

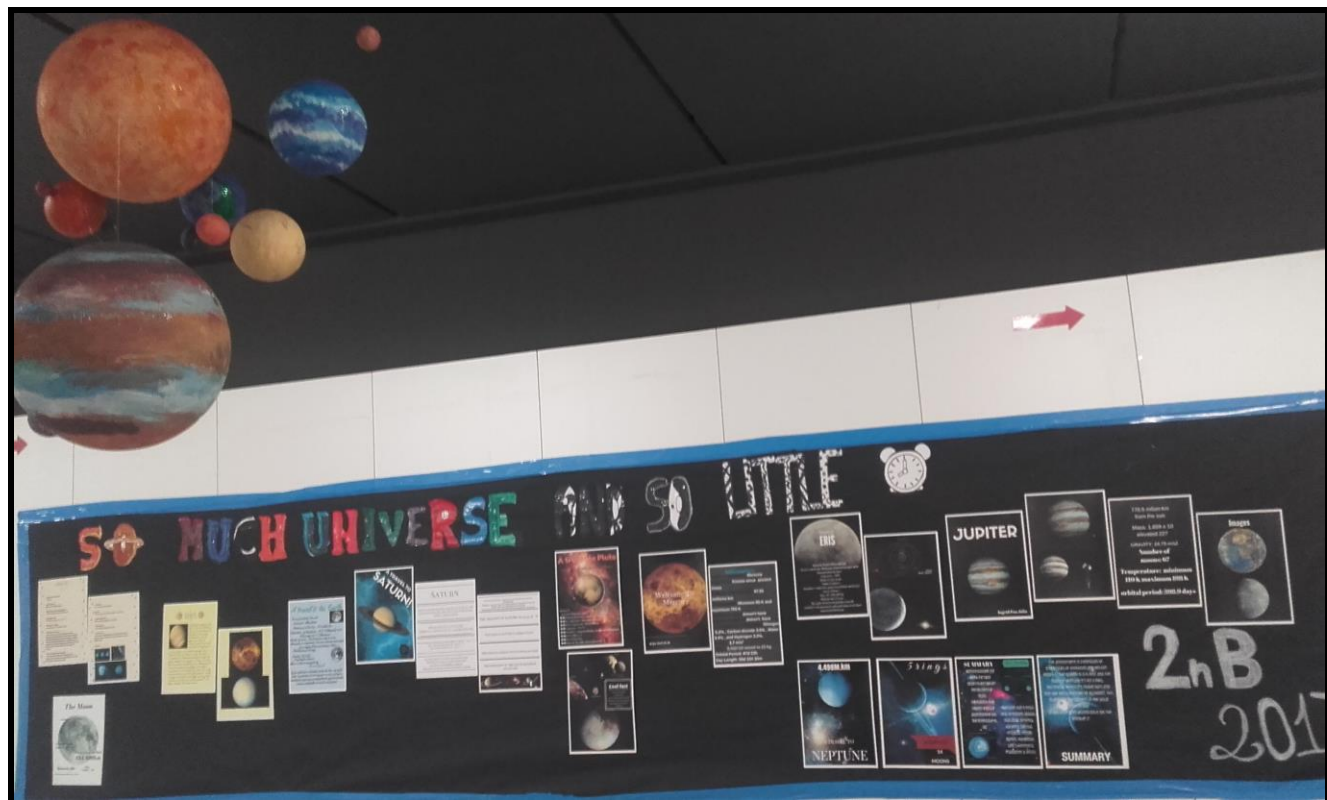
# GRUP D'EXPERIMENTACIÓ PER AL PLURILINGÜISME

## ***SO MUCH UNIVERSE AND SO LITTLE TIME***

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Àrea: Física i Química

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MARC PER AL  
PLURILINGÜISME

A FAVOR  
DE L'ÈXIT  
ESCOLAR  
PLURILINGÜISME

# GRUP D'EXPERIMENTACIÓ PER AL PLURILINGÜISME

Material elaborat durant la realització de la formació adreçada als docents que implementen el pilotatge del GEP (Grup d'Experimentació per al Plurilingüisme) durant el curs 2016-2017.

