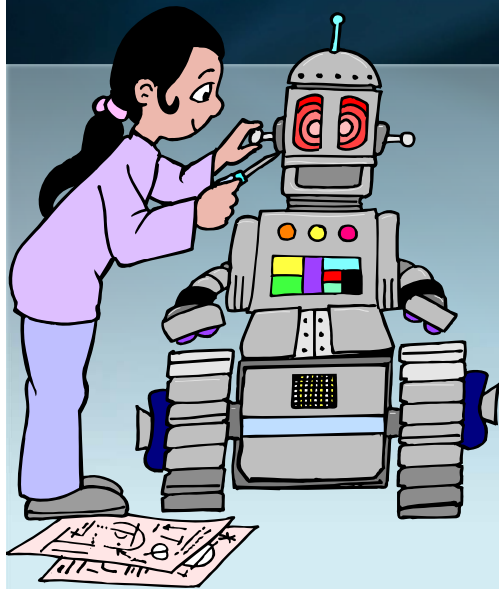


Everything is about Physics!
Inquiry for Learning
by Anjali Ahooja

What is this?



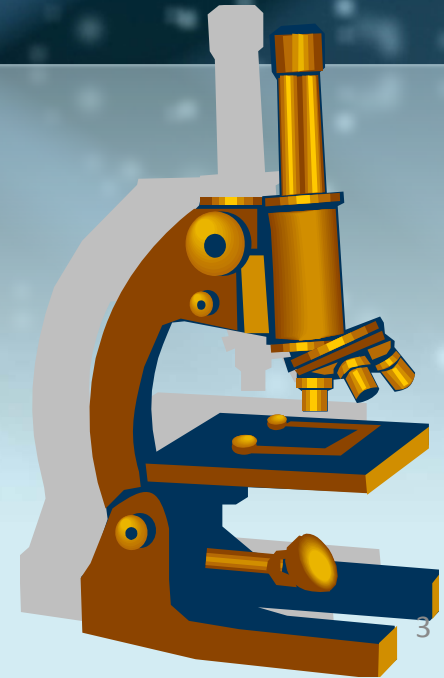
Picture from: <http://hyperphysics.phy-astr.gsu.edu/hbase/electric/vandeg.html>



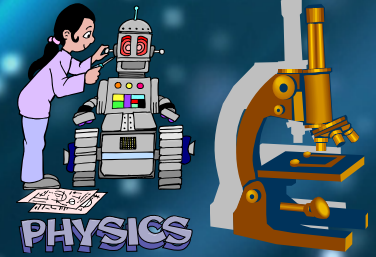
PHYSICS

...and this?

Anjuli Ahooja

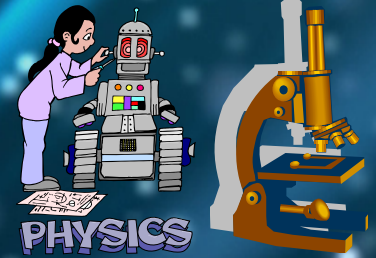


Vision Statement



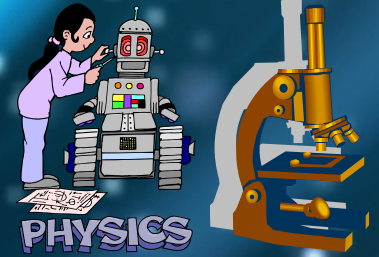
- To develop a love of physics
- Make it possible for the students to see the connection between physics and their daily lives
- Show them the relevance of their learning in physics to their possible future professions
- Providing them with the knowledge of applications in different fields

Today's Situation



- Closed compartments
- Cross curricular projects not significant
- Most applications that we relate to, and the experiments that the students perform in Physics, are related to objects
- Is time really an issue?

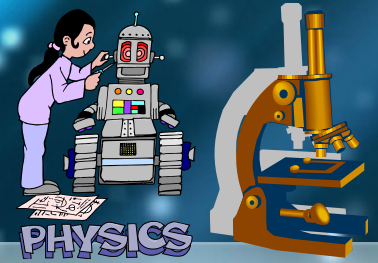
We cannot keep doing this as.....



