Big Ideas In Physics And How To Teach Them Teaching Physics 11 18

#physics education #big ideas in physics #teaching physics 11-18 #high school physics curriculum #physics pedagogy

Explore the fundamental 'Big Ideas' in physics and discover effective pedagogical approaches for teaching these complex concepts to students aged 11-18. This resource provides insights into practical teaching strategies and curriculum development for secondary physics education.

Big Ideas In Physics And How To Teach Them Teaching Physics 11 18
research, such as biophysics and quantum chemistry, and the boundaries of physics are not rigidly defined. New ideas in physics often explain the fundamental... 89 KB (10,099 words) - 13:10, 27 February 2024
year. In 1897, at the age of seventeen, he enrolled in the mathematics and physics teaching diploma program at the Swiss federal polytechnic school in Zürich... 220 KB (22,257 words) - 21:35, 15 March 2024
ideas that students bring to physics instruction are in stark contrast to the physics concepts and principles to be achieved – from kindergarten to the... 64 KB (7,372 words) - 15:23, 27 February 2024
professor in 1936. He made significant contributions to theoretical physics, including achievements in quantum mechanics and nuclear physics such as the... 168 KB (18,767 words) - 20:33, 20 March 2024
contributions to the development of quantum electrodynamics, Feynman received the Nobel Prize in Physics in 1965 jointly with Julian Schwinger and Shin'ichirM.126 KB (14,487 words) - 21:25, 16 March 2024
believed to be related to the quantity of matter in a body, until the discovery of the atom and particle physics. It was found that different atoms and different... 76 KB (10,096 words) - 06:01, 10 March 2024
diploma course to teach physics and mathematics in secondary schools (section VIA) at the same time as Albert Einstein. She was the only woman in her group... 41 KB (4,584 words) - 23:43, 17 March 2024
Nobel Prize in Physics in 1922. Bohr was also a philosopher and a promoter of scientific research. Bohr developed the Bohr model of the atom, in which he... 101 KB (10,990 words) - 09:02, 19 March 2024
In the same way that Fritjof Capra carried out an analysis of the parallels between modern physics and Eastern mysticism, the teaching of the Big History... 85 KB (10,113 words) - 19:46, 20 March 2024
to concepts involves making connections between facts, procedures, and ideas. (This is often seen as one of the strong points in mathematics teaching... 54 KB (5,757 words) - 23:24, 14 March 2024
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Young Scientists" by the World Economic Forum in 2013 and one of the top ten "Next big names in Physics" by the Financial Times. Marlan Scully (born 1939):... 264 KB (25,309 words) - 09:19, 12 February 2024
participate [in active learning] when they are doing something besides passively listening." According to Hanson and Moser (2003) using active teaching techniques... 49 KB (6,132 words) - 21:34, 17 March 2024

important step in science at this time were the ideas formulated by the creators of electrical science. Their work changed the face of physics and made possible... 194 KB (22,063 words) - 21:47, 6 March 2024
to practice law. Instead, he proceeded to teach Spanish, physics and mathematics at New Albany High School in New Albany, Indiana, where he also coached... 49 KB (5,081 words) - 11:27, 15 March 2024
atomic bomb, in spite of his knowledge of radioactivity and nuclear fusion. He continued to teach physics at George Washington University and consulted for... 40 KB (4,773 words) - 15:21, 8 March 2024
Wald, Katharine Way, and Arthur Wightman. Wheeler gave teaching high priority, and continued to teach freshman and sophomore physics, saying that young... 55 KB (6,013 words) - 00:55, 4 March 2024
for teaching in higher education in India, exposing Hindu scholars to Western secular ideas; this started a renaissance regarding religious and philosophical... 190 KB (22,956 words) - 20:16, 20 March 2024
on drinking sprees and disappeared from the house, locked the kitchen cabinets so the four boys could not get to the food in them and used a bullwhip as... 13 KB (1,242 words) - 15:47, 5 March 2024
century experimental physics to a wide audience. From 1853 to 1887 he was professor of physics at the Royal Institution of Great Britain in London. He was elected... 93 KB (11,852 words) - 11:09, 24 February 2024

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Classical mechanics
Knowing the change in velocity, you can make predictions
Buoyant Force
About 1 Newton
Newton's Law of Universal Gravitation
Energy and thermodynamics
Energy is not a vector
20 mph (32 km/h) faster almost doubles the energy of a car
Total energy is kinetic plus potential
Gasoline has chemical potential energy
Thermodynamic Systems Thermal Energy
Kinetic energy of car converted to thermal energy from friction of the brakes
Entropy is a measure of "disorder," or the information required to describe microstates
2nd law of thermodynamics: Entropy of an isolated system can never decrease
Gasoline more useful for work than heat from exhaust
Exhaust will not rearrange itself to become gasoline
but gasoline can be converted to heat and exhaust
One way flow of entropy appears to be the only reason there is a forward flow of time
Electromagnetism: Study of interaction between electrically charged particles
Moving charges create magnetic fields
Moving magnetic field affects charges
Magnets always have two poles
Faraday's law
Moving magnetic field creates an electrical field
Laws of physics on moving train is same as laws of physics standing still
Energy is not continuous, but is quantized
Heisenberg's Uncertainty Principle uncertainty in momentum
Note: central cluster of electrons exaggerated for illustration. Only a probability cloud exists
Model of hydrogen atom with electron at lowest energy state
A quantum system can be elementary particles

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Possible Future Discoveries
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