

HUMAN BUILDING INTERACTION



Solving the Occupant Problem

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Learning Objectives

From this session, attendees will learn:

- What does Human Building Interaction (HBI) mean,
- What is design thinking, and
- How we can use both to design new ways that our interactions with buildings can use less energy.

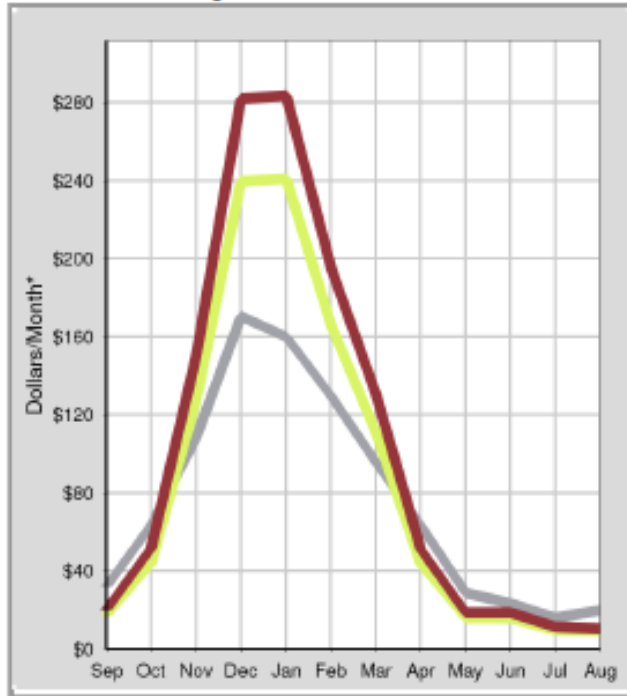






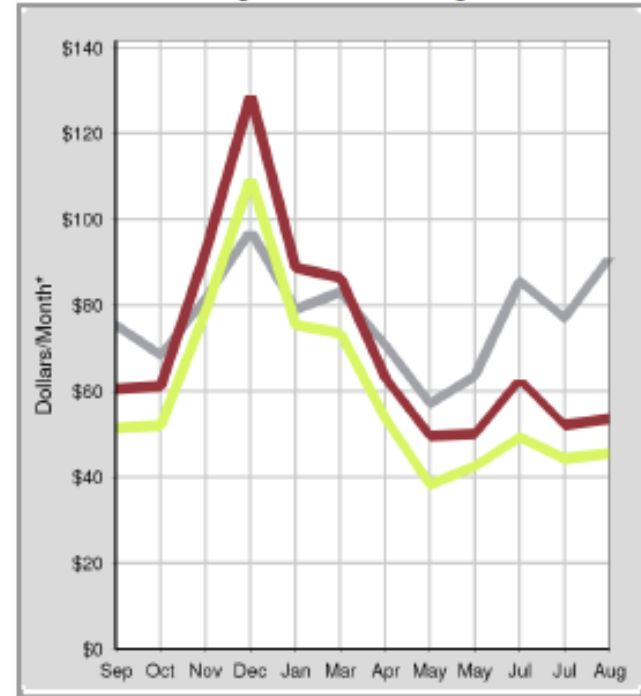


Monthly Natural Gas Use



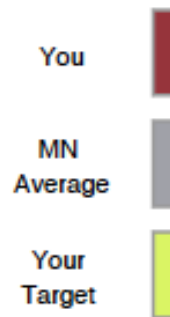
*Using average rate of \$0.81 / therm.

Monthly Electricity Use



*Using average rate of \$0.11 / kWh

Usage from
09/08 to 09/09













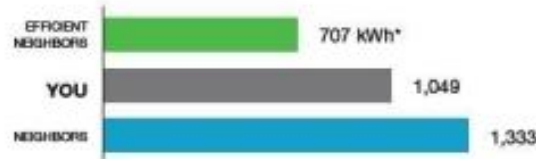








Last Month Neighbor Comparison | You used **48% more** than your efficient neighbors.



* kWh: A 100-Watt bulb burning for 10 hours uses 1 kilowatt-hour.

HOW YOU'RE DOING:



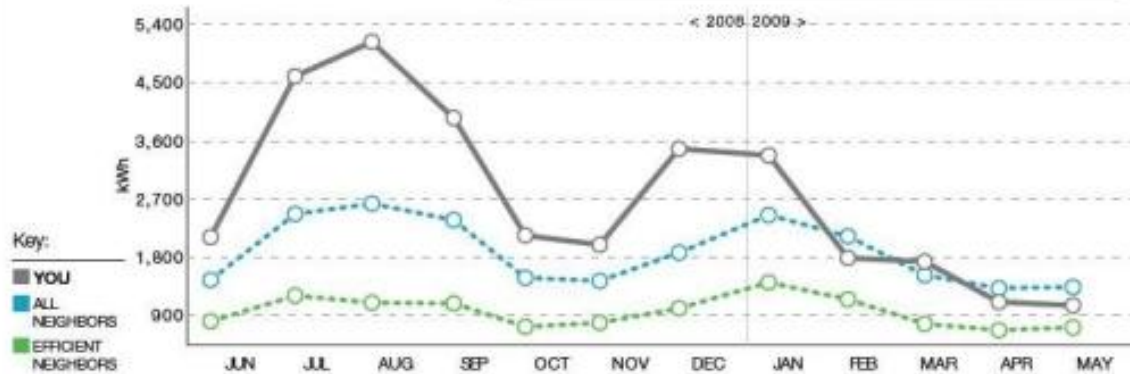
WHO ARE YOUR "NEIGHBORS"?

ALL NEIGHBORS
 Approximately 60 occupied, nearby homes that are similar in size to yours (avg 5,379 sq ft)

EFFICIENT NEIGHBORS
 The most efficient 20 percent from the "All Neighbors" group

Last 12 Months Neighbor Comparison

You used **45% more** electricity than your neighbors. This costs you about **\$1,029 extra** per year.



Personalized Action Steps

Set your thermostat for comfort and savings

Choose efficient light bulbs

Look for the ENERGY STAR® label

TURN OVER TO LEARN MORE ➔







U.S. DEPARTMENT OF ENERGY



U.S. Government Federal law prohibits removal of this label before consumer purchase.

ENERGYGUIDE

Refrigerator-Freezer
• Automatic Defrost
• Side-Mounted Freezer
• Through-the-Door Ice

