

A Pilot Professional Development Course for Primary School Teachers from Greece

P L A Y I N G W I T H P R O T O N S

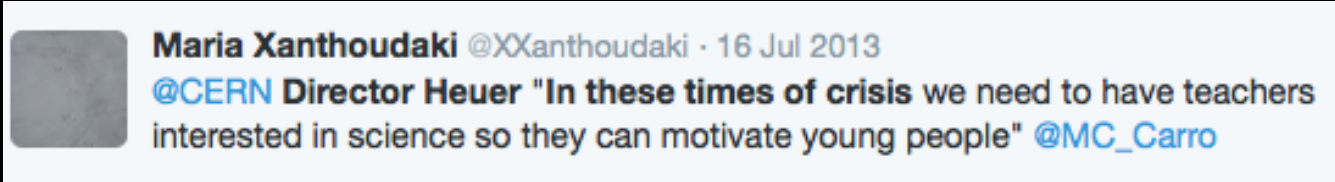
Engage your K-6 students with science, technology and innovation

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Angelos Alexopoulos | 17 Aug 2016



Background



Playing with protons in primary

by Angelos Alexopoulos



Safety first! Hill Primary School students get ready to build a cloud chamber at CERN (Image: Stella Tsikrika)

Soon after her return to Athens, Greece, from the Greek [Teachers Programme at CERN](#) last summer, primary-school-physics teacher Tina Nantsou started working on a science education project, *Playing with Protons*, for her students at [Hill Primary School](#), the oldest operating primary school in Greece. "The aim was to inspire my students about the magic of particle physics the same way I was inspired during my time at CERN," says Nantsou.

CERN inspires primary-school students to Play with Protons

by Cian O'Lunaigh



"Playing with Protons" (Video: Stella Tsikrika @)

This spring we [highlighted the activities](#) of primary-school teacher Tina Nantsou of Hill Memorial School in Athens, Greece, who, together with CERN, launched the *Playing with Protons* project to instill in her students the excitement of particle physics research. The documentary above charts the progress of the project, from its inception in Nantsou's classroom to a visit to CERN for 12 lucky students in her class.



Public Attention

Η ΚΑΘΗΜΕΡΙΝΗ

ΕΛΛΑΔΑ 19.04.2014

Τα «εκτάκια» που έμαθαν τα μυστικά του CERN

ΛΙΝΑ ΠΑΝΝΑΡΟΥ



Η ομάδα των μαθητών -στο CERN- επισκέφθηκε χώρους του Κέντρου που σπανίως ανοίγουν για στολεία. ενώ νιώοισε και την ελληνική κοινότητα που ΕΠΙΣΤΗΜΗ 12.06.2016

Δάσκαλοι στα «θρανία» του CERN

ΣΑΚΗΣ ΙΩΑΝΝΙΔΗΣ



Εκπαιδευτικά ξεναγούνται στις εγκαταστάσεις του πειράματος CMS σε παλαιότερο εκπαιδευτικό πρόγραμμα του CERN. Στην αεροφωτογραφία, δεξιά, διακρίνεται ο Μεγάλος Επιταχυντής Αδρονίων (LHC).

- ΕΚΤΥΠΩΣΗ
- ΑΦΑΙΡΕΣΗ
- COMMENTS
- MAIL
- TWITTER
- FACEBOOK
- INSHARE
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ΔΙΑΒΑΣΤΕ ΕΠΙΣΗΣ

Δέσμευση λογαριασμών βγενόπουλου διέταξε ο οικονομικός εισαννέλεας

- ΕΚΤΥΠΩΣΗ
- ΑΦΑΙΡΕΣΗ
- COMMENTS
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- GOOGLE PLUS

Outlet Name: Kathimerini (GR)

12/06/2016

Δάσκαλοι στα «θρανία» του CERN, του Σάκη Ιωαννίδη

...εγκαταστάσεις του πειράματος CMS σε παλαιότερο εκπαιδευτικό πρόγραμμα του CERN. Στην αεροφωτογραφία, δεξιά, διακρίνεται ο Μεγάλος...

