NSS Understanding and Interpreting the Physics Curriculum
Feb 2009

Understanding & Interpreting the NSS Physics Curriculum

Feb 2009

NSS Physics and Combined Science (Physics Part)

YU Hon-yui, Science Education Section, EDB

The NSS Physics Curriculum

will be implemented in September 2009.

Curriculum Framework

Compulsory Part (200 hours)	**9 topics + I.S.**
Elective Part (2 out of 4, 54 hours)	**Total lesson time: 270 hours**
Investigative Study (16 hours)	

The time suggested includes various activities, like teacher's or students' presentation, small-group discussion, field studies, investigations, article reading, assessment, etc.

Compulsory part (200 hours)

- compiled with fundamental physics knowledge, principles, concepts and science process skills
  - *Pave the way for acquiring science process skills such as*
    - *cognitive skills such as planning experiments and writing reports*
    - *manipulative skills such as using equipment and apparatus*

Compulsory Part (Total 200 hours)

I. Heat and Gases	Temperature, heat and internal energy Transfer processes Change of State, Gases		25 hours
II. Force and Motion	Position & movement Force & motion Projectile motion	Work, energy & power Momentum Uniform circular motion Gravitation	55 hours
III. Wave Motion	Nature and properties of waves Light Sound		48 hours
IV. Electricity and Magnetism	Electrostatics Circuits and domestic electricity Electromagnetism		56 hours
V. Radioactivity and Nuclear Energy	Radiation and radioactivity Atomic model Nuclear energy		16 hours

Heat Transfer and Gases

- Temperature, heat and internal energy
- Transfer process
- Change of state
- Gases
  - Gas laws
  - Kinetic Theory of Gases
- 14 + 11 hours = 25 hours

Existing AL Physics Curriculum

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Force and Motion

- Position and movement
- Force and motion
  - Moment of a force
- Motion in two dimension
  - Projectile Motion
  - Circular Motion
- Work, energy and power
- Momentum
- Gravitation
- 36 + 19 hours = 55 hours

Wave Motion

- Nature and properties of waves
  - Speed of propagation of waves along stretched strings
  - Wavefront diagrams, phase change on reflection
  - Refractive index in terms of speeds
  - Superposition , stationary wave
- Light
  - Young's double slit
  - $(1/u)+(1/v) = (1/f)$
- Sound
- 33 + 15 hours = 48 hours

Electricity and Magnetism

- Electrostatics
  - Coulomb's law, field lines, electric field strength
  - Electric potential
- Circuits and domestic electricity
  - E.m.f. , current vs applied p.d., Conservation of charge
  - Effects of T on R
- Electromagnetism
  - Field lines, B strength, $F = BIl\sin\theta$
  - Hall effect, Faraday's law, mean heating effect
- 33 + 23 hours = 56 hours

Radioactivity & Nuclear Energy

- Radiation and radioactivity
  - Exponential law of decay
- Atomic Model
- Nuclear Energy
  - Fission reactor, roles of fuel, moderator, coolant and control rods
- 12 + 4 hours = 16 hours

Elective Part (Total 54 hours)

Any 2 out of 4 elective topics

VI. Astronomy and Space Science	27 hours
VII. Atomic World	27 hours
VIII. Energy and Use of Energy	27 hours
IX. Medical Physics	27 hours

- Elective part (27 hours x 2)
  - Select any 2 out of 4 topics
  - In-depth treatment or extension of certain areas of the compulsory part or a synthesis of knowledge

Teachers' choices on the electives in a survey	
VI. Astronomy and Space Science	54%
VII. Atomic World	48%
VIII. Energy and Use of Energy	66%
IX. Medical Physics	36%

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Investigative study (16 hours)

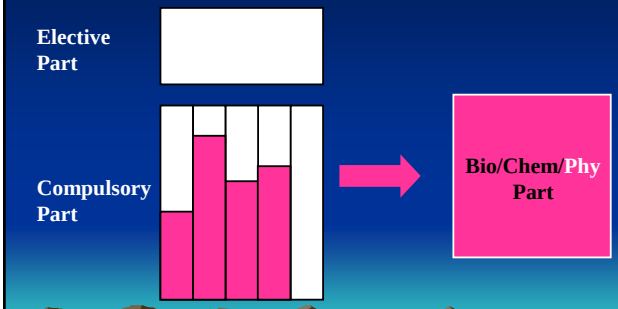
- Design and conduct a first-hand investigation

