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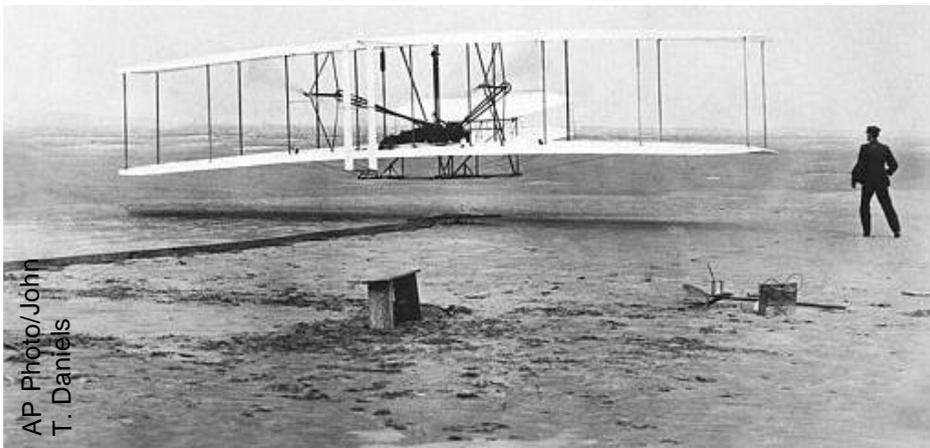
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FROM KITTY HAWK TO MARS

Just over 100 years have passed since the Wright brothers made the world's first sustained, powered and controlled flight in a heavier-than-air flying machine. Many American scientists and engineers have been working towards flying farther, longer and higher ever since. Take a look at the timeline below showing American achievements from the Wright brothers' first flight to the landing of the Mars Rovers on the Red Planet.



AP Photo/John T. Daniels

December 17, 1903
In the photo on the left, Orville Wright is at the controls of the *Wright Flyer* as his brother Wilbur looks on during the plane's first flight at Kitty Hawk. Made of wood, wire and cloth, the plane remained aloft for 12 seconds and traveled a distance of 120 feet.



May 21, 1927
Charles Lindbergh landed in Paris after the first solo flight from New York across the Atlantic in *The Spirit of St. Louis*. He flew 5,810 kilometers in 33.5 hours.

July 20, 1969
Apollo 11 astronaut, Neil Armstrong was the first man to step onto the moon. He was followed by Edwin "Buzz" Aldrin. They spent about two hours on the moon, conducting experiments.

July 20, 1976
The unmanned U.S. spacecraft *Viking 1* landed on Mars. It was the first object to reach the planet in working condition. *Vikings 1 and 2* obtained images of the Martian surface.

January 3, 2004
Mars Exploration Rover *Spirit* landed on Mars. The photo on the right is a NASA image of *Spirit*. The six-wheeled vehicle is equipped to play the role of a geological explorer.

Sources: Library of Congress, NASA



(AP Photo/NASA)

■ Make a Discovery - or Try ;-)

High school students from across the United States participate in science projects. Such programs are offered by different research institutions and the United States government. Many students from abroad, including Spain, are welcome to take part in the projects.

GLOBE

GLOBE is a worldwide education and science program for primary and secondary schools.

Students take scientifically valid measurements in the fields of atmosphere, hydrology and soils.

Then they report their data through the Internet. They may create maps and graphs on the free interactive website to analyze their data.

The most distinguished Spanish high schools participating in GLOBE include ones located in Madrid, Barcelona, Toledo, Ciudad Real and Zaragoza.

GLOBE websites:

- www.globe.gov
- wwwn.mec.es/cide/index.htm
(click on the GLOBE icon)

NASA NEEDS YOUR HELP

NASA scientists researching Mars are asking students from around the world to help them understand the Red Planet.

They would like you to send in a rock you or your class collected from your region of the world. NASA will use a special tool like the one on the Mars Rover to tell you what the rock is made of.

A picture of your rock will be posted on the web and you will receive a report on it.

More information:

<http://marsprogram.jpl.nasa.gov/rockworld/>

(Image: Copyright 2004 Pixel Perfect Digital, Inc.)

MARS EXPLORATION

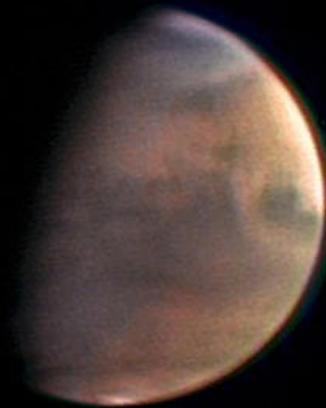
In 2003 the Planetary Society conducted an international contest to select a group of students to work with the Mars Exploration Rover Mission team at the Jet Propulsion Laboratory in Pasadena, California. One of the winners was a Spanish student called Tomás Kogan.

"Being part of planetary exploration through the student astronaut program is a real honour for me. I have always been interested in everything related with space, and investigating the evidence of life on other planets is one of the most interesting aspects."

"I have always dreamed about seeing the way unmanned missions are controlled so this is a dream come true for me. That is why I am willing to sacrifice time and effort in this project, because I think it is a unique opportunity in my life, which must not be wasted."

said Tomás Kogan about his work at Red Rover Goes to Mars project.