XYZ Corporation
Model ABC-L
Capacity: 23 Cubic Feet

Estimated Yearly Operating Cost

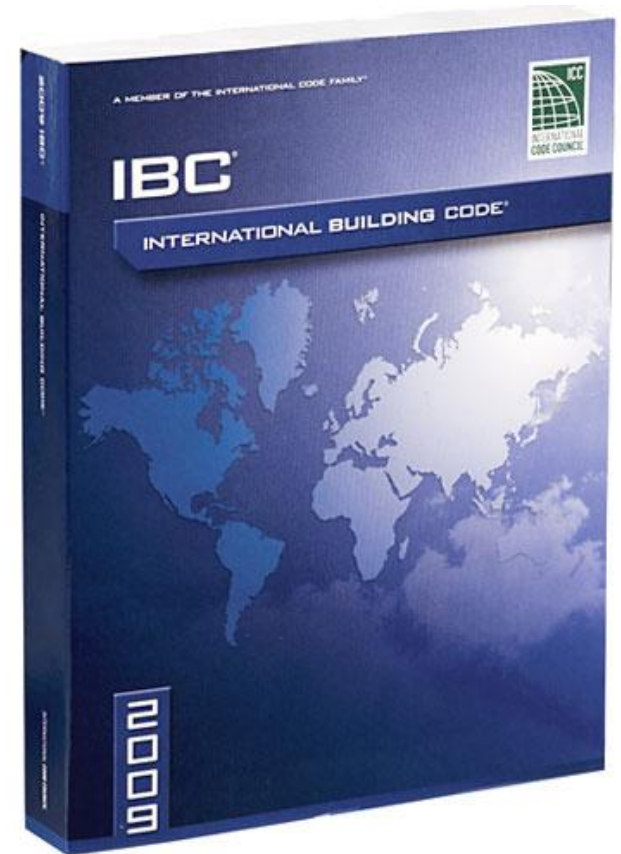
\$67

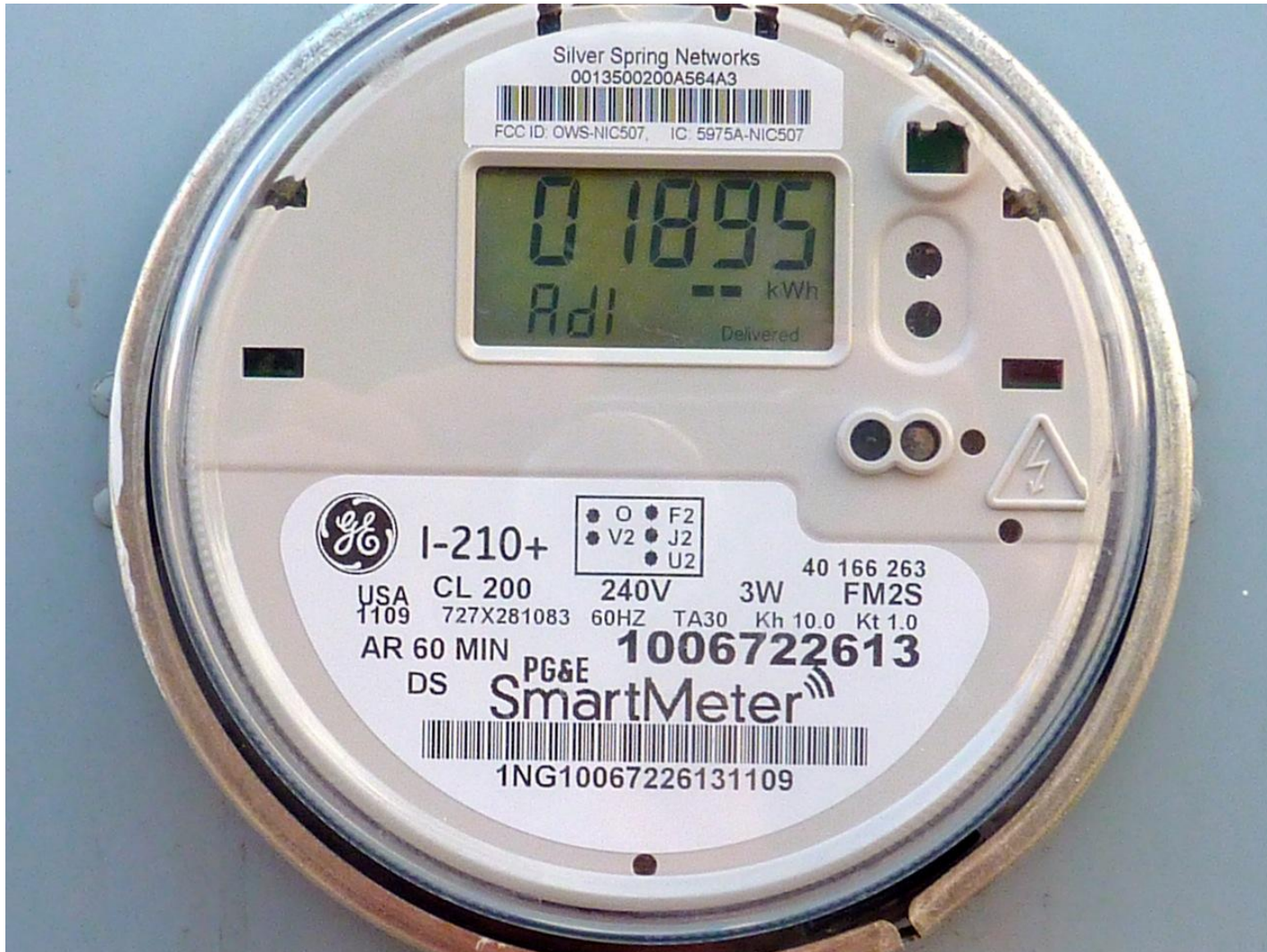
\$57 ————— \$74
Cost Range of Similar Models

630 kWh
Estimated Yearly Electricity Use

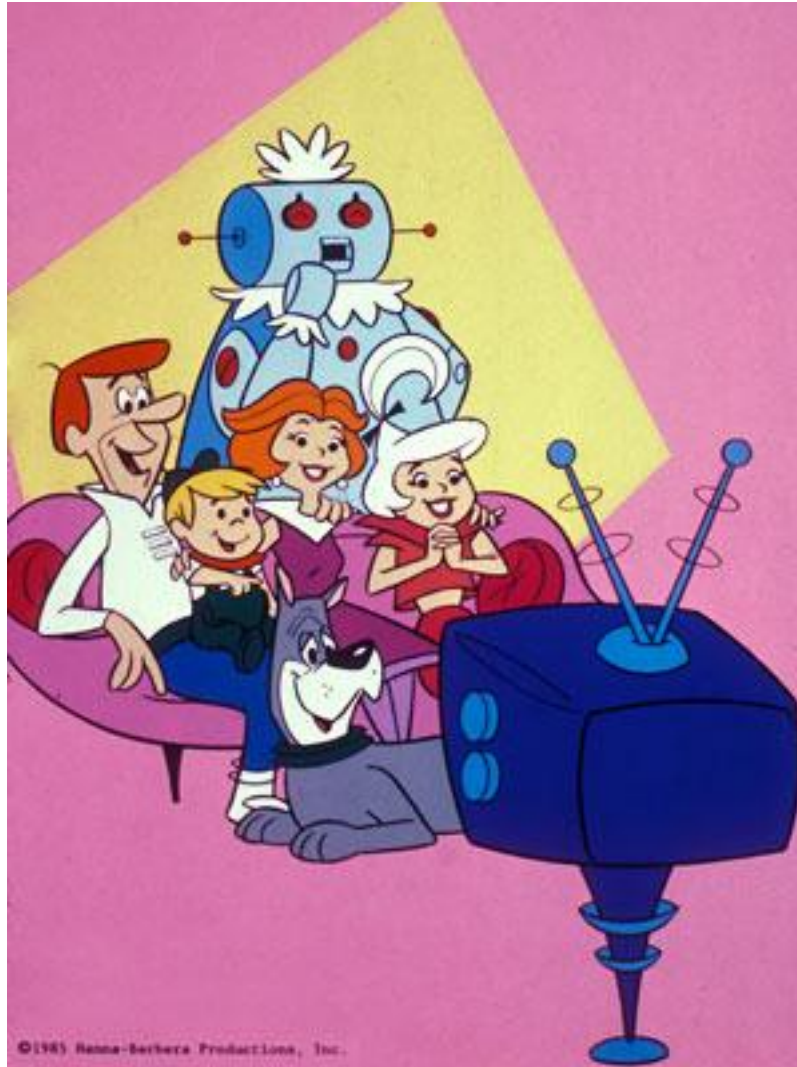
Your cost will depend on your utility rates and use.

- Cost range based only on models of similar capacity with automatic defrost, side-mounted freezer, and through-the-door ice.
- Estimated operating cost based on a 2007 national average electricity cost of 10.65 cents per kWh.
- For more information, visit www.ftc.gov/appliances.

