

Inventors and Inventions



Leonardo Da Vinci

W/C: 20th April 2020

Leonardo Da Vinci is famous for a number of reasons. He is probably best known as the artist who painted the 'Mona Lisa' but he wasn't just an incredible artist. He is also known for being an architect, a sculptor, a scientist, an inventor and much more!

Subject: History

Activity Outcome: Produce a timeline of Leonardo Da Vinci's life and achievements.

Explain: Timelines are used to show events in chronological order. For your task, your timeline should begin with his birth and end with his death. You should note down the key events that occurred in Da Vinci's life and the year in which they took place. Then, you should place these accurately on your timeline. Remember, you can rephrase the key events or even add an illustration to support your findings.

Subject: Art

Activity Outcome: Produce a drawing in the style of Leonardo Da Vinci.

Explain: We would like you to create a drawing which shows life-like qualities in the face. You can use a variety of shading techniques to add interesting effects. Below are two videos that may also help you.

<https://www.youtube.com/watch?v=TVqLEDXM7S4>

https://www.youtube.com/watch?v=KGsnPi_dSWA

Subject: Geography

Activity Outcome: Create your own accurate world map.

Explain: Use the information from Da Vinci's maps, atlases and the internet to create your own accurate world map.

On your map you need to include:

- Compass position
- Annotated labels of countries, oceans, seas, continents, capital cities etc.
- Locate Italy and France on your world map
- Prior knowledge

Subject: Science

Activity Outcome: Write a scientific report based on Da Vinci's inventions.

Explain: Imagine you were with Leonardo Da Vinci on the day of testing the flying machine. You have all the ideas and technology from the current day of today (so you can use the internet to support your subject knowledge and design ideas). How you present your notebook design is entirely up to you. I want you to write a report like Leonardo has done in his notebooks. Consider the science behind the flying machine (gravity, air resistance, thrust). What would happen to the flying machine during his experiment? Improve his design ideas so that it would work. Ensure your design is detailed and uses annotations.



Leonardo Da Vinci

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Leonardo Da Vinci was born on 15 April 1452 near the Tuscan town of Vinci, the illegitimate son of a local lawyer.



Leonardo grew up on his father's family's estate, where he received education including: reading, writing and arithmetic.

As a child, Leonardo was seen as a very able artist. When he was about 15 (1467), his father, who enjoyed a high reputation in the Florence community, apprenticed him to artist Andrea del Verrochio. At this time, he was given training in painting and sculpturing.



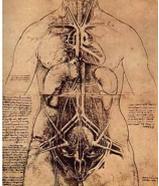
In 1472 Leonardo was accepted into the painters' guild of Florence (people that controlled the arts and trades in Florence), but he remained in his teacher's workshop for five more years, after which time he worked independently in Florence until 1481.



In 1482, Leonardo moved to Milan. He moved here to work for the ruling Sforza family as an engineer, sculptor, painter and architect.



- In 1490, Da Vinci really began his research. He kept a record of his findings in a notebook. To start with, his research and notes were to just develop his paintings. He studied anatomy (human body) to bring detail to the reality. He studied rocks and plants to make them authentic for his paintings. Somewhere during Leonardo's life, his notebook became a record of his life-long fascination with nature and his genius for invention.



One of many of Da Vinci's detailed anatomy drawings.



During his time in Milan, Leonardo Da Vinci created one of his most iconic paintings in 'The Last Supper' (1495). It was made as part of a renovation of the church and its convent buildings by Leonardo's patron Ludovico Sforza, Duke of Milan. The painting represents the scene of the Last Supper of Jesus with his apostles, as it is told in the Gospel of John, 13:21. Leonardo has depicted the consternation that occurred among the Twelve when Jesus announced that one of them would betray him.



Sketches from his notebook based on the painting.



The painting itself and covers an end wall of the dining hall at the monastery of Santa Maria Delle Grazie, in Milan, Italy.

In the year 1500, Leonardo Da Vinci returned to Venice with the company of mathematician Luca Pacioli. He was appointed an architectural expert on a committee investigating damages to the foundation and structure of the church of San Francesco al Monte.



Luca Pacioli SRL

It seems at this point, Leonardo Da Vinci is concentrating more on his research and mathematician than his paintings.



Maths theories and ideas that he had.

In 1502, Da Vinci became an architectural engineer for Military. His main role was travelling with the troops creating maps and sketches as he did so.



Map created of Italian town of Imola.

For 10 months, Leonardo travelled across the condottiere's territories and surveyed them. In the course of his activity, he sketched some of the city plans and maps.

