Material Matchmakers · Teacher sheet

Year 10 · choosing materials by their properties · works solo · 50 minutes

The idea

Each student runs a one-person materials consultancy. Clients send job briefs. Students use the Materials Catalogue to choose the best material, justify it with two properties, and earn a fee. Fees add up to a rank.

Print (per student)

- Materials Catalogue (page 2) · can be shared by two students, or laminated and reused.
- Job Board (pages 3–4) · double-sided.
- Consultant Report (pages 5–6) · double-sided.

Running it

1. **5 min:** PowerPoint up to the worked example (Garage Gary: not on the Job Board).
2. **30 min:** students work alone, any order. Rule: do at least two Bronze jobs before Silver or Gold.
3. **10 min:** students mark their OWN report in green pen using the answer slides, writing the fee in the last column. No swapping.
4. **5 min:** totals and ranks. **The Audit:** anyone claiming Senior Consultant or Director brings their report to you to check. Then discuss a job lots of people got wrong.

Fees

Bronze £100 · Silver £200 · Gold £300. **Full fee** = right material + two properties each linked with **so…** · **Half fee** = right material, weak reasons (or an accepted alternative) · **£0** = wrong material · **+£50** = a sensible rejected material with a reason.

Ranks

£0–499 Junior Consultant · £500–1,199 Consultant · £1,200–2,399 Senior Consultant · £2,400+ Director

Note: the catalogue ratings (1–5) are simplified to compare materials in class; they are not exact data.

Materials Catalogue

Every score is out of 5. **5 = a lot of it** (darker = higher). **Lightness 5** = very light. **Cost 5** = very expensive. Conducts heat/electricity **1** = good insulator.

Material	Strength	Hardness	Toughness	Lightness	Heat conductor	Electrical conductor	Rust / weather resistance	Flexibility	Cost	Key facts
Oak Hardwood	4	4	4	2	1	1	4	1	4	Attractive grain; very durable outdoors
Pine Softwood	3	2	3	3	1	1	2	1	1	Cheap, easy to cut; needs a finish outdoors
Balsa Hardwood	1	1	1	5	1	1	1	1	2	Lightest timber; cuts with a craft knife
MDF Manufactured board	3	3	2	2	1	1	1	1	1	Smooth, flat, no grain; takes paint; swells if wet
Plywood Manufactured board	4	3	4	3	1	1	3	3	2	Layers at right angles; resists splitting
Aluminium Non-ferrous metal	3	2	3	4	4	5	4	2	3	Does not rust; can be anodised
Copper Non-ferrous metal	2	2	3	1	5	5	4	3	5	Best everyday conductor; very ductile
Mild steel Ferrous metal	4	3	4	1	3	4	1	2	1	Very malleable sheet; rusts unless painted
Stainless steel Alloy	5	4	4	1	3	4	5	2	4	Resists rust and stains; hygienic
High speed steel Alloy	5	5	3	1	3	4	3	1	5	Stays hard and sharp even when hot
Brass Alloy	3	3	3	1	4	4	5	2	4	Gold colour; polishes well; does not rust
Acrylic (PMMA) Thermoforming polymer	2	3	1	4	1	1	5	1	2	Clear or coloured, glossy; laser cuts cleanly; brittle
HIPS Thermoforming polymer	2	2	4	5	1	1	5	2	1	Cheap; vacuum forms well
Polypropylene (PP) Thermoforming polymer	2	2	4	5	1	1	5	5	1	Can be folded thousands of times without breaking
Melamine formaldehyde (MF) Thermosetting polymer	3	5	2	3	1	1	5	1	2	Scratch- and heat-resistant; food safe
Urea formaldehyde (UF) Thermosetting polymer	3	4	2	3	1	1	5	1	2	Excellent electrical insulator; never softens with heat
Corrugated card Board	1	1	2	5	1	1	1	3	1	Fluted layers trap air; easy to print on; recyclable
Cotton Natural fibre	2	1	3	5	1	1	1	3	2	Soft, breathable, absorbent
Elastane (Lycra) Synthetic fibre	2	1	3	5	1	1	3	5	3	Stretches a long way and springs back

Job Board · Bronze and Silver

Read the brief. Underline what the product MUST do. Find the material in the catalogue that fits best. Do at least two Bronze jobs first.

