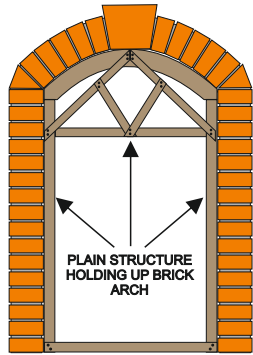


# REVISION CARDS - STRUCTURES

## PLAIN FRAME STRUCTURE

These are structures created in **two dimensions**. An example is seen opposite. This is a flat wooden frame, holding bricks in position, whilst the cement dries. This is a typical construction technique. Once the brick work is set in position, the plain frame structure can be removed, leaving the brick arch firmly and permanently in place.



USEFUL LINK: <https://technologystudent.com/struct1/struindex.htm>

## STRUCTURAL FRAMES

These are **three dimensional** structures, often composed of girders, beams and columns. They are characterised by having columns to hold up sections of the structure. The steel structure of a stadium may have many anchor points to the ground. The roof of many sporting stadiums, are held in position, by this type of structure (see below).



USEFUL LINK: <https://technologystudent.com/struct1/struindex.htm>

## SPACE FRAME STRUCTURES

A space frame structure is characterised by a single large interior space, with no columns or supports interrupting the open area. An excellent example of this, is the Biomes Buildings, of the the Eden Project in Cornwall, UK. Each space frame structure is based on a hex-tri-hex space frame, a composition of hexagons and triangles. This is a very lightweight structure and yet provides structural strength.



1. Describe a Plain Frame Structure and give one example ? *4 marks*

2. Describe a Structural Frame and include one example..

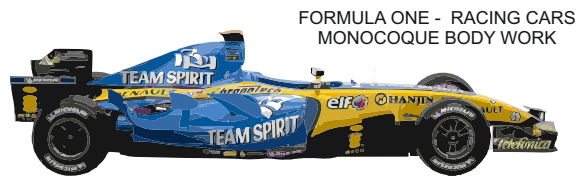
*4 marks*

3. What is a Space Frame Structure? Include one example *4 marks*

# REVISION CARDS - STRUCTURES

## A MONOCOQUE STRUCTURE

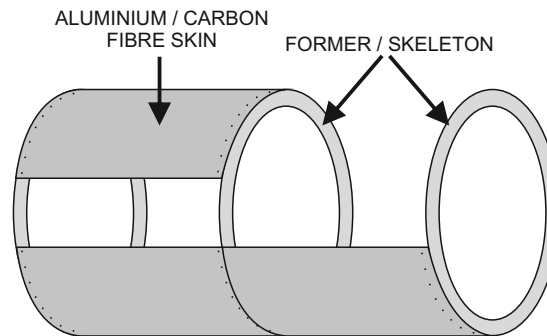
A 'monocoque' structure does not rely on a frame for strength / structural integrity. It relies on the outer skin / shell, to counter stresses and loads. For example, the carbon fibre reinforced bodywork, of a modern Formula One racing car, is an example of this type of structure. The bodywork is one piece and does not require internal strengthening, through the inclusion of a frame.



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## A SEMI-MONOCOQUE STRUCTURE

An example of a semi monocoque structure is the fuselage of a plane has several advantages. The combination of the 'skeleton' and 'skin', provides improved structural integrity. The combined structure is lightweight, which leads to fuel efficiency and consequently, reduced pollution, when in flight.



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## A SEMI-MONOCOQUE STRUCTURE



## F1 MONOCOQUE STRUCTURE



4. Describe a Plain Frame Structure and give one example ? 4 marks

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5. Describe a Structural Frame and include one example.. 4 marks

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6. What is a Space Frame Structure? Include one example 4 marks

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