In the spring of 1503, Leonardo returned to Florence to make an expert survey of a project that attempted to divert the Arno River behind Pisa so that the city, then under siege by the Florentines, would be deprived of access to the sea.



This picture is Di Vinci's plan to create a canal to connect Florence and the sea.

In the Autumn of this year, it is said this was the time when Da Vinci created his most iconic painting the Mona Lisa



During this time in Florence (1504-1506), Leonardo took a lot of time for the study of science. He made systematic observations of the flight of birds. This research on birds and movement led him to design his very own flying machine. It works by flapping the wings like a bird.



- In May of 1506, Da Vinci returned to Milan. He had a range of job roles that mainly were around architectural designs.

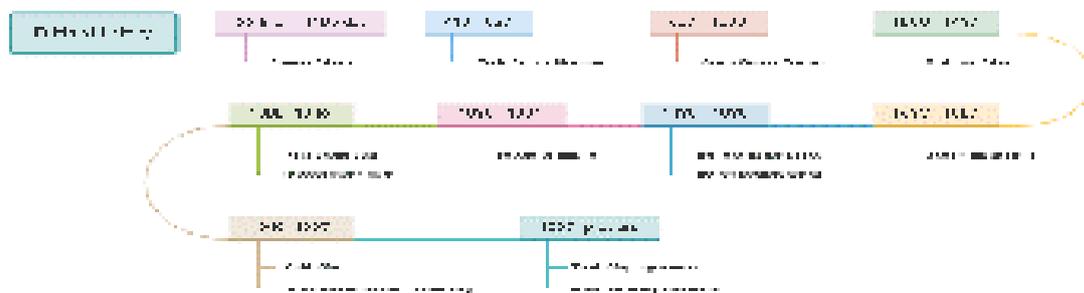
At the end of 1516, he left Italy forever. At the age 65 Leonardo accepted the invitation of the young King Francis I to enter his service in France. Leonardo still made sketches for court festivals but the king treated him in every respect as an honoured guest and allowed him freedom of action.



On May 2nd 1519 Leonardo Da Vinci died.

