# 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