

# Pleather vs. Leather: A Tale of Two Couches

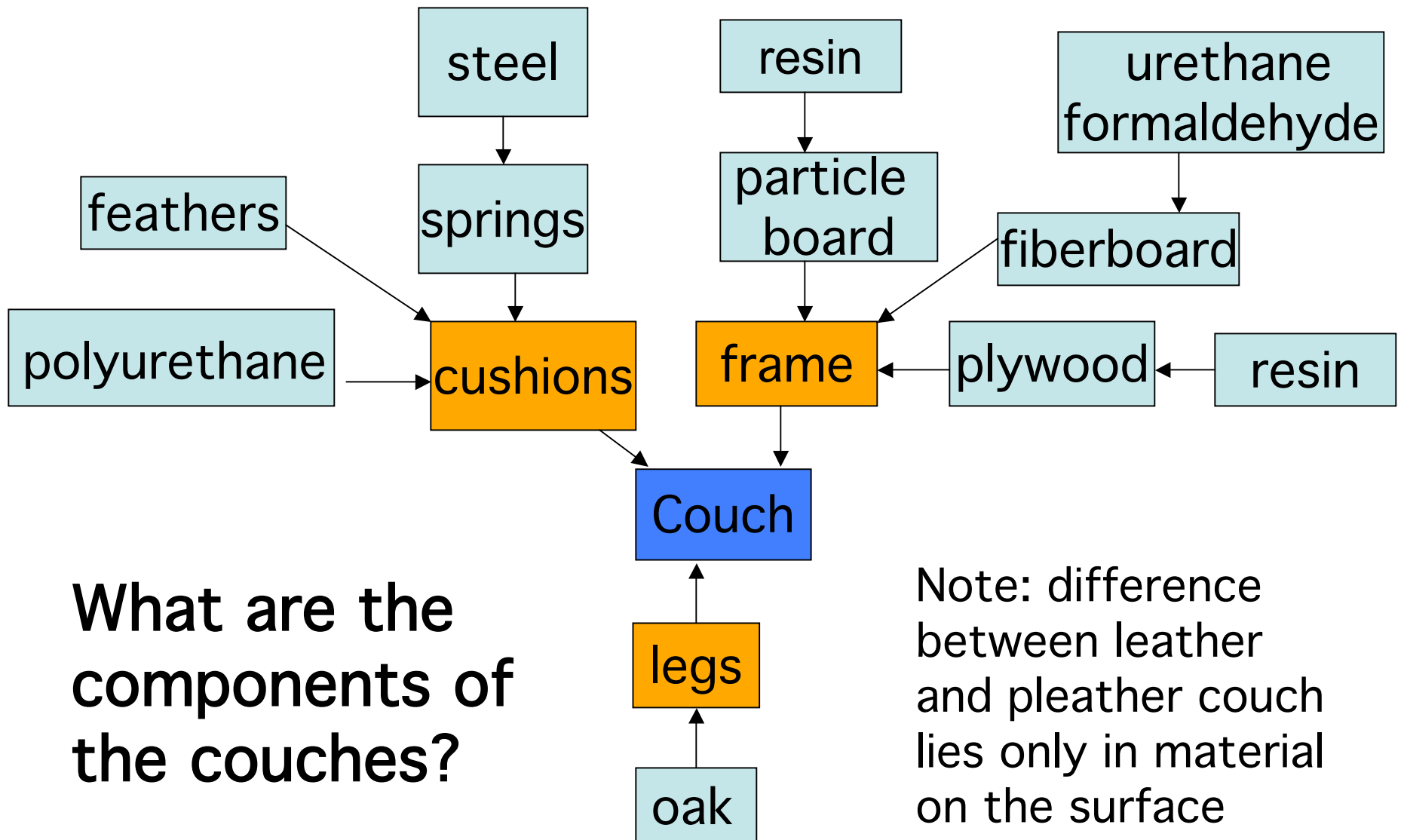
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ME222: