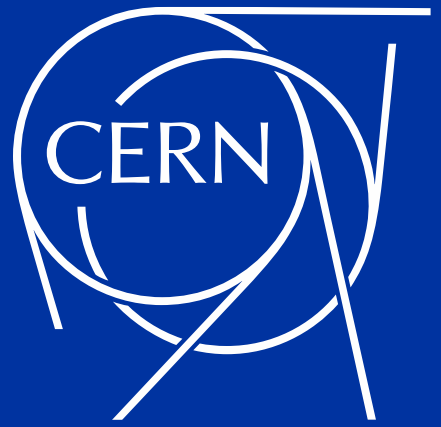


Concept Maps

Norwegian Teacher Programme 2024

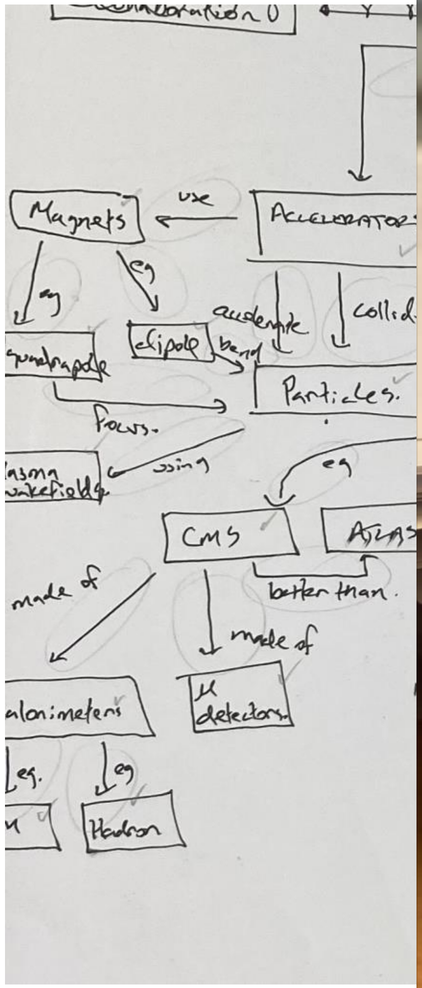
Milena Vujanović

23/02/2024

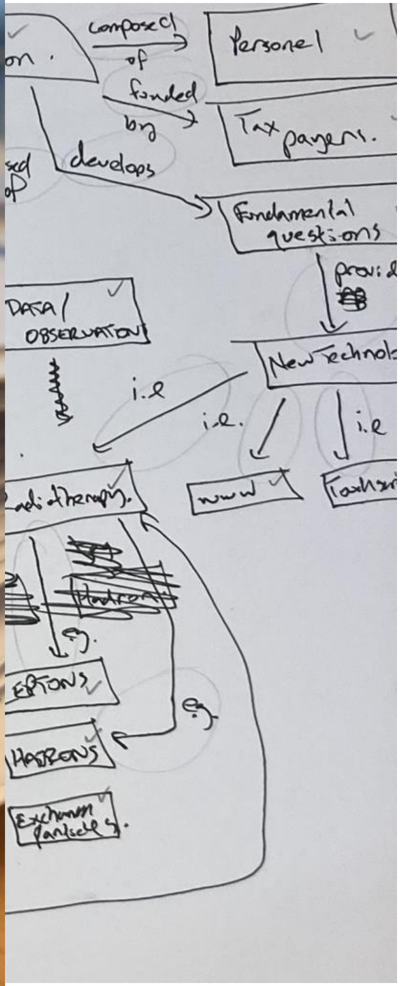
What is this all about?

- We are conducting a study to evaluate the impact of CERN's teacher programmes ➢ Concept Maps

The problem?