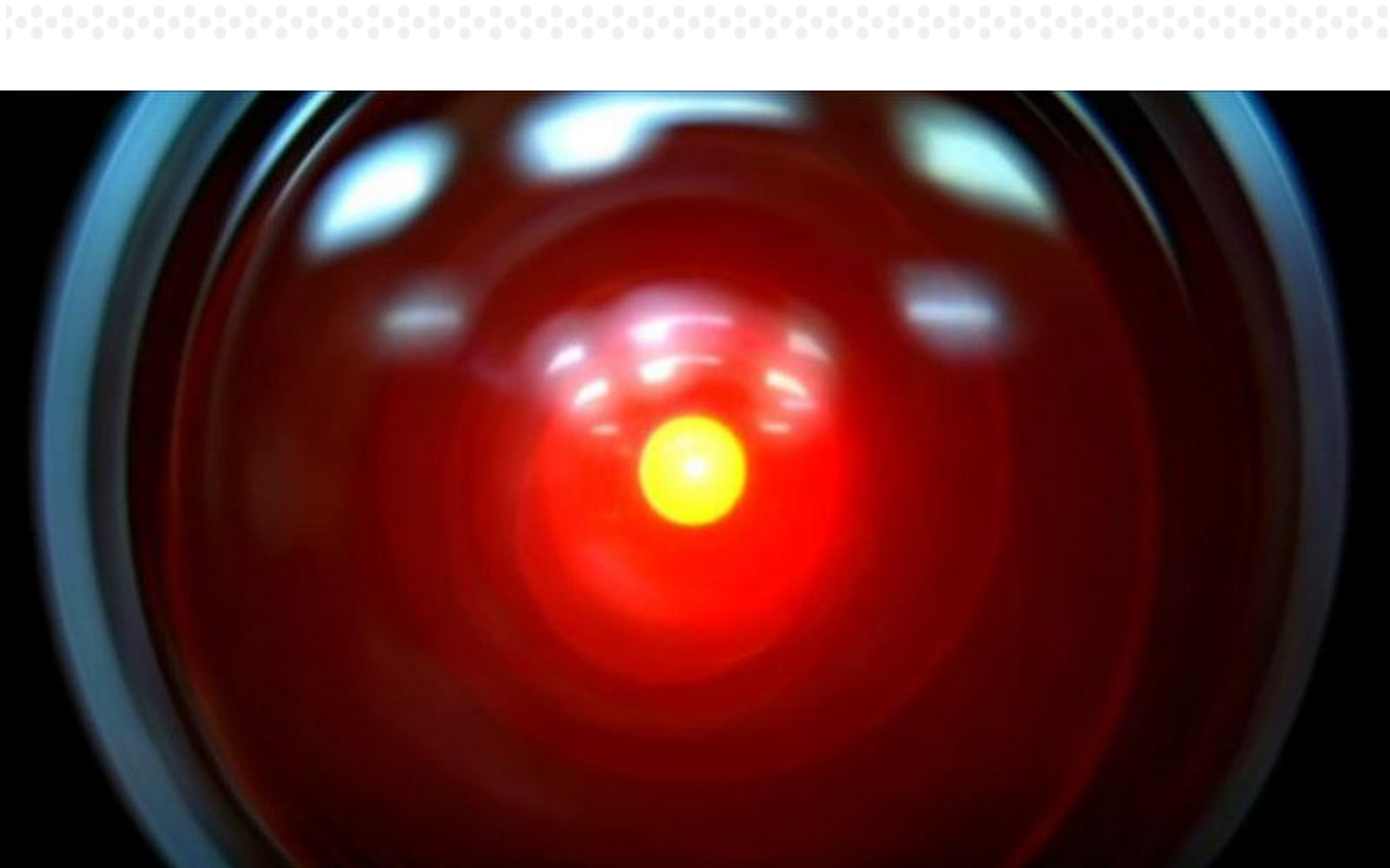




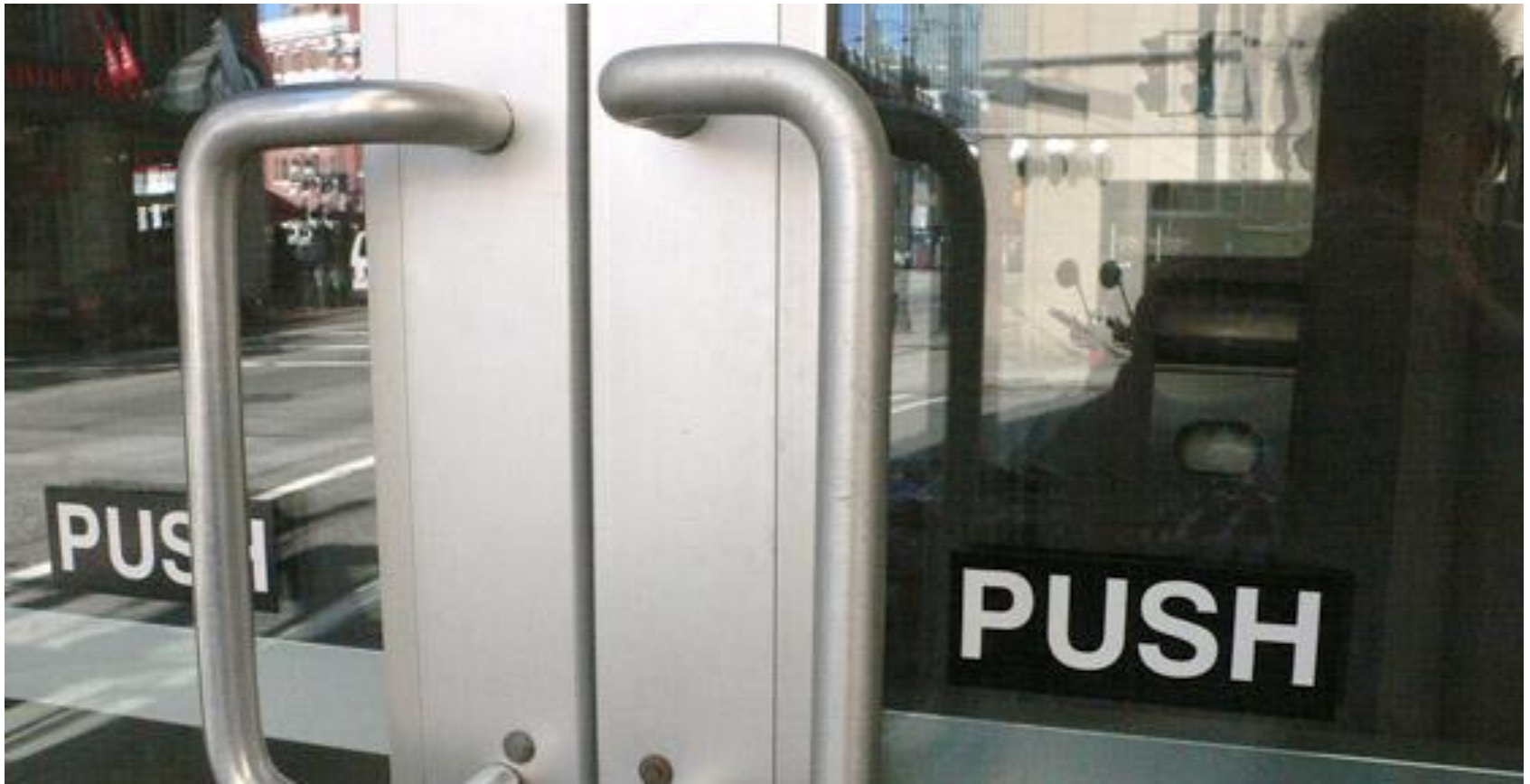


























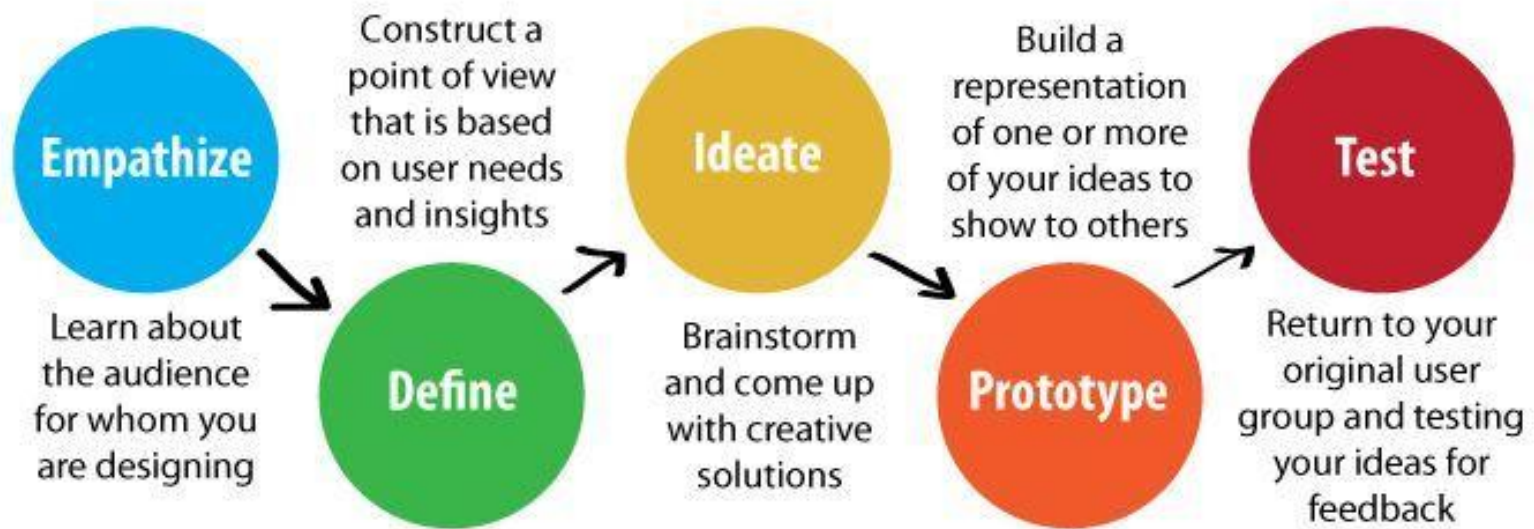




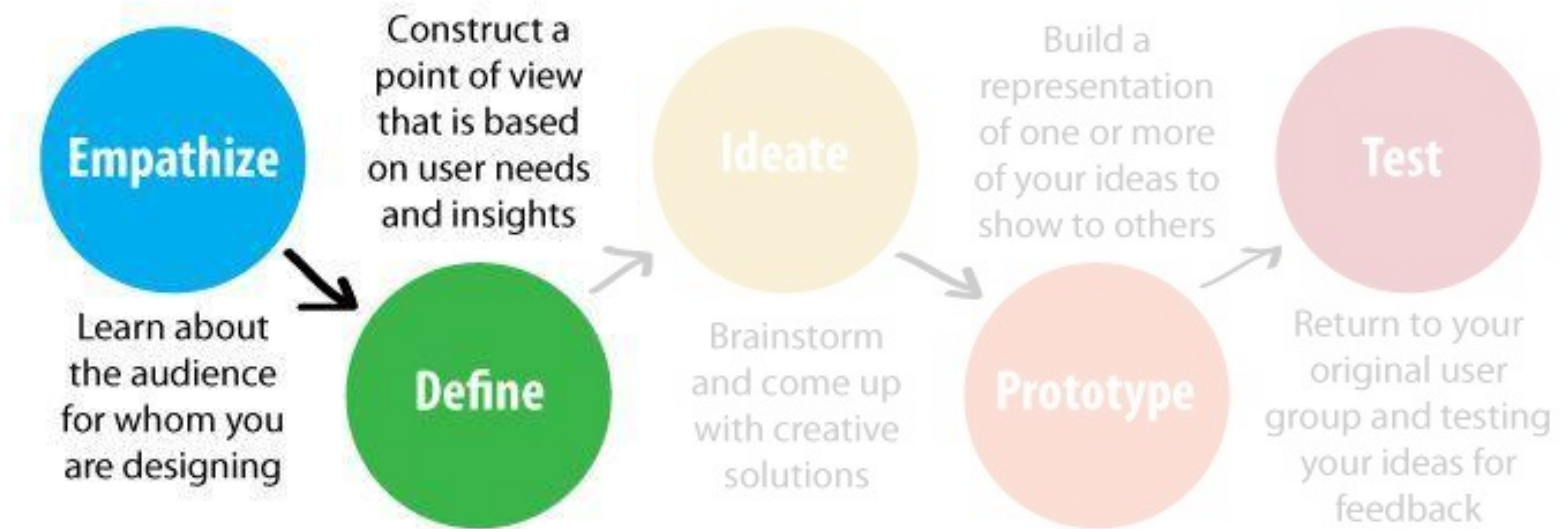
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Design Thinking

