

# Design Thinking in the Makerspace

## Heat Absorption

Purpose Statement: Understand and compare data regarding heating with solar energy.

### Step 1: Understand

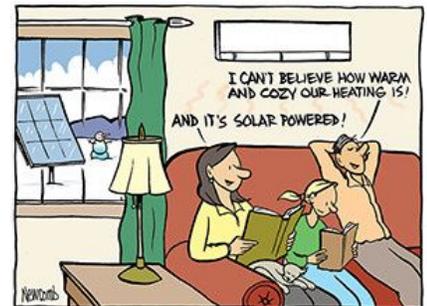
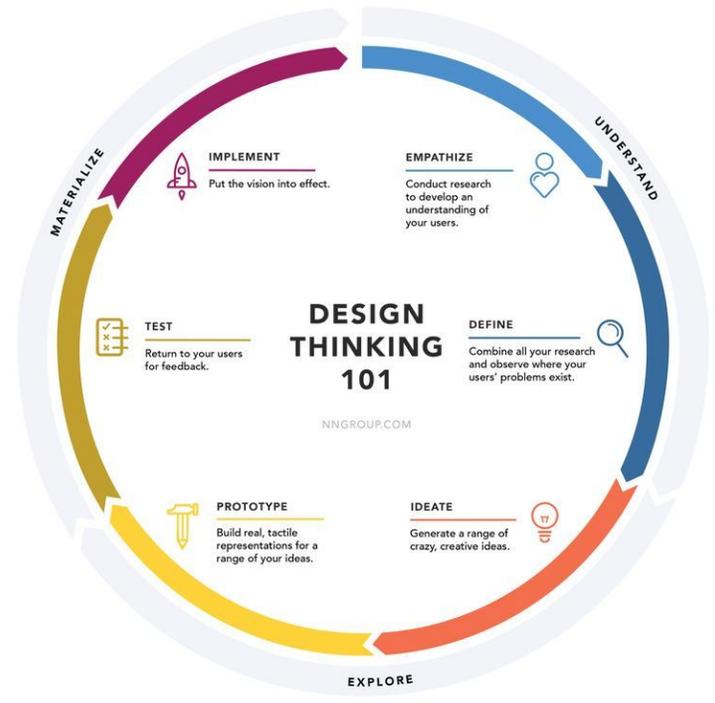
- Empathize- How do you have a warm home in the winter? Do all people have a warm place to sleep?
  - Show this video clip to introduce this idea: <https://youtu.be/61JT9SYBk4A>
- Define-
  - Problem Statement: A roofing company is trying to decide what color shingles are best to put on a house to keep the home as warm as possible.

### Step 2: Explore

- Learn & Experiment- Put students into small groups and allow them to choose three different colors to explore. Use square disposable containers for the house and have the students place the different colored paper on the top (roof) of each house and prepare a staging area near a source of sunlight.
  - Record observations over time.
  - Discuss the results from each group- a great tie in would be to create a graph of the results. Something as simple the warmest house was... To something as complex as putting a thermometer in the box and recording the temperature of each house.
- Ideate- Allow students time in their groups to explore what color/product might be the best and how they will test it.
  - Present- the groups will present their ideas to the class to get some thoughts/feedback
- Prototype- Build/ Create your solution
  - Supplies needed:
    - Disposable containers to be used as "houses" for each group
    - Different colored materials for "roofing"- possibly rubber, foil, plastic wrap, etc.
    - Any materials students brainstorm during the Ideate stage...

### Step 3: Materialize

- Test- Use the staging area for students to test our their design. This is a great time to talk about what a comfortable temperature is in a home and temperature in general. Depending on your students, you may want to pull in some resources on weather/temperature at this point as well.



- Reflection- Give students time to reflect on the choices they made and how warm/cold their “home” was. Take time to make adjustments and share ideas.
- Implement- Commercial
  - Have the students create a commercial advertising their roofing material with their reasoning. This could be done using iMovie or even the Green Screen with DoInk. Post these on Schoology to share with parents.
  - Possibly find a contractor to invite in for the students to share with.