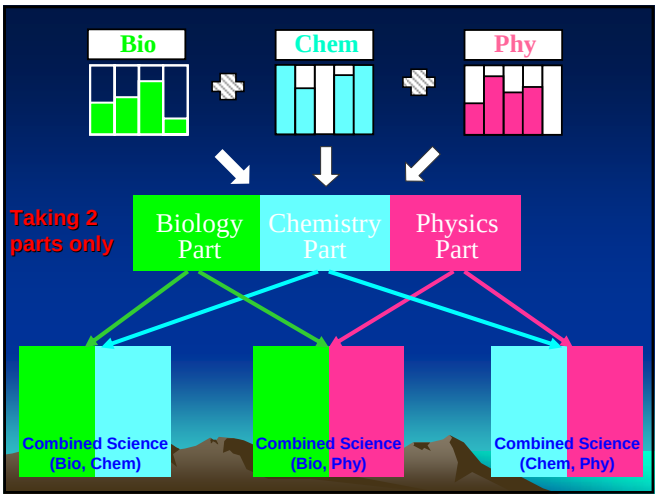
Searching for and defining questions	3 hours
Developing an investigative plan	3 hours
Conducting the investigation	4 hours
Organizing and analyzing data	3 hours
Presenting findings	3 hours

The Combined Science Curriculum

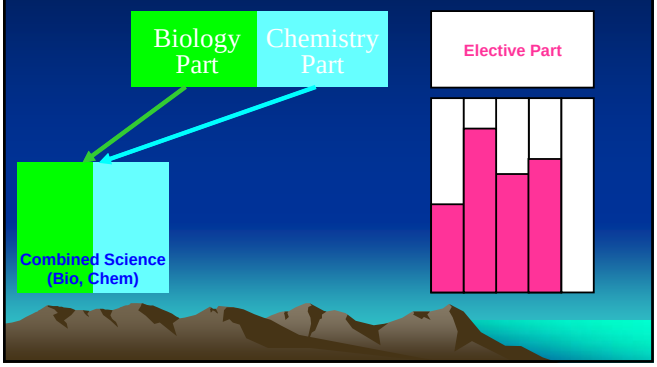
Combined Science

Biology / Chemistry / Physics





2X Combined Sci + Physics 2X



Combined Science
Physics Part (Total 135 hours)

I. Heat	15 hrs
II. Force and Motion	42 hrs
III. Wave Motion	34 hrs
IV. Electricity & Magnetism	36 hrs
Investigative Study	8 hrs

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Physics Part of Combined Science

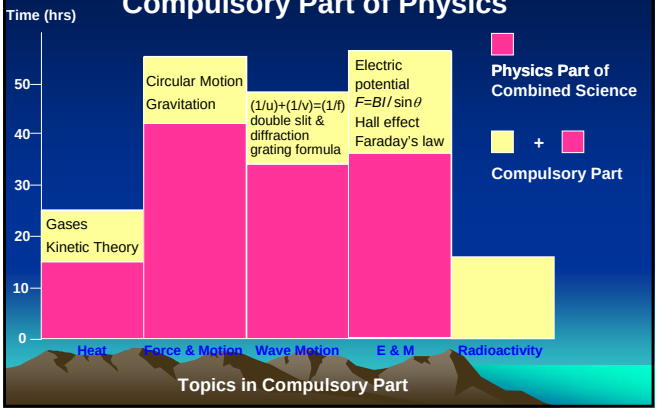
Compulsory part

- Heat Transfer and Gases
- Force and Motion
- Wave Motion
- Electricity and Magnetism
- ~~Radioactivity and Nuclear Energy~~ **Removed**

excluded in the phy part

- **gases & kinetic theory**
- **circular motion**
- **gravitation**
- **(1/*u*)+(1/*v*)=(1/*f*)**
- **double slits - formula**
- **electric potential**
- ***F=BIl*sin*θ***
- **Hall effect**
- **Faraday's law, a.c.**

Physics Part of Combined Science and Compulsory Part of Physics



Supporting Measures

Professional Development Programmes for NSS

http://iclassroom.hkedcity.net/teacher/teacher950

1. Astronomy & Space Science
2. Atomic World
3. Energy & Use of Energy
4. Medical Physics
5. Investigative Study

Upcoming seminars/workshops

http://www.hk-phy.org/teacher/board/board_e.php

- Public Assessment and Standards-referenced Reporting (Oct & Nov 2008)
- Astronomy courses on the use of telescope (Dec 2008 – Mar 2009)
- Induction Course for New Panel Chairpersons (27/11/2008)
- Assessment for Learning (Re-run) (Dec 2008)
- Enriching Knowledge Series:
  - Energy & Use of Energy (Re-run) (1 & 2/12/2008)
  - Atomic World (Re-run) (22 & 23/12/2008)
- Astronomical Camps for teachers (12-13/12/2008, 9-10 & 16-17/1/2009)
- Understanding & Interpreting the Curriculum (Re-run) (12 & 13 Feb 2009)
- Learning and Teaching Series:
  - Medical Physics (Jun 2009)
  - Investigative Study (Jul 2009)
- A seminar on the use of resource materials (Jul 2009)

http://www.edb.gov.hk/cd/sc

Thank you

Your views please

END