What will I know by the end of the unit?

* understand how a *shaduf* mechanism enabled farmers to move larger/heavier quantities of water. Explain how levers work.
* Explain how friction can be reduced to make dragging heavy objects easier.
* Understand how simple pulley systems can be used to lift heavy objects and reduce the amount of force required to do so.
* Understand how water resistance helps to keep things afloat and use this knowledge to design transportation rafts.
* report and present findings from enquiries, including conclusions and explanations of variables that effected results, by presenting to the class and producing neatly written reports.
* Explain who Isaac Newton was and his theory of gravitation.

**Learning Experiences:**

Investigate how to reduce the force of friction when dragging large stones on sledges to build pyramids.

Investigate mechanisms for lifting and placing stones to build pyramids:

Can we create a pulley system to help lift a heavy book or a water-filled bottle?

How can we lift a 1kg weight using a lever?

Construct a working model of a shaduf and explain how it works.

Make a model reed boat and test it for the Pharaoh

Research Isaac Newton and his theory of gravitation.

**Vocabulary:**

Friction

Isaac Newton

Resistance

Gravity

Newtons

Pulley

Lever

Force

Fulcrum

Pivot

Hinge

Mechanism

Gears

Variables

Prediction

Enquiry

**What should I already know?**

Y3 NC objectives: Compare how things move on different surfaces.

Notice that some forces need contact between two objects, but magnetic forces can act at a distance.

Recognise push and pull as forces that can move stationary objects.

**National Curriculum:**

* Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.
* Identify the effects of air resistance, water resistance and friction, that act between moving surfaces
* Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.
* Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary

Working Scientifically:

 taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate

 recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs

 using test results to make predictions to set up further comparative and fair tests

 reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations

 identifying scientific evidence that has been used to support or refute ideas or arguments.