SourceTalk 2010
Göttingen

Gerd Kortemeyer
Michigan State University

Begrüßung und Einführung

Überblick

LON-CAPA ist ein System für

- Kursverwaltung, z.B.:
  - Bereitstellung von Materialien
  - Diskussionen
  - Bekanntmachungen
  - Notenverwaltung
- Lehrmaterialverwaltung, z.B.:
  - Speichern von online Materialien zur Wiederverwendung
  - Verwaltung von Zugriffsrechten
- Lernerfolgskontrolle, z.B.:
  - Hausübungen
  - Tests

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  - Tests

Viele kennen LON-CAPA
nur in diesem Zusammenhang

Überblick

- Diese Einführung wird auch mit der Diskussion von Lernerfolgskontrollmechanismen beginnen
- Ich werde daraufhin allerdings hoffentlich zeigen können, warum auch die anderen Komponenten wertvoll sind

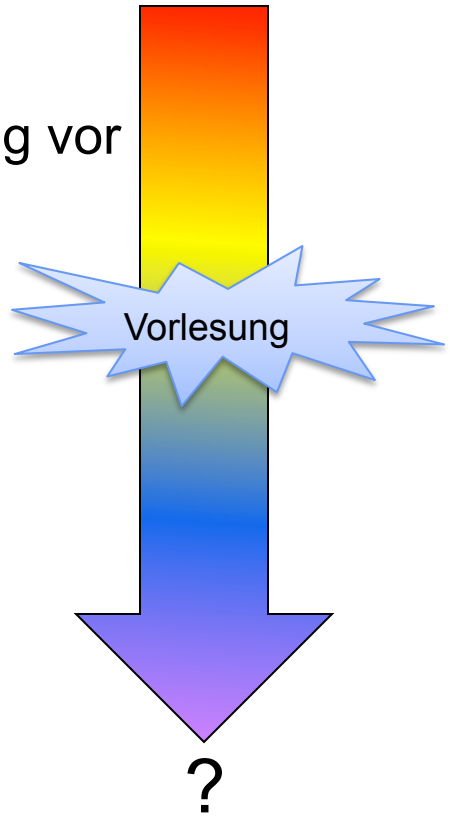
Lernerfolgskontrolle

- Lernerfolgskontrolle (“Assessment”): Feedback an Lernende und Lehrende
- “Formative assessment”:
  - Lernende können ihren Fortschritt verfolgen
    - Fallen nicht hinter dem Lehrstoff hinterher
  - Lehrende können den Fortschritt der Lernenden verfolgen
    - Können ihre Lehre dem Lernen anpassen
- “Summative assessment”: Klausuren
  - Technologie ermöglicht häufigere Klausuren

Lernerfolgskontrolle

Diskussion des gesamten Spektrums:

- Vor-Vorlesungsfragen
  - Studierende bereiten sich auf Vorlesung vor
  - Just-In-Time Teaching
- In-Vorlesungsfragen
  - Clickers
- Nach-Vorlesungsfragen
  - Hausübungen
  - Online Diskussionen, “Helprooms”
  - Klausuren
- Funktioniert das überhaupt?
- ***Wie ist das realistisch verwirklichbar?***
  - *Hier kommt Lehrmaterialienverwaltung ins Spiel!*



Vor-Vorlesungsfragen

Studierende bereiten sich auf Vorlesung vor

Just-In-Time Teaching

Vor-Vorlesungsfragen

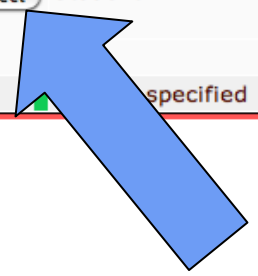
Gerd Kortemeyer (No Role, Cumulative Privileges) Messages Roles Help Logout

Main Menu

Menu » **User Roles**

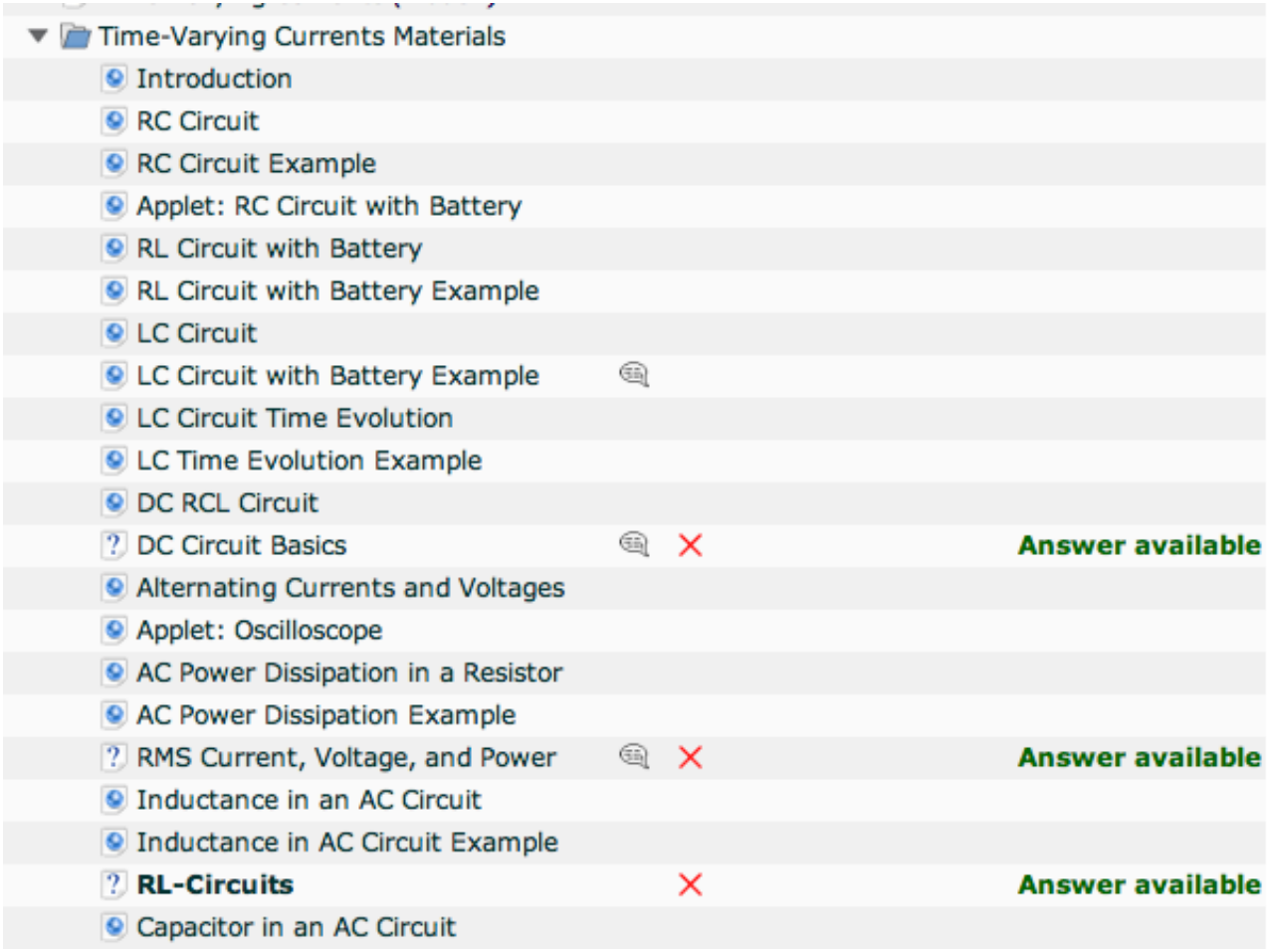
☐ Show all roles Update display

	User Role	Extent	Start	End
		Construction Space		
Select	Author	Domain: nds Server: vita.sonia.de	Tue May 11 12:13:40 am 2010 (CEST)	
		Course		
Select	Course Coordinator	Your Test Course Syllabus Domain:nds		
Select	Student	LB271, Fall 2008 - Intro Calculus-Based Physics I Syllabus Section: guest	Sun Aug 24 06:00:00 am 2008 (CEST)	Tue Dec 14 05:59:59 am 2010 (CET)
	specified			Currently selected.



Vor-Vorlesungsfragen

- Leichte Verständnis-fragen
- In die online Inhalts-materialen eingebettet
- Vor der Vorlesung fällig



Vor-Vorlesungsfragen

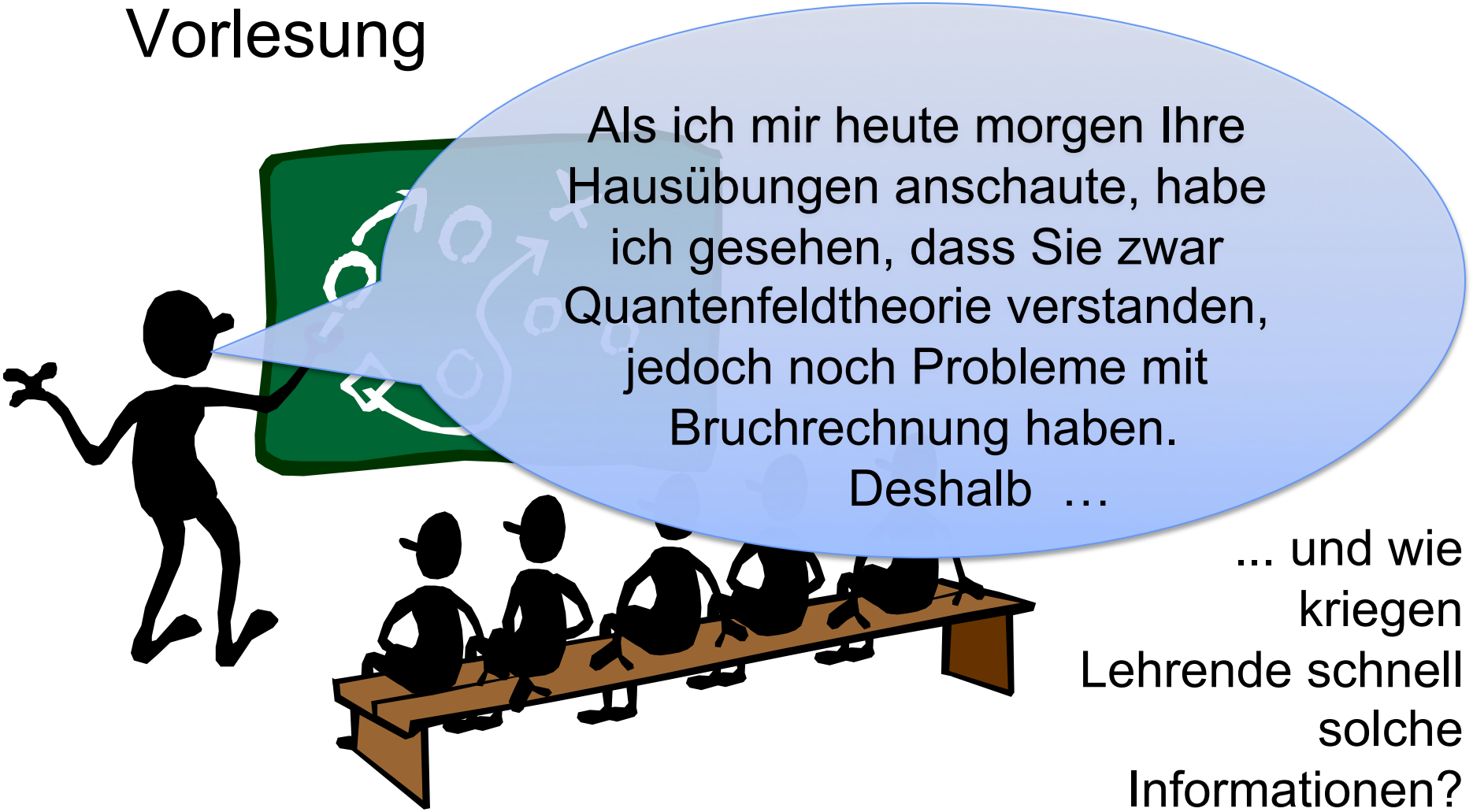
- Fragen sind unmittelbar auf dem Material basierend (“Bloom Level 1”)
- Sicherstellen, dass Studierende das Material lesen
- Studierende kommen vorbereitet zur Vorlesung, und ...