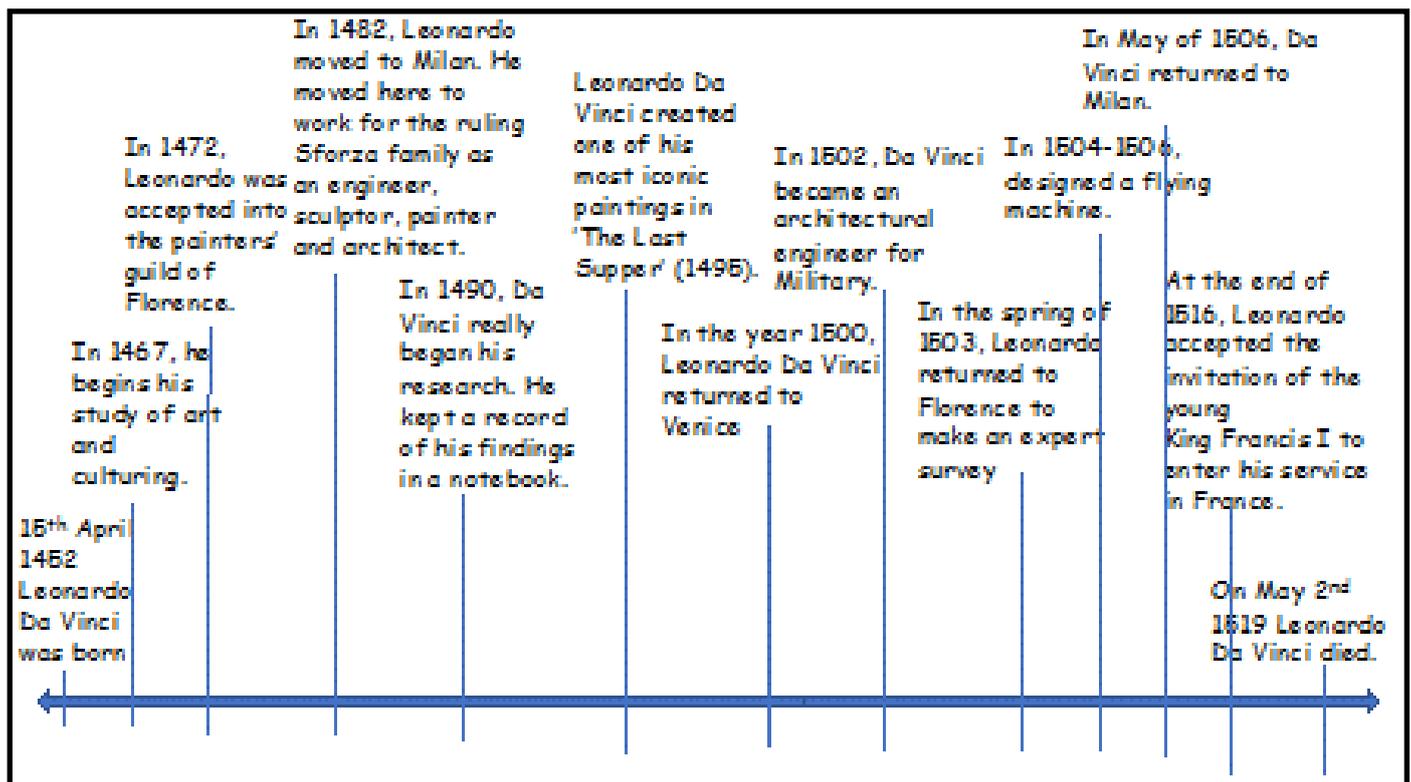
Your Task

- Using all the research I have found for you to create a brief timeline of the life of Leonardo Da Vinci
- Your timeline should start with his birth and end with his death.
- In between the timeline, plot in the great events that impacted Leonardo's life.



Ex

The next slide is a parent cheat sheet (for parents) to give you an idea of the outcome.





Leonardo Da Vinci

Inventors and inventions

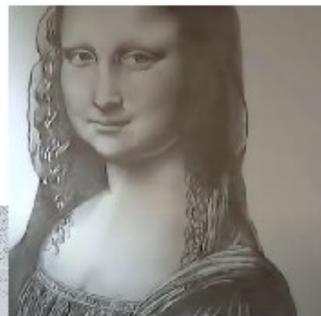


Recap

- In what year was Leonardo Da Vinci Born?
- In what year did he die?
- What was the two most important paintings that he created?
- What did he try to invent?

Your task

- I want you to draw in the style of Leonardo Da Vinci.
- Try to show life like qualities in the face.
- Use a variety of shading techniques to add interesting effects (e.g. reflections and shadows).
- There are many videos online to help support your drawings.
- Support videos
 - <https://www.youtube.com/watch?v=TVqLEDXM7S4>
 - https://www.youtube.com/watch?v=KGsnPi_dSWA





Do You remember?

On a map where would you find ..

- Equator
- Tropic of Cancer
- Tropic of Capricorn
- Northern Hemisphere
- Southern Hemisphere
- Arctic Circle
- Antarctic Circle

Equator means "even marker" (Latin) and is an invisible line halfway between the North and South Pole (halfway through the Earth).

Northern Hemisphere

Equator

Southern Hemisphere

The Tropic of Cancer is an imaginary line that marks the Northern edge of the globe. It is 23° above the equator.

The Tropic of Capricorn is an imaginary line that marks the Southern edge of the globe. It is 23° below the equator.

Arctic Circle

Antarctic Circle

Leonardo Da Vinci

During Leonardo Da Vinci's life, he made maps on a few different occasions:

- For the military so they were aware of different areas and territories.
- Connecting Florence to the sea by canal.



Da Vinci's maps were very accurate and detailed to showcase exactly what he wanted.



His maps were always accurate representation to size.

His maps can be seen to use annotations to locate places.

He uses a 8 point compass markings to show the position.

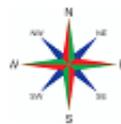


Here is a modern day map of Europe (one of our seven continents in the world).

What does this map have that are similar to that of Da Vinci?

Similarities:

- Uses compass for position
- Uses annotations to label countries
- The maps are very accurate to represent the continent.
- The size is to scale to what it should be (countries are the right size in scale to other countries areas).



A compass normally is positioned on a map to show which way the map should be read from.

Your task

Use the information from Da Vinci's maps, atlas, the internet to create your own accurate world map.

On your map you need to include:

- Compass position
- Key coding of the 7 continents
- Annotated labels of countries, oceans, seas, continents, capital cities etc.
- Locate Italy on your world map (country of birth of Leonardo Da Vinci)
- Locate France on your world map (country where Leonardo spent his last few years).
- Prior knowledge: The equator, Tropic of Cancer, Tropic of Capricorn, Northern Hemisphere, Southern Hemisphere, Antarctic Circle and Arctic Circle.





Leonardo Da Vinci

Inventors and inventions

Leonardo Da Vinci has designed/created a range of inventions and designs which have gone on to shape many things we are aware of to this day.

But what are these inventions?