Design for Sustainability  
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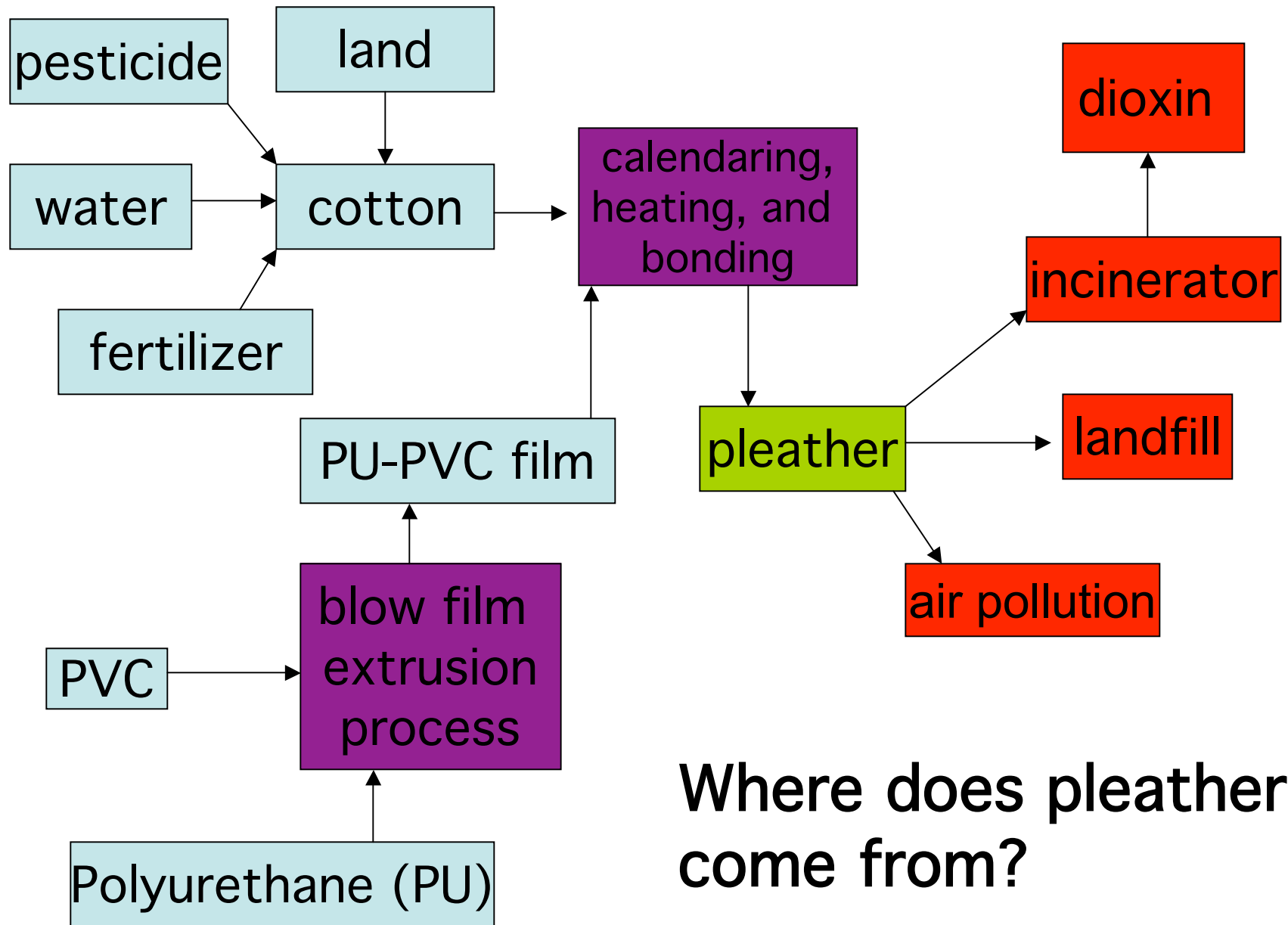


