

Nanotechnology 5-E Lesson Plan

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Topic: Nanotechnology

Title: What is a Buckyball?

Grade Level: 5 - 8

Lesson Summary: After watching the PowerPoint presentation, “What is a Buckyball?” students will explain the composition of a “buckminsterfullerene”. Students will be able to describe the physical appearance and size of a buckyball. Students will be able to list some future uses of buckyballs. Students will have a brief understanding of the history of buckyballs. There are review questions at the end of the presentation.

Arkansas Science Frameworks SLEs:

PS 5.8.2 Explain the structure of atoms and molecules.

PS 5.8.5 Investigate historical breakthroughs

Main SLEs covered in this activity:

PS 5.8.2 Explain the structure of atoms and molecules.

Objectives: The learner will

- 1) State the definition of nanometer.
- 2) Explain the composition of buckminsterfullerene.
- 3) Describe the physical appearance and size of a buckyball.
- 4) List some future uses of buckyballs.
- 5) Be able to give a brief account of the discovery of buckyballs.

Essential Question: What is a molecule of buckminsterfullerene?

BACKGROUND INFORMATION

Timeline:

1 class period (45 minutes)

Materials:

- Computer with projector
- PowerPoint application software
- “What is a Buckyball?” PowerPoint

Teacher Preparation:

- Preview the PowerPoint Presentation and the review questions at the end.
- If possible, have a diamond, a graphite pencil, and a buckyball model to demonstrate the three pure carbon molecules.
- If desired make a rubric to score the Buckyball paragraphs.

PROCEDURE

Engage (5 min):

- Students brainstorm about what they think are the uses of a “buckyball” without knowing anything about a buckyball. This can be quite humorous, but student suggestions usually include a type of video or pinball game, a ball used in a game, buckwheat debris, or the bouncing teleprompter screen ball.

Explore and Explain (25 min):

- Students will view PowerPoint Presentation of “What is a Buckyball”? The teacher will discuss each slide with the students, and the students will add their ideas and questions to the discussion.

Elaborate: Ask to students to summarize what they learned.

- Teacher should clarify any misconceptions.
- Teacher could extend discussion with current news articles.

Evaluate: Students should:

1. Successfully answer the review questions at the conclusion of the PowerPoint Presentation. These may be collected and scored.
2. Write a paragraph describing buckminsterfullerene and the future uses. The paragraphs can be scored for content, grammar, spelling, and writing style.

CROSS CURRICULAR CONNECTIONS

Math: Fractions, Metric System of Measurements, and Size Comparisons

Language Arts:

- New words such as nanometer, electron microscope, buckminsterfullerene, buckyball.
- Oral and written communication

Engineering: Geodesic Domes

Parental Involvement: Parents can complete a survey asking whether they work in a field that uses buckyballs, carbon nanotubes, or geodesic domes; and if so, they could be invited to make a class presentation.

Technology Connections: Enrichment through Internet Research

Resources:

- Computers and Internet

Notes: This PowerPoint lesson can be used as an introduction to the lesson entitled, Let's Make a Buckyball!

Credits:

This lesson: _x_ is original __ was adapted from _____'s original lesson. This uses information and images from several different websites that are credited at the end of the PowerPoint presentation.