Magnets
use
ACCELERATORS
eg
dipole
accelerate
bend
Particles
Focus
using
CMS
ATLAS
better than
made of
made of
calorimeters
detectors
eg
Hadron



composed of
Personel
funded by
Tax payers.
develops
Fundamental questions
DATA/ OBSERVATION
New Technol
i.e
i.e.
i.e
www
HADRONS
Exchange Particles

The solution

- Use a software instead of paper and pen
- Tested many different softwares

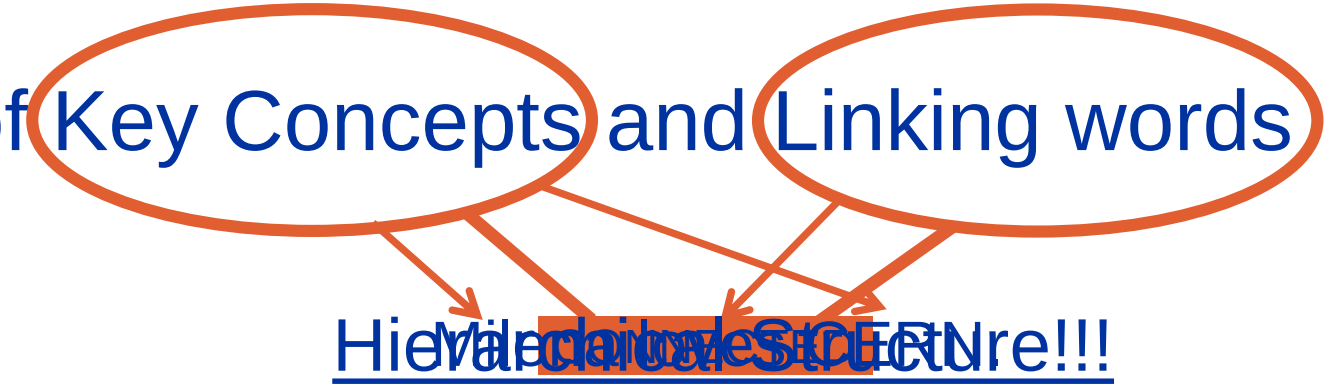
Finally, we found a software we like!

But… do our experts like it too?

- Create a concept map using the software

Concept Maps

- Graphic Organiser
- Needs to answer the focus question
- Consists of Key Concepts and Linking words



