

Level 1

Blue Medical Physics Facility

- Provided with annual fund
- Students buy equipment for summer
- Considered in annual budget order
- Discovered that equipment is provided

Level 2

Brian's Fan Club

different difficulty levels

different year

different price

different quantity

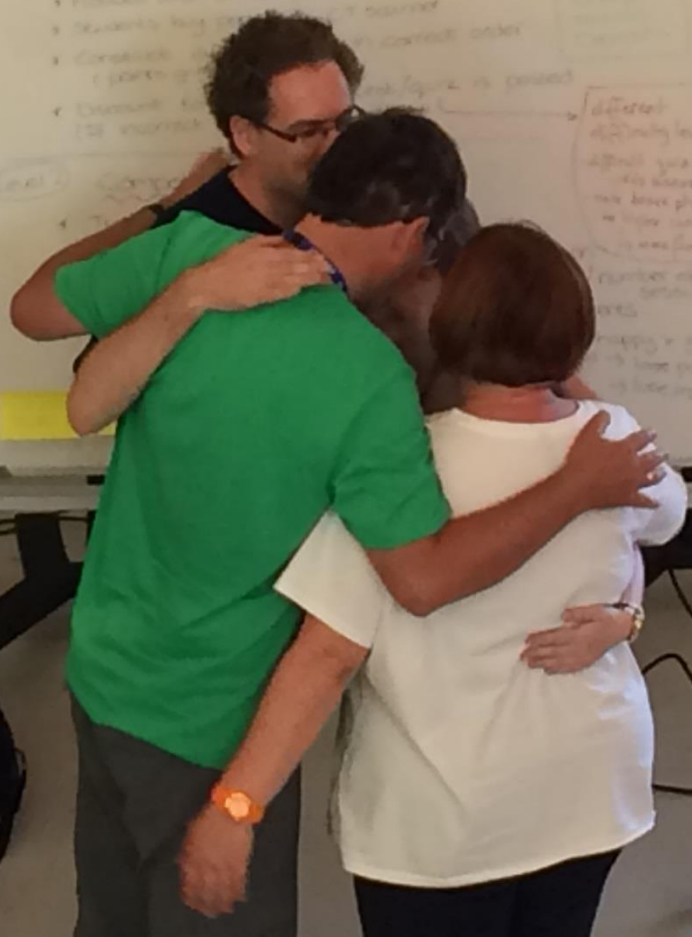
different number of attendees

different number of items

different number of items

different number of items

different number of items





Learning Intention

compare and contrast
different imaging techniques

→ advantage / disadvantages.

copy-centre

Level 1

① Build Medical Physics Facility

- * Provided with annual fund
- * Students buy parts eg. CT scanner
- * Construct different areas in correct order (parts given)
- * Discount for parts if a test/quiz is passed (If incorrect → points lost)

Brian's Fan Club

Patrick
Grzegorz
Nataša
Deborah

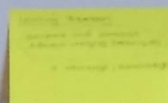
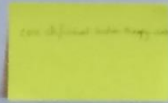
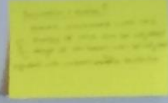
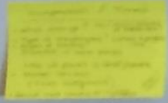
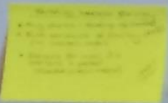
different difficulty levels:

- difficult quiz yields bonus pts
- more bonus pts
↳ higher cure rate
↳ more funds

Level 2

Competition

- * Two hospitals compete to save the most patients.
- * Student selects the dosage/energy/location of markers / angles of gantry / treatment type / number of sessions.
- * Hospital receives more money for surviving patients.



Please vote
online for LA

Group name
1. Who? Age group 15-18

The Smurfs Miles, Gurpreet, Patrick, Zach Chris, Parvika

Hadron Therapy Tech

- Tools (None → Advanced)
- Difficulty (Simple → Complex)
 - Control
 - Beam (Energy, Dose, Type, etc.)
 - Accelerator (Wavelength, etc.)
 - Imaging (PET, CT, MRI)
 - 3D imaging of organs with explorations