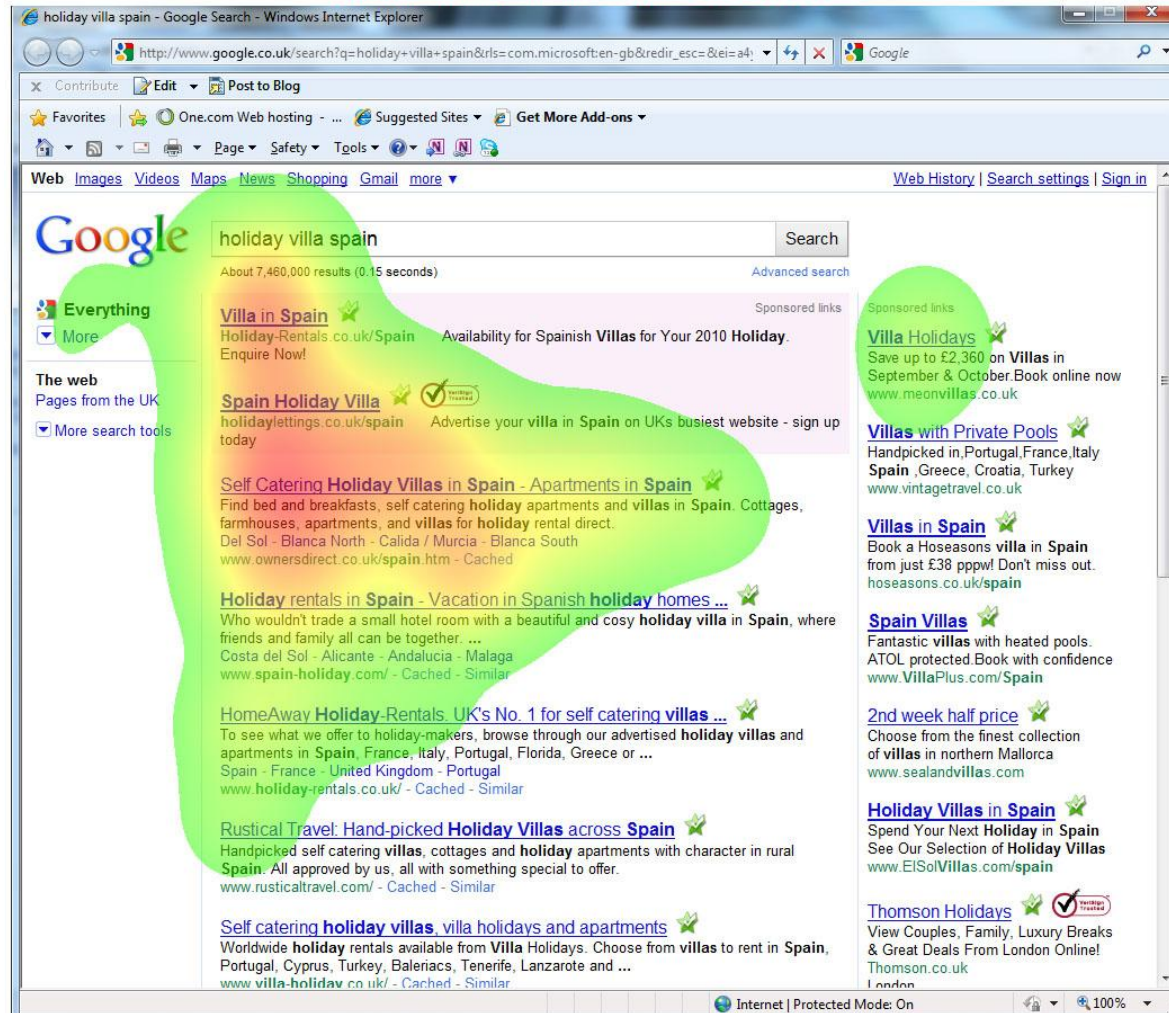


Design Thinking





EyeLink Fixation Map (Duration Based): trials=5, fixations=154, max=1157.59 msec















LEFT A universal headwall design allows patient rooms to flex easily from acute care rooms to critical care rooms, minimizing the need to move the patient and allowing for unit flexing to meet census needs. **RIGHT** Taking procedures to the patient reduces patient movement, eliminates staged waiting and can increase staff efficiency.