Ad Value: \$251.97

Outlet Type: Online, trade/industry

Page Views: 0

Unique Visitors:

1,565,013



Ευρωπαϊκή Επιτροπή στην Ελλάδα

15 January ·

Ετοιμαστείτε να "παίξουμε με τα πρωτόνια" στο CERN!

Η New Wrinkle σε συνεργασία με το #CERN οργανώνει ένα καινοτόμο εκπαιδευτικό πρόγραμμα, με τίτλο Παίζοντας με τα Πρωτόνια. Απευθύνεται σε δασκάλους πρωτοβάθμιας εκπαίδευσης στην Ελλάδα, και θα λάβει χώρα στο #CERN τον Αύγουστο του 2016.

Η επιλογή των συμμετεχόντων δασκάλων θα γίνει μέσα από μία ανοικτή διαδικασία αξιολόγησης όπου εκτός των τυπικών κριτηρίων, θα πραγματοποιηθούν διαδικτυακές συνεντεύξεις από επιστημονικ...
See more



64k Views

- Throw some more...
- That's great guys!



Support



“It was moving and exciting to see what is possible with primary school students, going beyond exciting them about science to getting them engaged effectively.”

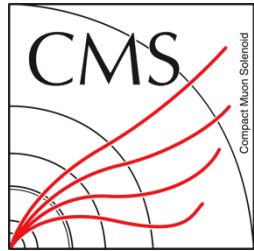
John Ellis





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Coordination

A. Alexopoulos (CERN)
G. Divanis (New Wrinkle)

Educational Coordination

T. Nantsou
(Hill Memorial School)

Follow-up & Evaluation


A. Alexopoulos (CERN)
S. Cherouvis (EA)




Application Process & Selection



29 Mar  Call by Ministry of Education

31 May  Deadline for submissions
151 applications received
(70% females)

30 Jun  Pre-screening ✓
Shortlist ✓
Video interviews (20) ✓
Final selection (10) ✓

17-22 Aug  [PwP Course at CERN](#)

Public primary schools

- all islands
- underprivileged urban areas
- permanent & temporary teachers

- CV
- motivation letter
- vision for the school of tomorrow

Two committees

- advisory (Greece)
- selection (CERN)

Typical criteria

- eligible areas
- good ENG (B2)
- min 30% females

Desired criteria

- 5th+6th grades
- community involvement
- PD in STEM



Committees

Selection Committee

John Ellis

Clerk Maxwell Professor of Theoretical Physics, King's College London

Mick Storr

Physicist, Uni of Birmingham & CERN

Machi Tsirou

Applied Physicist, CERN

Emmanuel Tsesmelis

Head of Associate and Non-Member Relations, CERN

Angelos Alexopoulos

Education & Outreach Officer, CERN



Committees

Advisory Committee

Thanasis Valtinos

President of the Academy of Athens

Stavros Zoumboulakis

President of the Supervisory Council of the
National Library of Greece

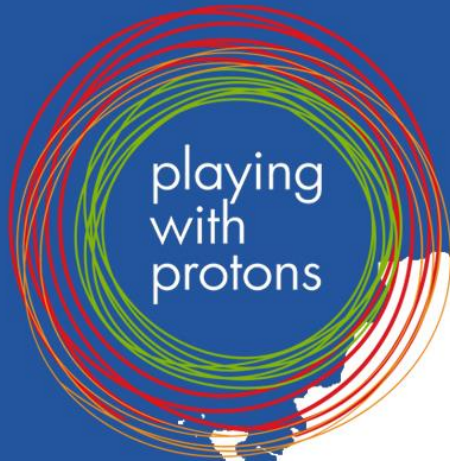
Dimitris Nollas

Writer



Participants

#PwPGreece2016



- Evdokia ARGIANNI | Elefsina
- Despoina ARMENAKI | Chios
- Sarantis CHELMIS | Rafina
- Eleni ELLINIADOU | Spata
- Nektarios FARASOPOULOS | Syros
- Panagiota-Alexandra FRATTI | Salamina
- Dimitrios KARITIS | Chios
- Foteini SYLIGARDOU | Crete
- Filippos TZORTZOGLU | Santorini
- Kyriaki ZERVOU | Thessaloniki





