FACS: Nanotechnology and "Smart" Textiles (IT)

Summary

(1 IT day) This lesson defines nanotechnology and how nanotechnology products are being used in the development of new textiles.

Main Core Tie

FCS 6th Grade
Strand 5 Standard 1

Time Frame

1 class periods of 45 minutes each

Group Size

Small Groups

Life Skills

Thinking & Reasoning, Social & Civic Responsibility

Background for Teachers

The links above are for your reference.

Student Prior Knowledge

None needed.

Intended Learning Outcomes

The intended outcome is that students will obtain an understanding of the term "nanotechnology" and how nanotechnology products will be used more and more in products that they will be in contact with on a daily basis. The focus of this lesson will be on nano innovations in the textiles industry and to introduce students to occupations in the nanotechnology field.

Instructional Procedures

I. Motivator: (5 Minutes)
Question: Ask the students to tell you some of the things that they don't like about their clothing. Make a list on the board of their responses.
Example: Shrink, fade, stain, too big or too small, don't like the color, to hot or too cold for certain times of the year, etc.
These flaws can all be fixed through nanotechnology!
II. Activity #1: (8 Minutes) Introduce Nanotechnology
-Explain to the students that all of the flaws identified in the previous activity can all be fixed through nanotechnology.
Below are some ways innovations in nanotechnology are being used today to improve and help our lives:
-Stain-free clothing, carpet, furniture and mattresses
-Light weight bullet-proof vests and shirts
-Bug repellent clothing
-Shirts, pants and jackets that will not rip, tear or wear holes

-Clothing that scans the body for a perfect fit
-A wrist watch runs off of body heat
-Soldiers uniforms that change color to adjust to the surroundings, temperature, lightning, wind and rain
Explanation of Nanotechnology: Nanotechnology is a very complex field combining science (biology, chemistry & physics), technology (computer programming), engineering (electronincs & design) and math. Nanotechnology not only includes the fields above, but you have to work at a very small level. "Nano" is a Greek word for small or dwarf. A nanometer is one billionth of a meter. Nanometers are so small that 150,000 of them fit across the width of a strand of human hair.

III. Activity #2: (20 Minutes) Teamwork
1. Divide students into 6-8 small teams.
2. Give each team a copy of a different nanotechnology article and a copy of the nanotechnology article team worksheet. (see attachments and web sites for articles)
3. Have each team read their assigned article and complete the nanotechnology article team worksheet. (see attachments) Each team will also have to select a team leader to present the team's findings. If computers with web access are available, students can also view video clips that go with the articles (see web sites for links to the articles)
4. Each team leader with then present their findings to the class.

IV. Activity #3: (20 minutes)Team Presentations
1. Before the presentations talk to the students about proper listening skills. ie. look at the speaker, not writing or playing w/ items, no talking, sit up straight, and nod for understanding.
2. Also quickly role play appropriate and inappropriate presenting skills. ie. holding paper over face, talking to quiet, being silly or distracting from information.
3. Pass out one copy of the Nanotechnology Presentation Summary Worksheet to each student. (see attachments)
4. Instruct the students to complete a two sentence summary on each article presented.
5. After the presentations have concluded, take a few minutes to discuss question 7 from the worksheet as a class. Use the following discussion point:
-Nanotechnology is a new and growing field
-Many career options
-Courses to take in jr. high and high school include: All Science (biology, chemistry, physics), All Math, Information Technology (computer programming), Health Sciences (biotechnology), Technology (electronics, engineering, drafting) etc.
6. If students are interested in more information on nanotechnology have them research additional articles on sciencentral.com.

Bibliography
sciencentral.com

Authors
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