- Progress
- 1
 - 2
 - 3
 - 4
 - 5
 - 6

Hugging point



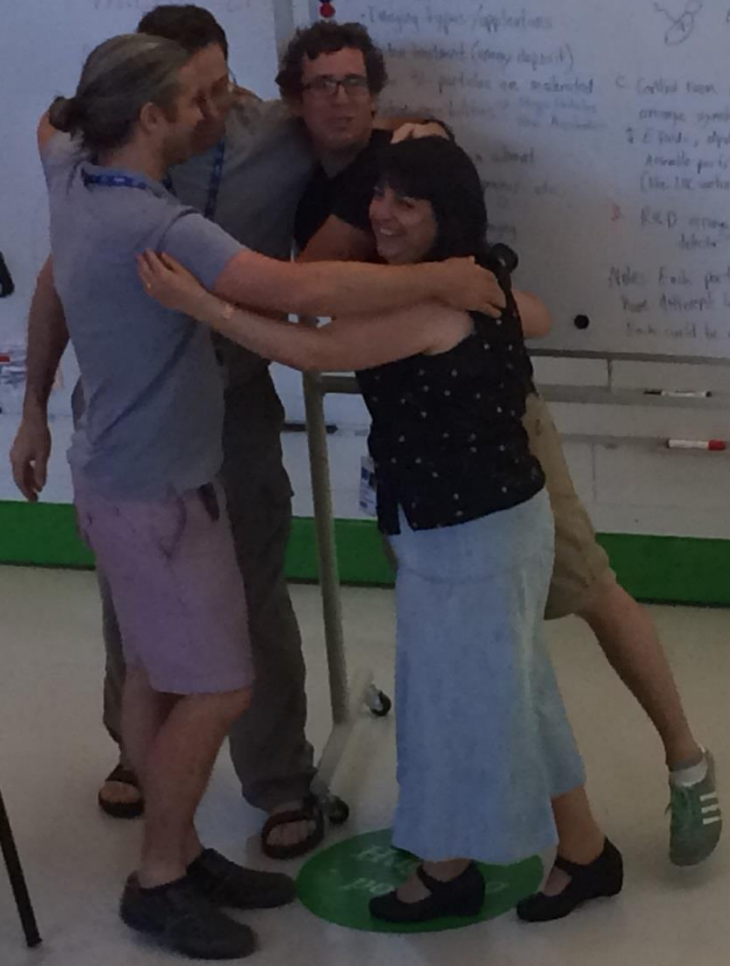
Please vote
same for
middle left

Group name
1 Who? Age group 15-18

Hadronics
Gluons, quarks, leptons, neutrinos

- 1) Particle energy, gives images and almost, adjust energy
- 2) Collide beam, then particle E, arrange symbols, not least
- 3) R&D wrong, not use lower population data

Notes: Each part (A,B,C,D) could have different levels of achievement. Task could be completed on its own







module name
project
container no.
started

Please vote
online for the
mid
model
of ideas
or from

Habermas
• Lower self model
• Energy types / applications
• Value instead (Gross diagram)
• How to partition an individual
• False possibilities
• Trapping: Access internet
log, how, process, who
• Non-epistemic energy
• Habermas: social theory and action
• Social theory and energy
and action: social energy
• Social from Gross: partition
energy, symbols and how
I.E. like, which, possible
• Power: power
(Can be social work)
• Is it necessary to be popular
before?
• Habermas: social theory and action
• Habermas: social theory and action
• Habermas: social theory and action

Build Your
Bubble

NPSD



Please vote
online for

Group name
1 Who? Age group 15-18

The Smurfs

Milos Gurbrest, Patrick, Zach

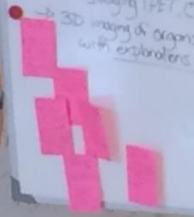
chess article

Hadron Therapy Tech

- * Levels (None → Advanced)
- * Difficulty (Simple → Complex)
 - Control
 - Beam (Energy, Beam Type, etc.)
 - Accelerator (Magnets, etc.)
 - Imaging (PET, CT, MRI)
 - 3D imaging & diagnosis with endoscopes.

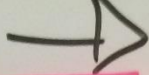


- numbers
- 1
 - 2
 - 3
 - 4
 - 5
 - 6



Fun
score





3D imaging of a with explanation

→ Path through the center

- * Role Playing - students
- * research to answer patient questions
- * What are we looking for in a useful game?
- Connection of Chem, Phys & Bio.
- * Learning Objectives
- Smarts

* What are we looking for in a game?