Aims & Expected Impact

Teachers will:

- get familiar with the unique CERN culture of cutting-edge science, technology and innovation
- get inspired and motivated to share their newly acquired knowledge and experience with their pupils and peers
- design learning activities, especially hands-on experiments in the classroom, customized to their pupils' needs
- develop educational methodologies and resources that will enhance the standard curriculum

Create sustainable impact by:

- instilling a culture of collaboration and participation among educators and pupils, especially in remote and underprivileged areas
- developing a digital platform for sharing ideas, advice and resources
- creating a network of science ambassadors who will act as leaders and inspirators in their local communities
- serving as a blueprint for future science education initiatives



Foster Creativity in Science Education

“

Every great advance in science has issued

”

from a new audacity of the imagination.

John Dewey, in the *Quest for Certainty*, p. 294

creativity

is the

process of applied imagination

Sir Ken Robinson

“An essential first thing in being creative yourself is to question your own way of looking at things”

Source: [The](#)



Image: Bob
Krist/CORBIS



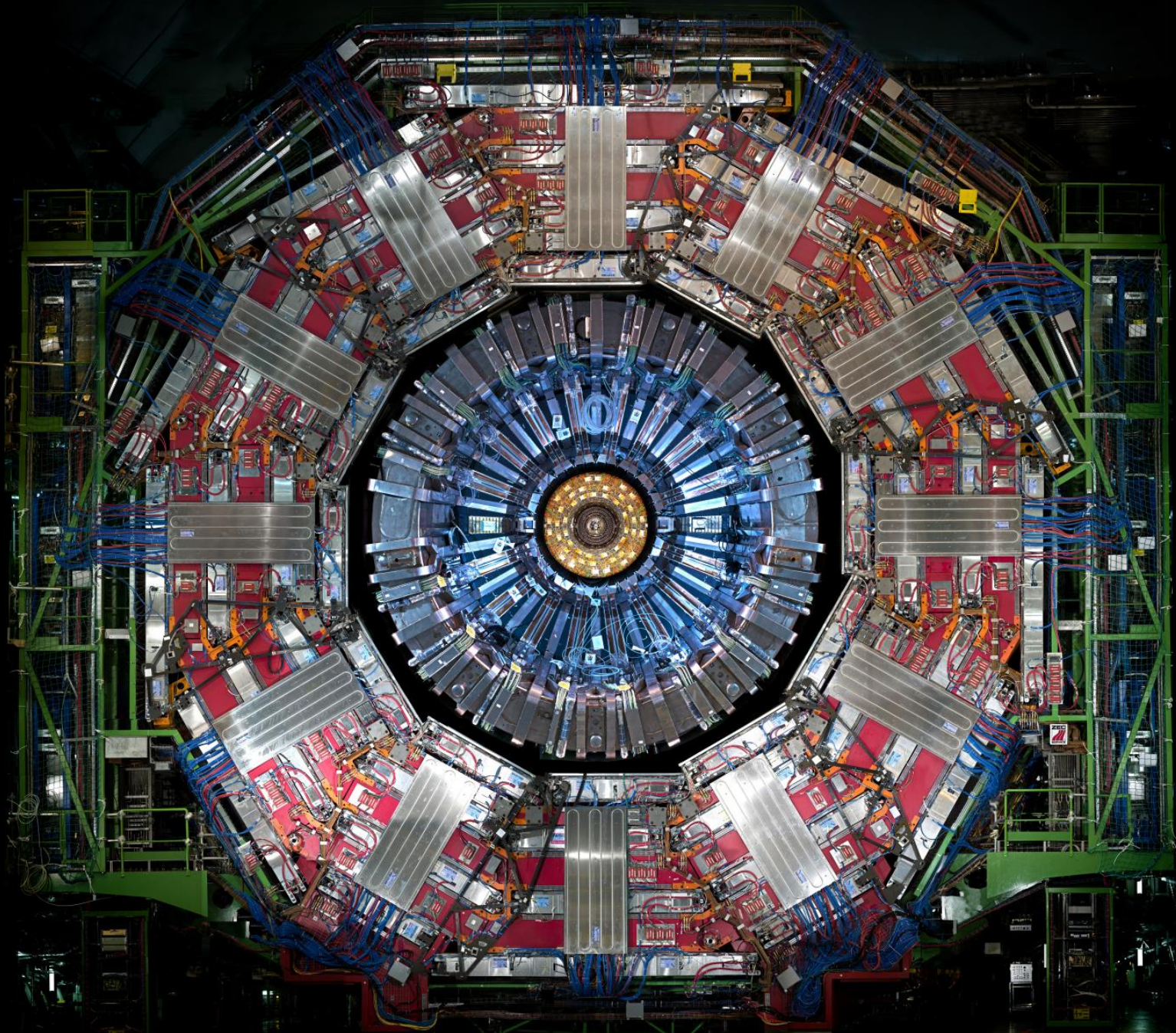
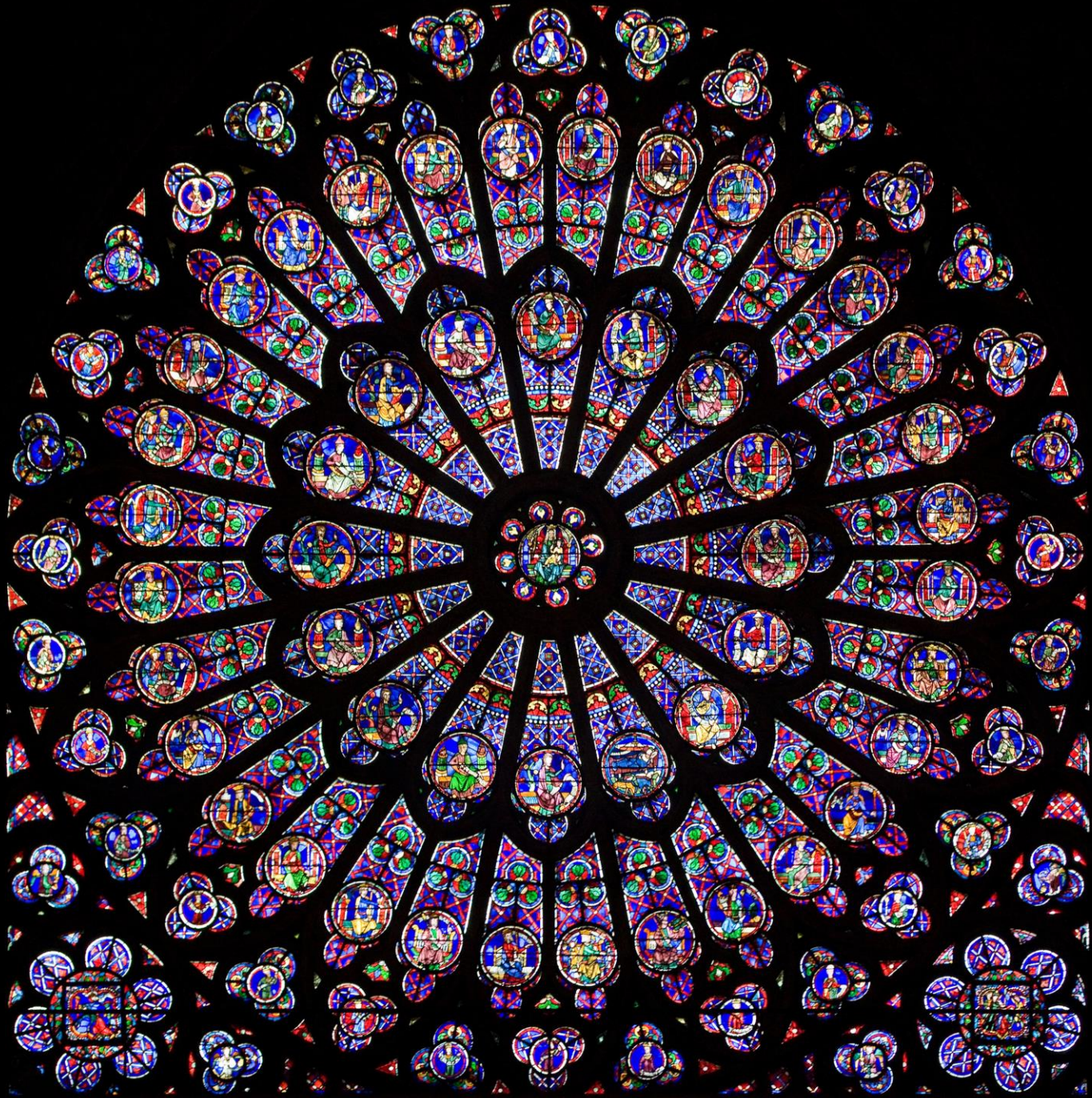