The Parachute



Model of his ideas



Forever fascinated by the possibility of flight, Da Vinci spent much of his time thinking up ways to get mankind in the air—and perhaps more importantly, how to get them back down safely. Eventually, he came up with the first-ever parachute: a wooden pyramid structure draped with a piece of cloth that would slow down a person's terminal velocity as they fell to earth. As Da Vinci himself wrote, it allowed man to "throw himself down from any great height without suffering any injury."

His ideas for the parachute were way before his time and don't differ too much from today's parachutes.

The armored truck/tank

Da Vinci was the first person to design an armored tank. While working for the Duke of Milan, he created an armored war machine, complete with 36 guns to be driven by eight men. In theory, it was virtually invincible.

However, the diagram contained an error: the gears caused the front and back wheels to move in opposite directions.




Diving suit

Da Vinci was employed by the military to find ways of increasing its chances in warfare. Originally designed as a way of warding off invading ships, Da Vinci's diving suit would allow men to engage in a little underwater sabotage by cutting holes in the bottom of the enemy's hull. Unfortunately, the design, complete with breathing hose and glass goggles, wasn't needed at the time and would only find itself submerged in planning stages.



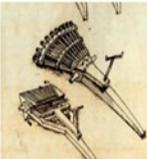
Diving suits today have developed dramatically today to Da Vinci's ideas but without his initiative that may not be the case.



Crossbow and machine gun

The machine gun was yet another of Da Vinci's deadly designs that never came to fruition, but it certainly would have destroyed any incoming enemy.

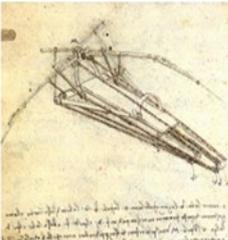
Not quite the same as a modern machine gun, Da Vinci's '33-barreled-organ' allowed a set of 11 muskets to fire one after another, rotating to allow the barrels to cool off.




Flying Machine

Most of Leonardo's aerial machines were designed after he studied birds. For this reason they generated their forward motion by mechanisms designed to flap the wings. In his notes he recorded, "the bird is an instrument functioning according to mathematical laws, and man has the power to reproduce an instrument like this with all its movements."

He built a working model of one of his flying machines and on January 2, 1496, he recorded in his notes that he was going to attempt to fly it the next day. It is unknown whether he didn't try or if the flight was a failure.




Later on he did make a note to himself to try any more flying experiments over a lake where he would be less likely to be injured in a landing.

Leonardo's man-powered flight designs, though ingenious, would never have worked. A man cannot generate enough energy with his muscles to lift himself and a flying machine off the ground without the use of very high efficiency designs and materials made possible by modern technology. If Leonardo had concentrated more on building a glider, rather than a powered flying machine, he might have been much more successful in getting off the ground.

<https://www.youtube.com/watch?v=Y0htkvCVpE> - Helpful video (from beginning until 2:30 for the flying machine).

Overtime, near enough all of Leonardo's research and inventions have been developed. His worked has been built up, scrutinised and tested many different times.




When he began his study of birds in flight, Leonardo da Vinci realised that humans are too heavy. Because of this, they would not be strong enough to fly if they were only using wings attached to the arms.

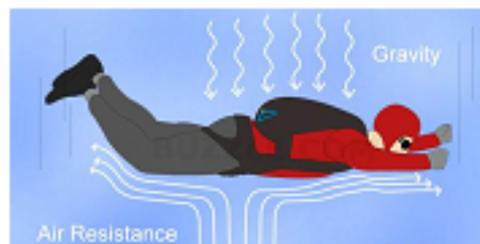
He envisaged that to achieve flight there would be a need to include levers, pedals and pulleys. On this basis, in about 1490 Leonardo da Vinci drew his up plans for a flying machine that would keep a man in the air by the beating of its wings.

If you look at the plan in the drawing, it shows a pair of giant wings that connect to a wooden frame. The pilot would lie face down inside the frame on a board.

Using his hands, the pilot would grip a stick coming down from each wing for direction control. As there was no engine, to achieve flight, the pilot would make a flapping motion by pushing his legs downwards with his feet held in two spurs.



Parent cheat sheet



Understand that it is not the weight of an object that affects how fast it falls, it is its surface area. (More surface area = more air resistance).

The weight of the object has an effect but not as much as its surface area size.



Thrust is the force which moves an aircraft through the air. Thrust is used to overcome the drag of an airplane, and to overcome the weight of a rocket. Thrust is generated by the engines of the aircraft.

Thrust is the force that keeps the object in the air.

Parent cheat sheet part 2

- A man cannot generate enough energy with his muscles to lift himself and a flying machine off the ground without the use of very high efficiency designs and materials made possible by modern technology.
- If Leonardo had concentrated more on building a glider, rather than a powered flying machine, he might have been much more successful in getting off the ground.