→ Connection to Chem, Phys & Bio (Fluid connection to each so that the pit is that the topics are interconnected.)

* Hadron Therapy Tech

→ Several parameters into explanation

→ students randomly act, to achieve "success"

→ show effects on DNA

- * Choose Beam size
- * Beam Energy (x-ray, p, ion)
- * Beam Position (early work)
- * Allow Development's Variable
- Blood Cancer Growth
- * Imaging (CT, PET)
- * Healthy Tissue/Tumor Destroyed

* What sections of the site could be developed to meet these needs?

→ Interactive Lessons

- Bio - Anatomy
- Chem - Organ
- Phys - Blood Cells
- Physics - Hadron Therapy

* 3D Organ

* Class Ranking System based on "Success Rate"

* Levels

→ Notice (single things forward)

→ more difficult

Adv

- Control Accelerator
- + Max parameters
- good reflect
- dipole
- Accelerator E

* Build your own accelerator

* Easy (head & back)

* Hard (Long & Organ)

* Hard (Long & Organ)

- * Time Resources
- * Typical Patient Knowledge
- focused on patient therapy
- Imaging
- * Multiple Beam Therapy

The Smurfs: Miloš, Gurpreet, Patrick, Zach

Hadron Therapy Tech

* Levels (Novice → Advanced)

* Difficulty (Simple → Complex)

→ Control

→ Beam (Energy, Position, Type, etc..)

→ Accelerator (Magnets, etc..)

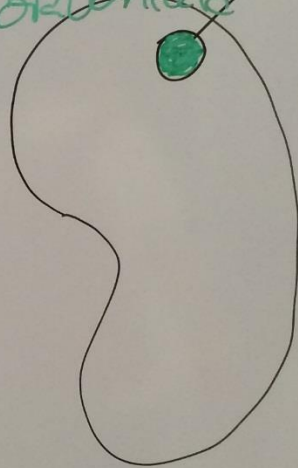
→ Imaging (PET, CT, MRI)

→ 3D imaging of organs
with explanations.

choose particle

(γ) (P) (e)

3D proton
ORBITATE



Parameters

1	← →
2	0 0 0 0 0
3	← →
4	← →
5	0 0 0 0 0
6	0 0 0 0 0

FUN
SUCCESS ↔ SCORE

Several pink sticky notes are attached to the whiteboard, containing various handwritten notes and diagrams.



Please vote

Group name
1 Who? Age group 15-18
2 Why? Learning objectives
3 What? Part of the map

Hadrantes

1 Lower vlt model
- Energy types / approaches
- Make answers (energy depend)
- How to particle, or distributed
- Fiber possibilities? new hardware

2 Energy above what
long low power etc.
- new approach energy

3 Particle energy, great imaging
and what about energy

4 Colored from same particle
energy, symmetries and how
5 E field, optics, geometry
available parts
(the 14 km tunnel)

6 Fix D, wrong in
labors?

Notes: Each part
has different logic
Each could be

Hugging
point





Group name: Hadrons

1) 15-16

2) Lower will model

- Imaging types/applications
- Media treatment (copy deposit)
- How % particles are accelerated
- Future possibilities?

3) Imaging. Assign subject

- lung
- bone
- pancreas etc.

choose appropriate imaging

PET
CT
etc.

Particle energy, angle, timing and almost, almost energy

Control from same point E, gamma, synchrotron, and laser

E field, dipole, quadrupole, sextupole

(the 12 vertical rows)

Rx/D: energy, not speed, position, identity?