Image: Michael Hoch & Maximilien Brice © 2008 CERN, for the benefit of the CMS Collaboration





Five-day Programme

Hands-on activities,
study groups



Seminars, Q&As



Special workshops

Up

Happy Families	Snap
Name: Up Surname: Quark	Likes: Z, W+, W-, gluon, photon
Mass: very light	Charge: +2/3
one of the main components of protons and neutrons amongst the first quarks to be discovered	together with the down they are the lightest of all quarks physicists thought up and down were the only quarks

Science & Technology Facilities Council Dr Maria Papadou Prof Cristina Lazeroni



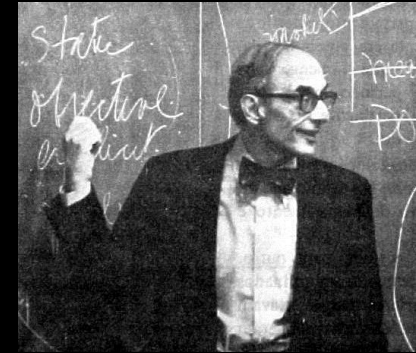
Visits



Embrace the challenge



“Smart people don’t learn...because they have too much invested in proving what they know and avoiding being seen as not knowing.”



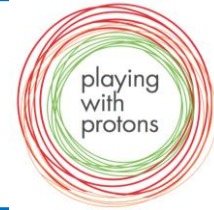
Chris Argyris

“When a distinguished but elderly scientist states that something is possible, he is almost certainly right. When he states that something is impossible, he is very probably wrong.”

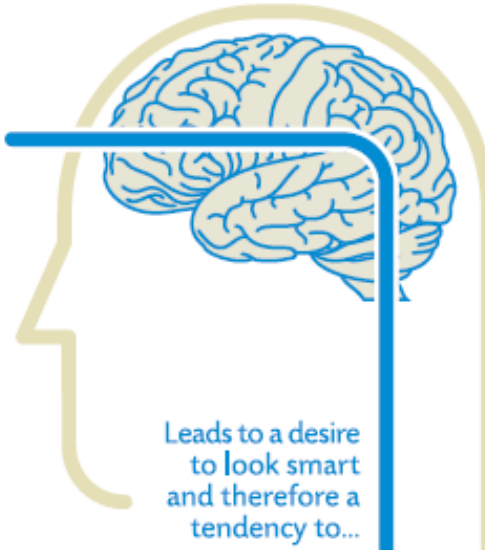


Arthur C. Clarke

The “Fixed” Mindset (Dweck, 2008)



Fixed Mind-set
Intelligence is static



A Fixed Mindset says:
“I don’t do physics (or maths or...science)”

Holmes, N. (n.d) Mindset graphic
http://www.stanfordalumni.org/news/magazine/2007/marapr/images/features/dweck/dweck_mindset.pdf
Richard, M. G. (n.d.) “Fixed mindset vs. growth mindset: which one are you?” <http://michaelgr.com/2007/04/15/fixed-mindset-vs-growth-mindset-which-one-are-you/>