...the education environment is changing very rapidly

....the students are changing rapidly

The Day 1 Challenge..



Is there physics in this?

- Tennis
- Basketball
- Hockey
- CT Scan
- Body Mechanics
- Talking
- Breathing
- Golf (Patrick's project)

Is there physics in this? – higher level focus questions

- Economics – Econophysics
<http://en.wikipedia.org/wiki/Econophysics>
- How can I improve my serve in tennis?
- How to become a better goalie? Physics of goal tending
<http://www.odec.ca/projects/2007/clif7c2/index.htm>
- Emotions Circuit – Physics of the Nervous System
<http://www.odec.ca/projects/2006/chan6c2/>

Is there physics in this? – higher level focus questions

- How people are so tone deaf!
- Perfect Pitch
- Physics of Heart Pumping/ Dancing/lacrosse stick
- **SCUBA** Diving
- The physics of body checking in hockey
- Surfing
- [Trebuchet](#)

Is there physics in this? – higher level focus questions

- [Hydrodynamics – Physics of Swimming](#)
- Gamma Knife Surgery
- How can we use robotics in domestic fire security?
- What factors apply to shooting the hardest slap shot a person is capable of (eg. Stick flex, hand placement, etc)?
- How does the height of a tennis player affect the velocity of the ball of a serve? Advantages: velocity, angles etc.

Is there physics in this? – higher level focus questions

- How does physics relate to Gymnastics and how can this prove to be beneficiary to the performance of an athlete? –
<http://sites.google.com/site/ramihamadiphysicsproject/>
- Music and Emotion –Does Music Really affect People's Minds -
<http://blogs.physicstoday.org/update/2009/11/musicality-of-speech-changes-w.html>
- Safe Clean Nuclear Power
<http://www.odec.ca/projects/2007/gree7a2/>

Is there physics in this? – higher level focus questions

- [A Investigation of Fluid Flow in Micro-Channels](#)
- Safe Clean Nuclear Power
<http://www.odec.ca/projects/2007/gree7a2/>
- [The Expression and Interpretation of Facial Expressions](#)
[The Physics Behind a Visual Interaction](#)
- Electrical Signals of the Heart

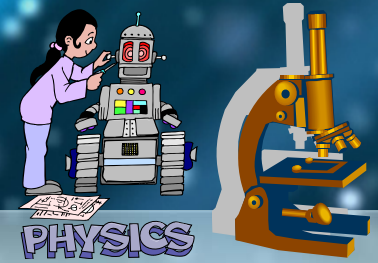
Quote

"...The physics behind skating. I am a figure skater...really interesting topic for me. How does the blade glide across the ice and what gives figure skaters the ability to jump, spin and rotate easily?"

What else?

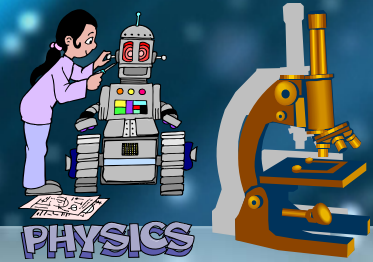
- Articles
- YouTube videos
- TED videos (Sixth Sense for Optics - <http://www.youtube.com/watch?v=mUdDhWfpqyg>)
- Discovery videos (Relativity Theory – Stephen Hawking)

Advantage



The advantage of doing this is that the students realize that physics concepts are being followed during every fraction of their time, whether they are breathing, thinking, eating, playing, working on their laptops....

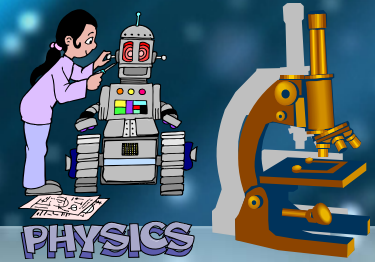
Recommendations



Mechanics - Kinematics & Dynamics:

- Kinesiology
- Orthopaedics
- Heart Motion
- DNA (Torque)
- Centrifuge & CT Scan
- Bio-Mechanics
- How one can make their sport skills better