LEAN, ENERGY & CLIMATE TOOLKIT



**Achieving Process Excellence
Through Energy Efficiency
and Greenhouse Gas Reduction**

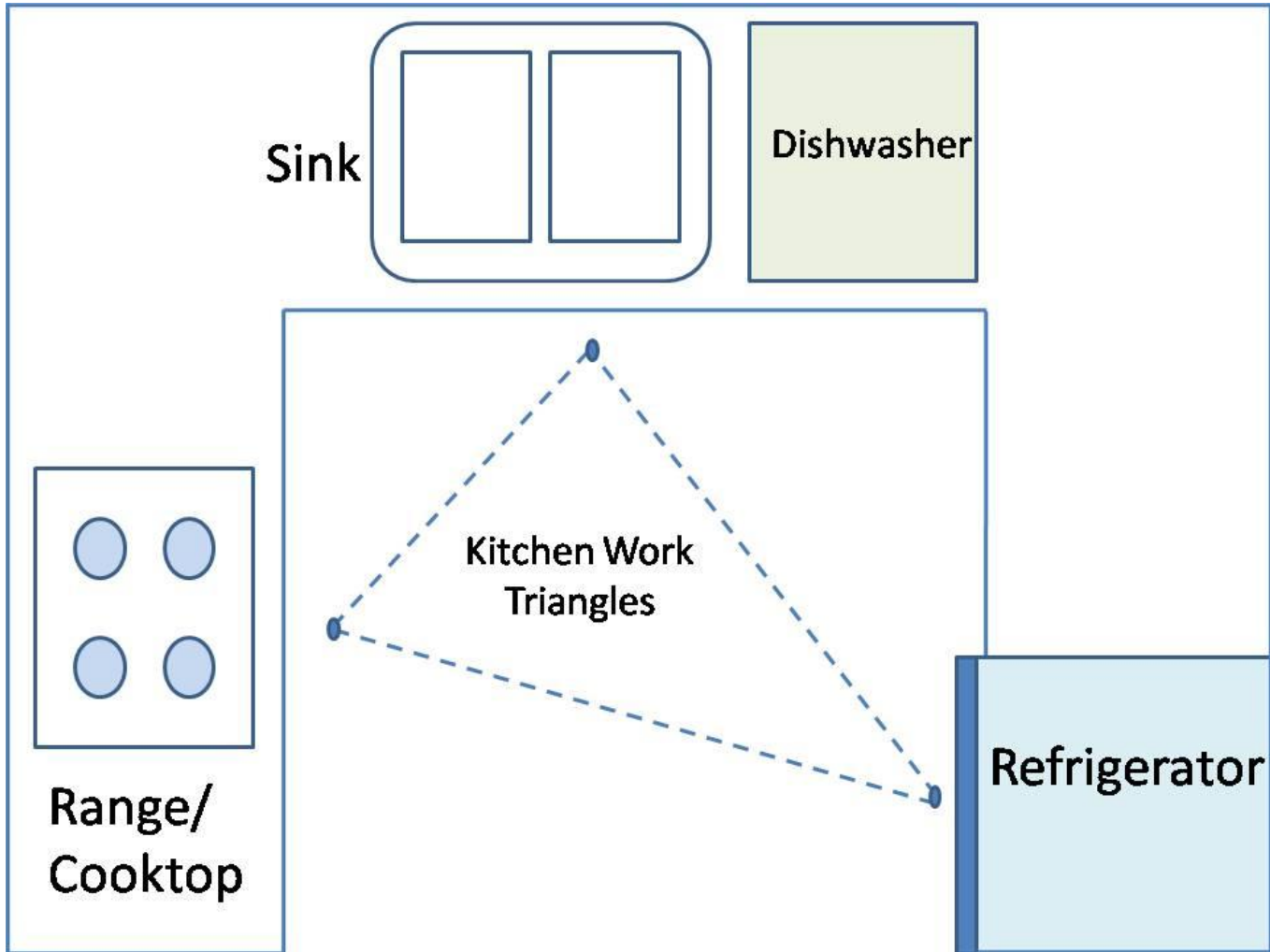
www.epa.gov/lean

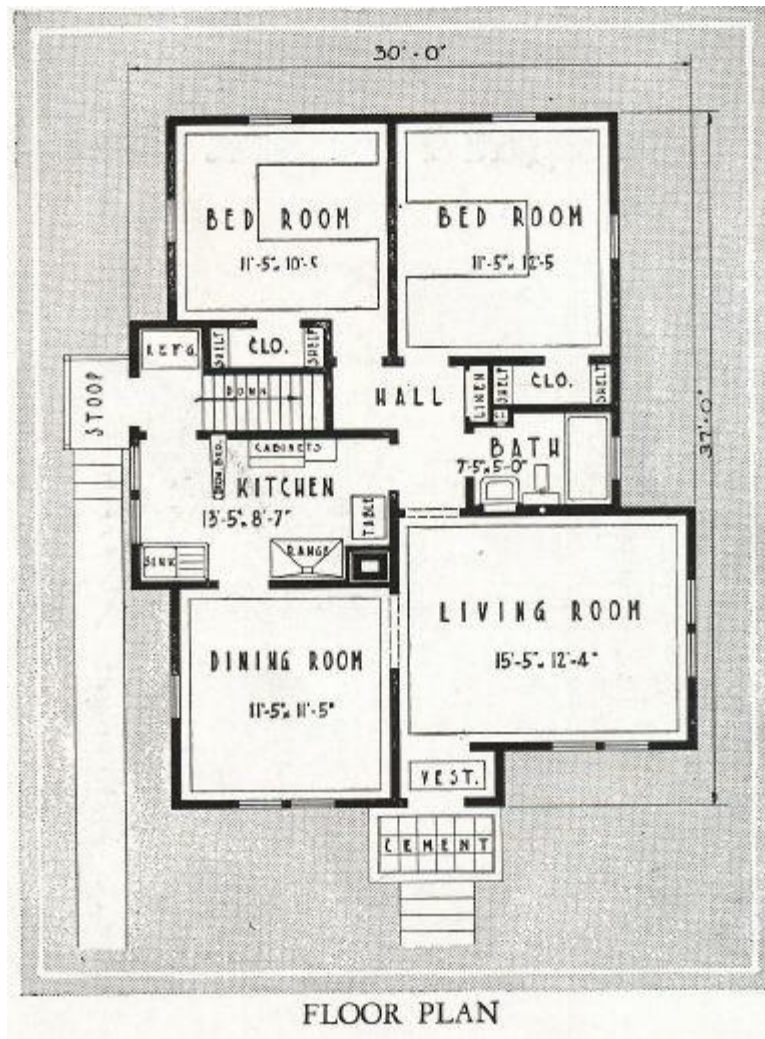


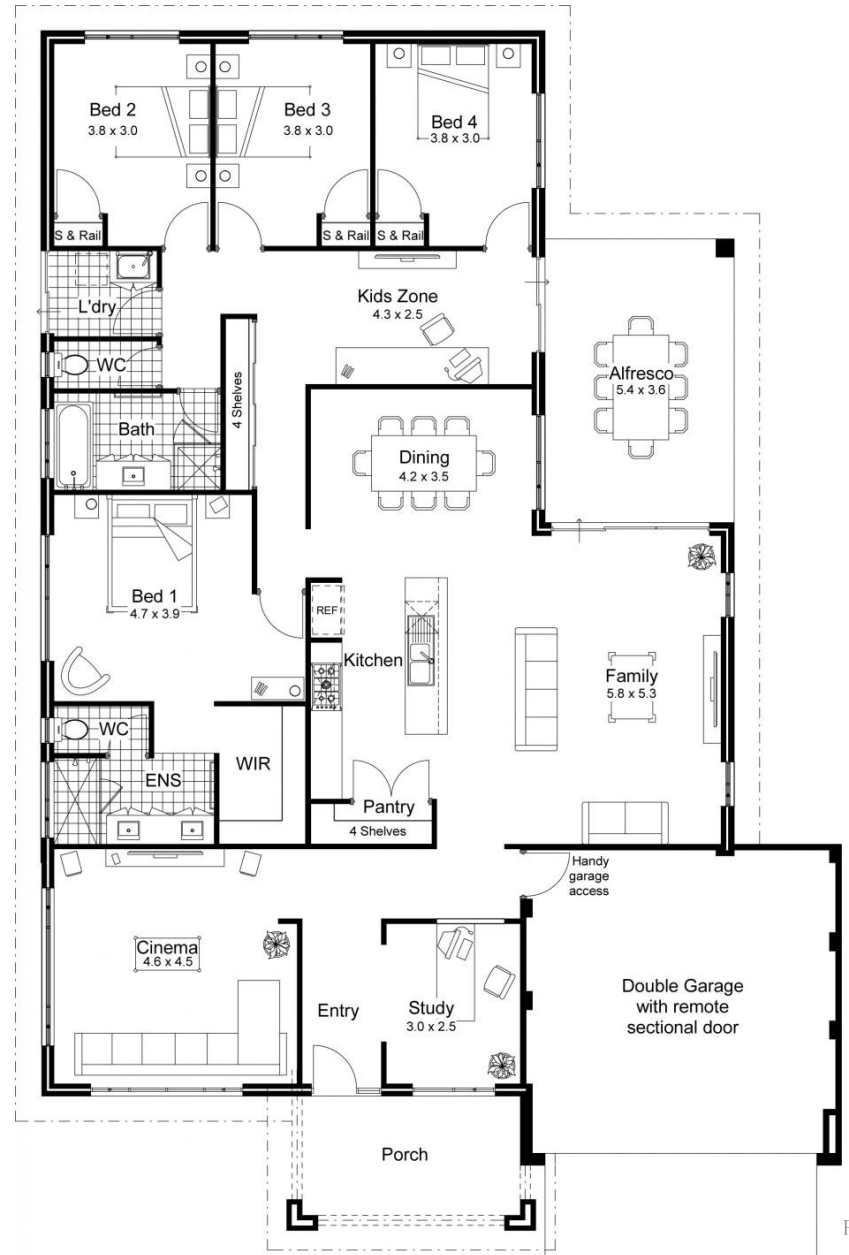
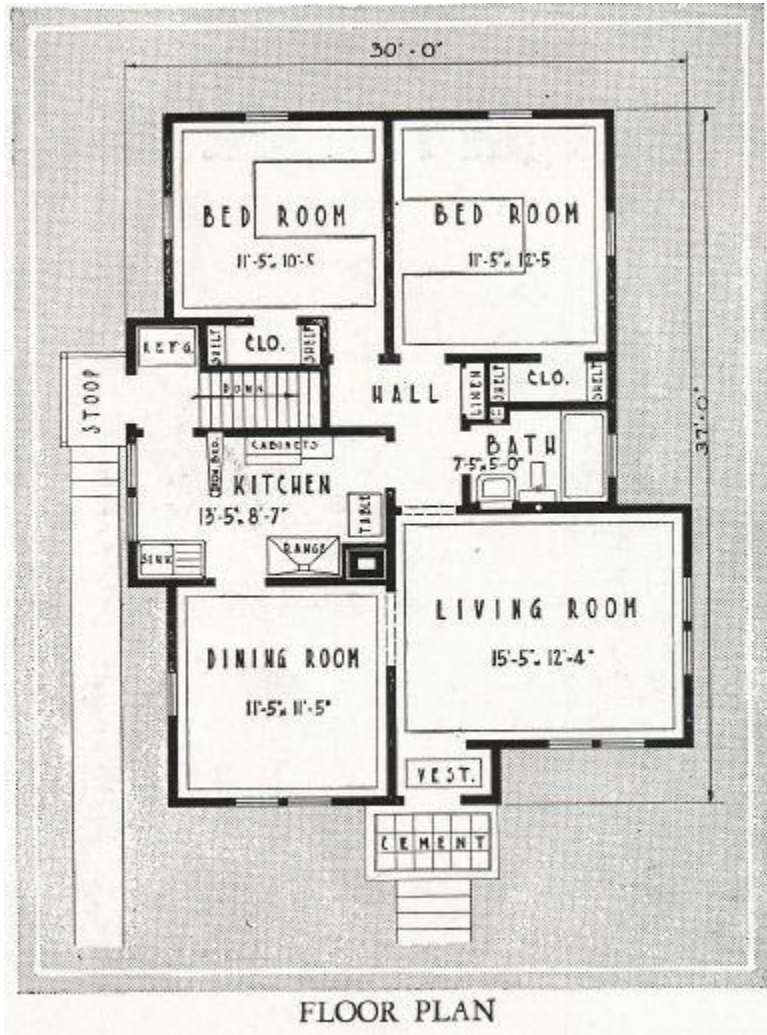








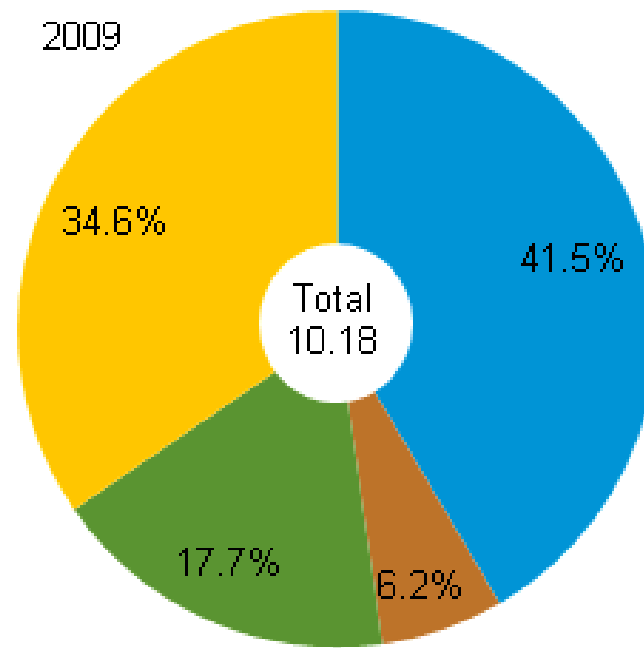
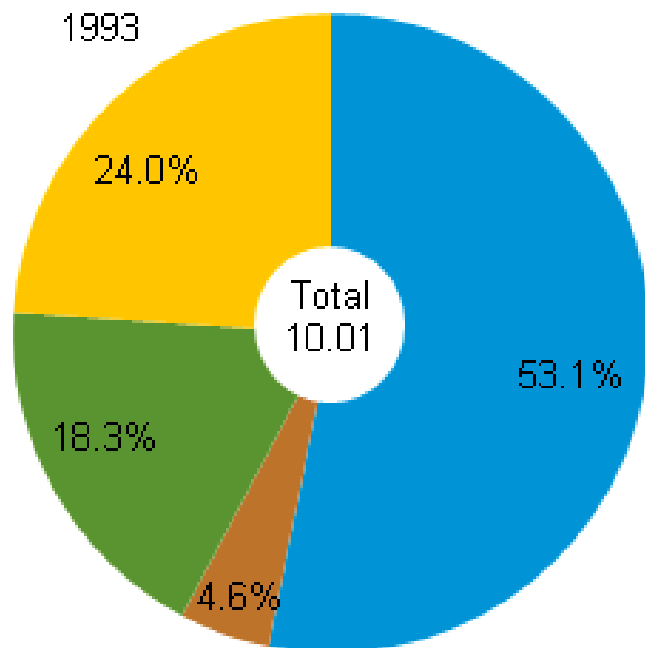




Design Thinking



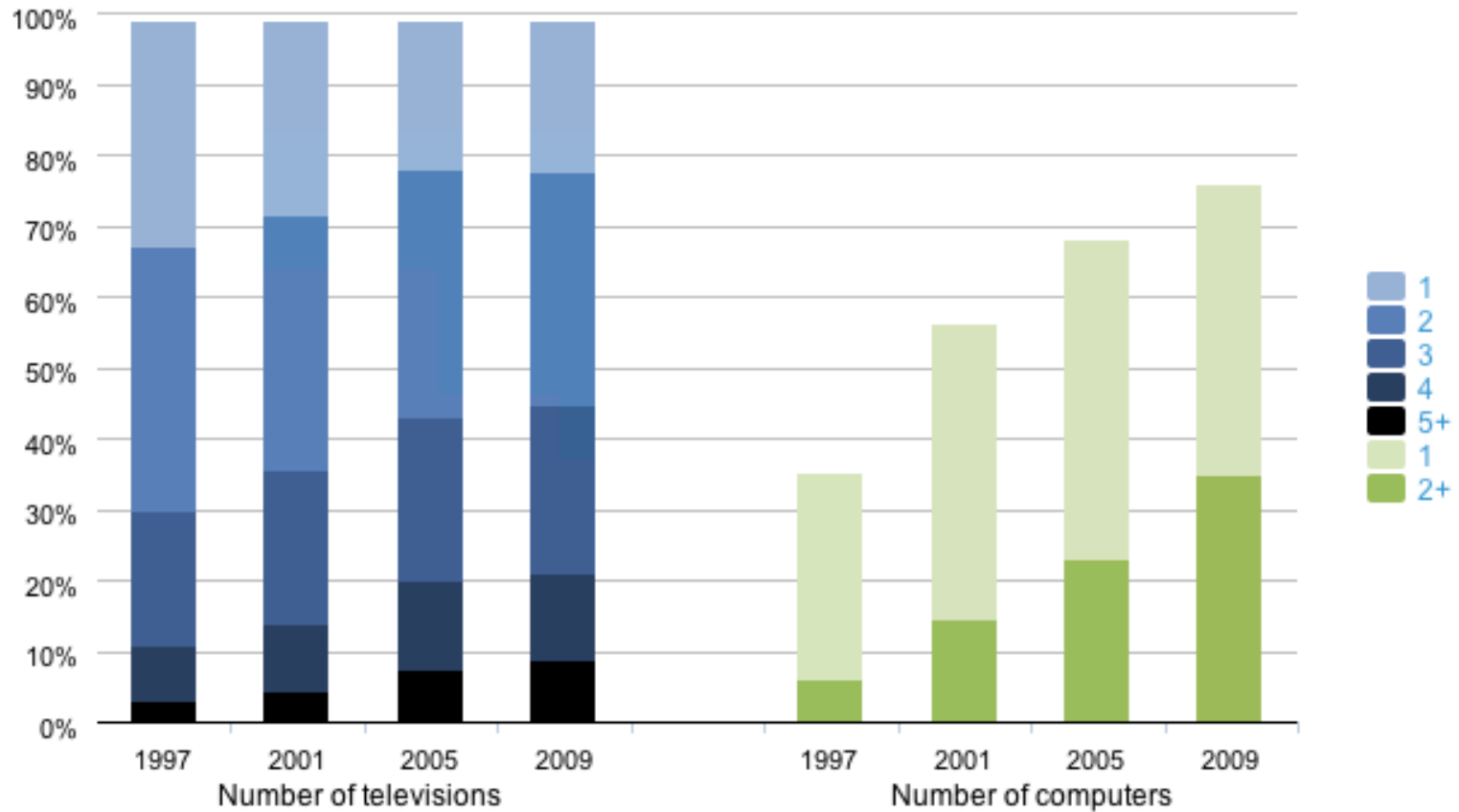
Energy consumption in homes by end uses quadrillion Btu and percent