Read Tomás's journal from the mission:
http://www.redrovergoestomars.org/journals/tomas_sol07.htm



Mars is seen from a distance of about 5.4 million kilometers. (AP Photo/ESA, DLR, HO)

■ Mars: Crewed Mission Possible by 2009



"Mimi" - a flaky rock
(NASA/JPL/Cornell)

Rover Opportunity at work
(NASA/JPL)

The logistics of a crewed mission to Mars are complex to say the least. Before setting out into the solar system on our way to the Red Planet, there are endless numbers of factors to take into consideration: transit vehicles and trajectories, crew safety and stay-times, required resources and equipment, and much, much more.

Conventional chemical rockets will be used to launch Mars-bound spacecraft into LEO. The propulsion system that will most likely be used by the Mars transit vehicles once in LEO will be Nuclear Thermal Propulsion.

The orbits of Earth and Mars provide us with a 15-year trajectory cycle, which is divided into 7 launch windows. Basically, about every 26 months a launch window presents itself and it is during this time that any spacecraft traveling to Mars must be launched.

In case Mars Missions would get approval and funding, the first crewed vehicle ever to make the journey to Mars will depart in mid-November of 2009. The first Mars crew will likely consist of 6 or 7 individuals who possess expertise in several disciplines.

A crewed mission to Mars would define a new frontier of human exploration both scientifically and philosophically.

Source: <http://nssdc.gsfc.nasa.gov/planetary/mars/>



Spirit's Destination (NASA/JPL/Cornell)

■ American English: FYI

In the text above, what does **LEO** stand for? It's *Low Earth Orbit*.

Do you know some other common English abbreviations and acronyms?

- ◆ Probably the most common one is **OK**, meaning *all right*,
- ◆ The common **e.g.** in the written language means *for example* (from Latin "exempli gratia");
- ◆ **ASAP** is a short version of *as soon as possible*;
- ◆ Found mainly as a title of a website section, an **FAQ** contains answers to *Frequently Asked Questions*;
- ◆ Used often in e-mails, **BTW** means *by the way* and **FYI** - *for your information*;
- ◆ People who put **PTO** on some documents are asking you to "*please turn over*" the page.

And can you decipher this **SMS** (*short message service*) message: **CUL8R**?

See you later!

■ How DOES That Work?

Ever wondered how inventions such as car engines, cell phones or microprocessors work? Check out **www.howstuffworks.com**

The editors explain not only how machines function but also the rules behind:

- ◆ sports such as **rock climbing**
- ◆ natural phenomena such as **time**
- ◆ institutions such as **NATO**
- ◆ historical events such as **September 11, 2001**
- ◆ making **chocolate Easter bunnies**.

Want more great websites on science? Check out the website for Scientific American (www.sciam.com) and click on "Science & Technology Web Awards." The page contains links to the magazine editors' 50 favorite links in 10 categories ranging from anthropology to physics.

Activity Page

Win a Poster!

To take part in a drawing for one of three Mars Posters, check out our website:

www.embusa.es/zoom/irc

and find the answer to the following question:

Who or what is Kitty Hawk?

- a. an American aviator
- b. a place in North Carolina
- c. the first plane

Send your answer to:
irc@embusa.es

Give your name, address, and age. The deadline is June 15.

Good Luck!

Who Invented That?

Match the names of inventors with their inventions. Then make sentences using the clues, e.g.: *Thomas Edison invented the modern light bulb.*

Alexander Graham Bell

Robert Jarvik

Willis Haviland Carrier

George Eastman

Jonas Salk

Thomas Edison

roll film and Kodak camera (devise)

modern light bulb (invent)

artificial heart (develop, late 1970s)

telephone (invent, 1876)

vaccine for polio (develop)

air conditioner (patent)

1. _____
2. _____
3. _____
4. _____
5. _____

Now rewrite the sentences in the passive form, e.g.: *The modern light bulb was invented by Thomas Edison.*

1. _____
2. _____
3. _____
4. _____
5. _____



About ZOOM

Zoom is online at
www.embusa.es/irc/zoom

Contact us at
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US Information Resource Centers

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Embajada de EE. UU.
C/ Serrano, 75
28006 Madrid

Barcelona
Consulado General de EE. UU.
Pº Reina Elisenda de Montcada, 23
08034 Barcelona

A Little Bit of Math?

The German physicist, Daniel Gabriel Fahrenheit (1686-1736), invented the first truly accurate thermometer using mercury. He also developed the first precise temperature scale. Americans use the Fahrenheit scale, unlike Europeans, who use Celsius. Here are formulas for converting the temperatures:

To convert from Celsius to Fahrenheit: $(9/5) \times ^\circ\text{C} + 32$

To convert from Fahrenheit to Celsius: $(5/9) \times (^\circ\text{F} - 32)$

Convert these record temperatures (source: <http://www.centennialofflight.gov>) into Celsius:

- The **hottest** U.S. temperature ever recorded was **134 degrees Fahrenheit (... degrees Celsius)** at Death Valley, California, on July 10, 1913.
- The **coldest** U.S. temperature ever recorded was **-80 degrees Fahrenheit (... degrees Celsius)** at Prospect Creek, Alaska, on January 23, 1971.

Name That Scientist!

Someone who works in the field of *botany* is called a *botanist*. What are the correct names for representatives of these scientific disciplines?

- geography -
- chemistry -
- microbiology -
- physics -
- veterinary medicine -