**Lesson Plane Table**

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| Subject: | Biology | | | | |
| Authors: | Teachers: Hélia Veríssimo Caetano; Margarida Silva  Students: Ana Patrícia; João Soares; Mafalda Machado | | | | |
| Date: | | | | 25/04/ 2018 | |
| Lesson time: | | 5 hours |  | |  |
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| Summary: | **Biological quality assessment of water of the Ribeira do Cadoiço** | | | | |

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| **Objectives**  (Specify skills information that will be taught) | **Activity/ Information**  **Teacher Guide/ Student guide** | **Materials Needed**  (Other resources - web, book...) | **Assessment Methods**  (steps to check for student understanding) | **Time**  **Where?** |
| **General**   * Cooperate in team work, revealing curiosity and open mind. * Participate in a creative way with responsibility on the developed activities * Execute with precision the experimental protocols * Understand and recognize the importance of macroinvertebrate for the determination of water´s ecological quality . * Value the utility of the practical activities on the ecological characterization of the surrounding environment; * Develop autonomy, curios and creative mind, as well as critical refection;   ***Specific:***   * Use temperature and pH meters ; * Colect water samples from Ribeira do Cadoiço; * Observe benthic macroinvertebrate with a  hand magnifying glass ; * Identify and count the different benthic macroinvertebrate ;   Discuss the importance of these ecological indicators  ***Know Concepts or Keywords :*** | **Motivation Activities**  Do you know where Ribeira do Cadoiço passes through Loule?  Do you know if the water that runs in the river has ecological quality?  **Field outing:**  Write in the worksheet the travel direction - north or south or east or west; | Material for sample collection and analysis   * Table * Trays * Plastic boxes * Rubber boots * Tags Pencil * Sieve * Sampling network (0.5mm mesh) * Thermometer * pH meter * Tweezers * Handheld magnifiers * Plastic spoons * Cuvettes * Sticky film | **Quiz** | **In Classroom**  50m  **Outside the classroom**  5 hours |

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| **Description of the activity:** | |
| **Introduction** | Some species of macroinvertebrates do not survive in polluted systems (sensitive species), however others survive, and can even develop reaching populations with high abundance. In an unpolluted aquatic system, the macroinvertebrate community includes a high diversity with sensitive and tolerant species; on the contrary, only a small number of pollution tolerant species are present in a degraded aquatic system. |
| **Main activity** | Sampling the water from Ribeira do Cadoiço |
| **Lesson Guide (Step by step)** | Protocol |
| **Exercises (2 or 3 levels of difficulty)** | For a more objective and advanced analysis and classification one can bring the samples to the school laboratory and confirm the classification using binocular loupes |
| **Conclusion and Evaluation** | Sudents will be asked to make a scientific poster |
| **Notes:** |  |

Bibliography

* [www.cienciaviva.pt/rede/oceanos/1desafio/trabalhos/Macroondas.pptx](http://www.cienciaviva.pt/rede/oceanos/1desafio/trabalhos/Macroondas.pptx)
* <https://aquaprojeto.wordpress.com/macroinvertebrados/>