Creative Activities for Teaching Modern World History SS 184

The mini-text is written to cover basic concepts and vocabulary. Each page has comprehension questions and a vocabulary list. At the end of the unit there is a vocabulary test and a vocabulary puzzle is included in the activities. Students should be encouraged to use the words in writing sentences and summaries of each page of the text. Each page is self-contained and can be used independently to supplement a textbook, or the entire mini-text can be reproduced and used as a supplementary booklet. The cover is a picture puzzle.

The timeline and scientific discovery activities require students to categorize and make judgements. The drawing activities encourage creativity. There are four activities that deal with critical thinking. Students are asked to make hypotheses and evaluate the positive and negative consequences of scientific efforts. The last two activities require the students to compare two interpretations of modern science and distinguish fact from opinion.

This title is part of a series: Creative Activities for Teaching Modern World History

Designed to teach about European History from the French Revolution to the present. Each unit contains a mini-text that emphasizes vocabulary, a simulation, visual perception and critical thinking activities. Tests are also included. 30 reproducible pages.

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Mini-Text

Activities

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Quantum Mechanics

Physics is the study of the motion and energy of objects. The most important event in the study of physics happened in the 17th Century when Isaac Newton combined all of the information known at the time into a single, basically simple picture. It was Newton's synthesis of scientific knowledge that laid the foundation for future scientific research. Newton's laws about motion and energy accurately described how large objects behaved. Newton studied gravity and light.

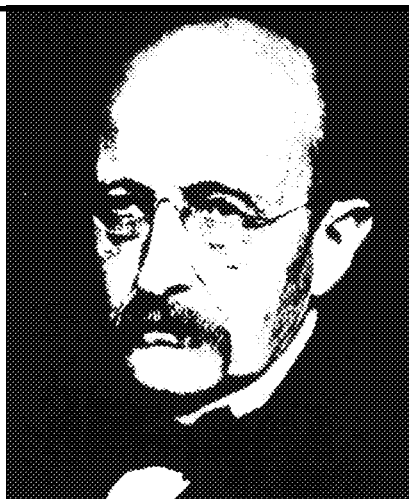
Scientists followed Newton's laws until the end of the 19th Century when Max Planck, a German physicist, developed a new theory. It had been believed until this time that light came in a continuous wave. Planck studied the radiation that came from a black box. Black is color that absorbs all light. Planck concluded that the energy that comes from light waves or radiation was not a continuous wave but came in chunks which he called quanta. Planck started a whole new theory of physics called quantum theory.

Other scientists built upon Planck's ideas. Albert Einstein and Niels Bohr developed new theories with Planck's ideas.

Werner Heisenberg, also a German physicist, realized that Newton's laws were not very good in describing the behavior of small objects such as the parts of the atom (electrons, neutrons) and the radiation given off by atoms (gamma, beta, alpha rays). He combined the ideas of Planck and others and developed quantum mechanics.

Heisenberg developed an important principle called the uncertainty principle. Heisenberg realized that in studying the behavior of microscopic particles that it was impossible to predict what an individual particle would do. Scientists would have to rely upon statistical probability to predict. Statistical probability means what a small particle is most likely to do but still may not do.

Quantum mechanics became important in the development of lasers, transistors, atomic energy, astronomy and chemistry.



Max Planck developed the quantum theory to explain the behavior of radiation.

Vocabulary

synthesis: (n.) a combination of ideas which produces a new idea.
radiation: (n.) energy given off by light.
quanta: (n.) small chunks of light.
microscopic: (adj.) so small that it cannot be seen without the use of special tools.
probability: (n.) something that is most likely to happen.
particle: (n.) a small part of something.

Sentences

Write sentences using each of the words above.

Comprehension

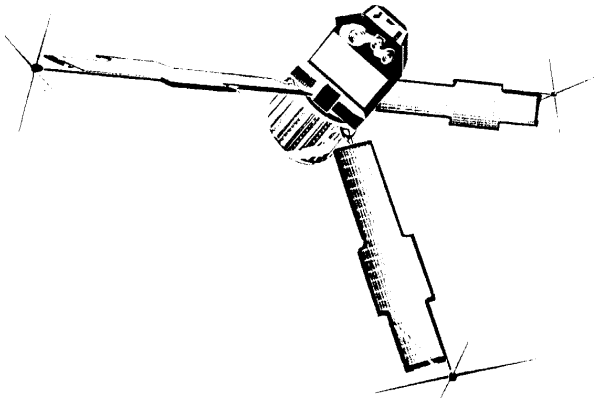
1. What was Isaac Newton's contribution to physics?
2. What is physics?
3. What was Max Planck's contribution to physics?
4. What did Heisenberg do?
5. What is the "uncertainty principle?"
6. What is statistical probability?
7. Quantum mechanics is important for what practical uses?

Directions

You are the science advisor to the president of the United States. You have to tell the president what you would recommend the government spend on scientific research.

You have $200 million to spend. Science researchers across the nation have put in applications for research grants. All of the people applying for research grants have good credentials and can carry out their projects.

You must approve the entire amount requested for a particular project and you must give reasons for financing the project.



Application 1: $50 million

Build a space station. The space station can be used to make new building materials and perfect crystals for lasers.

Application 2: $10 million

To build a new type of car engine made from ceramics that will be able to burn water for fuel.

Application 3: $10 million

Conduct research to find a cure for AIDS.

Application 4: $10 million

To find a cure for drug addiction by developing a chemical block that destroys the "need" a drug addict has for the drug.

Application 5: $50 million

To conduct genetics research to identify all the codes on the DNA double helix. This will enable medicine to cure birth defects and hereditary diseases.

Application 6: $20 million

To develop improved solar power plants. This will reduce air pollution.

Application 7: $40 million

To build a super-collider to smash atoms to discover new sub-atomic particles. This may provide new sources of energy.

Application 8: $50 million

Build a space probe that will carry astronauts to Mars.

Application 9: $20 million

Cancer research to find a cure for cancer.

Application 10: $20 million

Develop a practical artificial heart that can replace the human heart.

Application 11: $20 million

Develop a hypersonic jet airliner that can fly from the U.S. to China and Japan in three hours.

Application 12: $20 million

Develop a new powerful space telescope that will see farther out into space than any known telescope.

Application 13: $20 million

Develop a high-speed magnetic train. This will help relieve freeway and airway congestion.

Application 14: $30 million

Develop an artificial intelligence computer that will function like the human brain.

Application 15: $30 million

Develop non-polluting ways of eliminating toxic wastes.