Isaac Newton as an Inspiration for School Children

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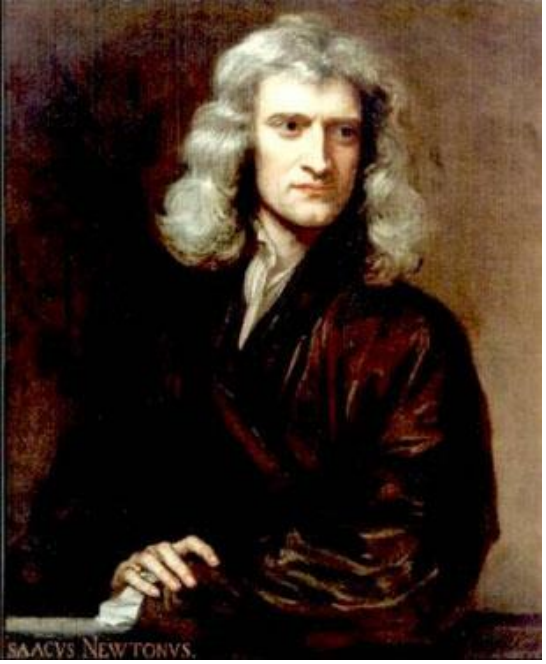
Tato prezentace je spolufinancována Evropským sociálním fondem a státním rozpočtem České republiky.



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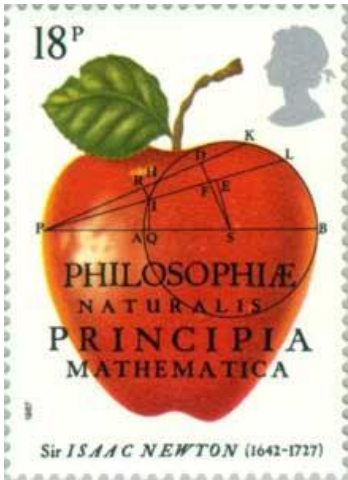
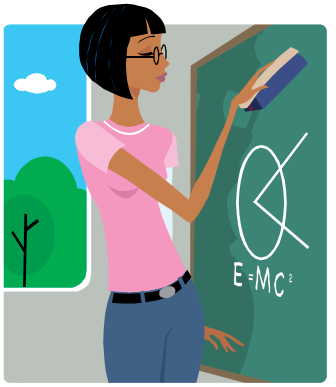


Goals

- Give a good feeling about
  math and science
- Aid in teaching physics
- Inspire teachers
- Disarm misconceptions about
  professors in ivory towers



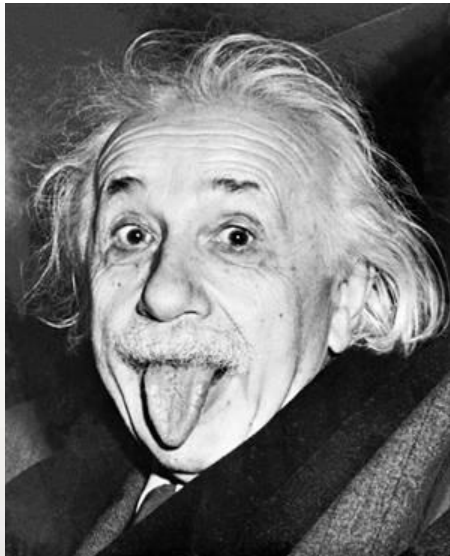
Meet Isaac Newton

- Who is Isaac Newton?
- Act 1 – Mechanics
- Act 2 – Optics
- Act 3 – Mathematics
- Epilogue

School visits

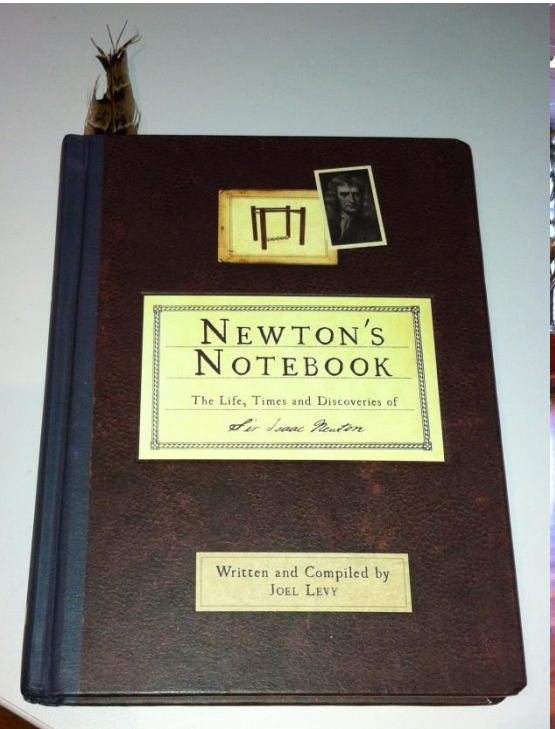
- Grades 4-6, age 10-12
- 19 classes from Gothenburg region
- Sep-Oct 2011 and April 2012
- House of William Chalmers