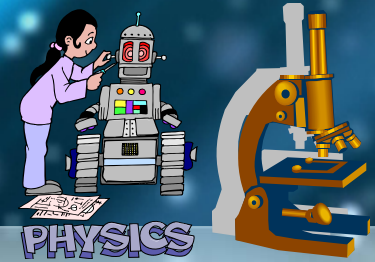
Recommendations



Elasticity & Strength of Materials

- Movement of Muscles
- Stress in Muscles
- Athletic Therapy
- Sport injuries

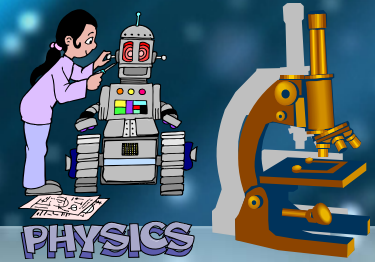
Recommendations



Fluids:

- Blood Pressure
- Blood Flow
- Heart as a pump
-

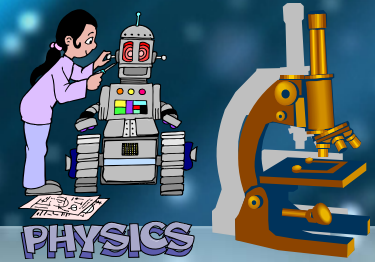
Recommendations



Waves & Sound

- Hearing
- Stethoscope
- Ultrasound
- Acoustic Microscope
- How do humans make sound?
- Larynx
- Musical Instruments

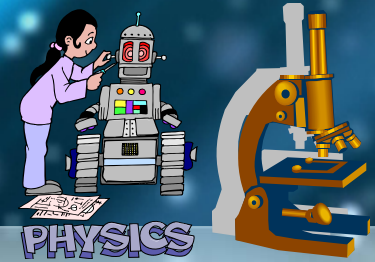
Recommendations



Heat & Thermodynamics

- Transfer of heat in human body for heat balance
- Heat transfer during digestion and metabolism
- Warm and cold blooded animals

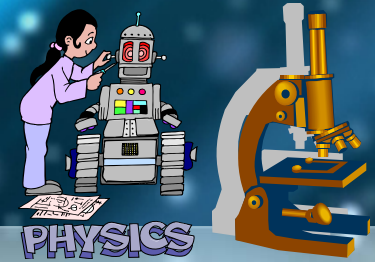
Recommendations



Electricity

- Nervous system (Emotions Circuit)
- Ion transfer at membranes
- Cell phones
- Computer
and.....

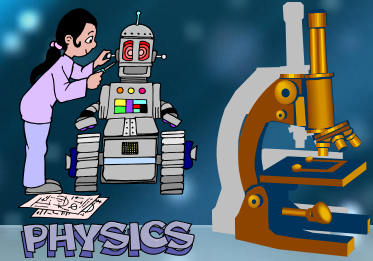
Recommendations



Magnetism

- Magnetic Resonance Imaging
- Magnetic Bracelets
- Electric guitar
- Nuclear Magnetic Resonance

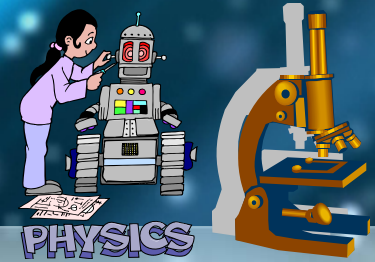
Recommendations



Light & Optics

- Microscope
- Lenses
- Non Reflecting coating
- Fiber optics - Endoscopies
- Light microscopy
- Laser therapy
- Skin Treatment & Imaging
- Electron Diffraction Microscope

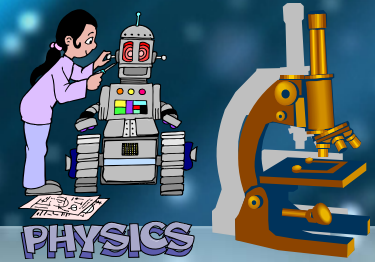
Recommendations



X-Rays

- Radiology
- CT Imaging
- Carbon dating
- Study of DNA

Recommendations



Others:

- Nuclear medicine
- Radiation therapy
- Positron emission tomography (PET)
- Pion therapy
- Tumour therapy (accelerators)
- Hodgkin's disease

Questions?