Pleather



Leather





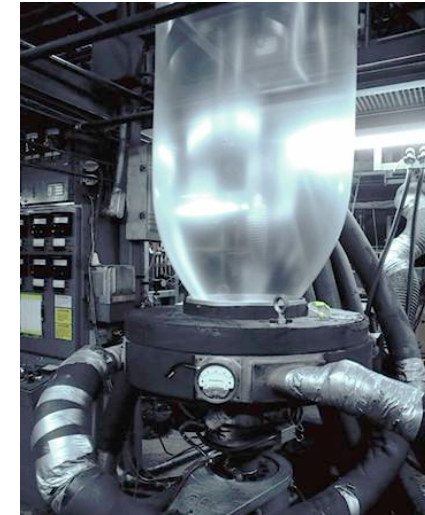
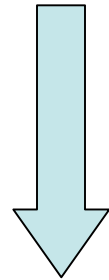
**Where does pleather come from?**



# Pleather Manufacturing

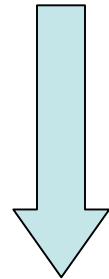
## Blow film extrusion

PVC and PU  
made into a film



## Calendering ↓

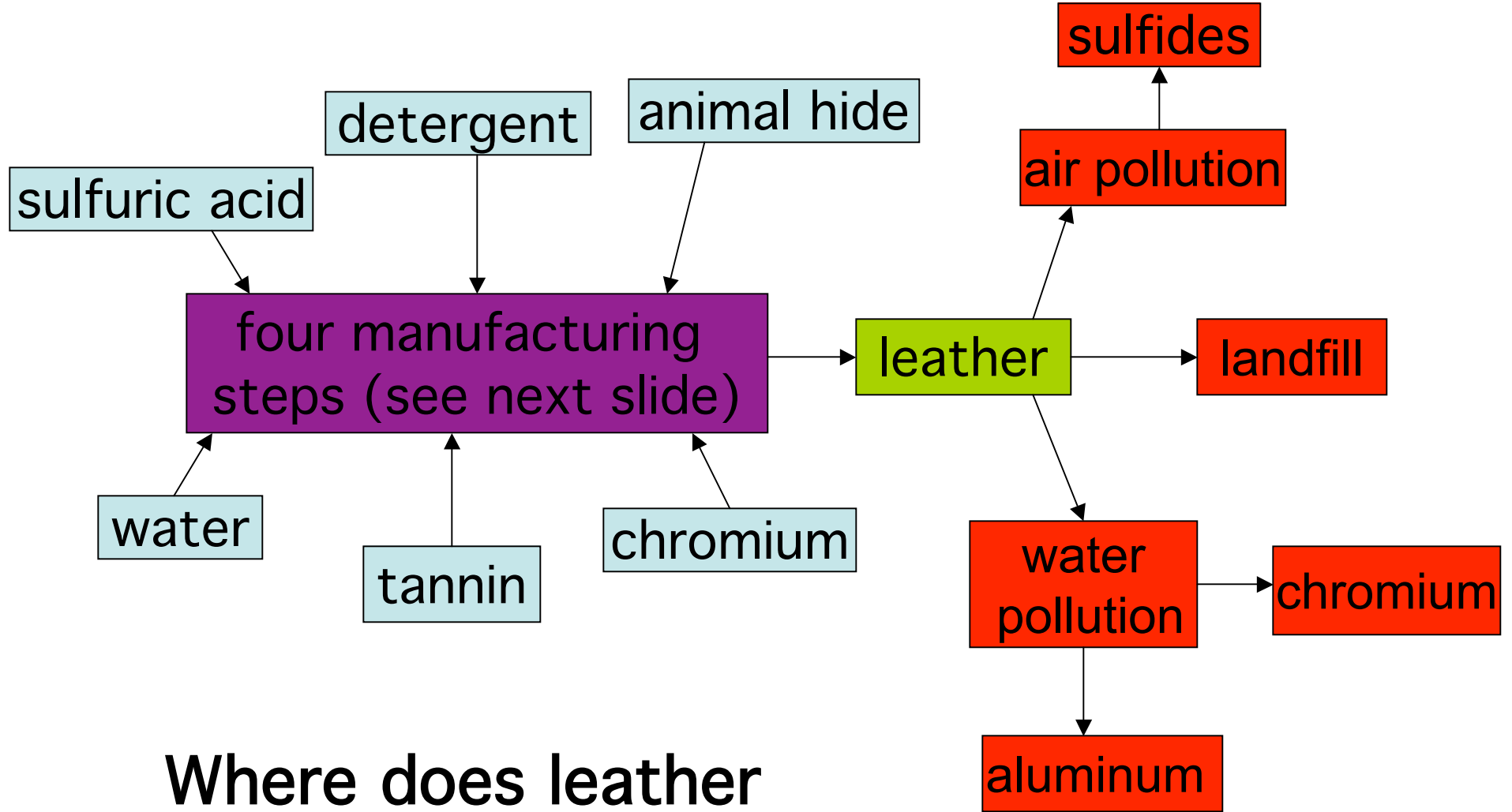
PVC/PU film combined with  
cotton and material passed  
between rollers to make  
surface shiny