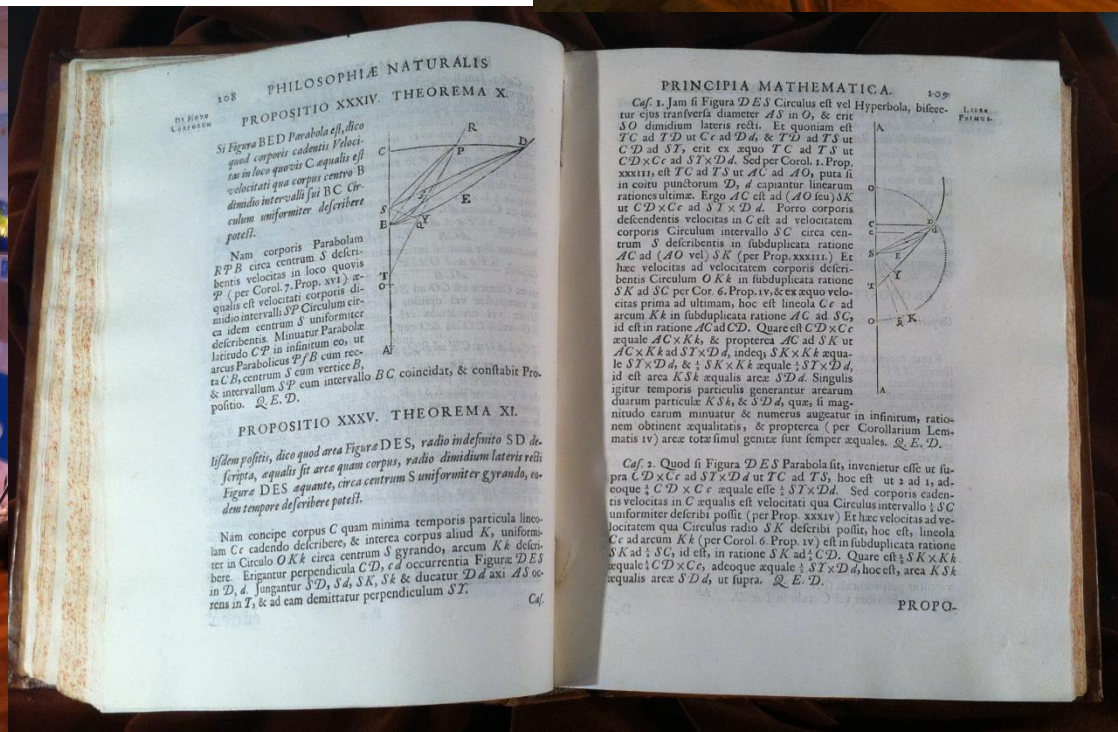




Who is Isaac Newton?

- Born on Christmas Day 1642
- Focus on childhood
- Story of Principia



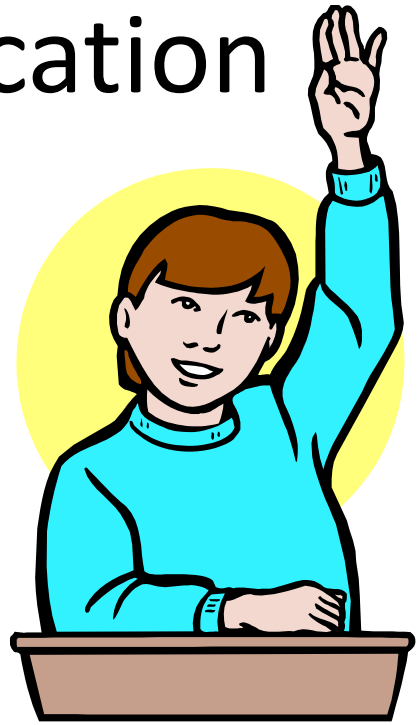


Act 1 - Mechanics

- Why doesn't the moon fall down like the apple does?
- acceleration, gravity, force, inertia
- hypothesis, experiment, observation

