



Teacher and technician notes TC2.8  
Lesson reference: C2.8 Making cars

Book links: Page 142  
Specification links: C2d

## Making cars

### Fundamental Scientific Processes:

Science in Society

- Identify some arguments for and against a scientific or technological development, in terms of its impact on different groups of people or the environment (L,S,H).

Institutions and Social Practices

- Distinguish between claims/opinions and scientific evidence in sources (L,S,H).

### Main ideas

#### Student activity AC2.8.1 *Materials for cars*

- Students may be familiar with the typical properties of different materials but may find it difficult to link the properties to particular uses.
- Emphasise that a material will be chosen for several reasons, which may include cost and appearance, not just its performance. For example, low-end vehicles will have artificial fibre seats but high-end vehicles may have leather seats.
- Consider the balance between using aluminium or steel for car bodies. It is noteworthy that despite the apparent advantages of aluminium over steel, most car bodies are steel.
- When discussing recycling, mention that many car parts are sold for re-use, even if the car as a whole may need to be scrapped (for example, after an accident).
- Discuss the implications for the EU directive that specifies the percentage in terms of mass, not volume or number of parts. What part of the car counts for the greatest mass?

### Answers

#### Student activity AC2.8.1 *Materials for cars*

A Example table:

Car part	Properties needed	Material(s)
Body	Hard, strong, does not rust	Aluminium, steel (if protected)
Cable for electrics	Conducts electricity, can be made into wires	Copper, aluminium
Carpet	Soft and hardwearing	Fibres
Dashboard	Can be moulded into shape and coloured	Plastics
Engine	Strong and heat-resistant	Aluminium, steel
Seat covers	Soft and hardwearing, insulators	Fibres
Windows	<i>Transparent</i>	<i>Glass, plastic</i>

- B** Multiple choices are likely to occur with the body, cable, dashboard, engine, and windows. Look for sensible reasons for choosing one material over another.

### Homework task HC2.8.1 Making and recycling cars

#### Materials for cars

- A** For example: steel is used to make car bodies because it is hard and strong; copper is used for electrical wires because it is a good conductor of electricity.
- B** For example: glass is more transparent, glass has a higher melting point, glass is stronger, glass looks better.
- C** For example: fibres are more comfortable than plastic film, there are good heat insulators, they are not slippery.
- D** Easily moulded, can be coloured, different plastics have a different appearance or feel.

#### Aluminium versus steel

- A** For example:

	Aluminium	Steel
Advantages	Does not corrode, lower density than steel	Cheaper than aluminium
Disadvantages	More expensive than steel	Corrodes, higher density than aluminium

- B** Aluminium is more expensive than steel; but an aluminium body will weigh less than one made from steel, so less fuel will be needed; it will also last longer because it does not corrode.

#### Recycling cars

- A Advantages:** conserves limited resources; uses less energy; reduces waste disposal problems.

**Disadvantages:** cars are made of many materials that have to be separated; it may be difficult to do; there may be no market for the recycled materials.

**Advantages:** running costs will be low; fewer resources will be used; there will be less waste; cars will be more reliable.

**Disadvantages:** fewer cars will be sold so manufacturers will be displeased but environmentalists will be pleased; new models will not come out or improvements in technology made, so car owners may be displeased.

**Comment [R1]:** Answers for 'Extension' question?

**Comment [h2]:** This is the extension question answer, please label accordingly

#### Further information

Students must be able to link a use to a property, eg glass is used for car windows because it is transparent not because it is a poor conductor of electricity.