Which of the following statements are true?
False: In a circuit consisting of an AC voltage source and a resistor, the dissipated power is proportional to the current.
True: In a circuit consisting of an AC voltage source and a resistor, the voltage drop across the resistor and the voltage source are in phase.
True: The rms-voltage is proportional to the maximum AC-voltage.
True: In a circuit with a capacitor and inductance in series (no resistance), if the capacitor is initially charged, an un-damped harmonic oscillation takes place.

Computer's answer now shown above. Tries 0/6

Just-In-Time

- Lehrende kommen vorbereitet zur Vorlesung



... und wie kriegen Lehrende schnell solche Informationen?

Just-In-Time

Course Action Items

Gerd Kortemeyer
Course Coordinator
LBS 272 - Spring 2006

LBS 272 - Spring 2006->Display Action Items

What's New?

Go to first resource

Page set to be displayed after you hav... tly: *What's New? page (user preference)* **Change** for just this course or for all your courses.

Hide all Show all

Diskusionen

Schwierige Probleme

Problems requiring handgrading Hide

Problem Name	Number ungraded
Electric Field	4

Problems wi...

No problems with errors

Problems with av. attempts ≥ 3 or deg. difficulty ≥ 0.8 and total number of students with submissions ≥ 4 Hide

Change thresholds?

Resource	Part	Num. students	Av. Attempts	Deg. Diff	Last Reset	Reset Count?
Field Lines	single part	24	2.12	0.84		☐
Net Force	single part	53	2.49	0.80		☐
Pith Balls	single part	52	4.12	0.90		☐

Reset counters to 0

Resources in course with version changes since last week Hide

Change interval?

Resource	Last revised	New version	Version used
Applet: Electron Orbit	Fri Jan 13 10:18:52 2006 (EST)	10	10
Capacitance of a Sphere	Mon Jan 16 12:03:13 2006	8	8

Unread course discussion posts Hide

Change options?

Location	Type	Time of last post	Number of new posts
Coulomb	Resource	last Monday, Jan 16 at 04:55 pm (EST)	1
Distance Change	Resource	last Monday, Jan 16 at 07:00 pm (EST)	1
Field Lines	Resource	last Monday, Jan 16 at 07:49 pm (EST)	1
Force	Resource	on Wednesday, Jan 11 at 07:01 pm (EST)	3
Net Force	Resource	23 hours, 19 minutes ago	5
Pith Balls	Resource	last Monday, Jan 16 at 09:21 pm (EST)	6
Point P	Resource	last Friday, Jan 13 at 02:34 pm (EST)	5
Potential	Resource	last Sunday, Jan 15 at 03:15 pm (EST)	1
Two Charges	Resource	last Sunday, Jan 15 at 03:26 pm (EST)	1
Vector	Resource	last Saturday, Jan 14 at 01:32 am (EST)	1
Vectors	Resource	last Saturday, Jan 14 at 12:09 pm (EST)	2

New course messages Hide

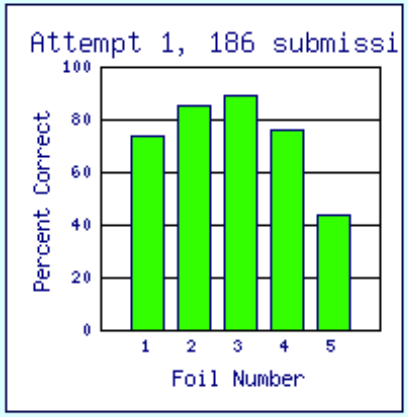
Number	Subject	Sender	Date/Time
1.	Feedback [msu/mmp/kap18/problems/cd460.problem]	[redacted]@msu	Sat Jan 14 10:45:02 2006 (EST)

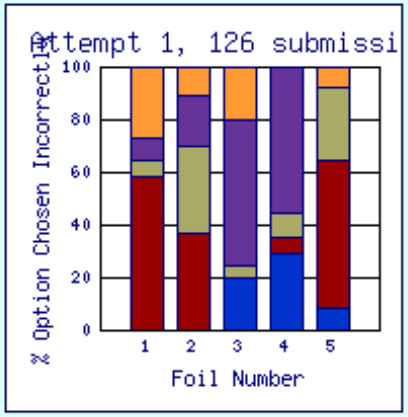
New critical messages in course Hide

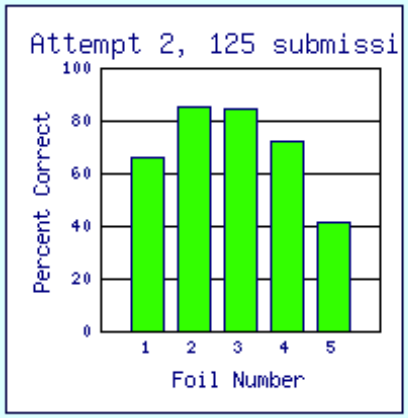
No unread critical messages in course

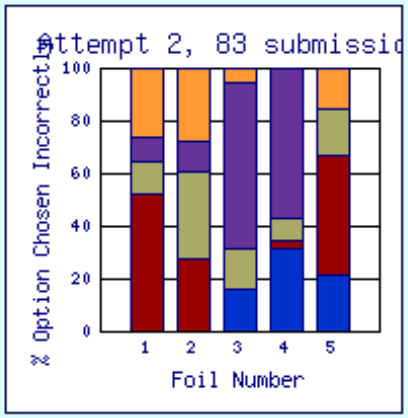
Just-In-Time

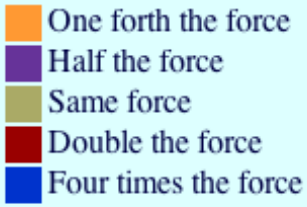
Foil Number	Foil Name	Foil Text	Correct Value
1	1_6_1_1_2	The distance between the two charges is cut in half.	Four times the force
2	1_6_1_2_2	The magnitude of both charges is doubled.	Four times the force
3	1_6_1_3_2	The magnitude of one of the two charges is doubled.	Double the force
4	1_6_1_4_2	The distance between the charges is doubled.	One forth the force
5	1_6_1_5_2	The charges are placed in a medium with a factor two higher permittivity.	Half the force

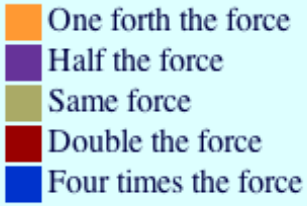












In-Vorlesungsfragen

Clicker

Clicker

Versteht er nicht, dass wir nichts verstehen?

Gähn!

Alles klar – nee, Moment mal …

Sieht so aus, als würden alle außer mir das verstehen

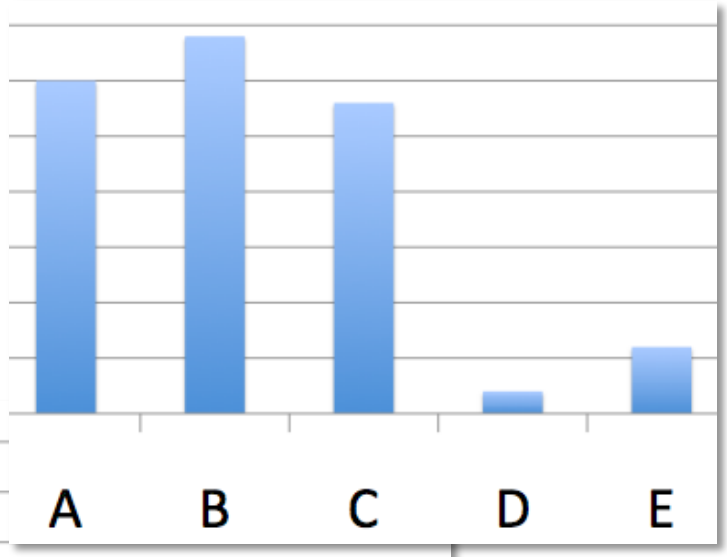
Clicker

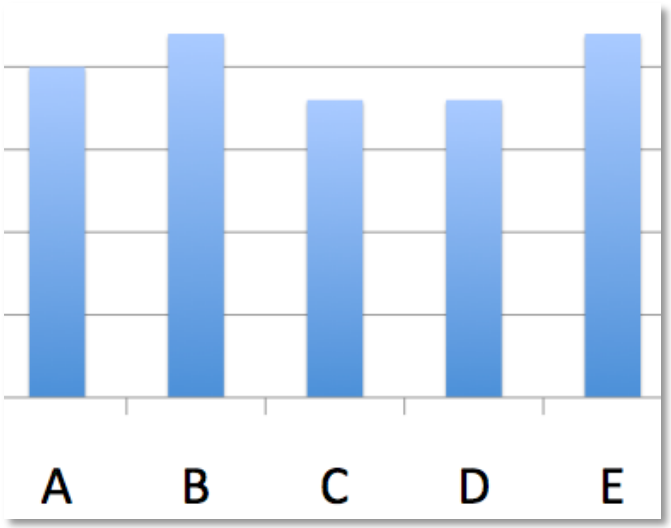
- Radiosender und -empfänger
- Einer pro Studierenden
- Studierende können während der Vorlesung Fragen beantworten

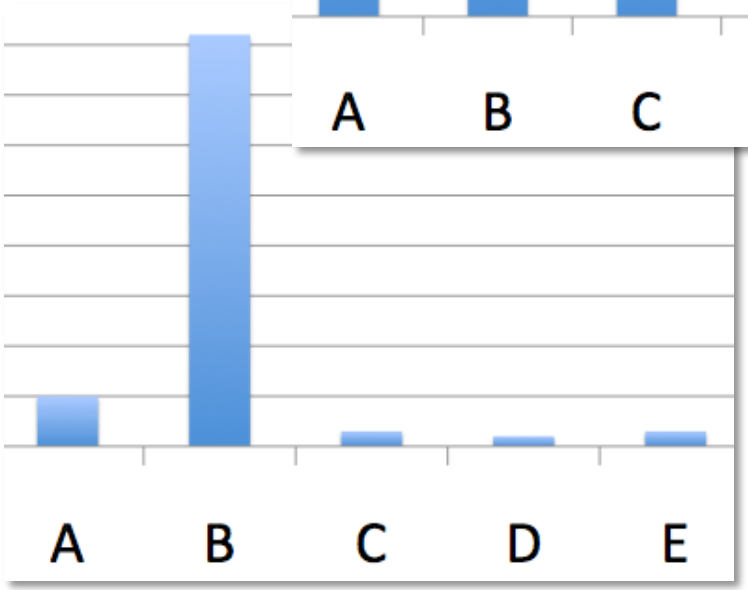
Clicker

Fortschritt der Vorlesung hängt von der Antwortverteilung der Studienden ab

- Nochmal zu erklären versuchen
- Weitermachen
- Studierende miteinander diskutieren und nochmals abstimmen lassen: „Peer Instruction“







