

Material properties comparison



LEARNING GOAL Compare woods, metals and polymers in the same tests, then choose one using evidence.

SUCCESS CRITERIA ☐ I can test fairly and safely. ☐ I can record with units. ☐ I can choose using evidence.

BENCH



NAME _____ CLASS _____ DATE _____ PARTNER _____

SAFETY ☐ Eye protection ☐ Sample clamped ☐ Burrs checked ☐ No heat

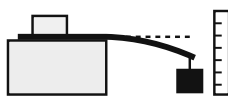
1 Four tests

same steps for every sample



A Scratch

Draw a steel nail once across, same pressure. Score the mark 0 to 3.



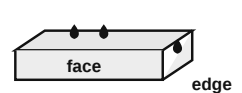
B Bend

Same overhang, same mass. Measure the drop in mm.



C Magnet

Touch a magnet to the sample. Does it pull? Y or N.



D Water drop

3 drops on the face, 3 on a cut edge. Wait 10 minutes, wipe, look.

2 Keep it fair

2 marks

I CHANGE ONLY _____ I KEEP THE SAME _____ AND _____

3 Record your results

6 marks

SAMPLE	A SCRATCH 0 TO 3	B DROP (MM)	C MAGNET Y OR N	D WATER ON FACE	D WATER ON EDGE	E APPEARANCE AND FINISH
Pine softwood		mm				
MDF manufactured board		mm				
Aluminium metal		mm				
Mild steel metal		mm				
Acrylic polymer		mm				
HIPS high impact polystyrene		mm				

A 0 none, 1 faint, 2 clear, 3 deep. D N no change, Dk darker, Sw swollen. E two words: grainy, matt.



Rank, explain and choose

4 Rank the samples

4 marks

TIES SHARE A BOX	1ST	2ND	3RD	4TH	5TH	6TH
Hardness 1st = faintest scratch						
Flexibility 1st = biggest drop						

5 Explain your results

10 marks

Q1
3
marks

Which was hardest? Quote two scores.

Q2
2
marks

Which did the magnet pull? Why?

Q3
3
marks

Compare MDF's face and edge in water. Why does it matter for a product?

Q4
2
marks

Bend test: one unfair step, one fix.

6 Choose a material

6 marks

MY PRODUCT

☐

Bathroom shelf

☐

Phone stand

Pick one. List two needs, such as: not damaged by water.

IT MUST...	BEST SAMPLE	MY EVIDENCE FROM THE TESTS

Final

MY CHOICE AND WHY

I would choose ... because my results showed ...

hard

stiff

flexible

brittle

absorbent

water resistant

ferrous

non-ferrous



GO FURTHER

A phone stand can be made by bending one flat sheet with heat. Which of your samples could be shaped this way? Why not MDF?