

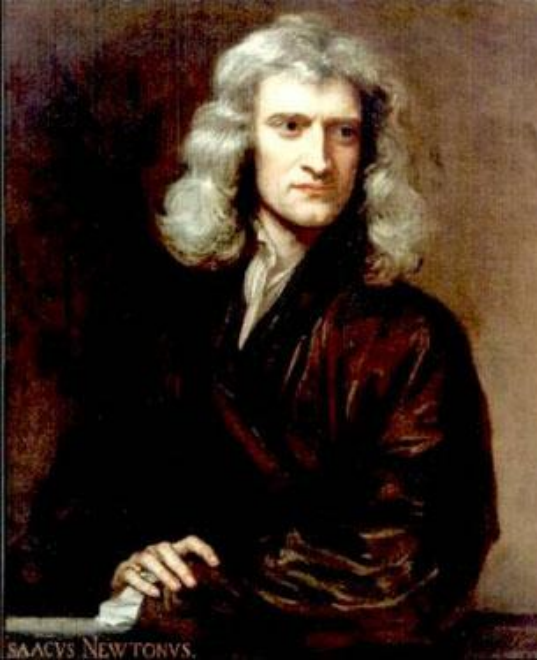
Isaac Newton as an Inspiration for School Children

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Prague, Nov 8 2012

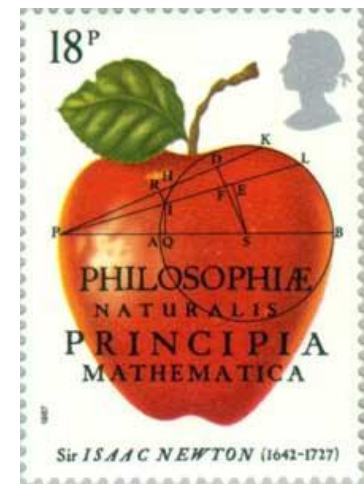
Tato prezentace je spolufinancována Evropským sociálním fondem a státním rozpočtem České republiky.