SG de Llengua i Plurilingüisme  
Servei de Llengües Estrangeres

*Març, 2017*



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### Ten tips for learning success

- ❖ *Use science to understand and explain real life situations.*
- ❖ *Work individually and be independent to solve problems and find solutions.*
- ❖ *Work in pairs and in groups, learning how to organize tasks.*
- ❖ *Use graphics and tables to organize and interpret data.*
- ❖ *Understand and use scientific terminology.*
- ❖ *Have and interest on articles, news, magazines, videos or games related to science.*

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*After seeing the 1st episode of 'Cosmos'..*

## Weird planets

<https://www.youtube.com/watch?v=CI5EknhEsSQ>



## Activities

### **Explicit**

*Related to the 1st episode of 'Cosmos':*

- ❖ *How large is the observable universe?*
- ❖ *Who is Giordano Bruno and which was his theory about the Earth, the solar system and the Universe?*
- ❖ *What is the big bang theory about?*
- ❖ *How the Earth and its moon were made?*
- ❖ *How much time of the cosmic year do humans occupy?*
- ❖ *Who is Carl Sagan?*

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*Related to 'Weird planets':*

- ❖ *Why are these weird planets so similar to the fictional planet 'Tatooine' seen in 'Star wars' movie?*
- ❖ *How many planets has the star system Kepler-47?*
- ❖ *How many kilometers far is the star system from the Earth?  
(1 light year = 9.4605284 · 10<sup>12</sup> kilometers)*

### ***Implicit***

- ❖ *Planet 'Kepler-47 b' complet each orbit in less tan 50 days. If you could live there... will you be older and younger? Why?*
- ❖ *What does it mean that these planets are in the habitable zone?*
- ❖ *Do star systems with three or four stars exist?*

### ***Referential***

- ❖ *Imagine the Earth has two suns. How day and night will be?*
- ❖ *Describe the weirdest planet you can imagine.*
- ❖ *What it would like if some of the planets were at the same distance as our Moon?*

<https://www.facebook.com/905282662925637/videos/905796972874206/>

## Revision

- ❖ *Draw the star system Kepler-47.*
- ❖ *And a planet without a Sun? Is it possible?*  
<https://spaceplace.nasa.gov/lone-planet/en/>  
<https://www.youtube.com/watch?v=XGd9PZ-nzBQ>
- ❖ *Does this planet look like Jupiter? Why? What colour is this strange planet?*
- ❖ *Write your own zany adventure story! You have to write a story about.. - Surfing in space. - Meteorites. - Bright lights in the night sky. - Far-away planets. - Black holes. Visit:*  
<https://spaceplace.nasa.gov/loopy-legends/en/>
- ❖ *‘Qué pasa si te caes en un agujero negro?’*  
<https://www.youtube.com/watch?v=rWdRL3KJxOg>
- ❖ *Black hole rescue! In this game, you must rescue words, one letter at a time, before they are pulled in by the powerful gravity of the black hole.* <https://spaceplace.nasa.gov/black-hole-rescue/en/#/review/black-hole>

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## Extension

*Choose one of these themes, read the information and explain to your classmates all you have learned about.*

- ❖ *What is an aurora? <https://spaceplace.nasa.gov/aurora/en/>*
- ❖ *Lunar and solar eclipses. <https://spaceplace.nasa.gov/eclipses/en/>*
- ❖ *The sun's mysteriously hot atmosphere.  
<https://spaceplace.nasa.gov/suncorona/en/>*
- ❖ *Dark matter <https://spaceplace.nasa.gov/dark-matter/en/>*
- ❖ *What is the big bang? <https://spaceplace.nasa.gov/big-bang/en/>*
- ❖ *How far away is the moon? <https://spaceplace.nasa.gov/moon-distance/en/>*

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## A class project: A model of Solar System

*As a class, you will create a model of our solar system. You will include the following items: Sun, Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, The Moon (Earth's), Mar's Moons: Deimos and Phobos, the four Galilean Moons of Jupiter: (Io, Europa, Ganyamede, Callisto), Titan and Phoebe (Saturn's largest Moons), Pluto (2nd largest dwarf planet), Erist (largest dwarf planet)*