■ space heating ■ air conditioning ■ water heating ■ appliances, electronics, and lighting

Household use of televisions, computers

percent of households



Source: U.S. Energy Information Administration, [Residential Energy Consumption Survey](#)

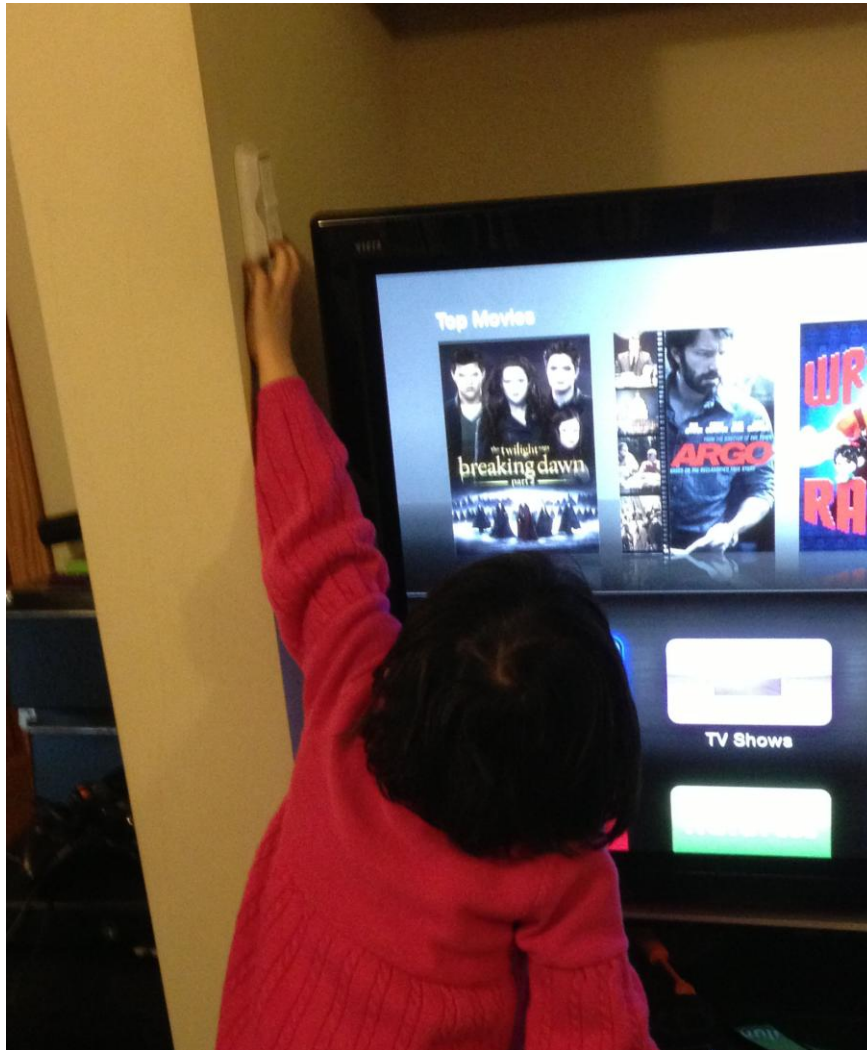
















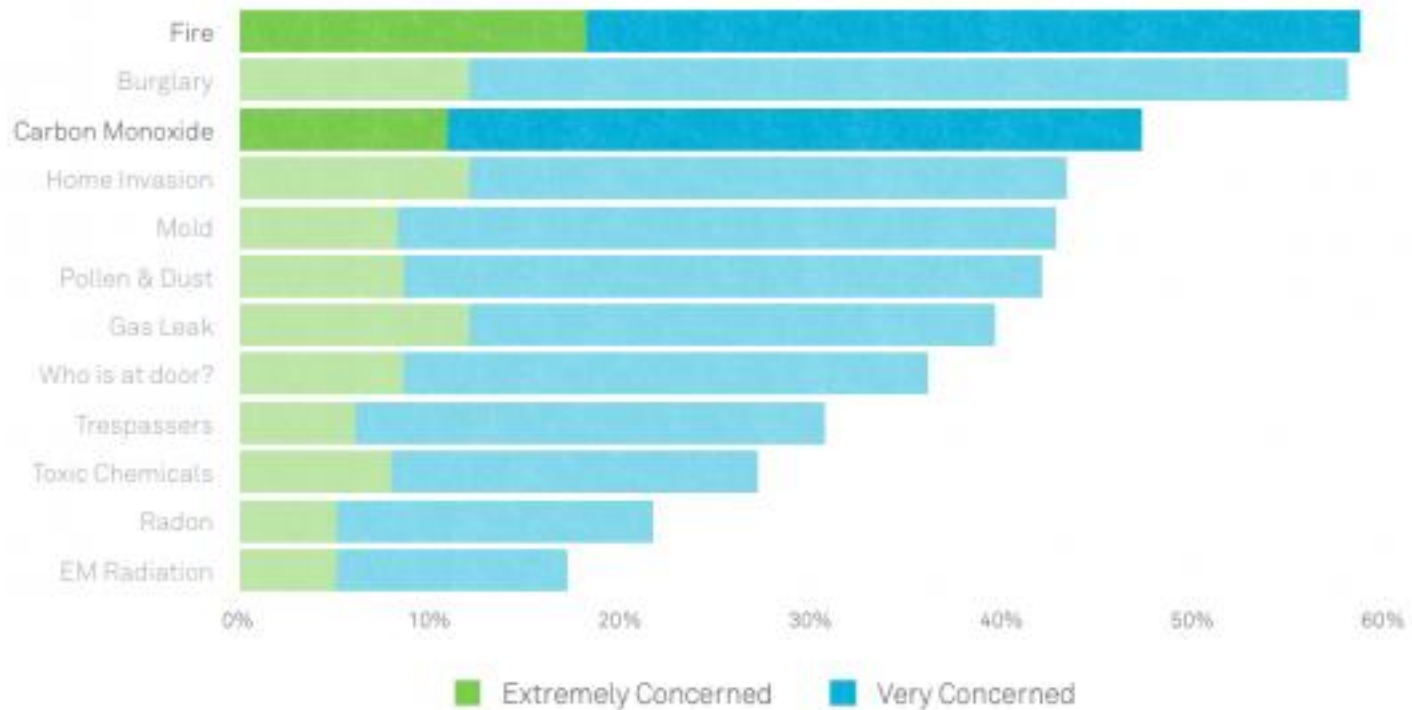






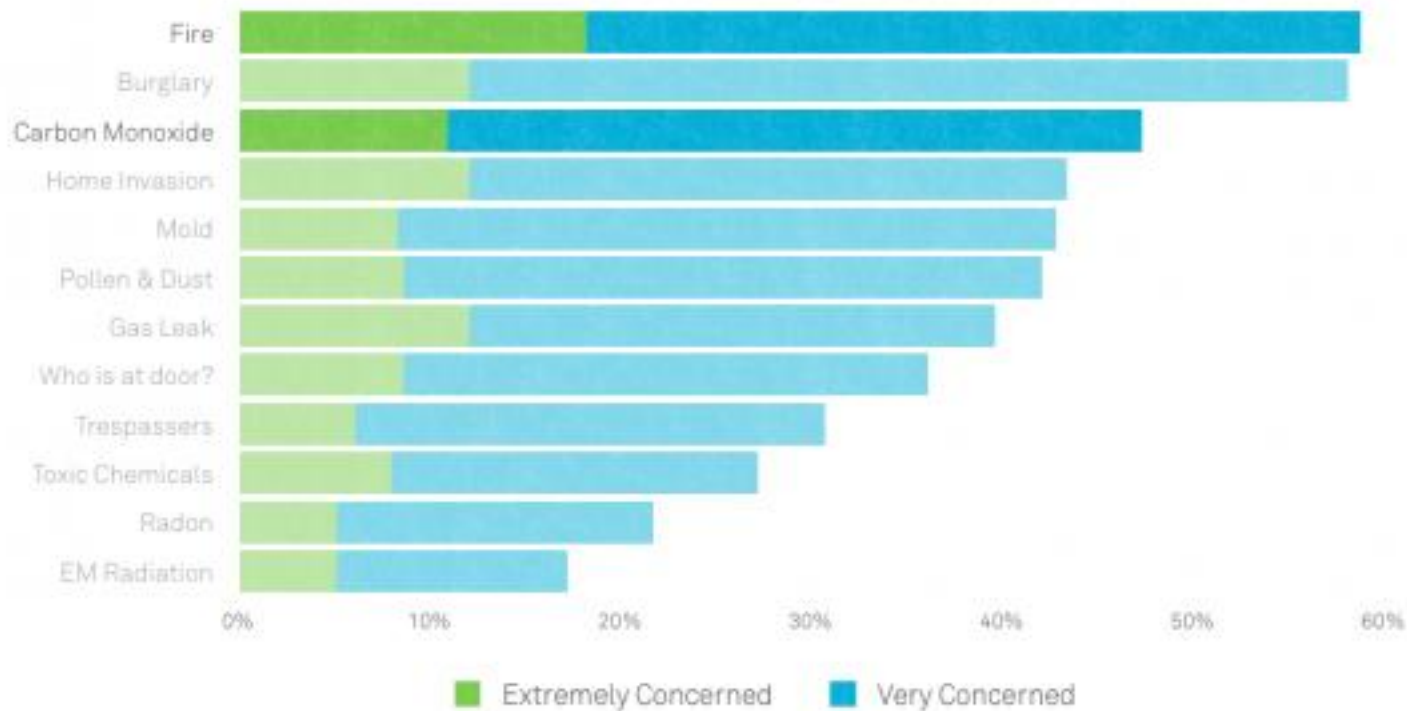


What do people worry about in the home?