JOB 1 · Chef Marco — **BRONZE · £100**

“My new saucepan base must get hot FAST so food cooks evenly. Money is no problem: I want the very best.”

JOB 2 · Wing Commander Wendy — **BRONZE · £100**

“I build model gliders. The wings must be as light as possible and easy to cut with a craft knife.”

JOB 3 · Pizza Pete — **BRONZE · £100**

“I need a cheap box that keeps pizza warm, is light to carry and has my logo printed on it.”

JOB 4 · Sparky Sam — **BRONZE · £100**

“I need the wire inside house cables. Electricity must flow easily and it must bend round corners without snapping.”

JOB 5 · Lunchbox Lola — **SILVER · £200**

“My lunchbox lid hinge is part of the box. It must bend open and shut thousands of times. Cheap and waterproof.”

JOB 6 · Café Carmen — **SILVER · £200**

“Plates for my café: knives must not scratch them, hot food must not soften them, and they must be food safe.”

JOB 7 · Neon Nina — **SILVER · £200**

“A shop-window sign people can see through, laser cut into letters, with a shiny finish.”

JOB 8 · Ranger Raj — **SILVER · £200**

“A park bench that stays outside for 20+ years, takes heavy use and looks natural.”

JOB 9 · Vroom Motors — **SILVER · £200**

“Car body panels pressed into curves from flat sheet. Cheap and strong. We paint them anyway.”

JOB 10 · Lady Grandhouse — **SILVER · £200**

“Front-door handles: rain must not ruin them, I want a golden shine, and they should feel solid and heavy.”

Job Board · Gold

Read the brief. Underline what the product MUST do. Find the material in the catalogue that fits best. Do at least two Bronze jobs first.

JOB 11 · Plugz Ltd — **GOLD · £300**

“Plug casings: must stop electricity reaching fingers, stay rigid and never go soft if the plug gets warm.”

JOB 12 · Rocket Racing — **GOLD · £300**

“A bike frame: as light as possible but strong, must not rust in the rain, and not crazy expensive.”

JOB 13 · Drill Sergeant Doug — **GOLD · £300**

“Drill bits that cut through steel and stay sharp even when they get hot.”

JOB 14 · FlexFit — **GOLD · £300**

“Gym leggings that stretch when you squat and spring straight back into shape.”

JOB 15 · Sparkle Kitchens — **GOLD · £300**

“A kitchen sink that never rusts or stains, is easy to keep germ-free and takes knocks from pans.”

JOB 16 · FlatPax — **GOLD · £300**

“Cheap flat-pack wardrobe panels: perfectly smooth and flat, ready to paint, won't warp. Kept indoors and dry.”

JOB 17 · Kickflip Kai — **GOLD · £300**

“A skateboard deck: strong and tough, a little bit of flex, and it must not split when I land a jump.”

How fees work

Full fee: right material + two properties, each linked to the job with **so…**
Half fee: right material but weak reasons. **£0:** wrong material.
Bonus +£50: name a material you rejected and say why.

Ranks

£0–499 Junior Consultant · £500–1,199 Consultant · £1,200–2,399 Senior Consultant · £2,400+ **Director**

Consultant Report

Name: _____ Mark in GREEN pen

Example: *Property 1: high strength (4)* ***so*** *the shelf holds heavy paint tins.*

Job no.	Material I chose	Property 1 … so …	Property 2 … so …	I rejected … because …	Fee £ (green pen)

Consultant Report (page 2)

Name: _____ Mark in GREEN pen

Example: *Property 1: high strength (4)* ***so*** *the shelf holds heavy paint tins.*

Job no.	Material I chose	Property 1 … so …	Property 2 … so …	I rejected … because …	Fee £ (green pen)

TOTAL EARNED: £_____ Rank: Junior Consultant · Consultant · Senior Consultant · Director (circle)