



Knowledge Organiser: Year 9 Sustainable Design

Keywords and glossary

biomimicry	using nature as a form for human inventions
biomorphic	resembling or suggesting the form of living organisms
model	a three-dimensional representation of an item which tests how it looks
prototype	a test model that explores how a product works
modular	using modules as the basis of design or construction.
architecture	the style, design and construction of buildings or other physical structures
analysis	a careful study of the parts of something in order to understand more about the whole.
design	to make or draw plans for the structure or form of.
sustainable	able to be maintained at a certain rate/level

Construction Materials

concrete	steel reinforced concrete	steel	glass	timbers
used in construction, road, brick laying	used for bridges, sky scrapers and construction	large multi-storey buildings	used in construction	used for building structures
<ul style="list-style-type: none"> strong compressive strength durable fire resistant impact resistant 	<ul style="list-style-type: none"> can withstand tensile forces strong durable 	<ul style="list-style-type: none"> moisture resistant fire resistant very strong durable rusts easily 	<ul style="list-style-type: none"> transparent heat resistant pressure resistant chemical resistant 	<ul style="list-style-type: none"> non-toxic safe to touch strong malleable recyclable sustainable

Biomimicry:

Designs inspired by how things in nature work....

KINGFISHER



JAPANESE BULLET TRAIN



BURR



VELCRO



Stealth B2 Bomber - Falcon USA

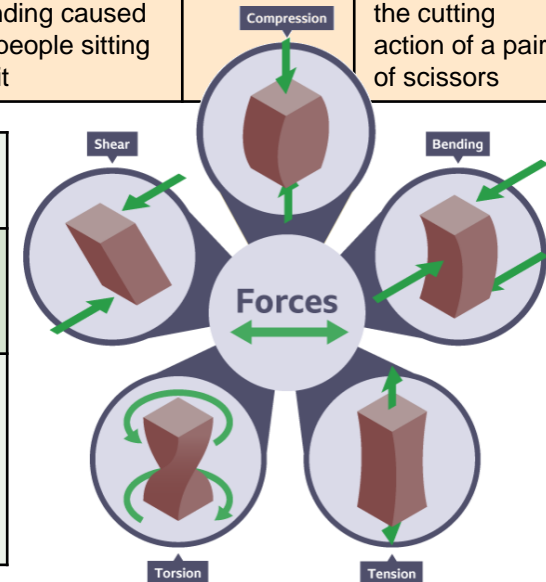
Bio morphism:

Designs inspired by how things look in nature...



Stresses & Forces

compression	tension	bending	torsion	shearing
a force pressing down e.g. a table has to withstand the compression on its legs	a pulling force e.g. a suspension bridges rely on tensile strength to stay up	force applied to a portion of an object e.g. a chair has to withstand the bending caused by people sitting on it	a twisting force e.g. a drill or propeller	force moving across an object in opposite directions e.g: the cutting action of a pair of scissors

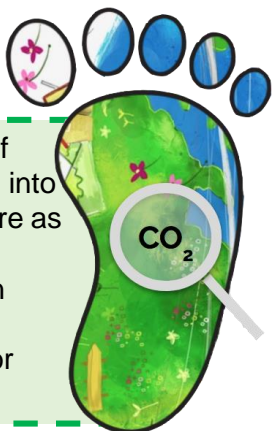




Sustainability means using resources in such a way that they meet our needs now, but will also be available for future generations.

Carbon Footprint...

The amount of CO₂ released into the atmosphere as a result of the activities of an individual, organisation or community.

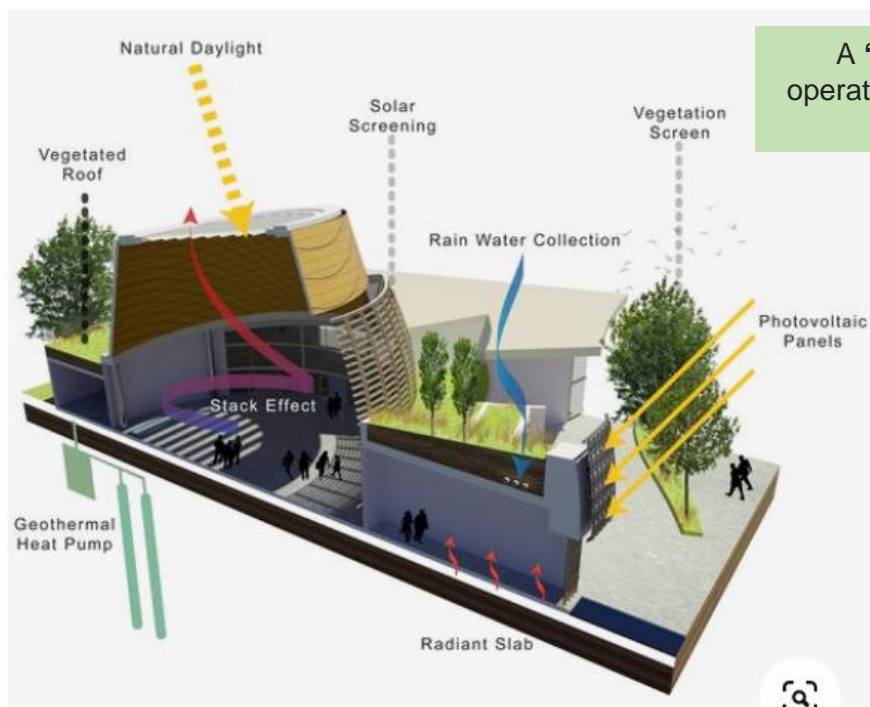
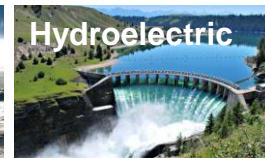


Fossil fuels are formed from the fossilised remains of plants and animals over millions of years.

Coal, oil and gas are extracted through mining and drilling. They are a **non-renewable** or **finite** resource.



Renewable alternatives (**non-finite**) to fossil fuels include:



A '**sustainable**' or '**green**' **building** is a **building** that, in its design, construction or operation, reduces or eliminates negative impacts, and can create positive impacts, on our climate and natural environment.

Models vs Prototypes

- A **model** is used to demonstrate **look** and **feel**.
- A **prototype** is geared towards **testing to see if the final product will work as intended**. Whether that is its physical size or function.

Careers in Architecture:

Lead architect	Structural engineer	Green building architect	Project manager
leads the team performing the design of the project	help create structures – they work as part of a team alongside architects, builders and engineers	ensure designs and buildings are sustainable and have minimal effects on ecosystem	responsible for planning, organising and directing the completion of a task