*The model will approximately reflect relative sizes from the Sun, but not the distances.*

*1st: Distribute the tasks: each couple choose a planet or a moon and make it using styrofoam balls of varying sizes.*

*2nd: Paint the planet/moon and decorate it as similar to reality as you can.*

*3rd: Make a physical representation and place the solar system in the correct location.*

*4th: Create a poster using canva.com with the information of each planet or moon. Name it: 'A travel to...'. Include:*

- ❖ Name of the planet*
- ❖ Known for..*
- ❖ Distance from the Sun (km)*
- ❖ Temperature*
- ❖ Number of rings*
- ❖ Number of moons*
- ❖ Atmosphere's composition:*
- ❖ Gravity:*
- ❖ Mass:*
- ❖ Orbital period:*
- ❖ Day length:*
- ❖ A cool fact:*
- ❖ Two beautiful images (or more)*

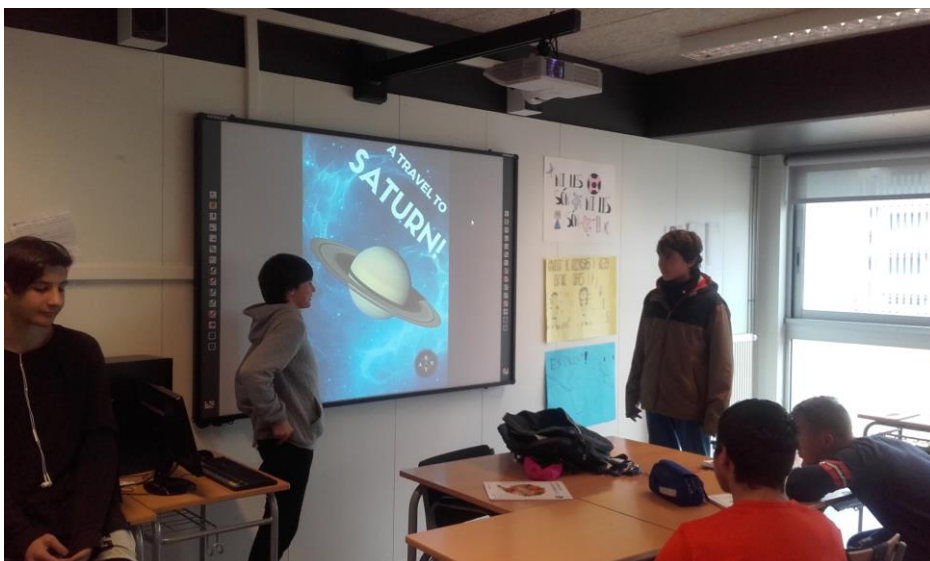
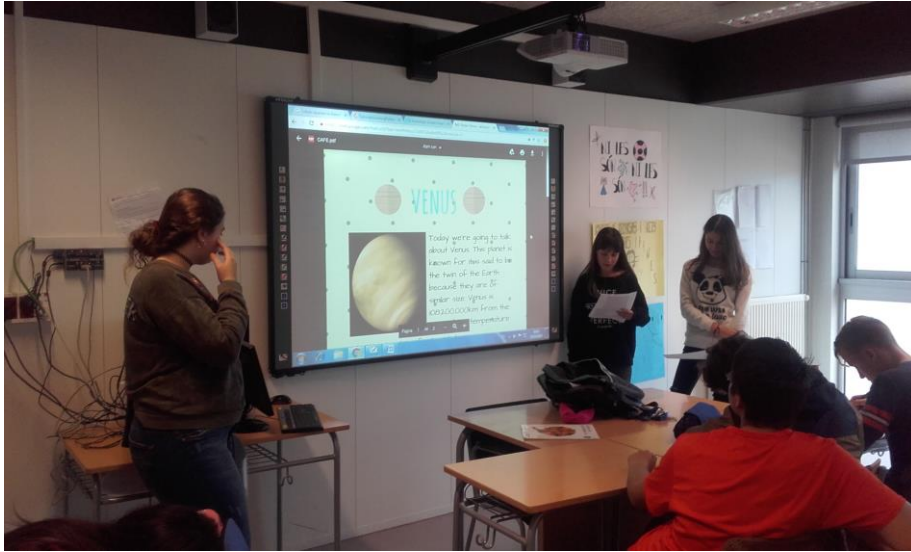
*5th: Explain to your classmates the information about your planet.*



