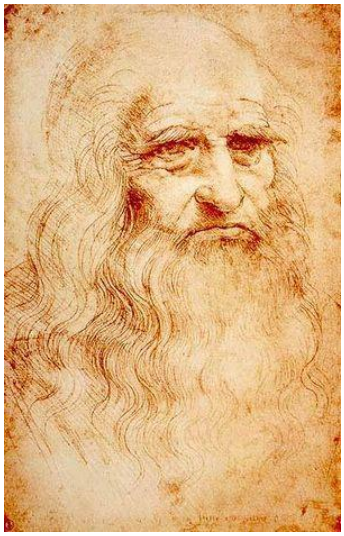
| **Building a parachute** | |
|---|---|
| Respective blueprint | Parachute (level 2) |
| Description | Build and experiment with different parachutes, including Leonardo da Vinci's |
| Learning Objectives | 1: Who is Leonardo Da Vinci?<br>2: Build parachutes with geometry (construction drawing)<br>3: Tests and experimentations - what is the best parachute? |
| Related curricular subject(s) | Geometry,<br>Science / History of science<br>Scientific approach<br>Measurements |
| Prerequisites / preparatory actions for teachers | Prepare the material (cf blueprint) |
| Prerequisites / preparatory actions for students | know how to use mathematical measuring instruments |
| Age of students | 13 |
| Duration | 1h30 |
| Level of difficulty | Medium |

## Step by step description of the tasks

Step 1 Who is Leonardo Da Vinci

The teacher introduces the man to the whole class.

Who knows about Leonardo Da Vinci?



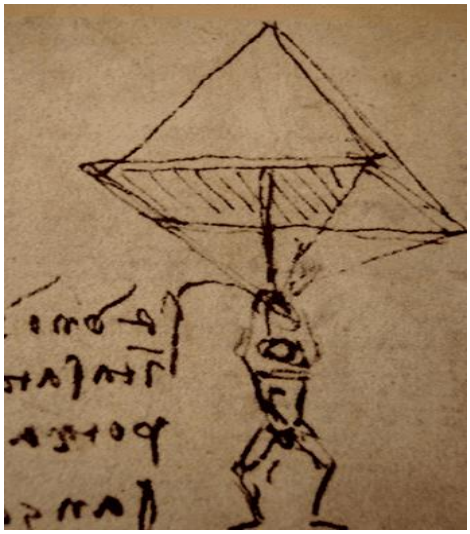


Figure WikiArt

Leonardo da Vinci was born in 1452 in Vinci, Italy and died in 1519 in Ambroise, France. He was a painter, inventor, engineer, scientist, humanist, and philosopher. Between 1485 and 1502, Leonardo da Vinci imagined the first parachute, a pyramidal parachute.

The teacher shows the drawing of Leonardo to the whole class.

Research can be done at home on the character, his life, his constructions...

The fact that Leonardo never made a prototype from his drawings adds to the appeal of the experience as the children are led to ask: "But why design machines that are not built? And why aren't they built?”

Talking about the time in which Leonardo lived is important to understand the level of knowledge of his contemporaries and to understand how avant-garde his drawings and studies were.

However, it is important to point out that, even today, not all the machines imagined are necessarily built.

In order to move on to the construction of the parachute, we recommend that you start by having your students read Leonardo's text:

"Anyone with a tightly woven canvas tent twelve armfuls wide and twelve armfuls high can safely throw themselves from any height"

A question then arises... "How much is an armful? "

Step 2: Build parachutes with geometry

The teacher explains the instruction to the students.

INSTRUCTIONS 1: Build the parachute patterns - or use the patterns provided. – cf blueprint

INSTRUCTIONS 2: Build the parachute fabric, in the chosen material to the dimensions of the pattern. – cf blueprint

The phase of choosing materials is extremely significative because it highlights the students' motivations.

INSTRUCTIONS 3: Build the parachute without chimney and the parachute with chimney. – cf blueprint

Step 3: Tests and experimentations - what is the best parachute?

Conduct an experimental launch before the real jump!

It is advisable to try the "jump" first in class and to launch the parachute from a reduced height, from a chair or table.

After the first trials, it is time to decide on the height of the "real" launch. Parachutes can be launched from different floors of the school. This simplifies the measurement of the jump height:

a taut rope left hanging from the highest window can then be measured from each floor.

The children should be very careful about falling. To do this, it is advisable to have them fill in a "flight record" for each “jump”- noting the advantages and disadvantages.

Then, in class, an analysis is made to see which parachute performs better: those with or without the chimney.

Conclusion

According to your notes, which parachute is the most successful?

> The parachute without a chimney is less stable than the parachute with a chimney.

This is because the mass of the air flows through the chimney and provides better stability, allowing the parachute not to twist.

## Assessment activities

The following questions can be asked by teachers to evaluate the activity:

What do you know about Leonardo Da Vinci?

Which parachute performs better, the one with the chimney or without the chimney?