What do people worry about in the home?







Honeywell

Authorized Security Dealer

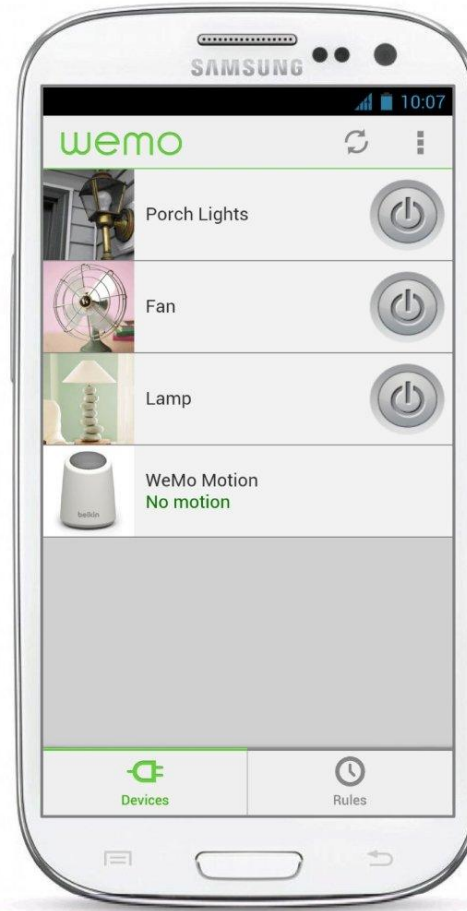


cee-
Center for Energy and Environment

AT&T
digital life™

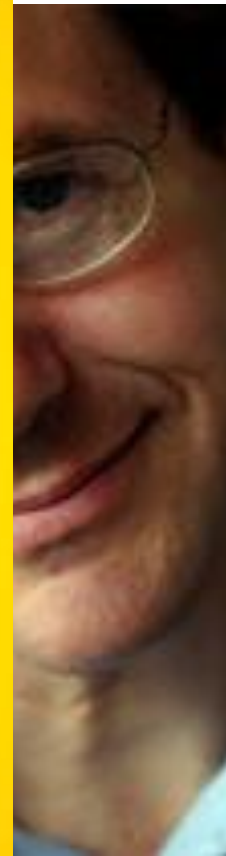
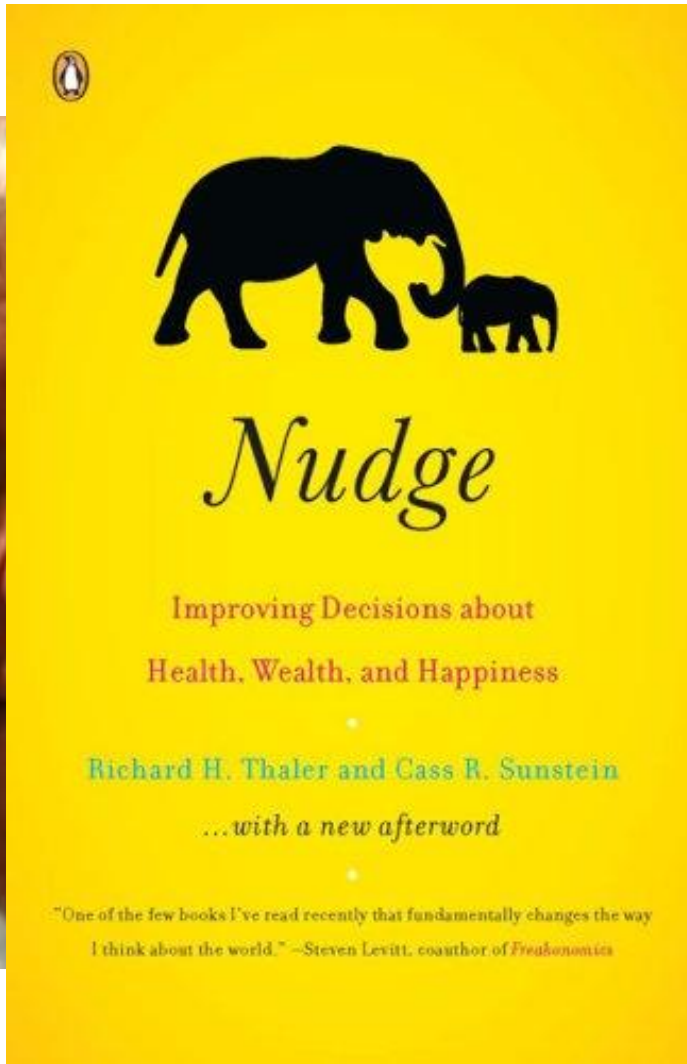














