TECHNOLOGY

Week 4

Instruction 1

What you should have observed after doing the practical Activities 5 and 6 last week :

Activity 5 – The 4 different shapes of tubing

The **circular** tubing is the strongest. It has no corners/edges, the places where the other structures caved in first. (triangles are only strong when used to strengthen frame structures by adding in struts in a triangular pattern). This is why bicycle frames are made out of circular tubing and not square or triangular tubing.

Activity 6 – the unfolded and the corrugated paper

The unfolded paper had no strength and could not hold up much weight, but the corrugated (folded) paper was very much stronger

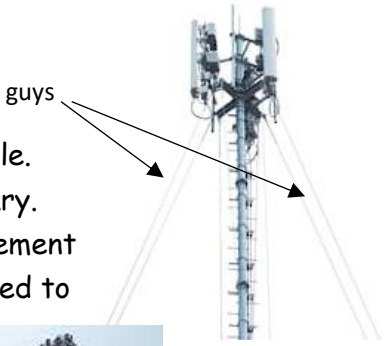
Instruction 2

Read the note below on “Design issues - cell phone towers”. Read it over and over again in order to have a clear understanding of the information. There is nothing more you need to do for Tech this week😊

DESIGN ISSUES - CELL PHONE TOWERS

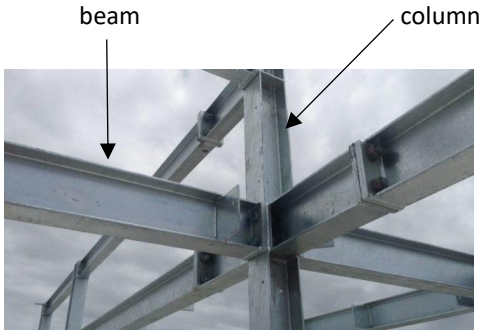
Cell phone structures are tall, large and heavy structures. They must be properly designed to resist **forces** and **loads** caused by the wind, water and earthquakes. A force or load is a push or pull on the tower which can result in it breaking apart, falling over or becoming deformed. A cell phone towers fail or break as a result of poor design, material failure or applying a force or load that is too heavy.

Identifying structural elements



Look at the following cell phone tower. It is tall, thin and not very stable. To increase stability and wind resistance, additional support is necessary. **Guys** are holding this cell phone tower in place. A **guy** is a structural element made from **flexible** material such as ropes, cable or chains, that are used to hold structures in place.

The next cell phone tower is called a **lattice** tower. It is made of criss-crossing parts. The frames consist of a series of stiff metal **columns** and **beams** that are welded or bolted together.



The **columns** are the parts that run **vertically** and the **beams** are the parts of the structure that run **horizontally**. A beam is used to span a gap and is supported by columns on either end.

The beams and columns used in lattice cell phone towers have different shapes, such as the I-shape, H-shape, U-shape, etc. Look at all the different beam and column shapes below. What shape do you think has been used for the beams and columns in the picture above?

NB : These shaped beams would be even stronger than the circular tubing we looked at earlier!!!