    - CFLs use 75-80% less energy than incandescent bulbs.
    - They are typically cheaper than LEDs, though they don’t last quite as long.
    - Come in all shapes, sizes, and color temperatures.
    - Don’t work as well in cold weather (need to heat up to full brightness).
    - Wear out quicker when turned on and off frequently.
    - Contain mercury gas, which must be disposed of properly when broken or at the end of lifespan (check with local recycling guidelines).
  + LEDs (Light Emitting Diode):
    - LEDs are the most efficient form of lighting on the market today.
    - LEDs produce little to no heat, meaning the majority of the energy they consume is given off as light (what we want!).
    - LEDs also last much longer (8-10 years under typical use) and come in all shapes and sizes.
* **Water efficiency**
  + Quick, low cost installations:
    - Converting to low flow shower heads on average saves 1 gallon/minute/shower.
    - Sink aerators in the kitchen and bathroom reduce water flow while still maintaining pressure. They save on average 1 gallon/minute.
    - Efficient toilets use as little as 0.8 gallons per flush, though 1.28 gallons/flush is most common:
      * Converting a post-1992 toilet to an efficient toilet saves 1/3 -1/2 gallon per flush.
      * Converting from a pre-1992 toilet can save anywhere from 2.2-6 gallons per flush (depending on the age of the toilet).
    - Look for the WaterSense label to know you’re getting an efficient fixture.
    - Consider xeriscaping your yard (less grass, more native plants that are suited to the environment, rocks).
* **Energy efficiency:**
  + Buy energy efficient appliances (Energy Star rated).
  + Insulate water heater and pipes (saves 7%-16% of energy bill/year).
  + Install a programmable thermostat.



(Energy.gov)

**Questions for HS and older:**

* Why are LED light bulbs the most efficient?
  + They generate little to no heat, meaning the majority of energy they consume is given off as JUST light
  + They last longer
  + They contain mercury gas which extends their life span
  + **Both A and B**
* What installations can be made in a home to reduce water use?
  + Low-flow toilets
  + Low-flow showerheads
  + Sink aerators
  + **All of the above**
* What combination represents the most efficient type of window?
  + Single-pane window
  + Double-pane window
  + Double-pane window with low-e coating
  + **Double-pane window with low-e coating and a gas fill**
* What is the term used for a yard that utilizes native plants and rocks instead of typical green grass?
  + Desertiscaping
  + **Xeriscaping**
  + Rock gardening
  + Ungrassification
* What device can you install in your house that controls temperature based off predetermined time settings?
  + HVAC system
  + **Programmable thermostat**
  + Thermometer
  + Ventilator