CHALLENGES

...avoid challenges



OBSTACLES

...give up easily



EFFORT

...see effort as fruitless or worse



SUCCESS OF OTHERS

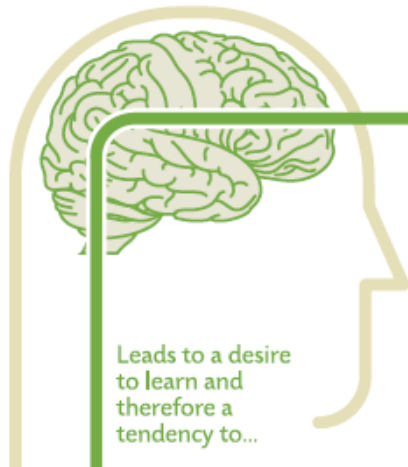
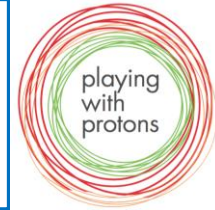
...feel threatened by the success of others



As a result, they may plateau early and achieve less than their full potential.

All this confirms a **deterministic view of the world.**

The “Growth” Mindset (Dweck, 2008)

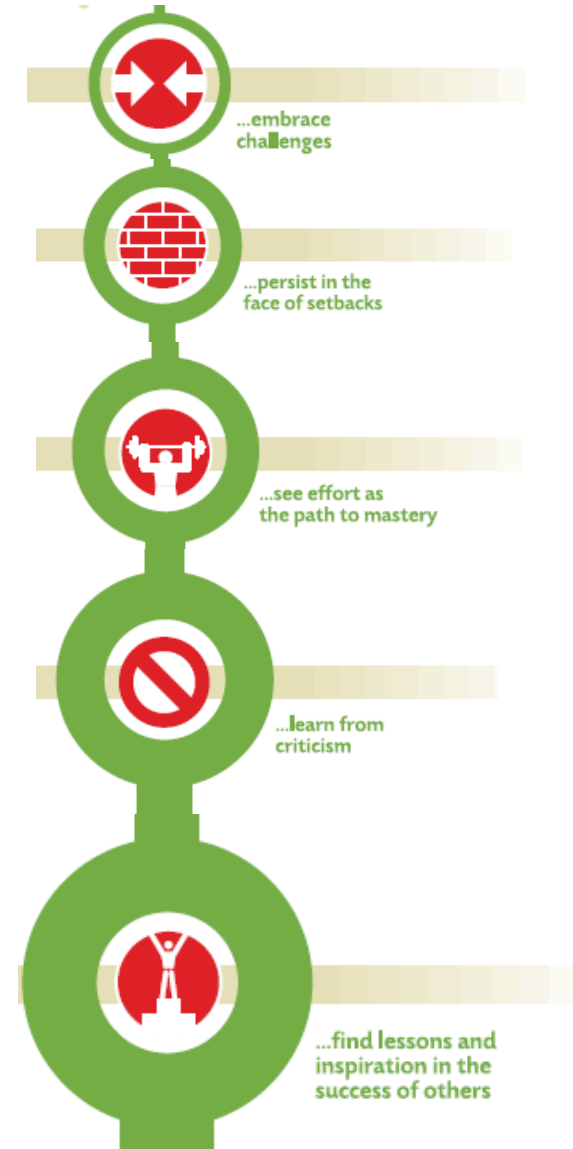


Growth Mind-set
Intelligence can be developed

Leads to a desire to learn and therefore a tendency to...

As a result, they reach ever-higher levels of achievement.

All this gives them a greater sense of free will.



Holmes, N. (n.d) Mindset graphic
http://www.stanfordalumni.org/news/magazine/2007/marapr/images/features/dweck/dweck_mindset.pdf accessed [02/01/12]
Richard, M. G. (n.d.) “Fixed mindset vs. growth mindset: which one are you?” <http://michaelgr.com/2007/04/15/fixed-mindset-vs-growth-mindset-which-one-are-you/> accessed [02/01/12]



“Joy in teaching
comes from having
helped the students
to appreciate and
love science”

Quote from a participant of CERN's High School Physics Teacher Programme

Thank you!

Angelos Alexopoulos