Constructing Concept Maps

1. Focus question → What do you know about Hogwarts?

2. Stop and think → Chose a starting concept and 2 – 5 key concepts

1. What do you know about Hogwarts?

School for magic

Students

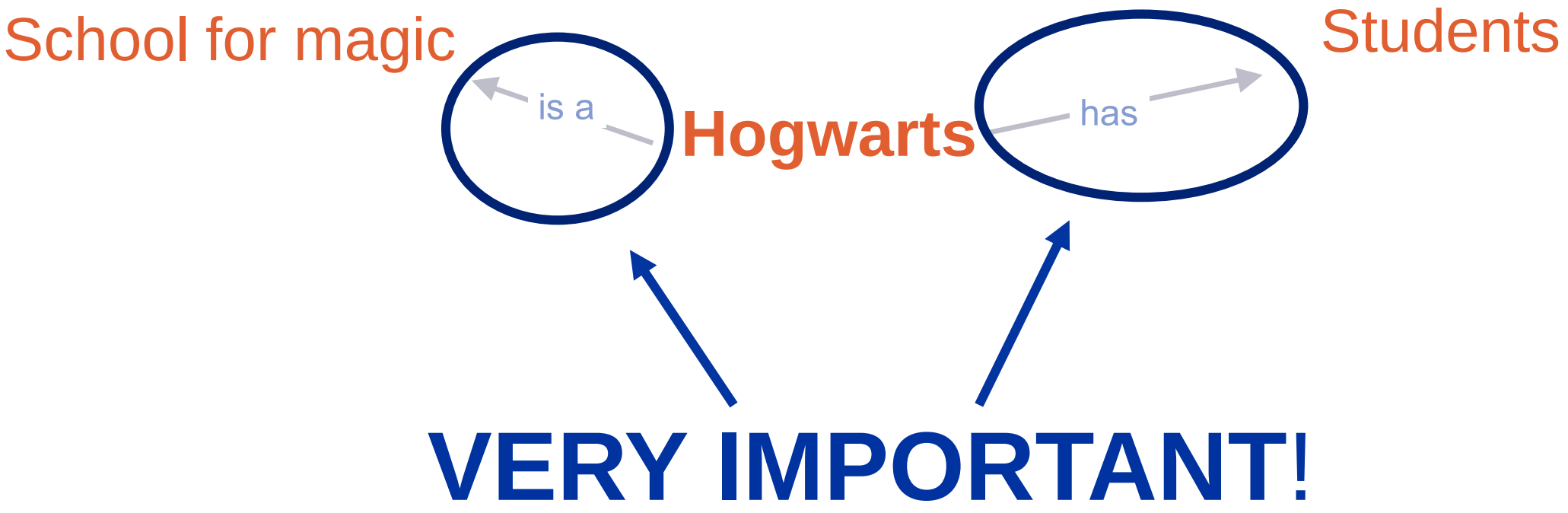
Hogwarts

1. What do you know about Hogwarts?
2. 2-5 key concepts
3. Link and use ARROWS