Isaac Newton as an Inspiration for School Children

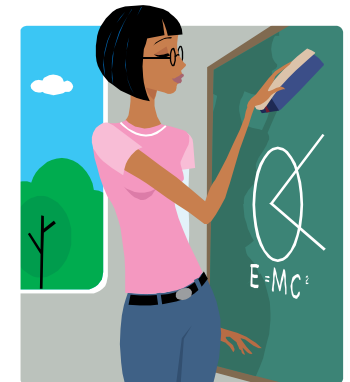


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Goals

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



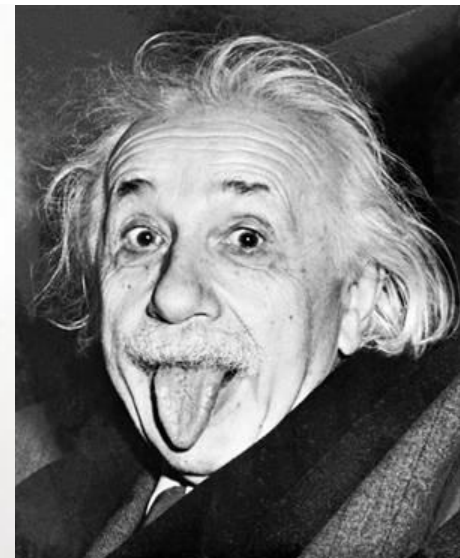
Meet Isaac Newton

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



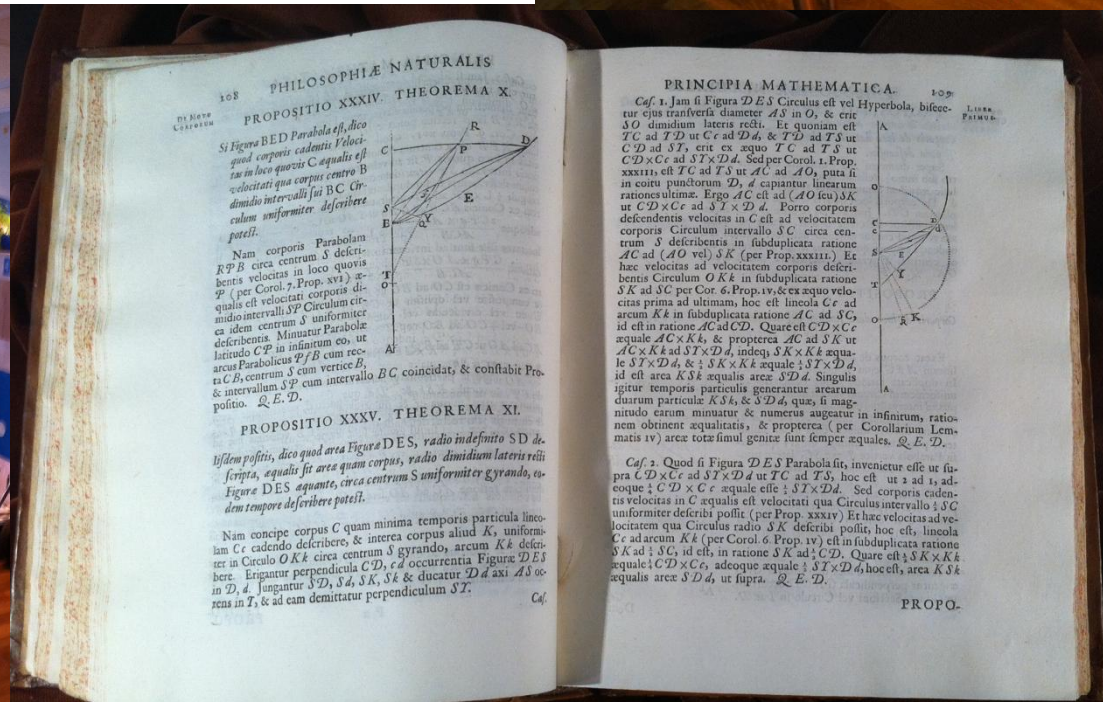
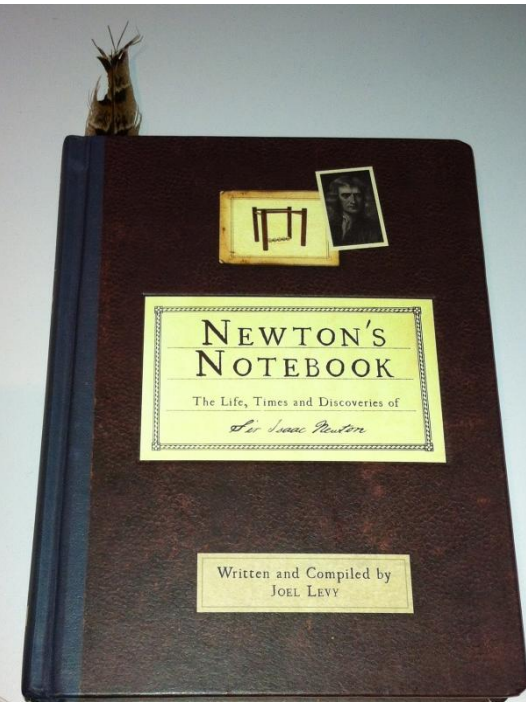
School visits

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



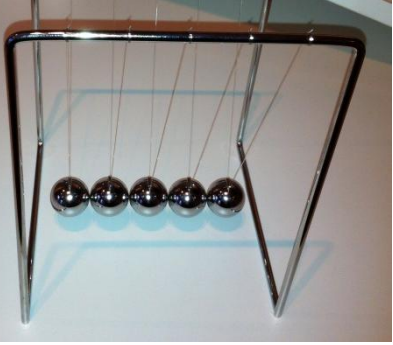
Who is Isaac Newton?