2-way Communication

- Ask questions
- Question the answers
- Declare hypothesis
- State observations
- Think, associate, side-track
- → Spontaneous new content



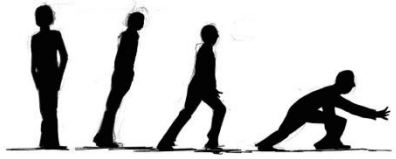
Act 2 - Optics

- Newton's technical problem:

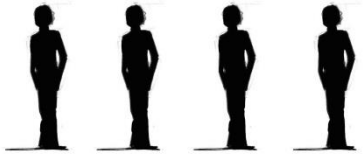
  a bad telescope
- light, lens, focus, mirror
- colour, prism, spectrum, diffraction

Factors for success

- Enthusiasm
- Time allocation (funding)
- Suitable location (funding)
- Experimental equipment (funding)
- Endorsement from leaders



Act 3 - Mathematics



- Newton's new math:

  rate of change → "derivative"

- position, speed, acceleration
- Take a ride on the "derivative wagon"

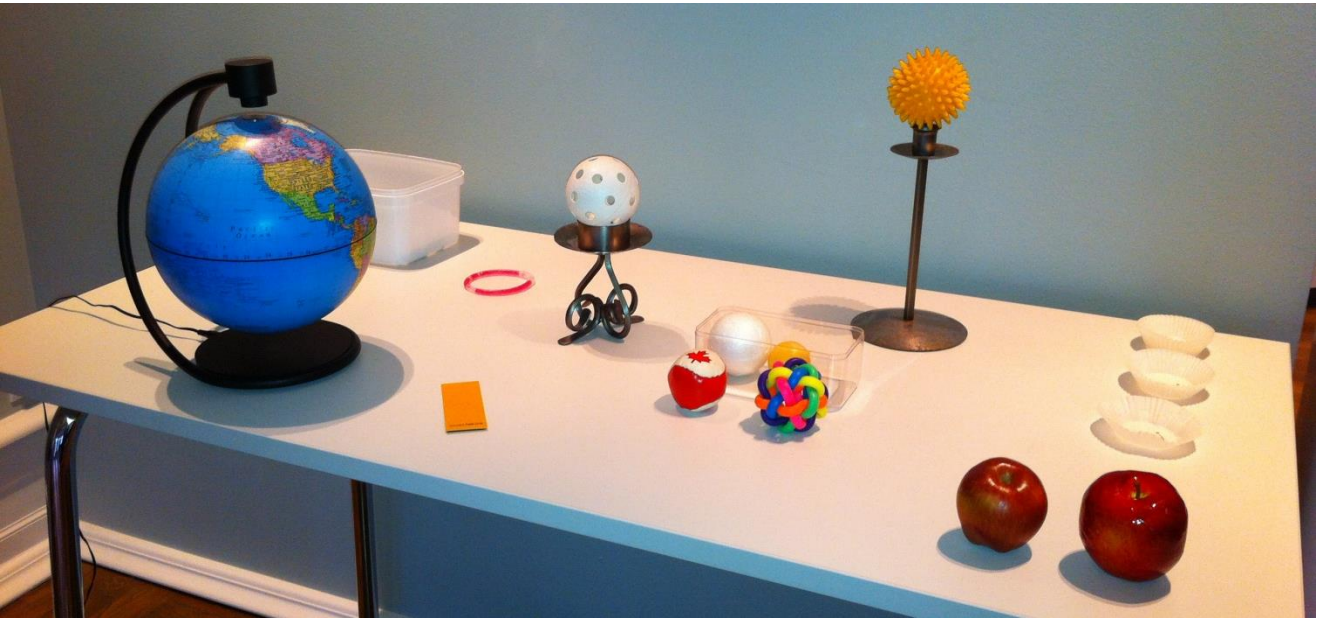
Engaging students

- Cascade learning
- Close the age gap
- Curriculum change
- Faculty attitudes

Epilogue

- “Sir” Isaac at the Royal Mint:

  a counterfeiter’s nightmare
- alchemy, pseudoscience, fuzzy thinking
- scientific method



Visions for the Future

- Increased number of classes
- Teacher training before and after
- Student involvement
- Road show to distant schools
- Follow-up of attitudes and learning

Thank you for your attention!