Notes: Each part (Rx/D) could have different levels of sub-components. Each could be completed in its own

module name
project
container no.
started

module name

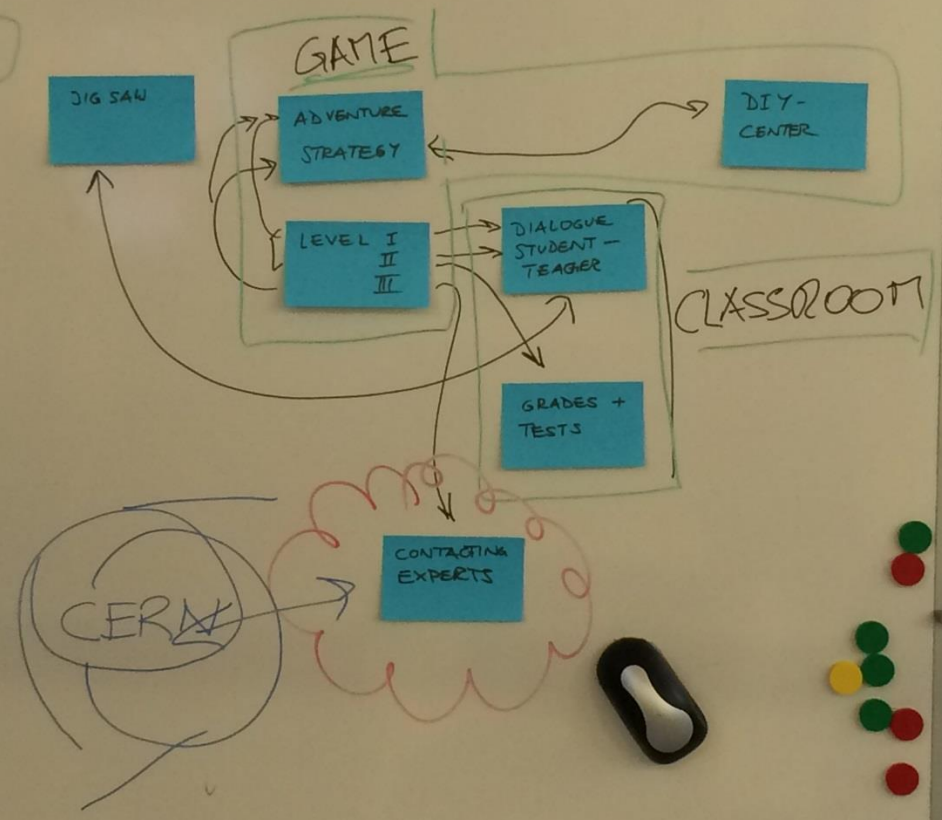
Huggett - Point

COLLABORATORS

LIVIA ANNE RIGONDA THOMAS

SUBJECTS

- IMAGING CT/PET
- TREATMENT PLAN
- BEAM ACCELERATOR
- X-RAY VS. PROTON THERAPY
- CANCER THERAPY









module
project
container

←

catch
BOX

SOME THINGS
ARE BETTER

Simulation / Game?

- Patient irradiated with ions
 - Energy of ions can be adjusted
 - Angle of ion beam can be adjusted
- adjusted with controls ^{by} ~~that~~ students.

cern.ch/virtual-hadron-therapy-centre

Level 1

① Build Medical Physics Facility

- * Provided with annual fund.
- * Students buy parts eg. CT scanner
- * Construct different areas in correct order (points given)
- * Discount for parts if a test/quiz is passed (If incorrect → points lost).

Brian's Fan Club

- Patrick
- Grzegorz
- Nataša
- Deborah

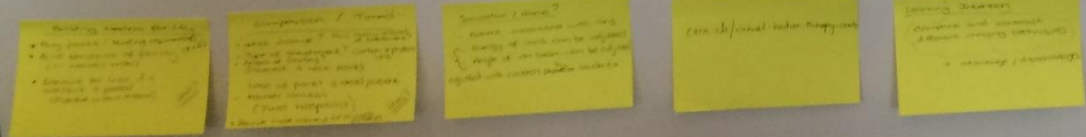
different difficulty levels:

- difficult quiz yields bonus pts
- more bonus pts
 - ↳ higher cure rate
 - ↳ more funds

Level 2

Competition

- * Two hospitals compete to save the most patients.
- * Student select the dosage/energy/location of markers / angles of gantry / treatment type / number of sessions.
- * Hospital receives more money for surviving patients and patient satisfaction * (Patient may not be happy & go to another hospital → lose points) → lose money)





COLLABORATION
 YOU HAVE RESPONDED THANKS

The Smurfs Miloš, Gorpo

Several people are seated on the left side of the room, including a woman in a pink top and a woman in a blue top. A man in a grey shirt stands near a large black screen in the background.