School for magic

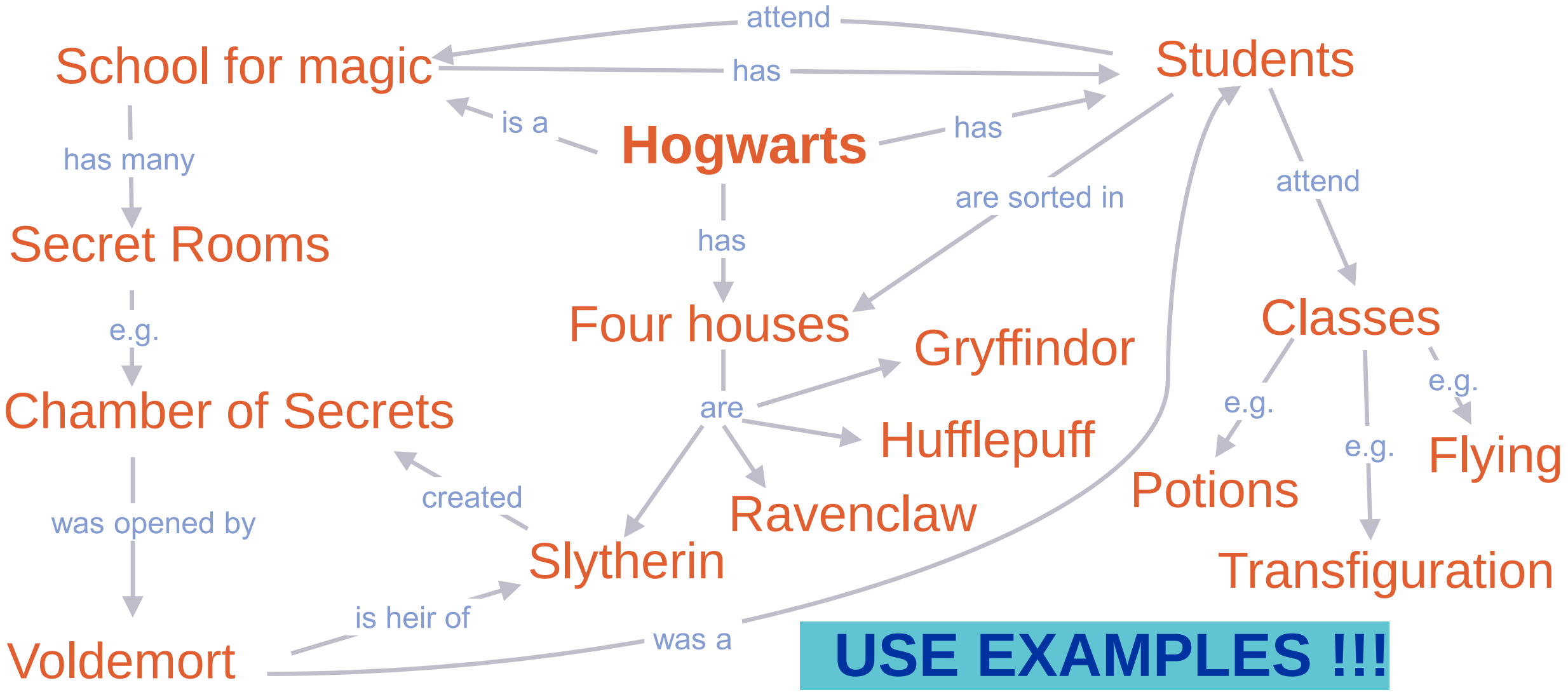
Students

1. What do you know about Hogwarts?
2. 2-5 key concepts
3. Link and use ARROWS and LINKING WORDS !!!



1. What do you know about Hogwarts?
2. 2-5 key concepts
3. Link and use ARROWS and LINKING WORDS !!!

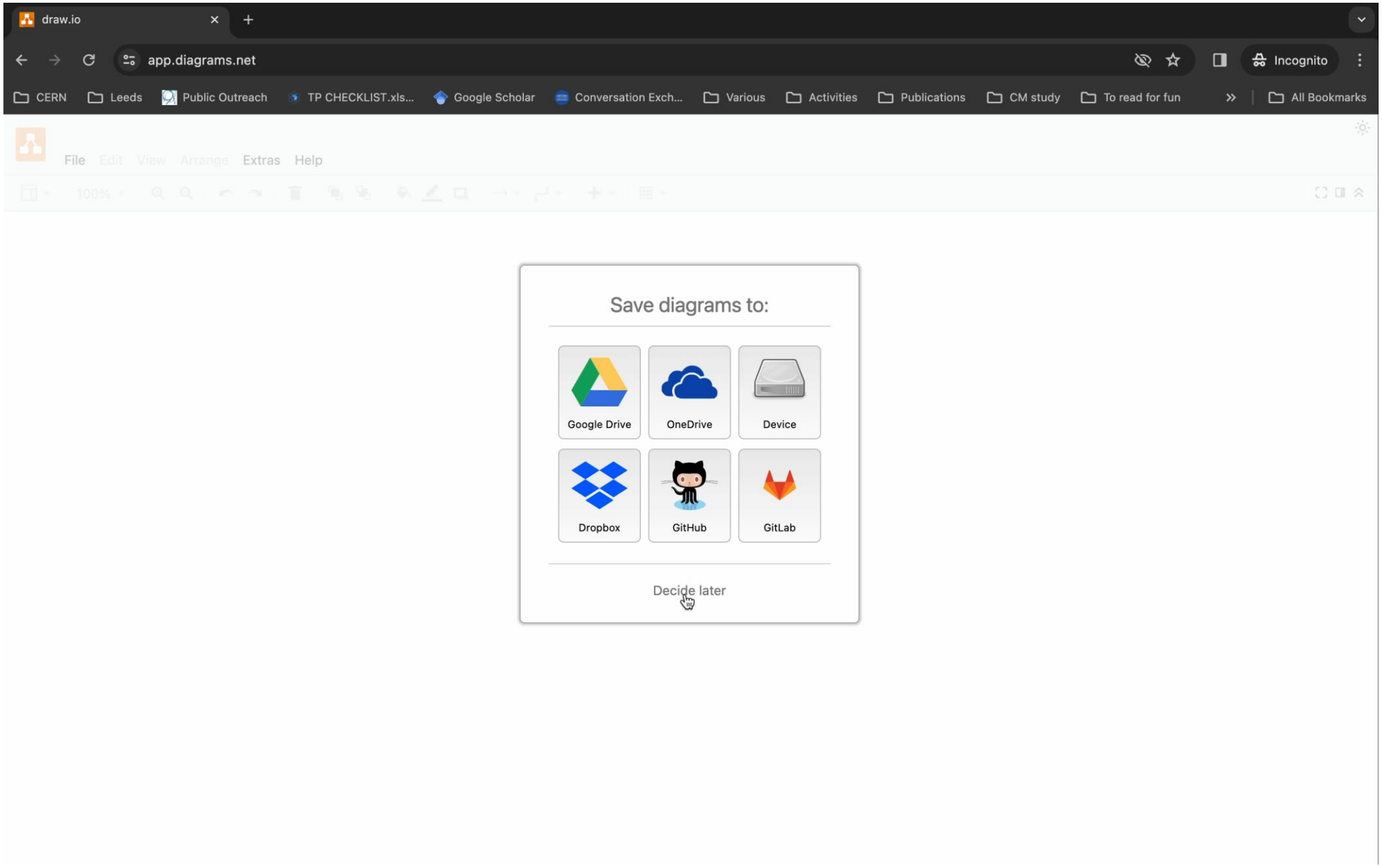
SECRET TIP !!!



