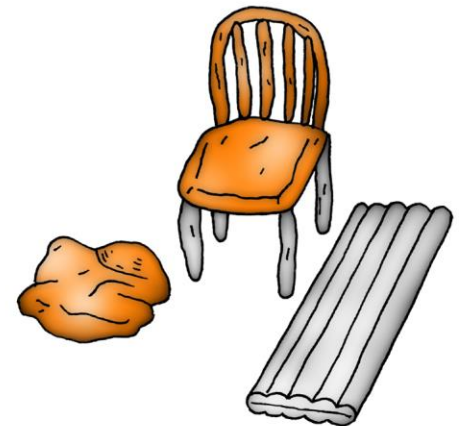


# ThinkKIT

## SMART AND MODERN MATERIALS



### Shape memory alloys

- Using PEE (point, explain and evaluate), compare the use of Nitinol to non-memory alloys in the construction and use of braces for teeth, from the patient's point of view.
- A stent is a metal or plastic tube inserted into a person's artery to help keep it open. Based on what you know about SMAs and plastics, compare the use of shape memory alloy tubes and bioplastic tubes in stent construction and use.

### Piezoelectric material

- Discuss the possibilities/restrictions of placing piezoelectric materials into the heels of shoes.
- Based on what you know about piezoelectrical material, what other applications can you think of where it might be used? Justify your answers using PEE (point, explain and evaluate).

### Thermochromic pigments and inks

- Compare and justify the use of thermochromic inks in a new T-shirt design.
- Using PEE (point, explain and evaluate), assess the use of thermochromic pigments in the design and manufacture of toasters.

### Quantum tunnelling composite

- Justify the use of QTC in the construction of textile jackets used in fencing competitions.
- Decide using PEE (point, explain and evaluate) if QTC would be suitable for use in a space suit.



### Smart glass

- Why would a family decide to use smart glass on their house?
- Between smart glass and a photochromic material, what would you recommend for the glazing of an outside child's playhouse. Justify your reasons.

### Photochromic material

- Compare the use of photochromic glass and smart glass in the manufacture of an outside display case.
- Based on what you know, how would you justify the use of photochromic material in the construction of a visor for a motorcycle helmet.

### Nanomaterials

- Discuss using PEE (point, explain and evaluate), the use of nanomaterials in the construction of a boat hull.
- Based on what you know, what judgment would you make on the use of nanomaterial in tennis rackets, if you were the chairperson of the All England Lawn & Tennis Club (ALETc)

### Polymorph

- Compare the use of polymorph as a modelling material compared to plasticine.
- Can you think of different innovative ways to use polymorph? Justify your reasons.