Timeline Activity

The origins of Canterbury Cathedral date back to the 6th Century AD when St Augustine first arrived in the City. Since then the Cathedral has grown and changed continuously. The Cathedral continues to evolve and develop to this day and there is a team of experts who oversee this, including architects, stonemasons, and engineers.

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Match the correct image to the correct dates to create a visual timeline of Canterbury Cathedral's development.

What do you think the most important part of the Cathedral's development was and why?

Why do you think the Cathedral is still evolving?









Who built the Cathedral?



Complete the cross word by guessing the names of these jobs at the Cathedral.

DOWN

I.They shape and fit the stone (6)

2. They dig stone from the earth (9)

3. They make the paste that holds stones together (6,6)

4. They cut timbers for the roofers (10)

5. Someone who makes or repairs the stained glass windows (7)

ACROSS

6. They move materials and dig foundations (9)

7. They cut big blocks of stone (5,7)

8. They cover walls and ceilings with a layer of plaster to smooth their appearance and form a foundation for any painted decorations (10)

9. Built or repair the roofs (7)





Some jobs were seen to be more skilled than others and people got paid more for doing them.

Which jobs do you think were more difficult and required more training?

Which job do you think you would have preferred and why?

I. Masons 2. Quarrymen 3. Mortar Makers 4. Carpenters 5. Glazier 6. Labourers 7. Stone Cutters 8. Plasterers 9. Roofers









The medieval Cathedral builders did not have the same machines as modern builders which meant that building the Cathedral could be a much more challenging activity.



What is a Lever?

A lever is a rigid bar that tilts at a point (called a pivot or a fulcrum). A see saw in the playground is a Lever. The fulcrum can be moved to increase or decrease the amount of effort used to lift a load.













Simple Lever Experiment Method:

1. Prepare the arm by taping it firmly to a flat surface with plenty of space either side (like a desk or table)



2. Stick or tape the labelled LOAD and EFFORT cups to each end of the wooden (this is your lever arm) as shown. Put your marbles into the cup labelled LOAD



3. Start by placing the lever arm onto the binder clip 8cm from the end marked LOAD



14. Place the pennies in the cup marked EFFORT one at a time and record how many pennies it takes to lift the EFFORT cup into the air



5. Move the fulcrum - or pivot point - away from the LOAD cup 2cm at a time and add more pennies as necessary. Don't forget to record your results



Materials:

30cm wooden ruler

2 clear plastic cups

Permanent marker

100 pennies

15 marbles (or something of a similar weight)

I Large metal bulldog clip, with the arms removed

Sticky Tape

Glue

Result:

You should notice that the farther away the fulcrum moves from the LOAD cup, the more pennies are required to lift the load.







What are Pulleys?

Pulleys are wheel shaped with a groove that allows a rope or chain to sit inside the groove. They allow you to move large objects, such as blocks of stone, more easily.

Pulleys are simple to use and are easy to transport to where they are needed and set up, but they do require somewhere firm and strong to hang.

Everyday single pulley systems include cranes, raising a flag or adjusting window blinds.



Single Pulley

A single pulley changes the direction of force when lifting an object.



Try this!

Is it easier to pull something down or lift something up?

Try lifting and lowering a heavy object such as a stack of dictionaries or a full carton of milk. Which is easiest?

Multiple Pulley's

The more pulleys you use the less force you need to lift objects. Using two pulleys together means you need half the force to lift. This is called a block and tackle, and is used to lift large, difficultshaped objects, such as stone blocks. Adding more wheels to the block and tackle increases the load it can lift.







Levers and Pulleys

A Medieval Pulley System

In medieval cathedrals they often used human treadmills, which were basically large pulleys, to lift heavy objects. One man in a treadmill could lift 1,200lbs worth of stone. This was incredibly hard work and could result in severe injuries. Human treadmills were used until Victorian times and philosopher John Stuart Mill wrote that they were "unequalled in the modern annals of legalised torture".



Method:

This experiment will help you make two different types of pulley. Ideally there should be enough space to set both types of pulleys up at once so you can do the tests immediately one after the other and compare them, however you can do one at a time if you have limited space and materials.

Continue Overleaf for Pulley A experiment method...



Pulley Experiment Materials:

4 empty cereal boxes

4 pencils

8 paper clips

20 metal washers or hex nuts of the same size

2.5 metres of String

Scissors

2 empty spools of thread (optional)



Levers and Pulleys

	Pulley A Experiment Method:		Pencil
1.	Stand 2 cereal boxes up parallel to each other on a table or desk.		String Paperclip
2.	Carefully poke 2 holes across from each other toward the top of the cereal boxes (on their inner faces) so you can push a pencil through the holes in a way it will be supported by the boxes.		Washer Cereal Boxes
3.	Cut a piece of string that is slightly longer than one cereal box is tall.		
4.	Tie a paper clip to each end of the string.		
5.	Hang the string over the pencil with one paper clip dangling off each side. This is your simple pulley.		
6.	Hang two washers from one of the paper clips (Bend the paper clip slightly so you can easily use it as a hook). These washers are your "load." Let them fall down to the tabletop.	7.	One at a time, start hanging washers from the other paper clip. Place the washers onto the paper clip carefully, do not drop them. These washers are your "effort" force.









