

Problem #3 Materials

You have decided to purchase a set of outdoor chairs for your yard. While looking through magazines you notice that outdoor chairs come in several different materials: wood, metal, plastic and composites (metal & plastic, metal & glass).

What are the advantages and disadvantages of each type of outdoor chair?

Material	Advantages	Disadvantages
Wood		
Plastic		
Metal		
Fibreglass Composite (Plastic+Ceramic)		

Which chair would you choose and justify why?

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Problem 3 Solutions

Material	Advantages	Disadvantages
Wood	<ul style="list-style-type: none"> -Hard, resistant to scratching -Easily Shaped and assembled -Light, easy to move around -Tough, unlikely to fracture -Low Cost 	<ul style="list-style-type: none"> -Decomposes, particularly if wet -Light, could be blown by wind
Plastic	<ul style="list-style-type: none"> -Very Light, Easy to move -Wide variety of shapes -Low Cost 	<ul style="list-style-type: none"> -Degraded by Acid Rain -Discoloured by sunlight -Oxidation over time by Oxygen gas -Very light, Wind damage -Fractures easily -Not very stiff, bends easily
Metal	<ul style="list-style-type: none"> -Ductile and Malleable, variety of shapes -Very hard, resistant to scratching -Very tough, resistant to fracture -Heavy, resistant to wind 	<ul style="list-style-type: none"> -Oxidation causes corrosion -Typically heavy, hard to move around -Conducts heat well, could hurt you on a very hot day
Fibreglass Composite (Plastic+Ceramic)	<ul style="list-style-type: none"> -Stiff, will not deform -Very Resistant to corrosion -Light, easy to move -Durable, lasts a long time 	<ul style="list-style-type: none"> -Not very tough, can crack -Degraded by acid rain -Discoloured by sunlight -Very light, moves in wind -Plastic matrix can be oxidized over time

Answers for choice of chair may vary. The choice should be supported by relevant advantages.