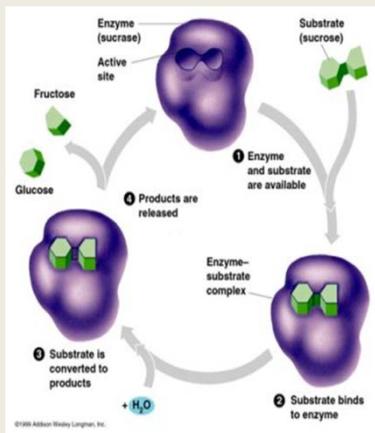
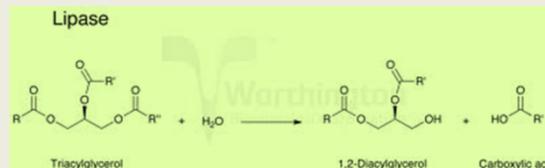
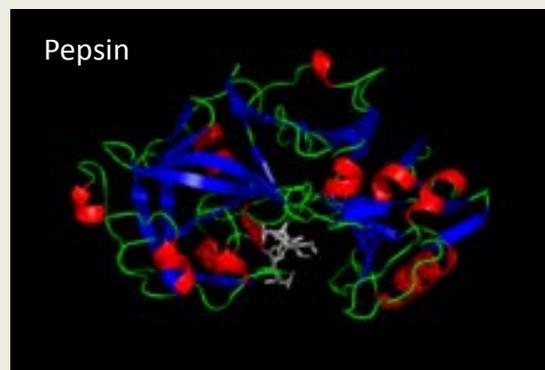
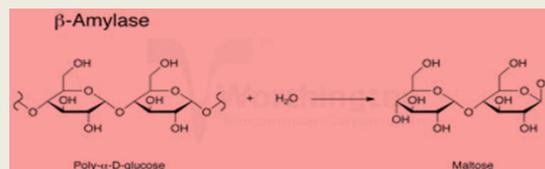


Enzymes – are they really needed?



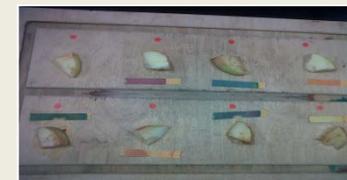
Objectives:

- To encourage students to question the function and importance of enzymes.
- To give students an understanding of how enzymes function and what factors affect enzyme action.
- To strengthen the students' inquiry based technique by allowing them to design experiments to test enzyme action.
- To improve the students' overall understanding of enzymes.
- To enhance the students' interest in enzymes by relating enzymes to real-life applications.



Results:

- Students became 'active inquirers rather than passive receivers' (Wenning & Khan, 2011).
- Participation increased especially among weaker students in the technology phase of the module.
- Students were taking responsibility for their own learning and had a folder of the information they had collected.
- Communication and co-operation had increased among the students in the class
- Confidence in their scientific literacy had developed.
- The link with science and society was established.
- Students had the opportunity to see how scientists develop their ideas and strategies of the scientific method.
- The module was not a 'cook-book' affirmation of scientific knowledge but rather an experience of scientific processes.



Evaluation:

- Different learning and teaching strategy which is beneficial to both students and teachers.
- Teachers may need practice in order to improve the effectiveness of the incorporation of IBSE into their classrooms.
- All students had a job to do so inclusion was paramount, interpersonal and intrapersonal skills were being improved. This leads to an increased confidence.
- There were definite changes of attitude. The different learning strategies using different skills painted the sciences in a brighter more accessible and achievable nature.

Conclusions:

- Students and teacher found the teaching and learning experience more enjoyable.
- It is a more natural approach as to how we function as humans, being thinking creatures naturally; this facilitates that aspect of our nature.
- Inclusion and accountability in the learning process increased students' necessity to participate.
- It is a non-threatening environment as it is acceptable not to know everything but essential to question.
- IBSE is a process that is inter-connected to other learning strategies that are important in how people come to understand new knowledge. It is intrinsically linked to multiple intelligences and achievement of the aims of Blooms taxonomy can be facilitated



Learning Outcomes:

The students could:

- Explain how enzymes work and devise a demonstration model to illustrate the activity and specificity of enzymes.
- Carry out experiments that investigate the activity of the enzymes under different conditions (pH, temperature).
- Interpret the information collected from the experiment and compare it with the information obtained from research to see if the results correlate with regard to the optimum pH and temperature of the enzymes. If the two sets of data do not agree, the students will be able to assess the reasons why.
- Discuss whether they think enzymes are needed/not needed, each side giving reasons for their opinions.
- Evaluate the socio-scientific use of enzymes and select the most recent research into enzymes to discuss with the class.

Activities:

The material that was covered in the lessons includes an understanding of what enzymes are and what they do. How they are used in digestion but also how useful they are in both domestic and industrial situations which allow a socio-scientific connection to be made.

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