**Structures: Inquiry and Design Project**

Over the next 10 days you and a partner/s will be conducting an inquiry into the topic of your choice that is related to structures. Besides asking questions and conducting research, you will also be responsible for constructing and testing your own structure.

You will be expected to work through inquiry and design processes that are outlined in our project package.

You will also be expected to write a reflection on what you learned during the process. With this in mind you will need to keep an **Inquiry Journal** with your notes about: what you are doing, what you observed, test results, where you found information, who you talked to, what was surprising/interesting.

You will also be expected to **build models** to show understanding of your topic

As far as the inquiry questions we want to focus on the **WHY?** and **HOW?** type of questions.

Some possible topics are as follows:

1) A famous structure of the World

-How was it built?

-Why is it so strong, special, interesting, etc…?

-What, When, Where, Who, Why about the structure.

-examples: Great Wall of China, Eiffel Tower, Pyramids in Egypt, Mayan Pyramids, Skyscrapers, Taj Mahal, castles, Leaning Tower of Pisa, Stonehenge, Twin Towers(how and why they fell)

2) Towers

-How to build the tallest model towers?

-What forces act on towers?

3) Bridges

-How to build the strongest bridge

-Why are there different types of bridges?

-How can you build the most efficient bridge?

-Famous bridges and their design

4) The structure of a house

-design and function of the different parts, particularly walls and roof designs

-forces that act on a house

5) Natural structures

-explain their shape and design

-connections between natural structures and Human made structures

6) Bicycles

-their frame structure: identify the parts and their function

-loads and forces on a bicycle

-different types/designs of bikes

7) Centre of Gravity and Stability

8) Human skeleton

-design and function

9) Demonstrate Forces

-tension, compression, torsion, shear

10) Design and build a storage device

11) Design and build a model working elevator

-research history and safety, etc… of elevators

12) Research, design and test different columns for strength

13) Examine static and live loads

14) Describe, using diagrams, how common structural shapes and components can increase the strength and stability of a structure.   
Examples: a triangle distributes the downward force of a load evenly between its two vertices

15) Describe and demonstrate methods to increase the strength of materials   
Examples: corrugation of surfaces, lamination of adjacent members, alteration of the shape of components

16) Dams, aqueducts, or Locks

17) Cable Cars Ski Lifts

18) The power of triangles and other powerful shapes

19) cranes

20) domes

21) Structures that are designed to collapse

22) structure designed to provide protection