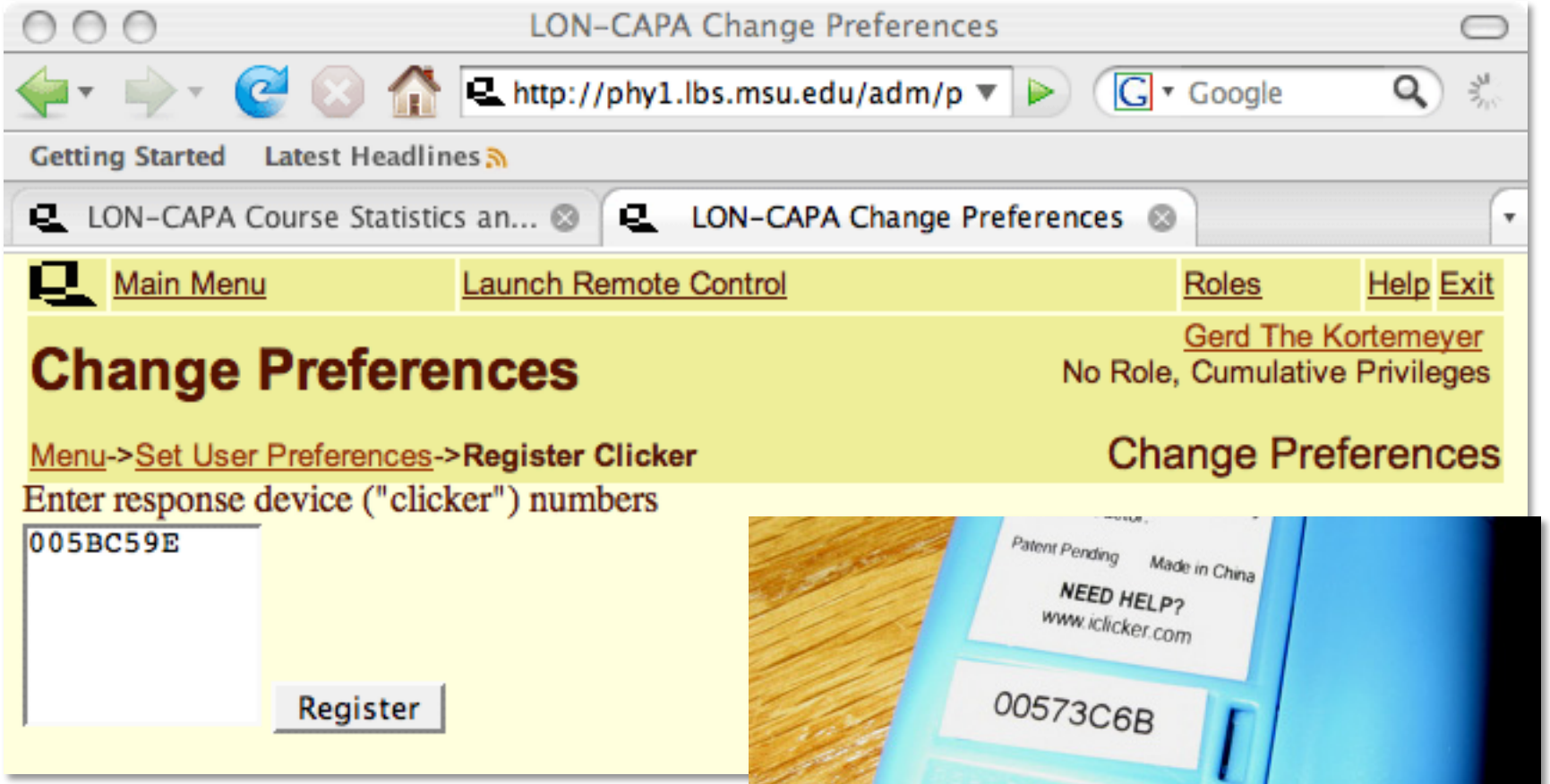
Clicker

Peer-Instruction

- Studierende können für sie neue Konzepte machmal besser erklären als wir
  - Wir haben häufig schon vergessen, wo die Anfangsschwierigkeiten waren
- Studierende lernen beim Erklären