Pulley B Experiment Method:

- 1. Poke 2 holes in each box so you can insert pencils parallel to the each other; they should be a few centimetres apart.
- 2. Cut a piece of string, roughly twice as long as one box is tall.
- **3.** Tie one end of the string to the second pencil, and drape the other end over the first pencil.
- 4. Hang a paper clip from the part of the string between the two pencils so it dangles down between them. Hang two washers from this paper clip and let them fall down to the ground. This will be your load.
- 5. Now tie the free end of the string to another paper clip. This paper clip should be up off the ground, close to the pencils. If not then you must shorten your string.

- 6. One at a time, start hanging washers from the second paper clip. How many washers do you have to hang on the paper clip until the load starts to lift up off the table? Record your results.
- 7. Compare the results for the two different types of pulleys.

Does it take more or fewer washers to lift the same load using a compound pulley compared with a simple pulley? Why?

Result:

You should find that it takes fewer washers to lift an equivalent load using a compound pulley compared with a simple pulley.

However friction may mean you need to exert a little extra force.





Worksheet Read a Stained Glass window

Many people in the Middle Ages couldn't read or write. Stained glass windows, carvings and paintings were all useful ways of telling people stories. They were like modern day comics or cartoons. They told stories, recorded histories or gave people messages about how the church expected them to behave.

There are many images which were codes for certain ideas, for example a lamb would represent Jesus, a dove represented peace and a snake represented the Devil and temptation.







What is happening in this picture?

Clue - The man has seeds in his hands

It is taken from a set of windows called the parable windows at Canterbury Cathedral. A parable is a simple story that Jesus told to illustrate a moral or spiritual lesson.

What do you think the parable shown here is trying to teach people?







Read a Stained Glass window



Could you make up your own parable?

Choose one of your school or family rules that you care about, for example, "Do your best", or "Be Kind".

Using the Story Hand writing frame to the right. Think of a story that shows why your rule is so important. This is the message of your story, your moral. For example if you were creating a parable about the importance of recycling, the moral could be that a clean planet is a happy place.

Charac	ters 2 Setting
Moral	3 Beginning
4	Middle (Problem)
5 End	(Solution)

2		
3		
4		
•		
5		



You can present your parable in a number of ways including a drama performance, a picture (like the stained glass window) or in a written story.

Parables are still found today in many different areas of our lives, including Art, TV and music. They are an important way of teaching people right from wrong. For example Disney's movie "Finding Nemo" is a parable about never giving up on the people you love.

Can you think of any others you might know?





Design and make a stained glass window

Robert and his friends

go down to the River

and Robert falls in.

tell his parents.

Medway to play. They start

throwing stones at frogs

Robert's friends run to

The Trinity Chapel at the far East end of the Cathedral once house the shrine of St Thomas. It is decorated with a series of stained glass windows that tell the stories of some of the pilgrims who came to visit the shrine and the miracles they received.



Some of these windows tell the story of Bobby of Rochester.

Can you match the right picture to the right part of the story?

Unfortunately the windows for parts 4 and 5 of the story have not survived.

Can you draw what you think they would have looked like?



What are the main messages of this story?

Why did the Cathedral want pilgrims to see the miracles St Thomas had done?



Ι.

2.

 Robert is hung upside down and rolled in a tub but he still appears dead.

 His mother measures him and offers St Thomas an equal length of silver wire if Robert recovers (this is very expensive). Miraculously he does!















Design and make a stained glass window



Think of a modern miracle that you may have come across in the news or elsewhere.

How couldyou show this in stained glass window?

Divide the story into key sections (beginning, middle and end, etc.). Each of these can be a frame in your window.

What messages are you trying to get across?







Making Glass

Recipe for Making Medieval Glass:

Today most glass is made by machine in factories, but in medieval times glass was made by hand by highly trained artisans called Glaziers.



The Muff Method

The Gaffer gathered a lump of molten glass on the end of a hollow tube, a long balloon was blown. Whilst the glass was cooling it was split along its length and flattened out.

The Crown Method

The Gaffer blew a lump of molten glass into a ball, a hole was made in the ball, and the glass was then spun so the hole got bigger and the glass became a large disc shape.

Ingredients

Sand (65%)

Alkali (20%) - this can be Soda (ashes from salt marsh plants, like seaweed) or Potash (ashes from forest plants, like beech trees)

Lime (15%) - this is calcium oxide, not the fruit!

Method

Mix the ingredients together

Melt at 1000C in a clay crucible (picture please) in a wood burning furnace (picture). This is hotter than lava in a volcano!

A glassblower, called a *"Gaffer"* gathers up a all of the melted glass on a long metal blow pipe (image) and then there are two ways they can stretch out the glass to form a sheet of flat glass.



The glass must now cool very slowly in a special kiln. If it cools too fast it will crystallize and be less clear, and too brittle. The cooling process is called Annealing.

At what point during the glass making method is the process irreversible?

Why is this?



