


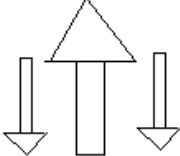
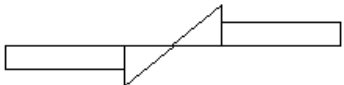


Re-Cycling Materials; Materials & Manufacturing



<http://www.cardboardtech.com/>

1. When considering a material for a build, the constraints that the material will have to endure are of special importance. Which parts of the bicycle are subject to the following constraints?

| Constraint | Symbol | Bicycle Parts |
|-------------------|---|----------------------|
| Compression |  | |
| Tension |  | |
| Torsion |  | |
| Deflection |  | |
| Shearing |  | |

2. Most bicycles use metal (mostly aluminium) as their main material. However it isn't the only material used in building bikes. In the table below describe some advantages and disadvantages for using each of the following material types in the frame of a bicycle.

| Material | Advantages | Disadvantages |
|-----------|------------|---------------|
| Metal | | |
| Wood | | |
| Plastic | | |
| Glass | | |
| Cardboard | | |

3. The cardboard used for the bicycle shown in the video was covered with a protective coating to make it heat and water resistant. How do we protect metal bicycles and what do they need protection from?

| Protection | Threat |
|------------|--------|
| | |

4. Very high end bicycles for recreational and sporting use have very few metal parts. Instead their frames are made of fibreglass. This material combines the advantages of ceramics and plastics.

a) What is the term used to describe this kind of material

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b) What are the two parts of these materials called?

| | |
|----------------------------------|-------------------------------|
| The fibreglass is an example of: | The plastic is an example of: |
|----------------------------------|-------------------------------|