Today’s Class

• Logistics
• Design for…
  – Usability
  – Affordability
  – Manufacturability
  – Sustainability
  – Reuse
  – Failure
“There are no solutions, there are only trade-offs”
Design for...
Usability
Solar Water Disinfection
Solar Water Disinfection
Design for Usability

- Ergonomics
- User interface
- User interaction and understanding
- Feedback

- Trade-offs
  - Cost
  - Performance
Design for...

Affordability
Charcoal Press

![Image of charcoal press in action]
IDE Drip Irrigation

Courtesy of iDE. Used with permission.
IDE Drip Irrigation

Courtesy of iDE. Used with permission.
Design for Affordability

- Remove material
- Material selection
- Reduce part count
- Increase scale of production

- Trade-offs
  - Product life
  - Flexibility
  - “Quality”
Design for...

Manufacturability
Manufacturing in Ghana
Manufacturing in Ghana
Manufacturing in Ghana
Manufacturing in Ghana
Phase Change Incubator
Design for Manufacturability

- Ease of manufacture
- Scale of production
- Processes and material selection
- Tooling, jigs and fixtures

- Trade-offs
  - Economic benefits
  - Environmental impact
  - Capital investment
Design for...

Sustainability
Design for Sustainability

- Material choice
- Manufacturing processes
- Systems design
- Life cycle analysis

- Trade-offs
  - Cost
  - Performance
Design for...

Re-Use
Car Parts
Emergency Shelters

Design Trade-Offs

- Which “design-fors” will dominate the design of your project?
- What are the trade-offs?
Design for...

- Usability
- Affordability
- Manufacturability
- Sustainability
- Re-Use
- Failure
Design for...

Failure
Plow
Design for Failure

• How will your device fail*?
• How will it fail first?
• What is the best failure mode?
• What is the worst failure mode?

* it will fail
Where are we now?

• If you haven’t chosen your final concept, do so soon!
  – Finish experimenting
  – Run through a selection matrix
  – Run it by your design mentors and instructors

• Next week’s design review
  – How exactly will you go about your project
    • Think of ideas
    • Experiment
    • Choose the best one
    • Work out the details
    • Test…
Coming up...

- Paul Polak
  - Discussion Questions
- Wheelchair and Stove Homework
- Design Reviews (April 7)
- ID Night at the Museum (April 9)
- Save the date for Awesomeness (April 21)