**180  
DEGREES**

## Cooling





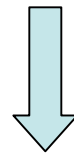
**Where does leather  
come from?**



# Leather Manufacturing

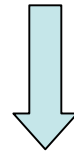
## Trimming/Liming

Remove hair and proteins



## Tanning

Soak in solution to alter color and texture



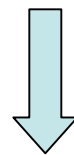
tannin



chromium

## Washing/Drying

Loosen fibers to make flexible



Vacuum dryer

## Cutting/Sewing

# Analyzing Impact: Pleather Couch

Material or Process	Weight (lb)	Okala Impact Factor	Total Impact (millipoints)
Feathers	negligible	N/A	N/A
Plywood	42.67	280/lb	11947
Particle Board	42.67	130/lb	5547
Fiberboard	42.67	89/lb	3797
Polyurethane Foam	4	33/lb	132
Polyester wadding	0.75	130/lb	97.5
Polyester fiber filling	0.5	130/lb	65
Steel	1	25/lb	25
Oak	3.75	5/lb	18.75
PVC	1.7	15/lb	25.5
Polyurethane	0.353	33/lb	11.649
Cotton	1.1556	17/lb	19.645
Film blow extrusion	2.053	0.6/lb	1.23
Calendaring	3.21	3.1/lb	9.95
<b>Total materials and processes</b>	141.2		<b>21697</b>



Frame/cushions



PVC, PU, cotton



Transportation

# Analyzing Impact: Leather Couch

Material	Weight (lb)	Okala Impact Factor	Total Impact (millipoints)
Feathers	negligible	N/A	N/A
Plywood	42.67	280/lb	11947
Particle Board	42.67	130/lb	5547
Fiberboard	42.67	89/lb	3797
Polyurethane Foam	4	33/lb	132
Polyester wadding	0.75	130/lb	97.5
Polyester fiber filling	0.5	130/lb	65
Steel	1	25/lb	25
Oak	3.75	5/lb	18.75
Leather	5	9/lb	45
<b>Total materials</b>	<b>141.2</b>		<b>21674</b>

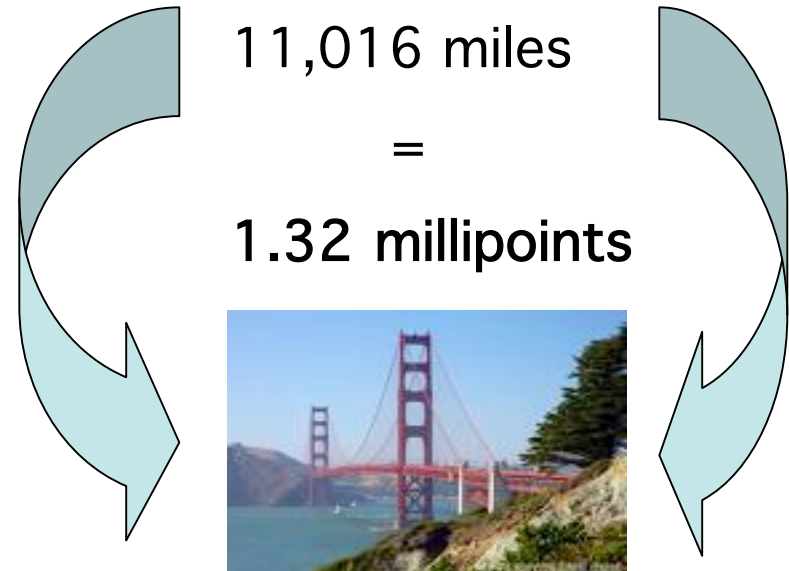
Materials



Frame/cushions



Leather



Transportation



# Pleather vs. Leather: First assessment

Taking into account **materials**, **processes**, and **transportation**:

Pleather couch impact = **21698 millipoints**

- Fabric impact (pleather) = 56.8 millipoints

Leather couch impact = **21675 millipoints**

- Fabric impact (leather) = 45 millipoints  
At first glance, it seems as though **leather** is the better option...

# Other Considerations

- Cows for leather couch, but not pleather



x 5 =



Each cow emits 6137 L of CO<sub>2</sub> per day



= 122 tons CO<sub>2</sub> =



x 31

Car emission  
per year

# Other Considerations

- Maintenance
  - Need to clean leather couch more often using toxic, acidic solutions
  - Pleather cleaning only requires wet cloth
- Lifetime
  - Pleather lasts for 200,000 double rubs, or 54 years
  - Leather lasts for 100,000 double rubs, or 27 years
  - Leather more prone to cracking and sun damage



When other factors are considered, **PLEATHER** becomes the more sustainable choice!

# Why buy leather?

- Main buyer: homeowners
- The allure:
  - Volume/presence in room
  - Luxury
  - Comfort
  - Cool feeling on skin
- The downfalls:
  - Sticky when hot
  - Hard to clean, especially in crevices



# Alternative Design

- Bamboo frame design
  - Resembles futon
  - Easy to disassemble
  - Requires less leather/pleather
  - Cleaning is easy
  - Durable



Check out our sketches!