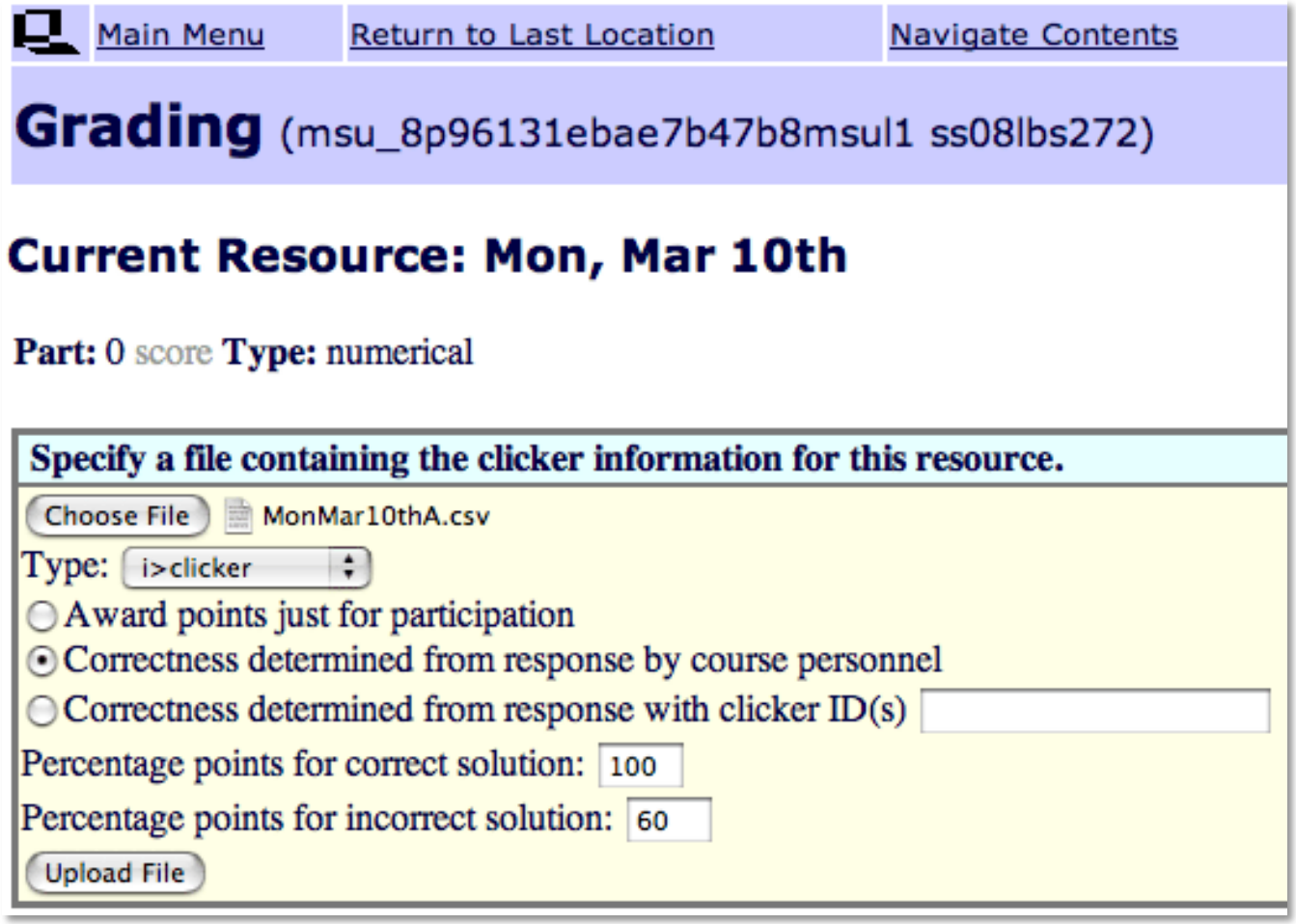
Clicker

- Studierende registrieren in LON-CAPA



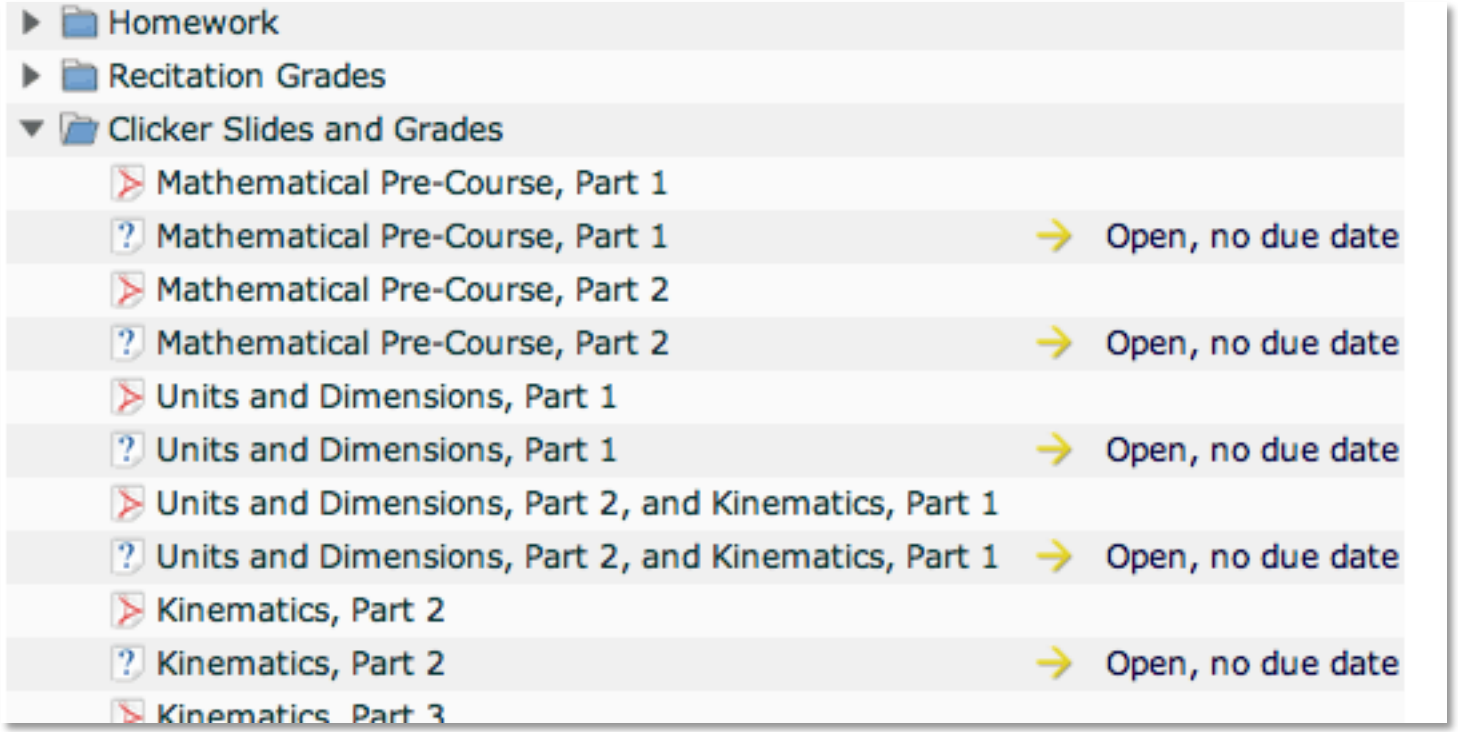
Clicker

- Bekommen (differentiell) Punkte sowohl für richtige als auch falsche Antworten



Clicker

- Noten eingebettet in den Kurs, zum Beispiel in Verbindung mit den Folien



Nach-Vorlesungsfragen

Hausübungen

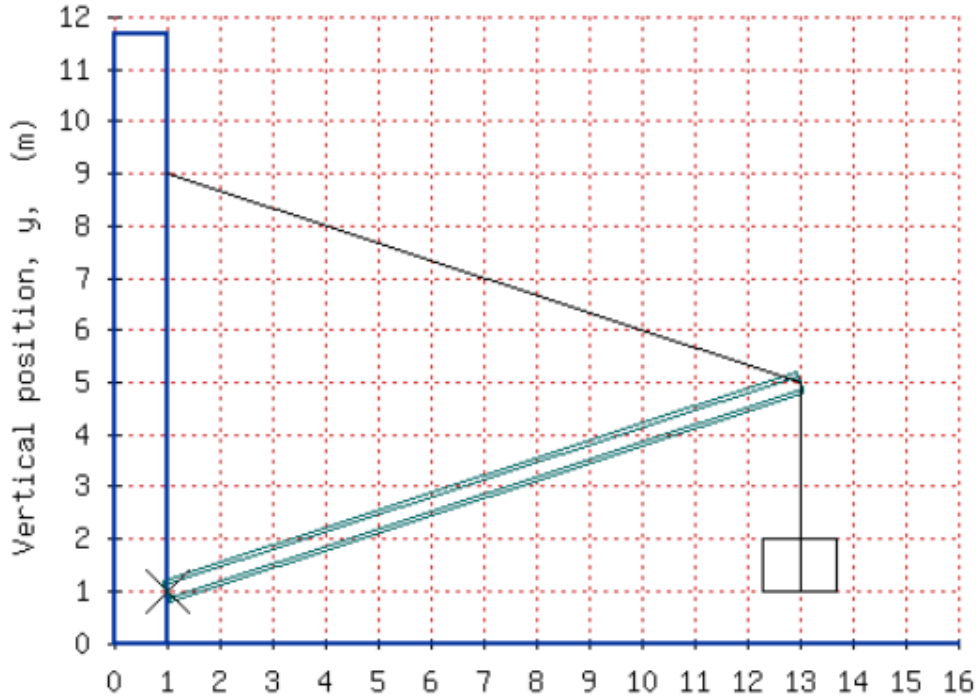
Online Diskussionen, “Helprooms”

Klausuren

Homework

- Anspruchsvollere Probleme (höhere Bloom Levels)
- Hochrandomisiert

A crate with a mass of 155.5 kg is suspended from the end of a uniform boom with mass of 89.5 kg. The upper end of the boom is supported by a cable attached to the wall and the lower end by a pivot (marked X) on the same wall. Calculate the tension in the cable.



Hausübungen

- Spezielle Betonung der Mathematik ...
  - einschließlich Unterstützung von
    - LaTeX
    - Maxima
    - R

What is the derivative of

$$\begin{pmatrix} 4\,t^3 \\ 8\,t^8 \end{pmatrix}$$

with respect to t? 4t^2,8t^7

You need to multiply with the original exponent.

Submit Answer Incorrect. Tries 1

Give an example of a function

1. which is orthogonal to $6\cdot\cos(7\cdot x)-2\cdot\sin(2\cdot x)$ with respect to the scalar product

$$< g \mid h > = \frac{1}{\pi} \int_{-\pi}^{\pi} dx\, g(x) \cdot h(x)$$

2. whose norm is 1.

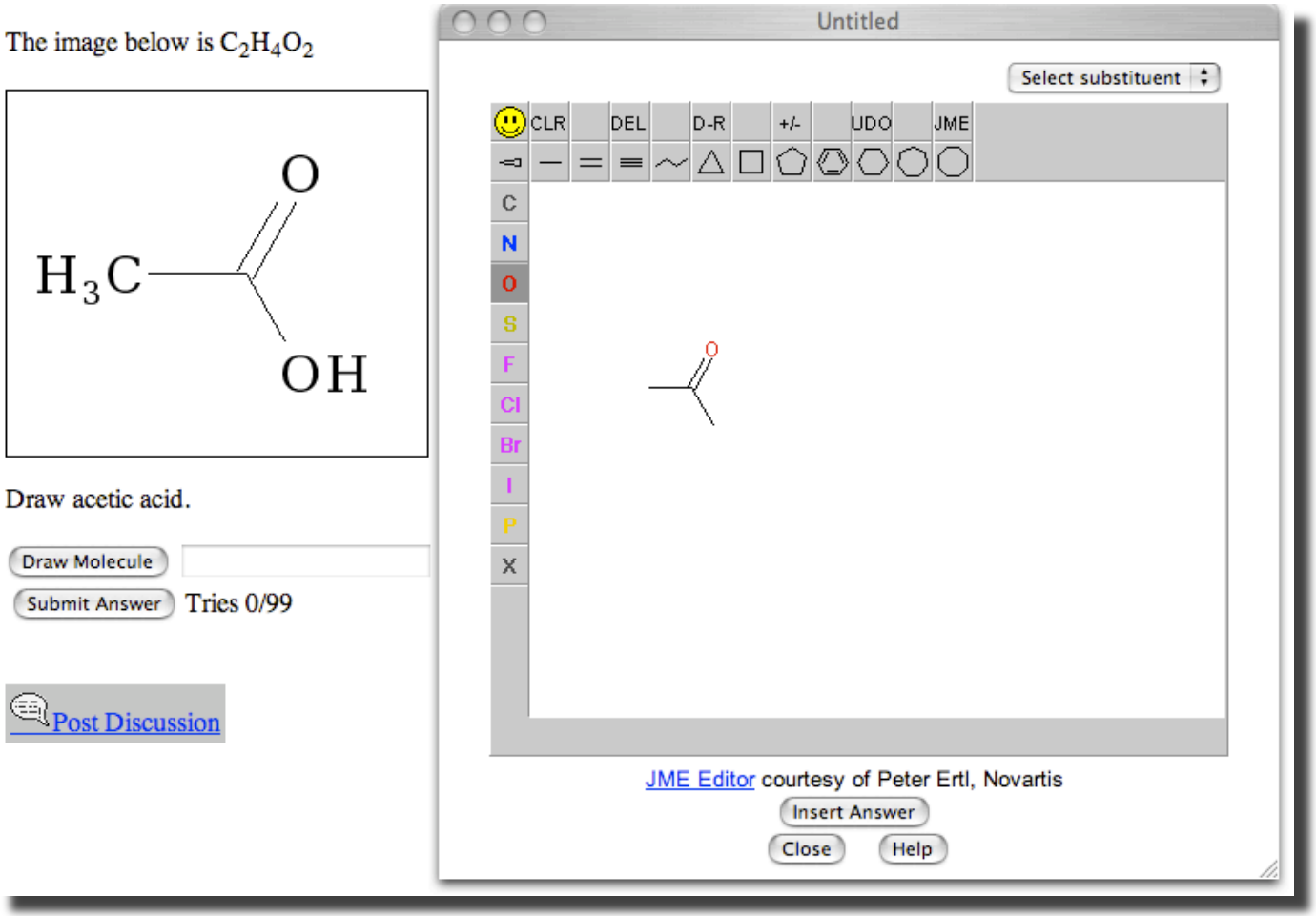
cos(2x)+sin(7x)

The function you have provided does not have a norm of one.

Submit Answer Incorrect. Tries 1

Hausübungen

- … Chemie …



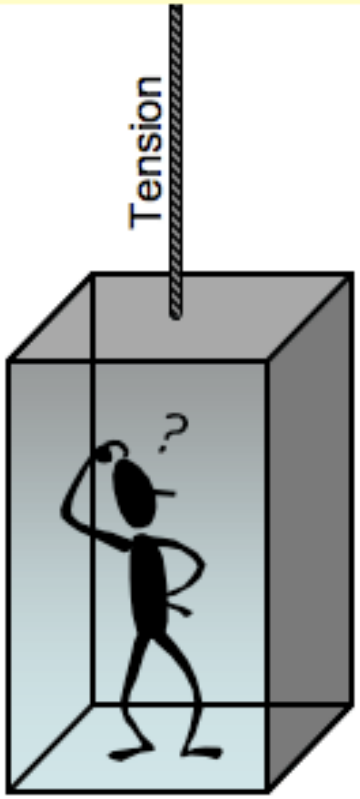
Hausübungen

- … und Physik.

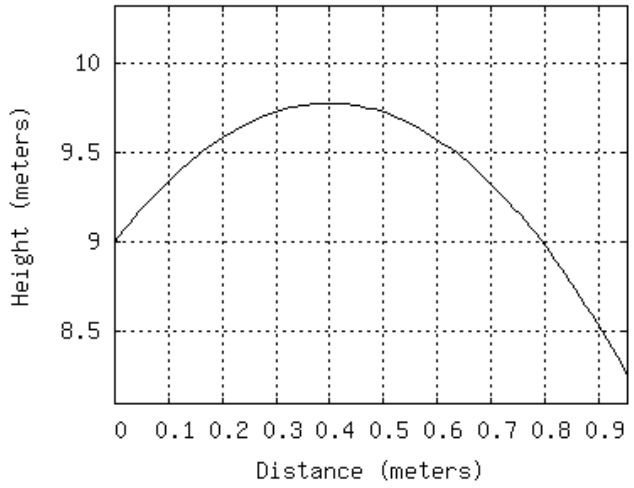
Elevator Problem Due never

An elevator (cabin mass 500 kg) is designed for a maximum load of 2600 kg, and to reach a velocity of 3 m/s in 5 s. For this scenario, what is the tension the elevator rope has to withstand? 32270 kg*m/s^2

Submit Answer Tries 0/99



Online Diskusionen



Diskusionen
Studierende werden ermutigt, zu diskutieren, da sie nicht einfach Antworten austauschen können
Wieder: Peer-Instruction.

The plot shows the trajectory (height versus distance) of an object launched at an angle of 75.6 degrees. What was the initial speed of the object? **4.0 m/s**
Computer's answer now shown above. Tries 0/12

Threaded View Chronological View Sorting/Filtering options Export?

Anonymous 1 (Fri Sep 22 01:26:29 2006 (EDT))

any hints to start?

Re: *Anonymous 2* (Fri Sep 22 01:56:48 2006 (EDT))

You need to find the Y component of velocity... you can do this by finding the height traveled (notice it does not start on the ground) and combining that with acceleration in a kinematics equation. From there use trig to get the original velocity.

Re: Re: *Anonymous 1* (Fri Sep 22 12:10:37 2006 (EDT))

how can we find the height traveled and how can we get the acceleration if we don't have the time?

Anonymous 3 (Fri Sep 22 16:41:27 2006 (EDT))

i'm lost on this one... can anyone help?

Re: *Anonymous 4* (Fri Sep 22 20:02:45 2006 (EDT))

Use the squared kinematics equation - so Vf^2 = Vi^2 + 2a (Xf-Xi).