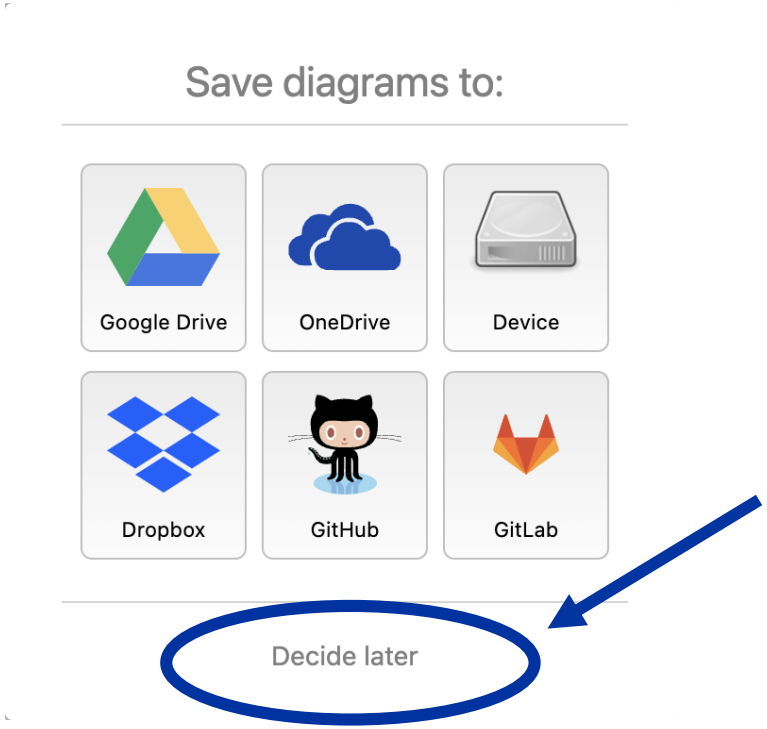
USE EXAMPLES !!!

Now, it is your turn!

