Teaching Modules in Particle Physics
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To make modern physics (in particular, particle physics) interesting and exciting to students
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AND...

do so at *earlier* stages in their science curriculum.
We are designing Teaching Modules that...
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Target students aged 14-15 years
...and that use topics that are related to the experiments being done at CERN.
Why create such a resource?
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*Let’s take a look at some statistics...*
Eurobarometer Special Survey (2005):
(Europeans’ general attitudes towards science and technology)
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In a short quiz on the level of scientific knowledge in the general public,

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In a short quiz on the level of scientific knowledge in the general public, of 13 true-or-false questions asked,

Source:
Eurobarometer Special Survey (2005):
*(Europeans’ general attitudes towards science and technology)*

In a short quiz on the level of scientific knowledge in the general public, of 13 true-or-false questions asked, those related to modern *physics* were among the most poorly answered.

Source:
Some questions from the Eurobarometer Survey:
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“Lasers work by focusing sound waves”
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“Lasers work by focusing sound waves”
Answered “true” 26%
Some questions from the Eurobarometer Survey:

“Lasers work by focusing sound waves”
Answered “true” 26%
“Didn’t know” 28%
Some questions from the Eurobarometer Survey:

“Lasers work by focusing sound waves”
Answered “true” 26%
“Didn’t know” 28%

“Electrons are smaller than atoms”
Some questions from the Eurobarometer Survey:

“Lasers work by focusing sound waves”
Answered “true” 26%
“Didn’t know” 28%

“Electrons are smaller than atoms”
Answered “false” 29%
Some questions from the Eurobarometer Survey:

“Lasers work by focusing sound waves”
Answered “true” 26%
“Didn’t know” 28%

“Electrons are smaller than atoms”
Answered “false” 29%
“Didn’t know” 25%
Modern physics content in LOWER secondary school curricula:
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*Norwegian National Curriculum in Natural Science (2006)*

*Achievement goals for students at the end of the 10th form:*
Modern physics content in LOWER secondary school curricula:

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Topics that could be considered as “modern”, according to subject:
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Achievement goals for students at the end of the 10th form:

Topics that could be considered as “modern”, according to subject:

Biology: 56%
Modern physics content in LOWER secondary school curricula:

*Norwegian National Curriculum in Natural Science (2006)*

*Achievement goals for students at the end of the 10th form:*

Topics that could be considered as “modern”, according to subject:

- Biology: 56%
- Chemistry: 50%
Modern physics content in LOWER secondary school curricula:


Achievement goals for students at the end of the 10th form:

Topics that could be considered as “modern”, according to subject:

- Biology: 56%
- Chemistry: 50%
- Physics: 35%
Modern physics content in UPPER secondary school curricula:
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*TIMSS Advanced 2008:*
Modern physics content in UPPER secondary school curricula:

**TIMSS Advanced 2008:**

Modern physics topics comprised 18% of the intended curriculum

*this reflected the curricular aims of the 10 participating countries—
6 from Europe, 4 from Asia*
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**TIMSS Advanced 2008:**

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*this reflected the curricular aims of the 10 participating countries—
6 from Europe, 4 from Asia]*

* Armenia, Iran, Italy, Lebanon, Netherlands, Norway, Philippines, Russia, Slovenia, Sweden
Antimatter Teaching Module
A review was conducted across a sample of national science curricula in order to establish a baseline for the background knowledge in science and mathematics of students entering the 9th form (14 years old) of lower secondary school.
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A pedagogical platform was designed to deliver the basic concepts of antimatter in a way that would be accessible to students aged 14-15 years.
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A pedagogical platform was designed to deliver the basic concepts of antimatter in a way that would be accessible to students aged 14-15 years.

A teaching module was developed consisting of 8 main lesson plans, 5 background lessons, and 2 extension lessons on antimatter.