

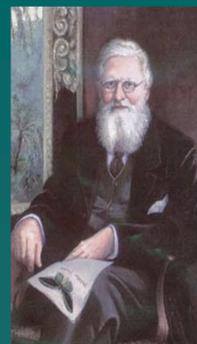
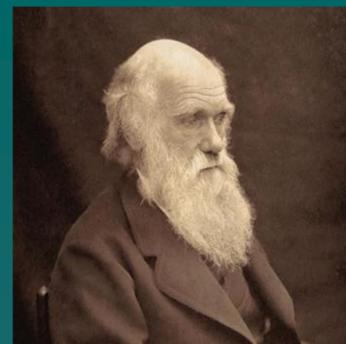


Evolution Project

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Introduction

- The "Departament de Educació" in Catalonia, as well as the "Ministerio de Educación" are very interested in the use of foreign languages other than mother languages at schools. At the same time, they are very interested in the development of investigation projects. Related to that, our school has developed a project where students should **investigate** some issues from some materials that are given in English or French. In this poster we are introducing our experience in the **English project**.
- It is a **30 hours** course and the main aim is to deepen in some aspects about evolution by creating and using their curiosity.
- Students are **14-15** and attending 4th grade of Spanish educational system.
- It takes **one hour a week** from September to June 30 hours.



Aims:

- Developing science competence
- Team grouping
- Having Initiative, autonomy
- Developing science thinking from evolution theory
- Undertaking ICT competence
- Differing opinions, beliefs, and speculations from scientific knowledge
- Looking for science argumentations
- Planning a research
- Using of English
- Understanding easy science texts in English.
- Writing some texts and communicating some ideas in English
- Introducing real problems at class related to evolution



Project Development and evaluation:

| First part: ten hours | | Second part: ten hours | Third: ten hours | Evaluation | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|------------------------|------------------|---|----------------|-------------------|--------------------|----------|-----------|----------|-----------|--------------------|--------------------------|-------------------|-----------------------------|-------------------|---------------------|-------------------------|---------------------------|---------|---------------------------|---------------------|------------|--|-------------------|--|--|--|--|
| <table border="1"> <thead> <tr> <th>Biology concepts</th> <th>Activities</th> </tr> </thead> <tbody> <tr> <td>Fossils</td> <td rowspan="2">Life is a fact, but what about evolution?</td> </tr> <tr> <td>Evolution tree</td> </tr> <tr> <td>Theory in Science</td> <td rowspan="4">Did Adam meet Eve?</td> </tr> <tr> <td>Genotype</td> </tr> <tr> <td>Phenotype</td> </tr> <tr> <td>Heredity</td> </tr> <tr> <td>Diversity</td> <td rowspan="2">Evolving, but how?</td> </tr> <tr> <td>Acquired characteristics</td> </tr> <tr> <td>Natural Selection</td> <td rowspan="2">Giraffes: Who will survive?</td> </tr> <tr> <td>Natural Selection</td> </tr> <tr> <td>Variation in traits</td> <td rowspan="2">Why studying evolution?</td> </tr> <tr> <td>Differential reproduction</td> </tr> <tr> <td>Plasmid</td> <td rowspan="2">Evolution takes the stand</td> </tr> <tr> <td>Horizontal transfer</td> </tr> <tr> <td>Resistance</td> <td></td> </tr> <tr> <td>Biological clocks</td> <td></td> </tr> </tbody> </table> | Biology concepts | Activities | Fossils | Life is a fact, but what about evolution? | Evolution tree | Theory in Science | Did Adam meet Eve? | Genotype | Phenotype | Heredity | Diversity | Evolving, but how? | Acquired characteristics | Natural Selection | Giraffes: Who will survive? | Natural Selection | Variation in traits | Why studying evolution? | Differential reproduction | Plasmid | Evolution takes the stand | Horizontal transfer | Resistance | | Biological clocks | | <p>They have to choose some questions related to evolution, and consult some information in English or tray some experiment (10 hours). For example:</p> <ol style="list-style-type: none"> Looking for evolution proofs <ol style="list-style-type: none"> Is cloning acceptable? What could be the benefits of cloning? Is it OK for sheep, cows or wheat but not for humans? Would you like to be cloned? What about your favourite pet? Darwin and Wallace presented their work at the Royal Academy in 1850, but at that time viruses and bacteria were almost unknown. Do you think that there is any relationship between viruses, bacteria and Evolution by Natural Selection? Galapagos: then, now and after. Go on the expedition Stem cells and evolution. Wallace and Darwin's relationship. Darwin's discoveries during his travel. Comparative genomes in evolution (for example: chimps and gorillas). Sex and evolution. Darwin in his time. Emma and Darwin's marriage: an interesting relationship. Others | <p>Finally they organise their information in groups, write an essay and make a presentation in front of the whole class and three teachers.</p> | <ul style="list-style-type: none"> The first part is evaluated from the activities done in class (participation, writing, speaking). They must organise all the information in a portfolio to do a self-evaluation and where teachers can follow their progress. "Evolution takes the stand" is a final activity to first part where students can evaluate other groups as well as teachers. It's a good activity to evaluate oral language as well as the use of biological concepts. The second part is evaluated from their own work plan and their ability to solve the problems that they have decided to solve. The third part is evaluated with the final written work and their presentation to the teachers and class mates. This process permits an initial, a formative and a summative evaluation. |
| Biology concepts | Activities | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Fossils | Life is a fact, but what about evolution? | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Evolution tree | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Theory in Science | Did Adam meet Eve? | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Genotype | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Phenotype | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Heredity | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Diversity | Evolving, but how? | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Acquired characteristics | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Natural Selection | Giraffes: Who will survive? | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Natural Selection | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Variation in traits | Why studying evolution? | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Differential reproduction | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Plasmid | Evolution takes the stand | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Horizontal transfer | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Resistance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Biological clocks | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