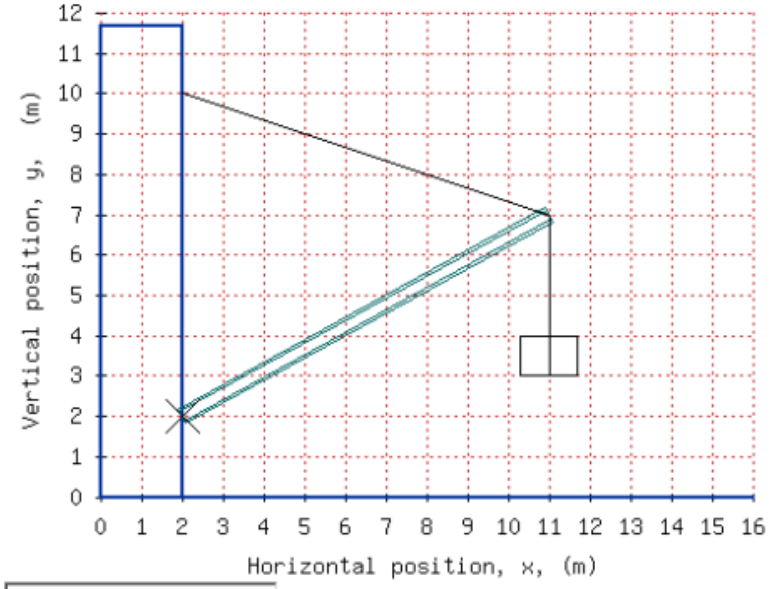
Helprooms

- Besetzt mit HiWis in den Abend-stunden
- Peer Instruction
- Zusammenarbeit beim Lernen

Klausuren

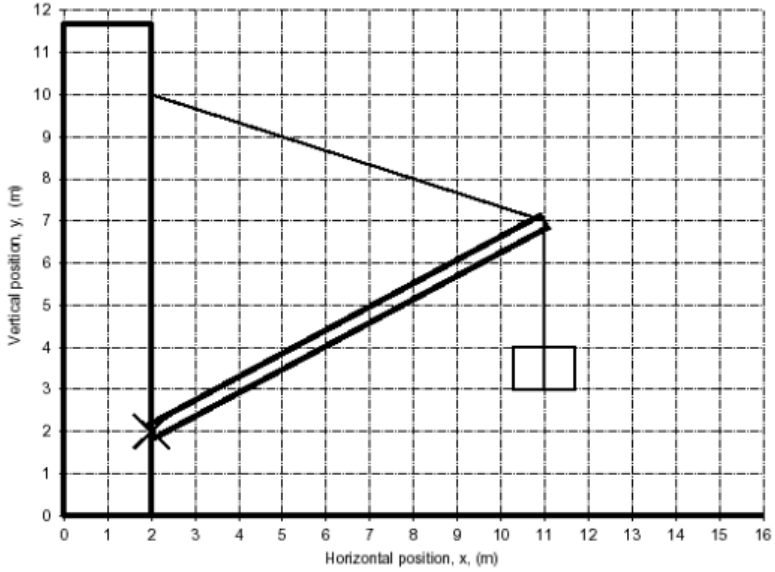
- Probleme können auch für Bubblesheets dargestellt werden
- Jeder Studierende hat eine andere Version

A crate with a mass of 177.5 kg is suspended from the end of a uniform boom with mass of 88.5 kg. The upper end of the boom is supported by a cable attached to the wall and the lower end by a pivot (marked X) on the same wall. Calculate the tension in the cable.



Submit Answer

1 pt A crate with a mass of 177.5 kg is suspended from the end of a uniform boom with mass of 88.5 kg. The upper end of the boom is supported by a cable attached to the wall and the lower end by a pivot (marked X) on the same wall. Calculate the tension in the cable.



(in N)

22. A○ 2.58×10^3 B○ 2.92×10^3 C○ 3.29×10^3
D○ 3.72×10^3 E○ 4.21×10^3 F○ 4.75×10^3
G○ 5.37×10^3 H○ 6.07×10^3

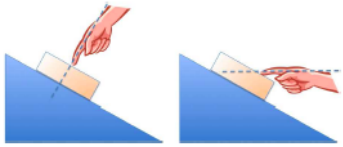
Klausuren

CODE - AACHDA
LB 271 - Introductory Physics Lecture
Version A

Name:

LB271 Fall 2009 Final Exam Version A

Gravitational Acceleration on Earth	$g = 9.81 m/s^2$
Gravitational Constant	$G = 6.67 \cdot 10^{-11} m^3/(kg \cdot s^2)$
Absolute Zero	-273.15°C
Gas Constant	$R = 8.31 J/(K \cdot mol)$
Boltzmann Constant	$k = 1.38 \cdot 10^{-23} J/K$
Avogadro's number	$N_A = 6.02 \cdot 10^{23}$ particles/mol
Specific heat of water vapor	$c_{vapor} = 0.48 kcal/(kg \cdot K)$
Specific heat of liquid water	$c_{water} = 1 kcal/(kg \cdot K) = 4186 J/(kg \cdot K)$
Specific heat of water ice	$c_{ice} = 0.5 kcal/(kg \cdot K)$
Latent heat of fusion for water	$L_f = 80 kcal/kg$
Latent heat of vaporizationfor water	$L_V = 540 kcal/kg$



A block is being held in place on an incline. The magnitude of the force applied by the hand on the block is the same in the left and the right scenarios.

1 pt In which scenario does the incline exert a lower normal force on the block?

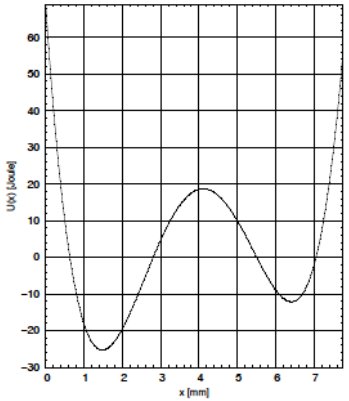
1. **A**○ The left scenario.
   B○ The right scenario.
   C○ Same in both scenarios.

1 pt In which scenario does the incline exert a lower frictional force on the block?

2. **A**○ The left scenario.
   B○ The right scenario.
   C○ Same in both scenarios.

1 pt By how many decibels does the sound intensity from a point source decrease if you increase the distance to it by a factor 6?

3. **A**○ 12.2 **B**○ 13.8 **C**○ 15.6 **D**○ 17.6
   E○ 19.9 **F**○ 22.5 **G**○ 25.4 **H**○ 28.7



1 pt
A particle is located at x=2.0 mm and has a kinetic energy of 29.5 Joule. What is the maximum x-coordinate the particle could reach? *(in mm)*

4. **A**○ 0.1 **B**○ 0.7 **C**○ 1.6 **D**○ 2.6
   E○ 3.2 **F**○ 4.7 **G**○ 5.3 **H**○ 7.6

Deep Space Nine sees Enterprise and a shuttle approach from exactly opposite directions with 0.8 c and 0.5 c, respectively.

1 pt At what fraction of the speed of light (β) does Enterprise see the shuttle approach?

5. **A**○ 0.00 **B**○ 0.50 **C**○ 0.83 **D**○ 0.91
   E○ 0.93 **F**○ 1.00 **G**○ 1.25 **H**○ 1.30

1 pt The shuttle has a length of 9 meters when at rest. How long is it in the system of Deep Space 9? *(in m)*

6. **A**○ 1.8 **B**○ 2.6 **C**○ 3.7 **D**○ 5.4
   E○ 7.8 **F**○ 11.3 **G**○ 16.4 **H**○ 23.8

1 pt Captain Picard on the Enterprise takes a 49 minute tea break. How long is this break in the system of Deep Space 9? *(in min)*

7. **A**○ 27 **B**○ 33 **C**○ 42 **D**○ 52
   E○ 65 **F**○ 82 **G**○ 102 **H**○ 128

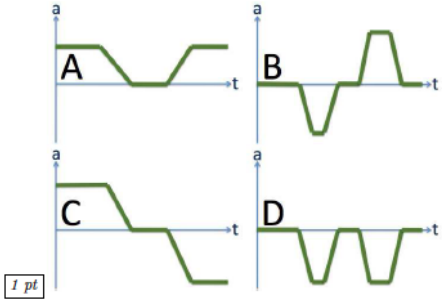
CODE - AACHDA
LB 271 - Introductory Physics Lecture
Version A

1 pt You have two organ pipes of the same length, one closed at both ends, one half open. Which one has a lower fundamental frequency?

8. **A**○ The closed pipe.
   B○ Same.
   C○ The half-open pipe.

1 pt In a very simple model of the lower atmosphere, air has a constant density of 1.26 kg/m³. How much would the air pressure change over a height difference of 130 m? *(in Pa)*

9. **A**○ 986 **B**○ 1110 **C**○ 1260 **D**○ 1420
   E○ 1610 **F**○ 1820 **G**○ 2050 **H**○ 2320



1 pt
A car drives in the forward (positive) direction. It first has a constant speed, then drives into a parking spot, waits for a few moments, and then drives out again backwards. Which one of the acceleration graphs could describe this scenario?

10. **A**○ Scenario A
    B○ Scenario B
    C○ Scenario C
    D○ Scenario D
    E○ None of the above.

1 pt
A box is sliding uphill as shown. What is the direction of the frictional force on the box?

11. **A**○ Downhill.
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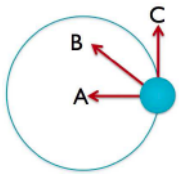

An object is rotating on a circular trajectory as shown. The indicated direction A is toward the center of the trajectory, C is tangential to the trajectory. The object is **rotating clockwise** and **slowing down**.

1 pt What could be the direction of the (linear) acceleration?

12. **A**○ Direction A.
    B○ Direction B.
    C○ Direction C.
    D○ Into the paper.
    E○ Out of the paper.

1 pt What could be the direction of the angular acceleration?

13. **A**○ Direction A.
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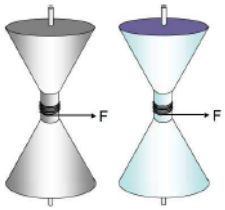
1 pt



You have two identical looking spools (same mass, same shape, same size). However, one is hollow, made from iron, the other is solid, made from aluminum. A string is wound around each spool. If you pull on both strings with equal forces, which spool is going to have the larger angular acceleration?

14. **A**○ Same
    B○ The solid spool
    C○ The hollow spool

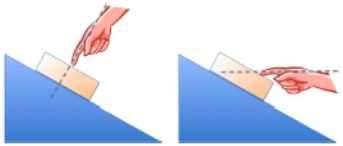
Klausuren

CODE - AAFIHH
LB 271 - Introductory Physics Lecture
Version A

Name:

LB271 Fall 2009 Final Exam Version A

Gravitational Acceleration on Earth	$g = 9.81 m/s^2$
Gravitational Constant	$G = 6.67 \cdot 10^{-11} m^3/(kg \cdot s^2)$
Absolute Zero	-273.15°C
Gas Constant	$R = 8.31 J/(K \cdot mol)$
Boltzmann Constant	$k = 1.38 \cdot 10^{-25} J/K$
Avogadro's number	$N_A = 6.02 \cdot 10^{25}$ particles/mol
Specific heat of water vapor	$c_{vapor} = 0.48 kcal/(kg \cdot K)$
Specific heat of liquid water	$c_{water} = 1 kcal/(kg \cdot K) = 4186 J/(kg \cdot K)$
Specific heat of water ice	$c_{ice} = 0.5 kcal/(kg \cdot K)$
Latent heat of fusion for water	$L_f = 80 kcal/kg$
Latent heat of vaporizationfor water	$L_v = 540 kcal/kg$



A block is being held in place on an incline. The magnitude of the force applied by the hand on the block is the same in the left and the right scenarios.

1 pt In which scenario does the incline exert a higher frictional force on the block?

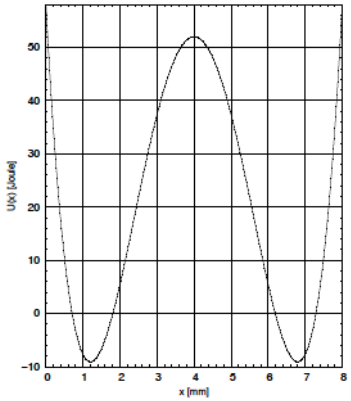
1. **A**○ The left scenario.
   B○ The right scenario.
   C○ Same in both scenarios.

1 pt In which scenario does the incline exert a higher normal force on the block?

