

# MATERIALS FACT FILES



think up

DEVELOPED IN ASSOCIATION WITH THE  
INSTITUTION OF STRUCTURAL ENGINEERS  
EDUCATIONAL TRUST

# MATERIALS FACT FILE 01

## Stone

- Strong in compression
- Brittle
- Ancient construction material
- Used for arches, columns and walls



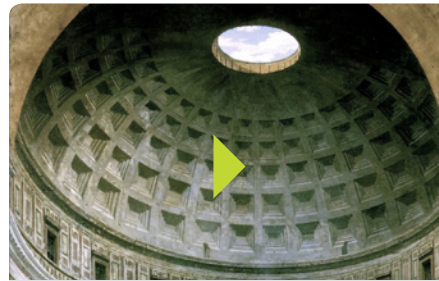
Pont du Gard near Remoulins, France



Pyramid

## Mass concrete

- Strong in compression
- Brittle
- First developed by the Romans
- Used in foundations and in dam



Pantheon



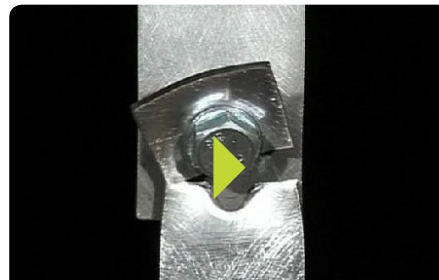
Videos about concrete



Hoover Dam

## Steel beam/column

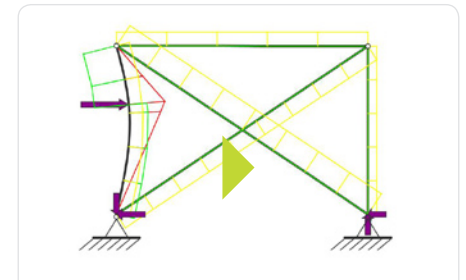
- Strong in compression, tension and in bending
- Used for columns and beams
- Combines strength and low weight



Videos about steel



Pompidou Centre



Behaviour of steel frames

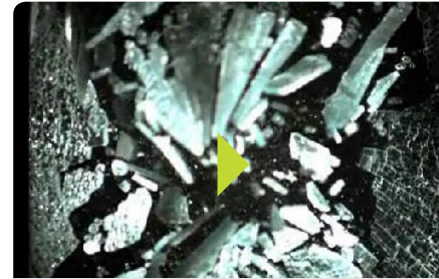
# MATERIALS FACT FILE 02

## Glass

- Brittle but can be made tougher
- Used in the construction of some small bridges



Failure of glass



Failure of toughened glass



Glass bridge the Apple Store

## Reinforced concrete

A composite material that makes the most of each of the component materials' strength:

- Concrete's strength in compression
- Steel's strength in tension



Sydney Opera House



Behaviour of a beam



L'Oceanogràfic, Valencia

## Steel cable

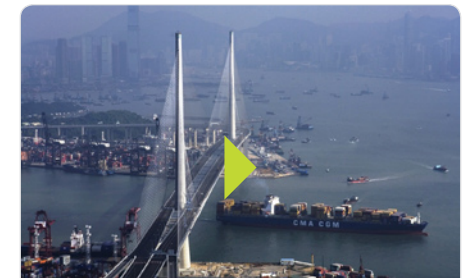
- Extremely high strength in tension
- Made from bundles of strands
- Stretches under tension



Steel cables



Cable net roof London Velodrome



Stonecutters Bridge, Hong Kong