Three women are standing in the center of the room, engaged in conversation. One woman is pointing towards the whiteboard. A man in a yellow shirt is partially visible on the right side of the frame, holding a white mug.

GROUP

NAME :

Hadronites

Scott, Mike, Silva, 'Nando

1) 15-18

2) Learner will model

- Imaging types / applications
- Hadron treatment (energy deposit)
- How +/- particles are accelerated
- Future possibilities?

3) ^A Imaging: Assign ailment

lung brain pancreas etc...

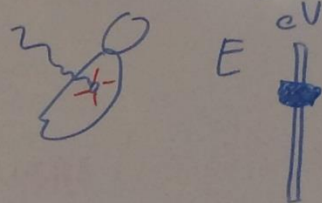
○ ⊗ ○

choose appropriate imaging

PET e⁺ etc...

○ ○

B. Particle energy: given imaging and ailment, adjust energy



C. Control room: Given particle E arrange synchrotron and beam
↓ E fields, dipoles, quadrupoles
Assemble parts?
(like LHC control room)

D. R&D - arrange new age laser propulsion detector?

Note: Each part (A, B, C, D) could have different levels of achievements.
Each could be

GROUP

NAME :

Hadronites

Scott, Mike, Silva, 'Nando

1) 15-18

2) Learner will model

- Imaging types / applications
- Hadron treatment (energy deposit)
- How +/- particles are accelerated
- Future possibilities?

3) ^A Imaging: Assign ailment

lung brain pancreas etc...

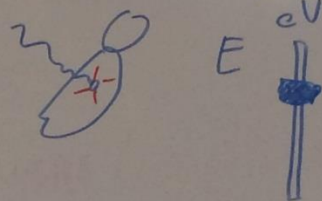
○ ⊗ ○

choose appropriate imaging

PET e⁺ etc...

○ ○

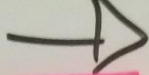
B. Particle energy: given imaging and ailment, adjust energy



C. Control room: Given particle E arrange synchrotron and beam
↓ E fields, dipoles, quadrupoles
Assemble parts?
(like LHC control room)

D. R&D - arrange new age laser propulsion detector?

Note: Each part (A, B, C, D) could have different levels of achievements.
Each could be



3D imaging of o with explana

→ Path through the center

- * Role Playing - students
- * research to answer patient questions
- * What are we looking for in a useful game?
- Connection of Chem, Phys & Bio.
- * Learning Objectives
- Smurfs

* What are we looking for in a game?

- Connection to Chem, Phys & Bio (Fluid connection to each so that the pit is that the topics are interconnected.)

* Holon Therapy Tech

- Several parameters into explanation
- students randomly act, to achieve "success"
- show effects on DNA
- * Choose Beam size
- * Beam Energy (x-ray, p, ion)
- * Beam Position (early work)
- * Allow Development's Variable
- Blood Cancer Growth
- * Imaging (CT, PET)
- * Healthy Tissue/Tumor Destroyed

* What sections of the site could be developed to meet these needs?

- Interactive Holon
- Bio - Academy
- Chem
- Organ
- Medical Chem
- DNA
- Physics
- Holon Therapy

* 3D Organ

- * Class Ranking System based on "Success Rate"
- * Levels
- Notice (single things forward)
- three levels
- Adv
- Control Accelerator
- Max parameters
- quad reflect
- dipole
- Accelerator E
- * Build your own accelerator

- * Easy (head & back)
- * Hard (Long & Organ)
- * Hard
- * Time Resources
- * Typical Patient Knowledge
- focused on patient therapy
- Imaging
- * Multiple Beam Therapy

140 Queensbury Kenton
Harrow on the Hill
Northolt Yeading
Marylebone Station



Hydrogen

- 1. Particle energy - speed energy and wheel - about energy
- 2. Capital from clean power (i.e. storage, conversion, and heat)
- 3. Emissions - clean power (i.e. the wheel part)
- 4. Emissions - clean power (i.e. the wheel part)
- 5. Emissions - clean power (i.e. the wheel part)

Each part (A&B) will have different levels of absorption. Each will be completed in its own...