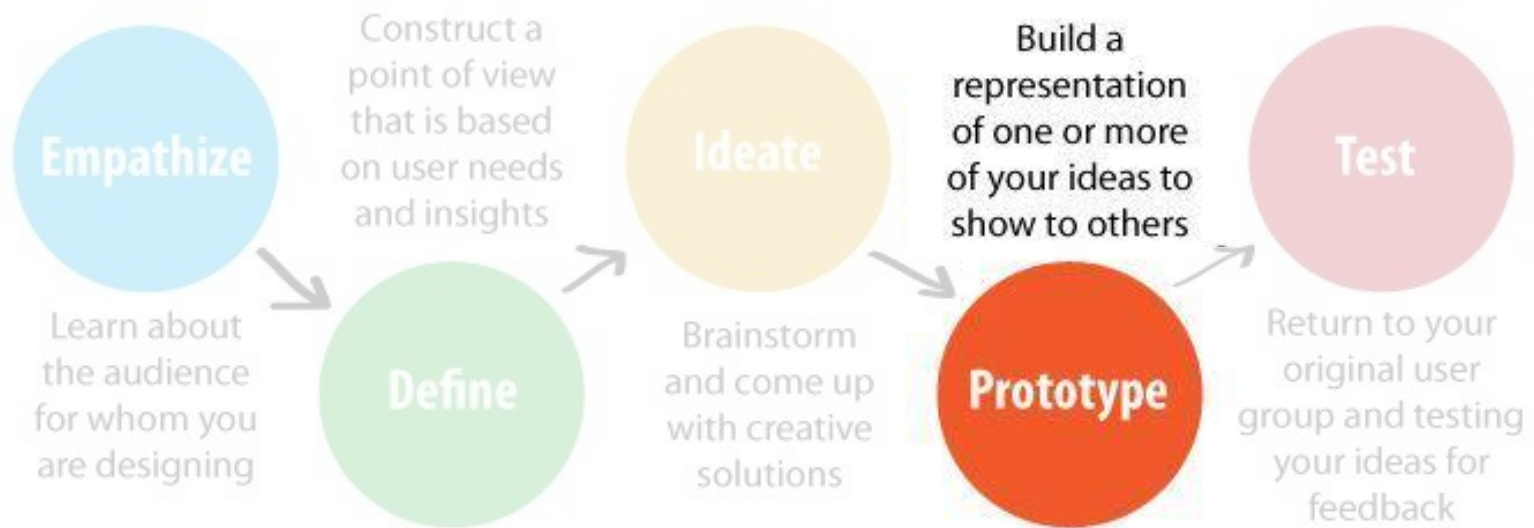


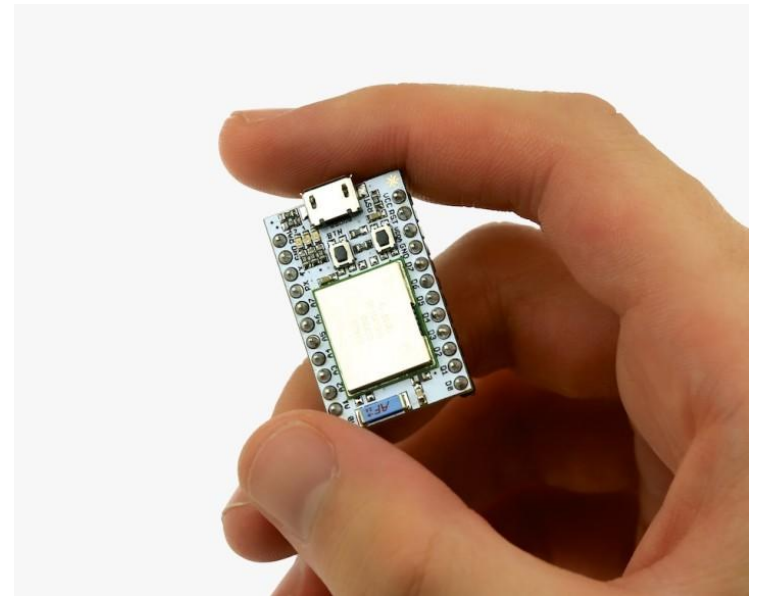


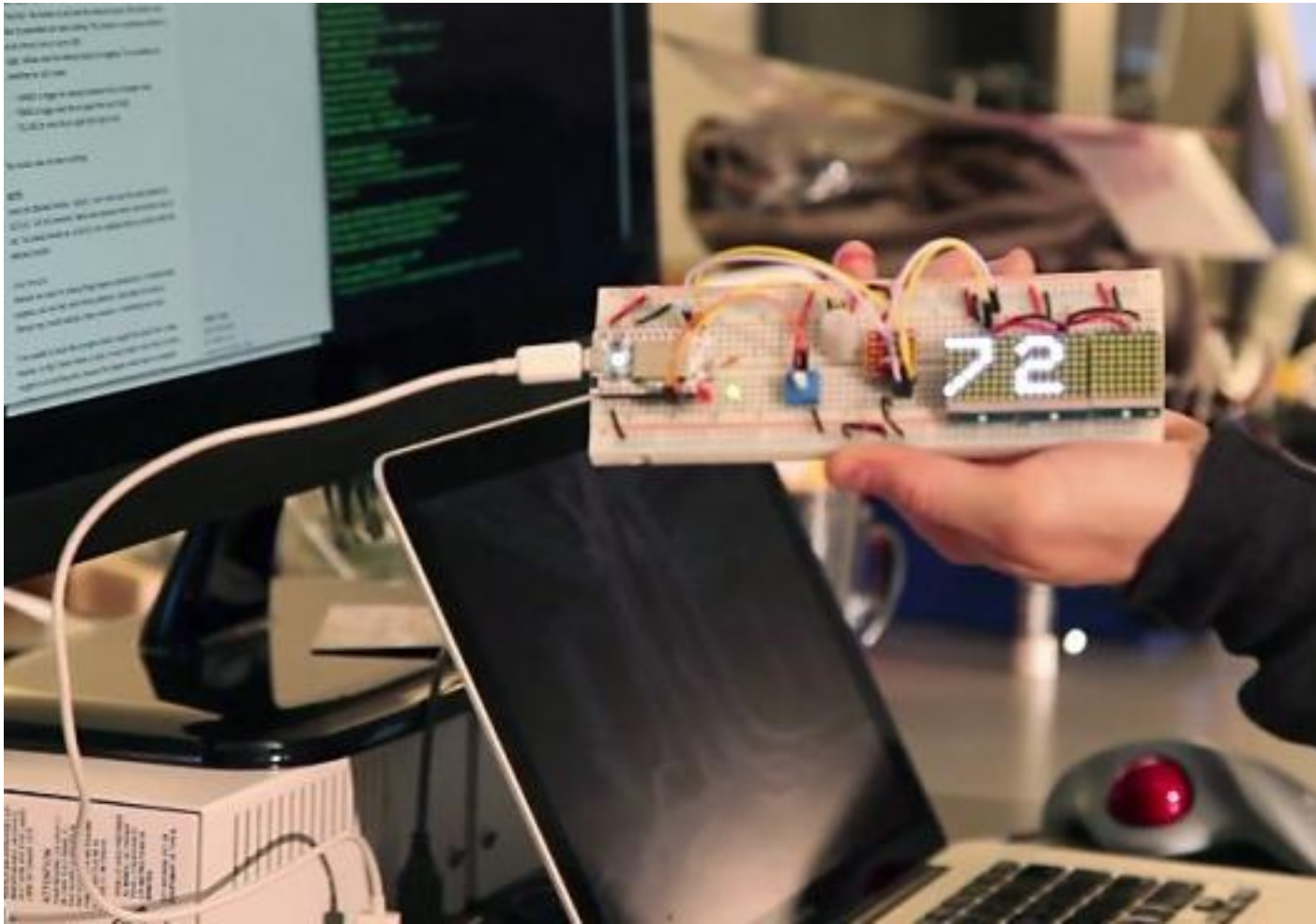




Design Thinking







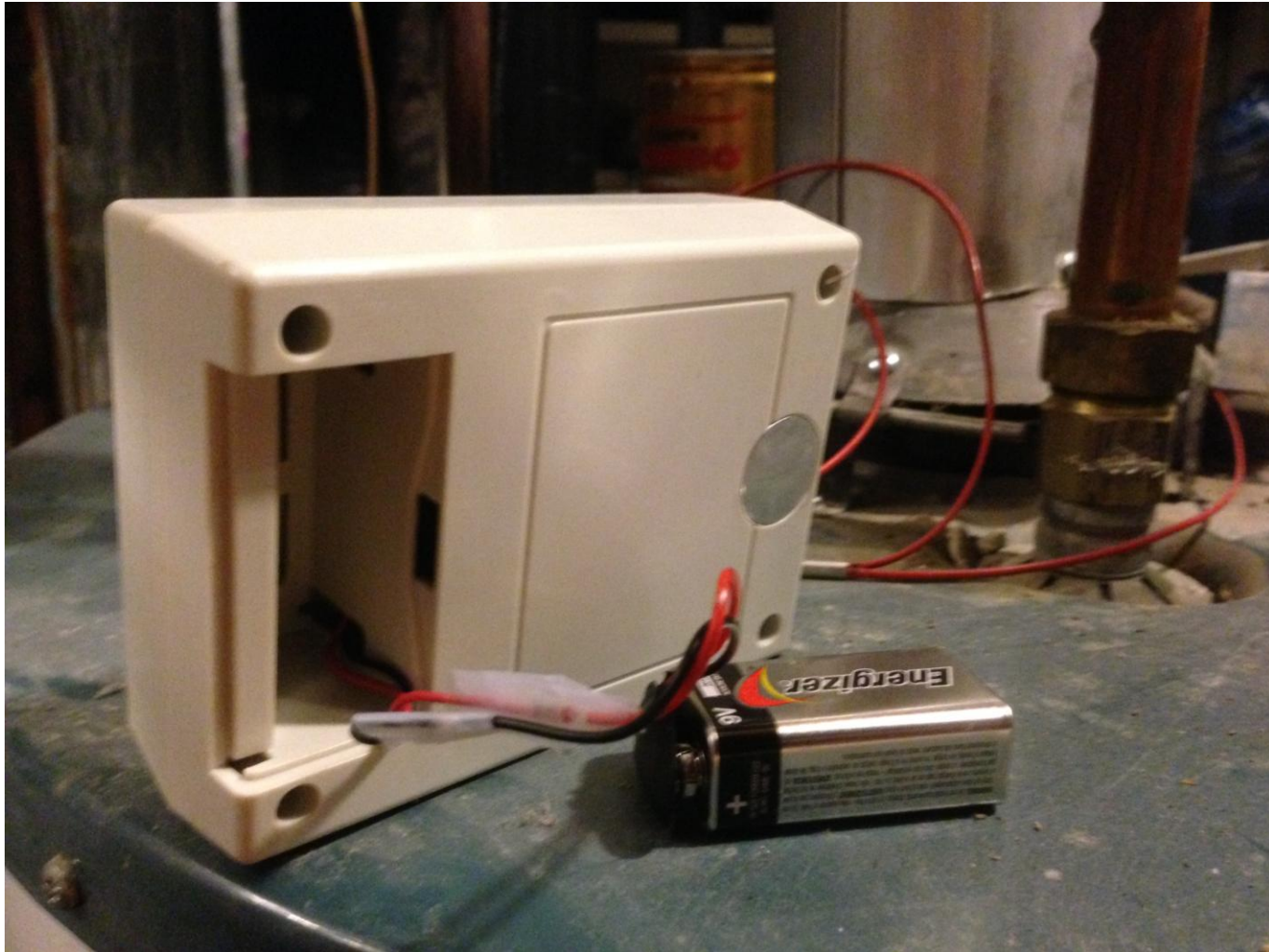




Design Thinking





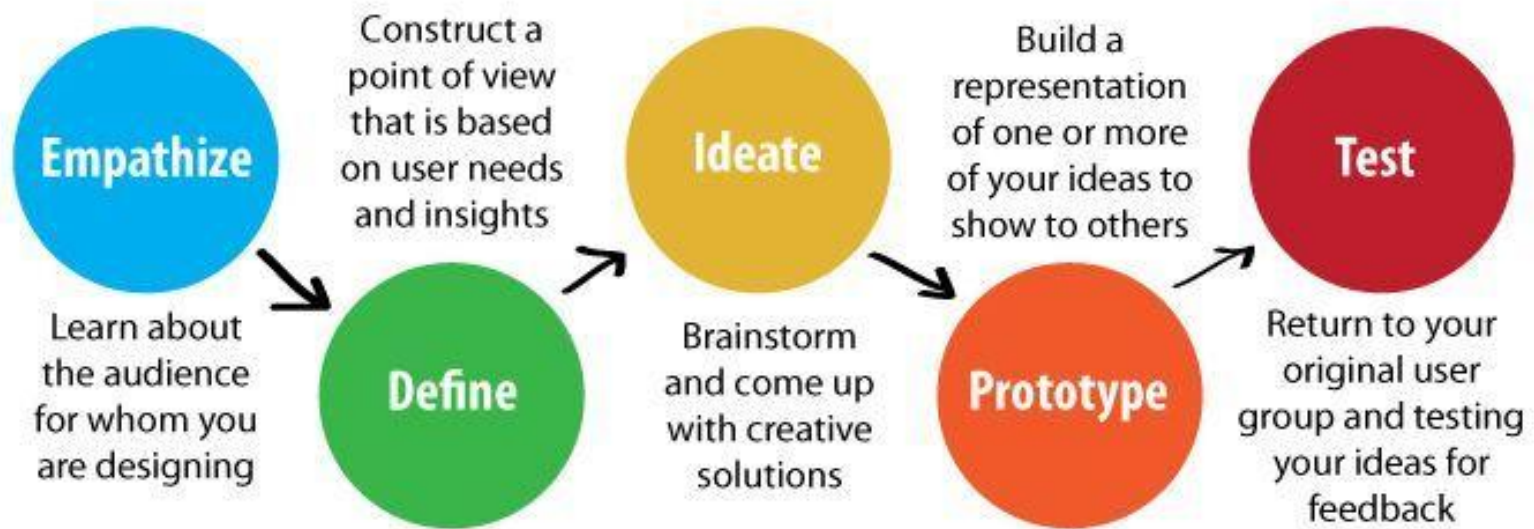


Human Building Interaction





Design Thinking





THANK
you!

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Questions?

This concludes The American Institute of Architects
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