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



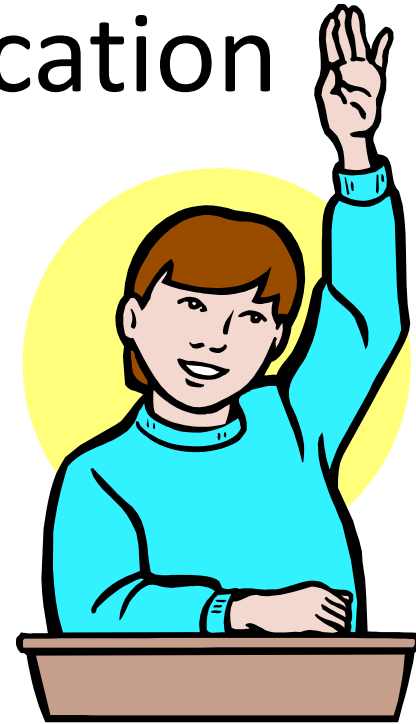
Act 1 - Mechanics

- 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



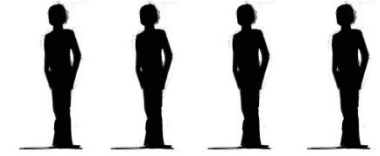
Factors for success

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





Act 3 - Mathematics



- Newton's new math:
rate of change \rightarrow "derivative"
- position, speed, acceleration
- Take a ride on the "derivative wagon"



Engaging students

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

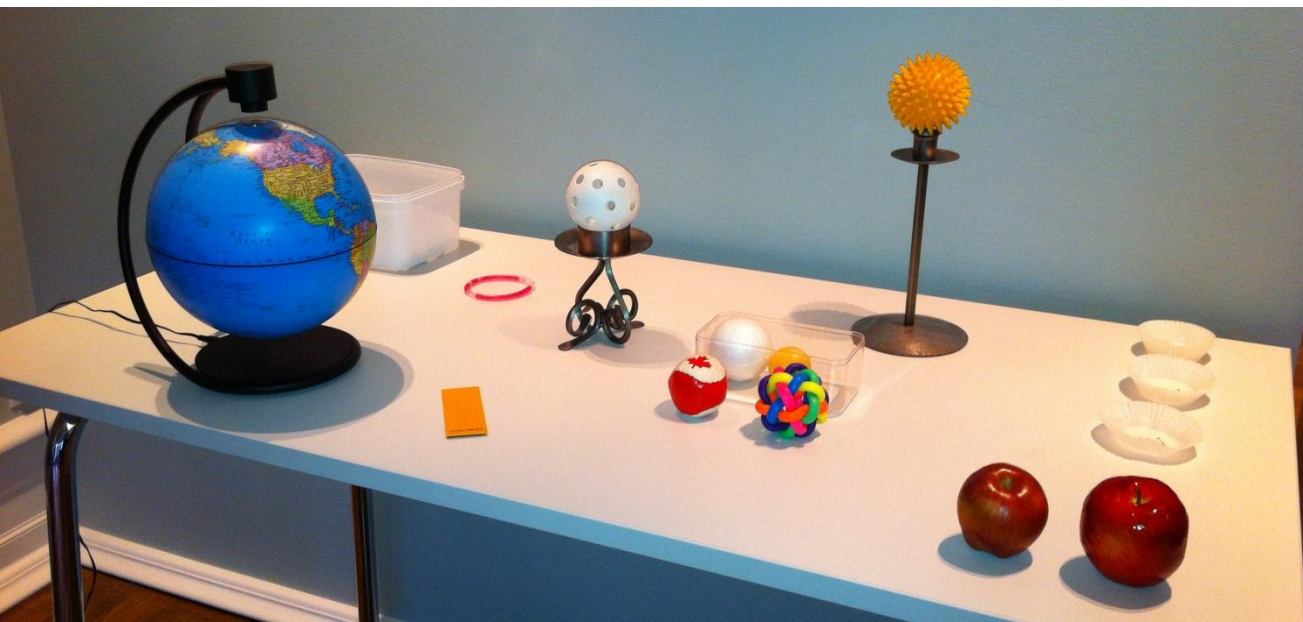




Epilogue



- “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!

