Guided Module on Nanoscience

This completed activity sheet demonstrates the use of research, writing, and learning skills in analysing concepts associated with the topic of nanoscience.

Subject / Course: Chemistry / SCH4U
Grade Level: Grade 12
Topic: Structure and Properties of Matter - Nanoscience
Specific Curriculum Expectations Met:

- A1.8 synthesize, analyse, interpret, and evaluate qualitative and/or quantitative data; solve problems involving quantitative data; determine whether the evidence supports or refutes the initial prediction or hypothesis and whether it is consistent with scientific theory; identify sources of bias and error; and suggest improvements to the inquiry to reduce the likelihood of error

- A1.9 analyse the information gathered from research sources for logic, accuracy, reliability, adequacy, and bias

- A1.10 draw conclusions based on inquiry results and research findings, and justify their conclusions with reference to scientific knowledge

- C1.2 evaluate the benefits to society, and the impact on the environment, of specialized materials that have been created on the basis of scientific research into the structure of matter and chemical bonding (e.g., bulletproof fabric, nanotechnologies, superconductors, instant adhesives)

Required Resources:

- Data projector
- Guided module
- One copy of the Journal Article *Medical applications of shape memory alloys* per student
- One copy of the student assignment that accompanies the article per student
- Instructor solutions
- Memory Metal

Content and Teaching Strategy of Lesson:

- **Overview:** Introduce concept of Journal Articles to students
- **Introduction:** Demonstrate the Memory Metal as an introduction to nanoscience
- **Teaching Strategies:**
  1. Guide students through the process of how to effectively use a journal article
  2. Provide students with an opportunity to practice paraphrasing
  3. Students read the article *Medical applications of shape memory alloys* and respond to questions in handout
- **Consoldiation:** Students review answers with each other and instructor; share paraphrasing stratgies; connect content in research article to the memory metal.

Title of article analysed: *Machado, L.G., & Savi, M.A. (2003). Medical applications of shape memory alloys. Brazillian Journal of Medical and Biological Research, 36,683-691.*

The goal of this exercise is to highlight and demonstrate the transition in Research, Writing and Learning Skills that a student might encounter during the transition from high school to post-secondary education.

We have provided all the necessary links to the activity on this site. This activity is to be used in conjunction with the downloadable student template

Title of article analysed: *Machado, L.G., & Savi, M.A. (2003). Medical applications of shape memory alloys. Brazillian Journal of Medical and Biological Research, 36,683-691.*

Step 1. Getting the Article

a) Go to the research module in order to gain access
b) Type in the search terms "shape memory" AND "biomedical"
c) Select above article

Or

a) Go to the Directory of Open Access Journals and select find articles
b) Type in the search terms "shape memory" AND "biomedical"
c) Select above article

Step 2. Reading the article

a) Reading material, highlighting and taking good notes are important skills required in post-secondary education. In order to get an idea of what is required of your students, take them through our Guide to University Learning activities .

Step 3. Filling out the student template

a) Plagiarism concerns are highlighted in this exercise. In order to address this concern, take your students through the Paraphrasing exercise.

For a complete solution of this module please email: learning@uoguelph.ca