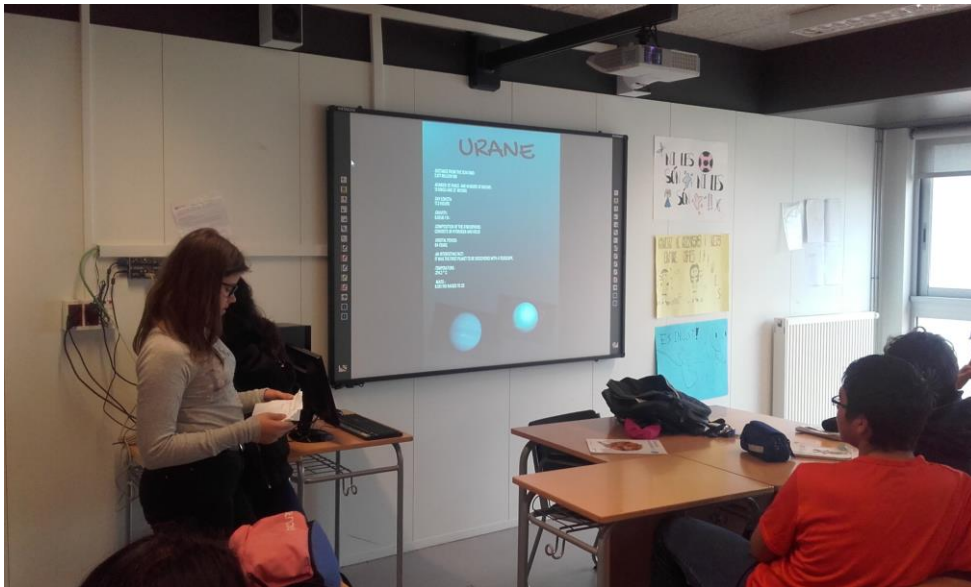
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## Assessment

### ASSESSMENT RUBRIC

Student: \_\_\_\_\_

Mark:  $\frac{\quad}{21} \times 10 =$

Score:	(1p.)	(0,5p.)	(0p.)
<b>Attitude</b>			
Expressiveness and eye contact	Lively and natural	Shortly spontaneous	Artificial and monotonous
Gesticulations and posture	Appropriate	Quite natural	Rigid
<b>Content</b>			
Personal introduction	Correct	Regular	Wrong
Development	Correct	Regular	Wrong
Topic introduction	attractive	Quite attractive	unattractive
Content	Well selected	Ideas were mixed	Some Ideas are forgotten
Ideas are	justified	Slightly justified	poorly justified
Topic is treated	In depth	With some depth	superficially
Examples are	Clarifying	Not clarifying	Not clarifying at all
Vocabulary	complete	Quite complete	incomplete
Props and visual supports	Are used effectively	Have been used with problems	Have not been used
Conclusion	Is concise	Isn't very concise	Hasn't been done
Time-Limit	appropriate	Too long or short	Excessively long or short
<b>Aspects of oral expression</b>			
Speaks clearly	clear	unclear	Understandable
Rythm	Appropriate	Unequal	Too fast or slow
Pitch and Volume	Appropriate	Slightly high or low	Too high or low
Accuracy of the language has been	Appropriate	Moderate	inappropriate
Pauses	Agile and fluid	Shortly fluid	With obstacles
<b>Reaction of the auditorium</b>			
Comprehension	Good	Difficult	Understandable
Enthusiasm	Helpful	Shortly helpful	Distracted
Answered the colloquim	Wide	Polarized participation	Null

## Checklist

*In this unit you have learned to..*

- ❖ *Work collaborately.*
- ❖ *Develop and organize science ideas.*
- ❖ *Show originality and creativity.*
- ❖ *Make decisions.*
- ❖ *Design principles and elements with technology.*
- ❖ *Speak in public.*
- ❖ *Respect for classmates.*

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