2. **A**○ The left scenario.
   B○ The right scenario.
   C○ Same in both scenarios.

1 pt By how many decibels does the sound intensity from a point source decrease if you increase the distance to it by a factor 6?

3. **A**○ 7.10 **B**○ 8.31 **C**○ 9.72 **D**○ 11.4
   E○ 13.3 **F**○ 15.6 **G**○ 18.2 **H**○ 21.3



1 pt A particle is located at x=5.5 mm and has a kinetic energy of 9.8 Joule. What is the minimum x-coordinate the particle could reach? *(in* mm*)*

4. **A**○ 1.6 **B**○ 2.6 **C**○ 2.7 **D**○ 2.9
   E○ 3.0 **F**○ 3.8 **G**○ 5.2 **H**○ 6.9

Deep Space Nine sees Enterprise and a shuttle approach from exactly opposite directions with 0.8 c and 0.4 c, respectively.

1 pt At what fraction of the speed of light (β) does Enterprise see the shuttle approach?

5. **A**○ 0.00 **B**○ 0.47 **C**○ 0.50 **D**○ 0.59
   E○ 0.78 **F**○ 0.91 **G**○ 1.00 **H**○ 1.20

1 pt The shuttle has a length of 12 meters when at rest. How long is it in the system of Deep Space 9? *(in* m*)*

6. **A**○ 3.6 **B**○ 4.5 **C**○ 5.6 **D**○ 7.0
   E○ 8.8 **F**○ 11.0 **G**○ 13.7 **H**○ 17.2

1 pt Captain Picard on the Enterprise takes a 35 minute tea break. How long is this break in the system of Deep Space 9? *(in* min*)*

7. **A**○ 19 **B**○ 28 **C**○ 40 **D**○ 58
   E○ 85 **F**○ 123 **G**○ 178 **H**○ 258

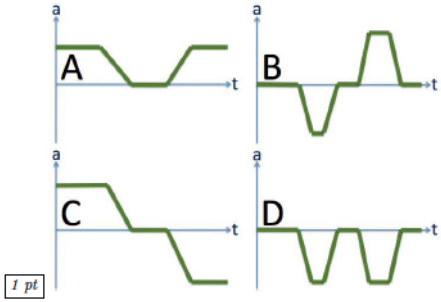
CODE - AAFIHH
LB 271 - Introductory Physics Lecture
Version A

1 pt You have two organ pipes of the same length, one closed at both ends, one half open. Which one has a lower fundamental frequency?

8. **A**○ Same.
   B○ The closed pipe.
   C○ The half-open pipe.

1 pt In a very simple model of the lower atmosphere, air has a constant density of 1.22 kg/m³. How much would the air pressure change over a height difference of 110 m? *(in* Pa*)*

9. **A**○ 1320 **B**○ 1490 **C**○ 1680 **D**○ 1900
   E○ 2150 **F**○ 2430 **G**○ 2740 **H**○ 3100



1 pt

A car drives in the forward (positive) direction. It first has a constant speed, then drives into a parking spot, waits for a few moments, and then drives out again backwards. Which one of the acceleration graphs could describe this scenario?

10. **A**○ Scenario A
    B○ Scenario B
    C○ Scenario C
    D○ Scenario D
    E○ None of the above.

1 pt

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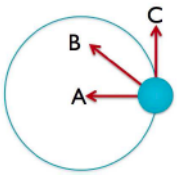

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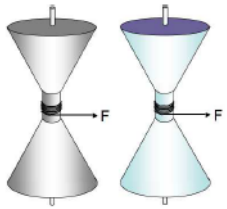


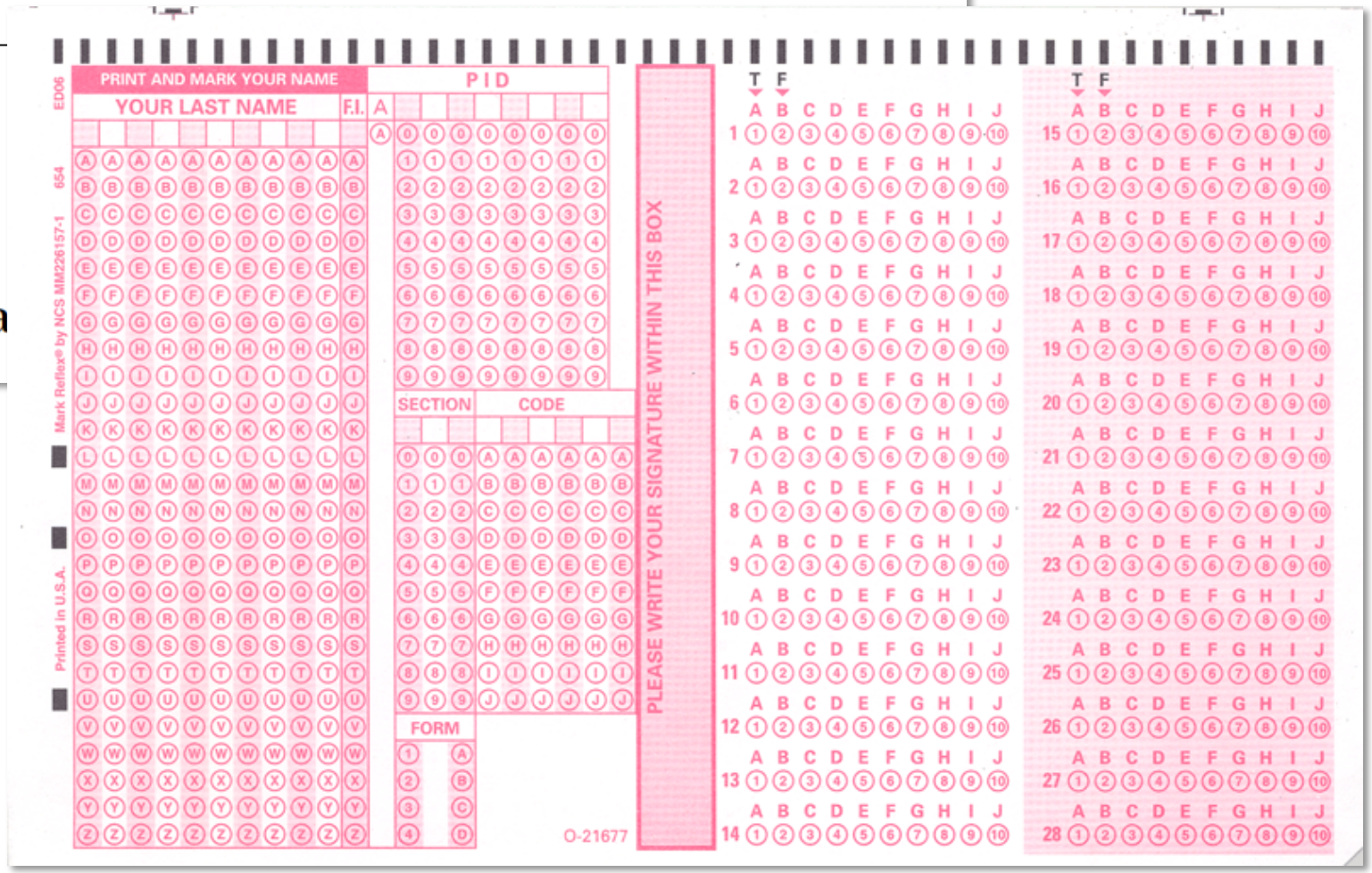
14. **A**○ The solid spool
    B○ The hollow spool
    C○ Same

Klausuren

CODE - AACHDA
LB 271 - Introductory Physics Lecture
Version A

Name:

LB271 Fa

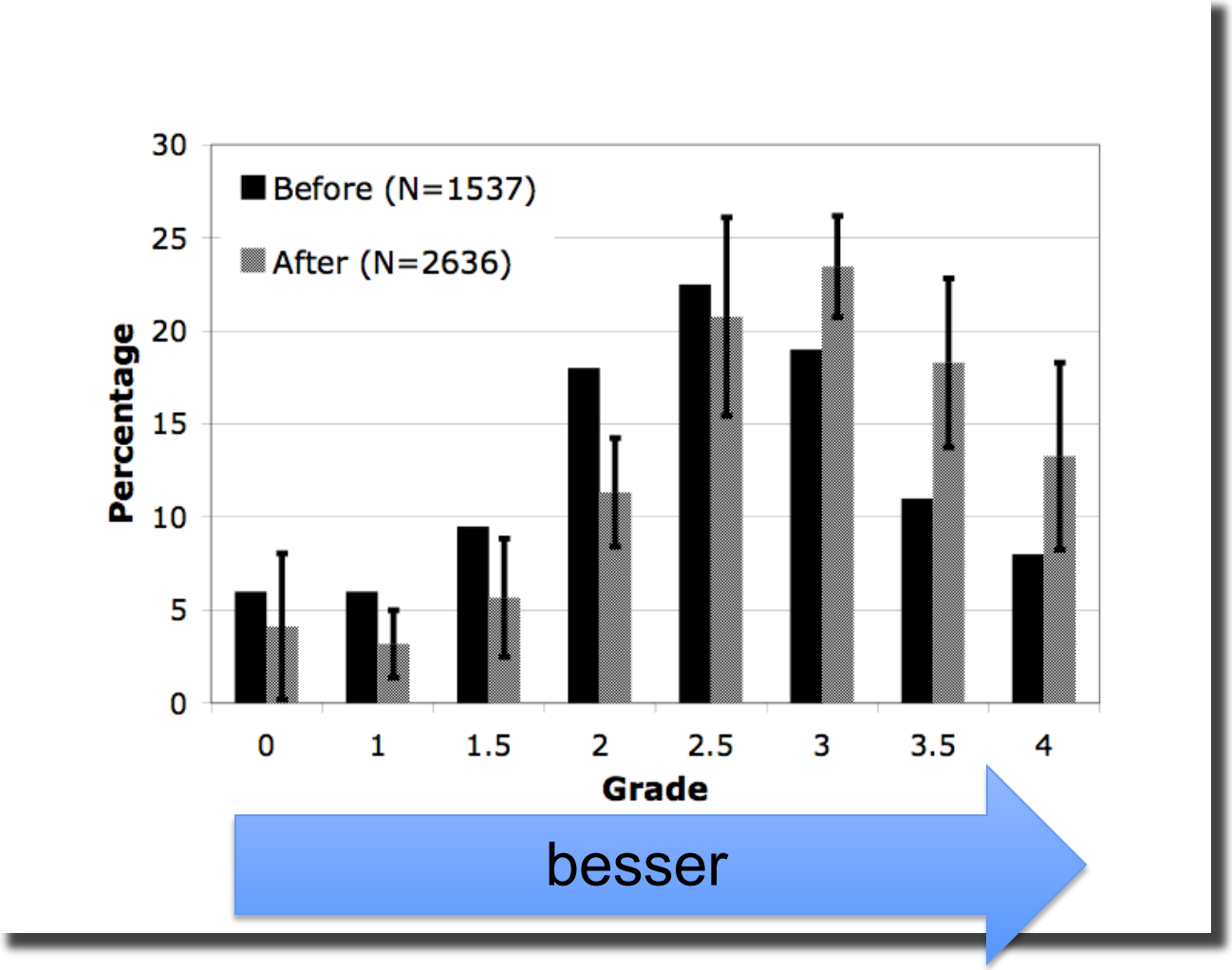


Bevor wir weitermachen …

… funktioniert das überhaupt?

