

**Activity Instructions:**

1. Split students into four groups.
2. Hand out prompt and copy of each Ashby plot
3. Give students 20-30 minutes to fill out table and come up with their final materials selections
  - (a) Walk around, asking probing questions and answer student concerns
  - (b) Encourage students to use their own experience with materials as a guideline. Ex: Are certain high temperature materials going to be used for common household items? Or are those reserved for products like jet engine turbine blades?
4. Have students stand up and explain their thought processes and final material decisions.

Additional Items for Discussion

- Allow groups five minutes for reflection after the students present their findings. Ask them if their decision would change based on a comment from another group.
- Have groups come together and discuss their findings. See if material selection changes.

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## Portable Bike Storage Shed

- Your design team has been charged with the task of designing a portable bike storage shed. It will be sold to people who live in apartment buildings and don't have access to a garage to store their bikes. As a materials engineer, it is your job to come up with the best material for the job.
- Constraints:
  - Light weight
  - Cheap
  - Ability to stand up to weather
- You must come up with two solutions: one with and one without sustainable material decisions

Materials	Pros	Cons	Overall Rating
<b>Best Choice (not including Eco considerations)</b>			
<b>Final Choice</b>			

## Cooking Spatula for a College Student

- Your design team has been charged with the task of designing a cooking spatula. It will be marketed towards college students as a good “first” cooking utensil. As a materials engineer, it is your job to come up with the best material for the job.
- Constraints:
  - Cheap
  - Will not melt while cooking
  - Won’t break when someone makes the best grilled cheese ever
- You must come up with two solutions: one with and one without sustainable material decisions

Materials	Pros	Cons	Overall Rating
<b>Best Choice (not including Eco considerations)</b>			
<b>Final Choice</b>			

## Inside of an Outdoor Oven

- Your design team has been charged with the task of designing an outdoor oven for someone’s patio. It is a special commission and money is not an object. As a materials engineer, it is your job to come up with the best material for the job.
- Constraints:
  - Has to withstand extremely high cooking temperatures ( $\geq 800$  °C)
  - Will withstand accidental hits from cooking utensils
  - Must be compatible with food
  - Owners are very environmentally conscious– they wouldn’t want a high energy footprint material being used
- You must come up with two solutions: one with and one without sustainable material decisions

Materials	Pros	Cons	Overall Rating
<b>Best Choice (not including Eco considerations)</b>			
<b>Final Choice</b>			

## Playground Monkey Bars

- Your design team has been charged with the task of designing the monkey bars for a local playground. As a materials engineer, it is your job to come up with the best material for the job.
- Constraints:
  - Will withstand the weight of many small children (and possibly some adults)
  - Won't get too hot during the summer
  - Reasonably priced
- You must come up with two solutions: one with and one without sustainable material decisions

Materials	Pros	Cons	Overall Rating
<b>Best Choice (not including Eco considerations)</b>			
<b>Final Choice</b>			