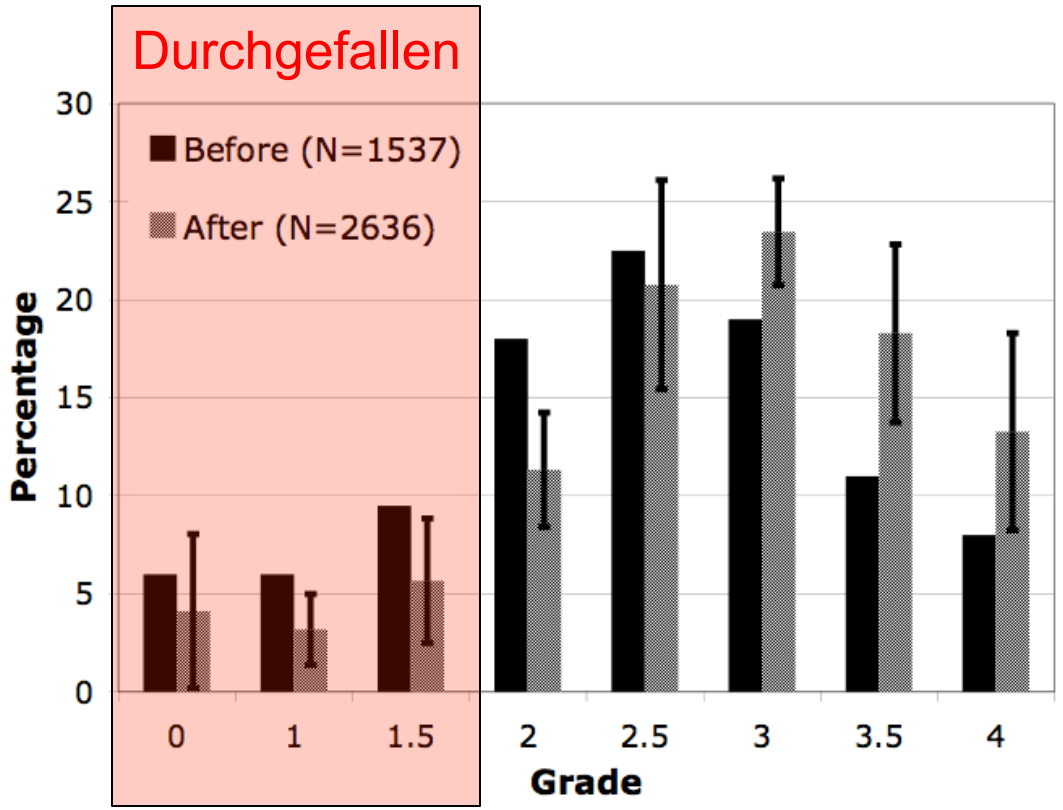
Lernerfolg

•Intro Physics for Scientists and Engineers
• Notenspiegel in Jahren vor und nach Einführung von online Übungen



Lernerfolg

Hilft besonders Studierenden, die an der Schwelle zum Durchfallen sind



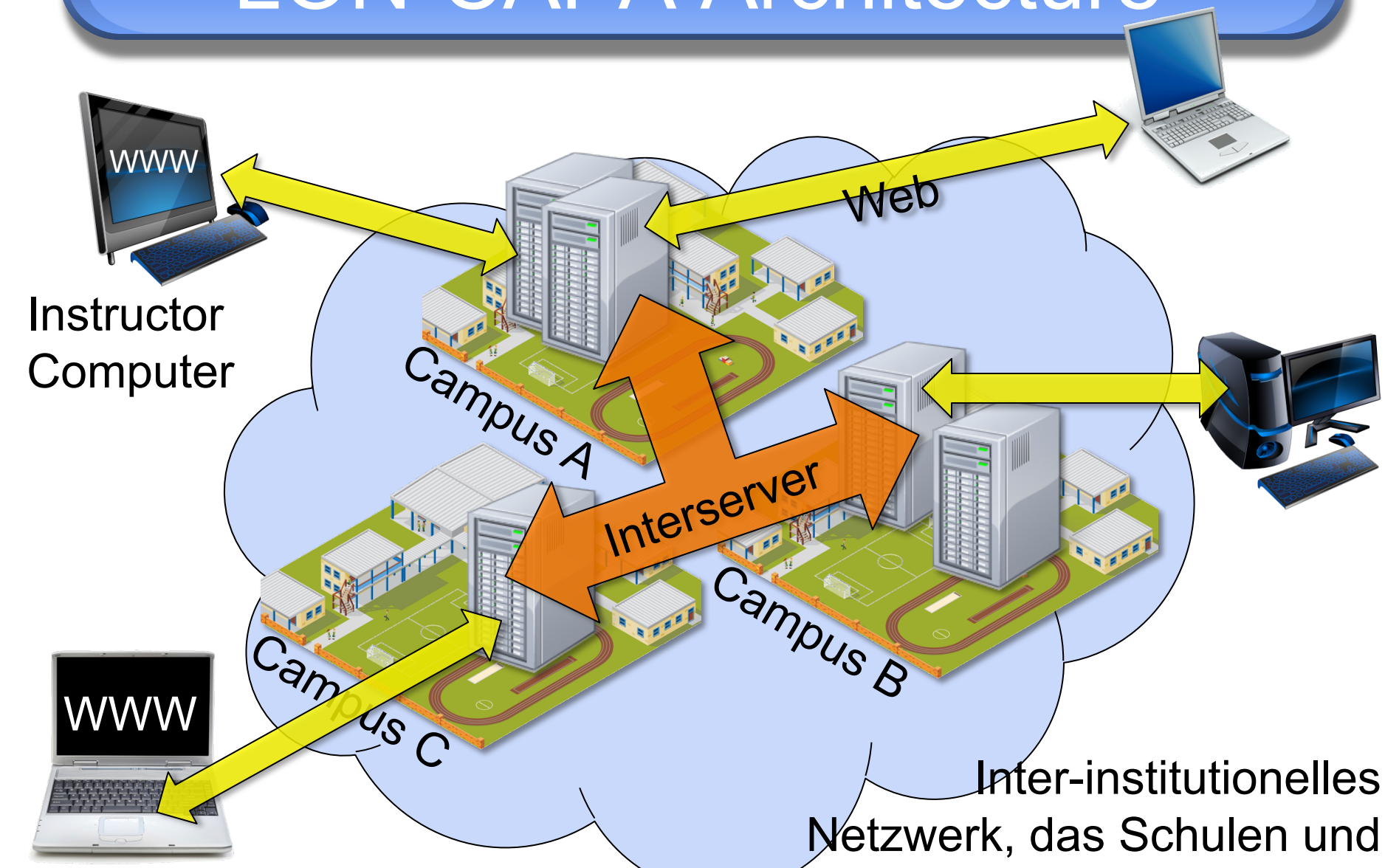
Wie ist das realistisch verwirklichbar?

Professoren haben nicht beliebig viel Zeit

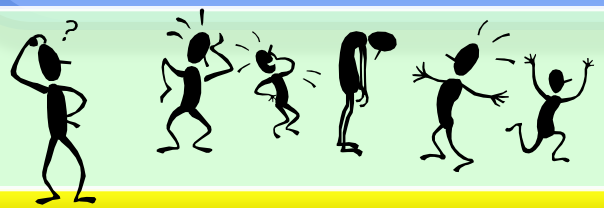
Ressourcen wiederverwenden

- Das Erstellen von online Ressourcen ist viel Arbeit
- Für nur einen Kurs eine Verschwendung von Zeit und Aufwand
- Viele Ressourcen könnten über Kursgrenzen hinaus verwendet werden

LON-CAPA Architecture



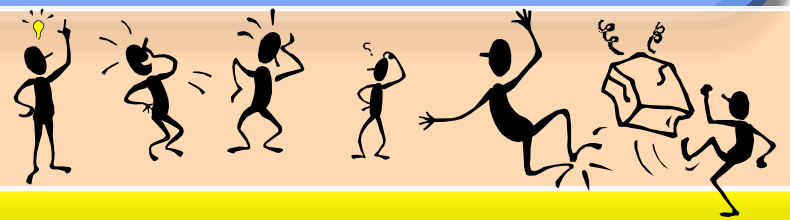
LON-CAPA Architektur



Course Management

Campus A

Ressource Zusammenstellung



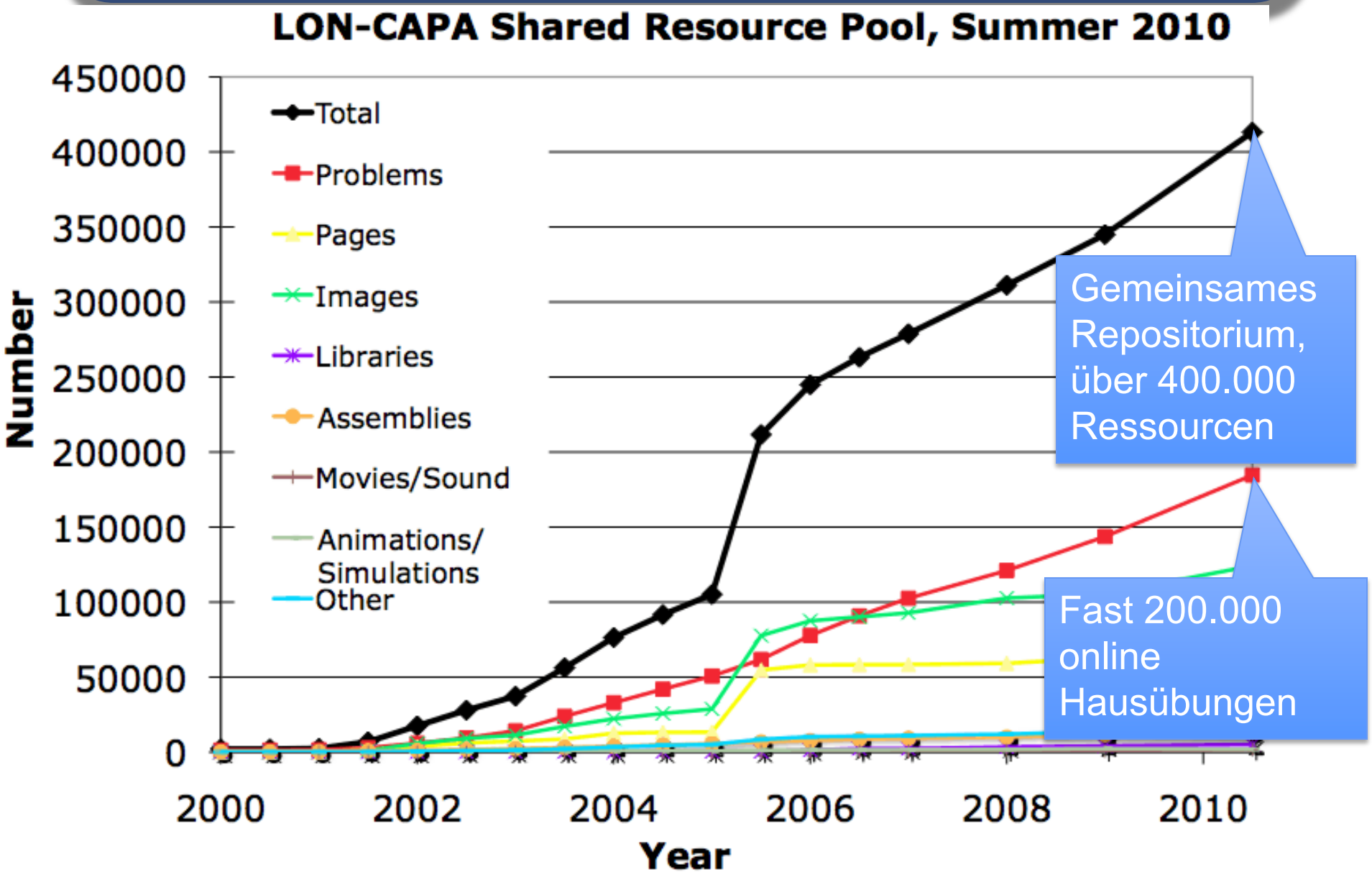
Course Management

Campus B

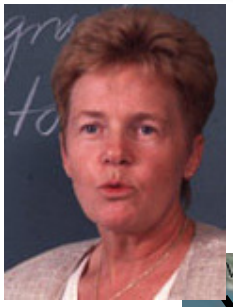
Ressource Zusammenstellung

Gemeinsames Repositorium

Die LON-CAPA Gemeinschaft

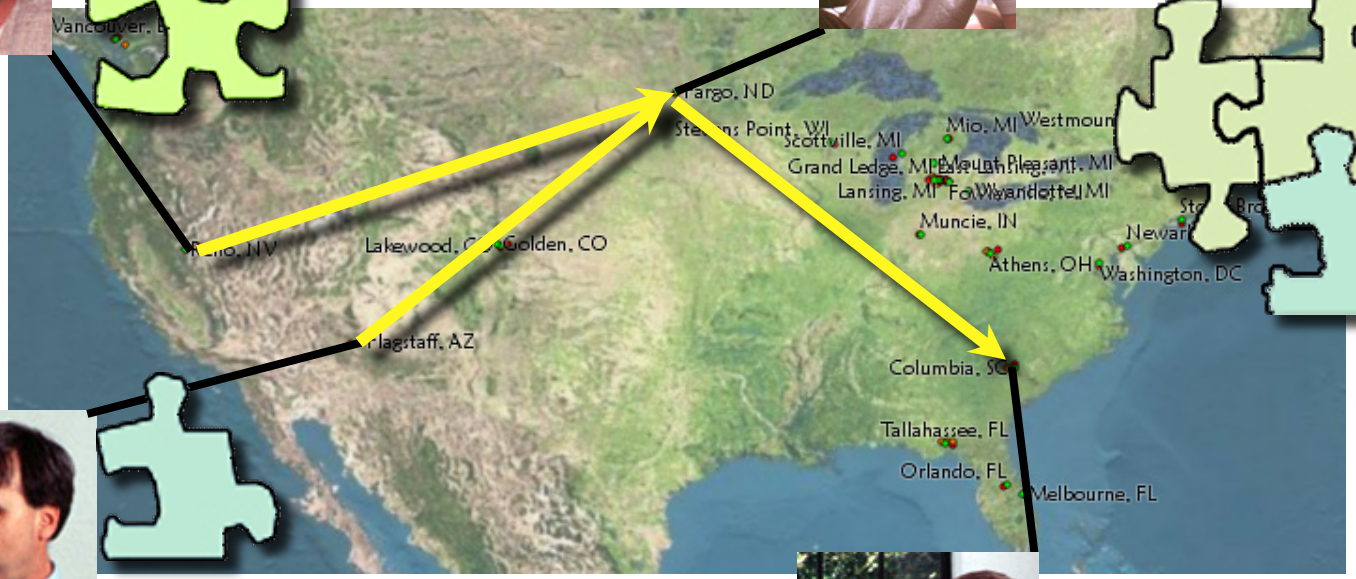


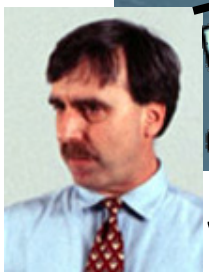
Ressourcen Zusammenstellung



Schreibt Modul über Energieerhaltung

Stellt Modul über Erhaltungsgrößen zusammen



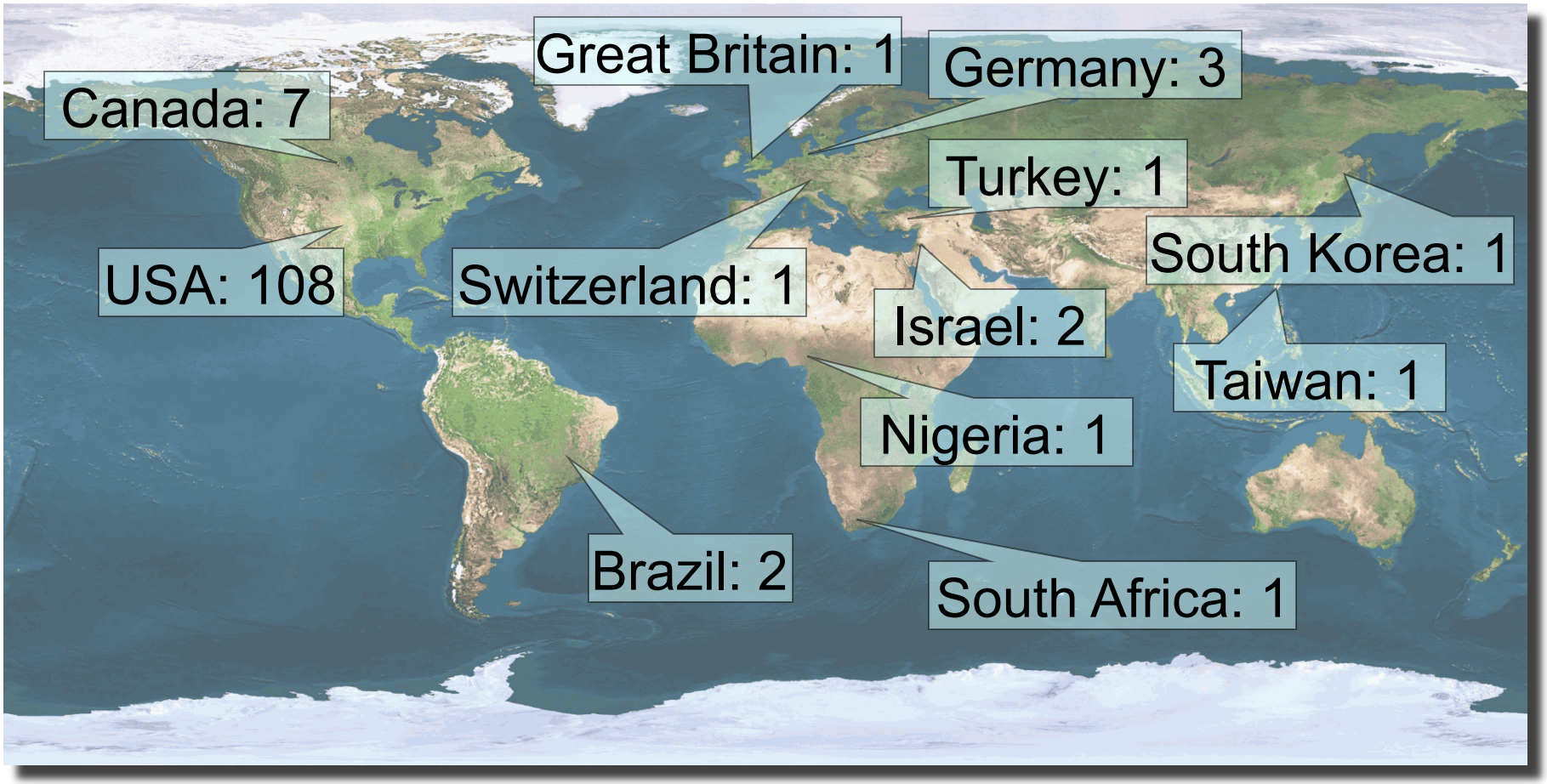


Schreibt Modul über Impulserhaltung

Benutzt das kombinierte Modul in seiner Vorlesung

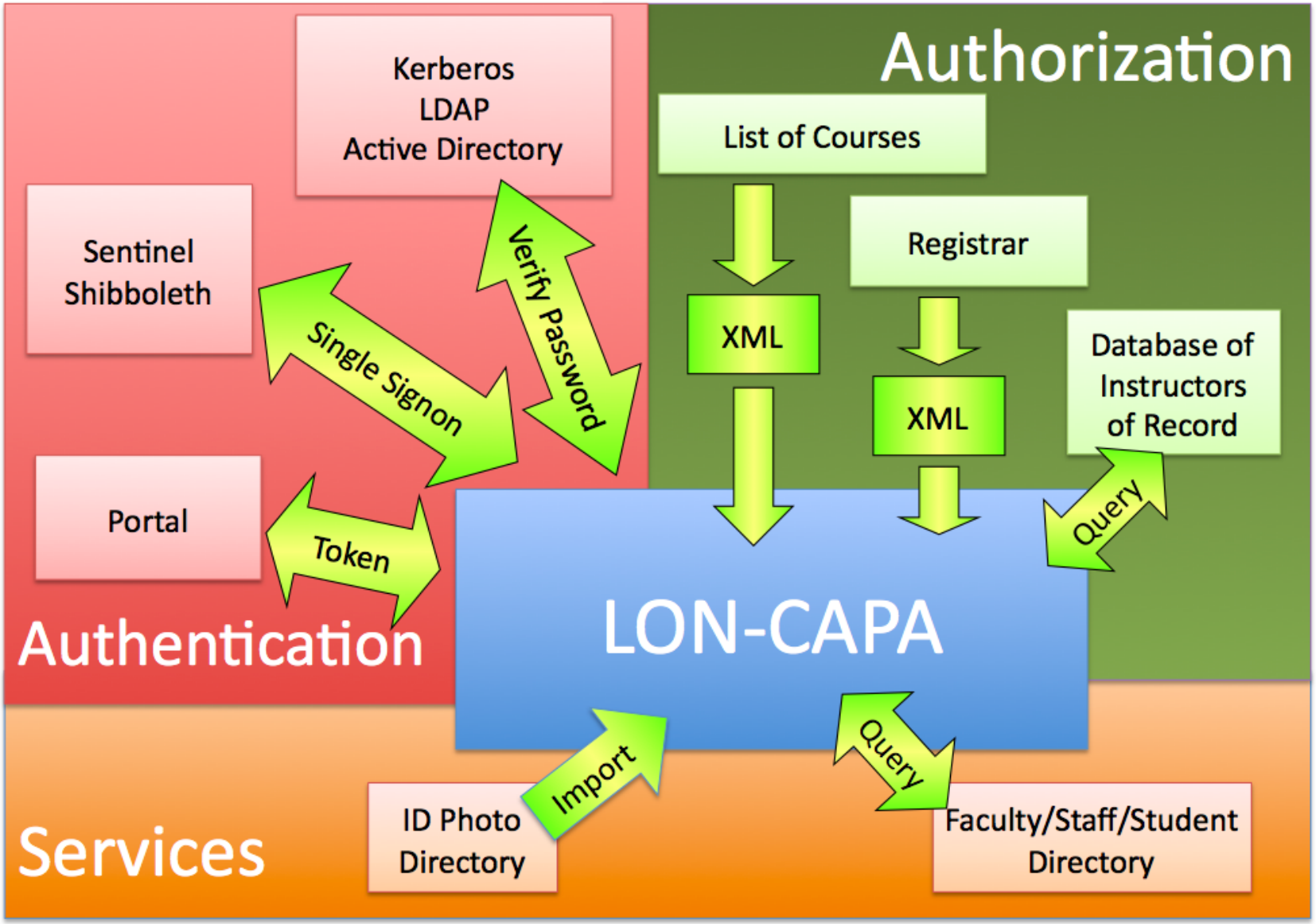
Die LON-CAPA Gemeinschaft

Schulen, Hochschulen und Universitäten



… plus grant projects and publishing companies.

Global handeln, lokal denken



Vielen Dank!

Gerd Kortemeyer

korte@lite.msu.edu

http://www.lon-capa.org/