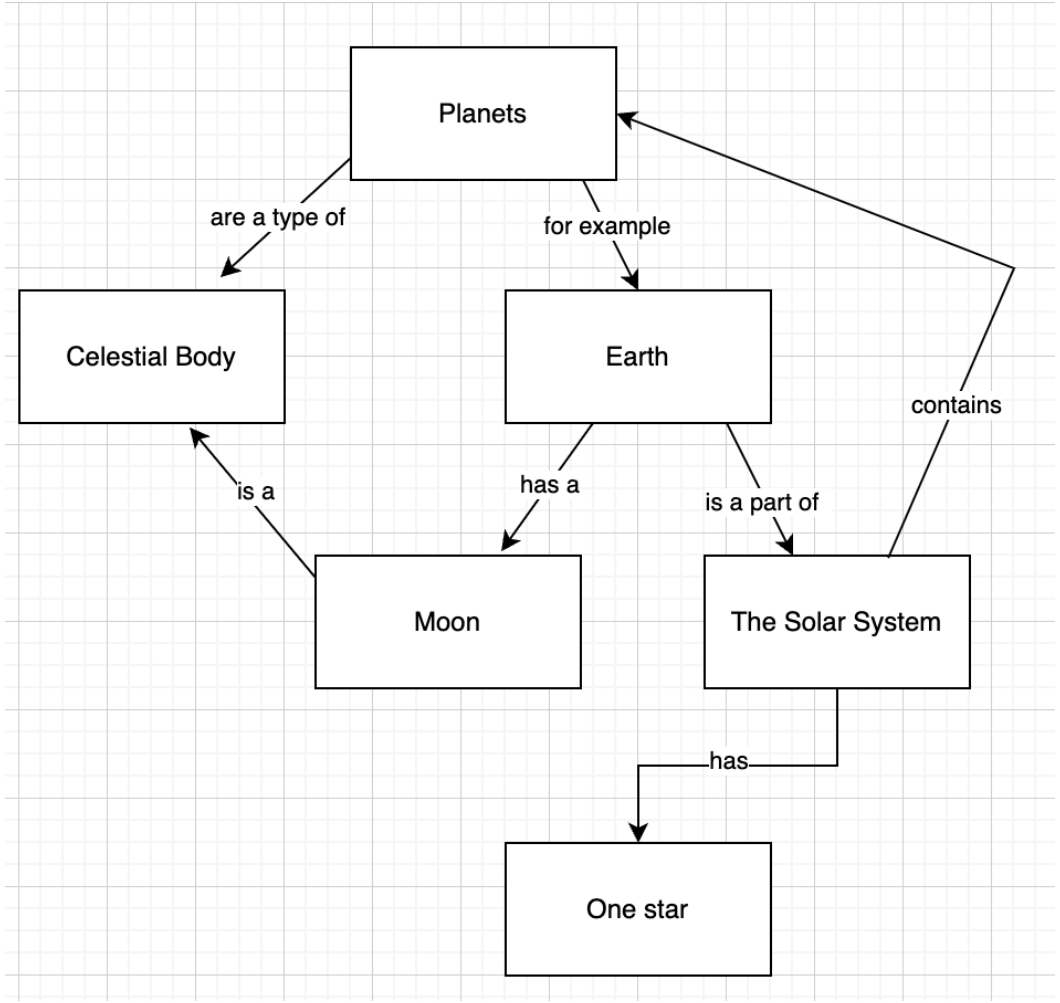
- You will use a software to create a concept map


draw.io
app.diagrams.net
Incognito
CERN
Leeds
Public Outreach
TP CHECKLIST.xls...
Google Scholar
Conversation Exch...
Various
Activities
Publications
CM study
To read for fun
All Bookmarks
File
Edit
View
Arrange
Extras
Help
100%
Save diagrams to:
Google Drive
OneDrive
Device
Dropbox
GitHub
GitLab
Decide later

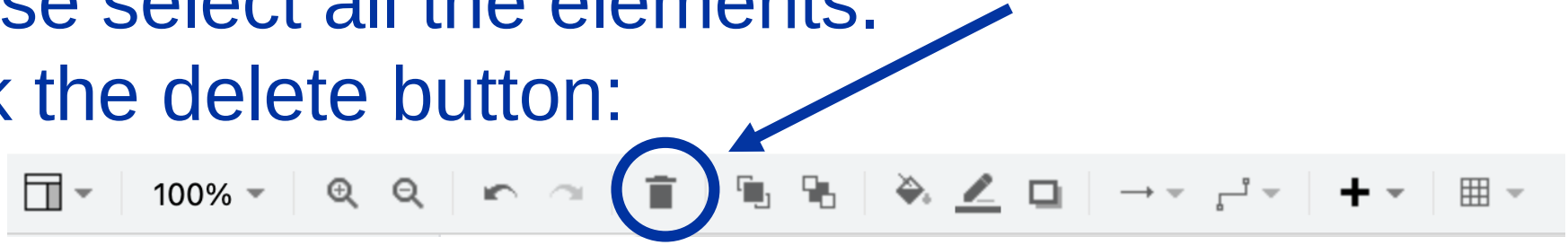
1. Open the laptop in front of you
2. Enter the password
3. Open an internet browser and type: **www.draw.io**



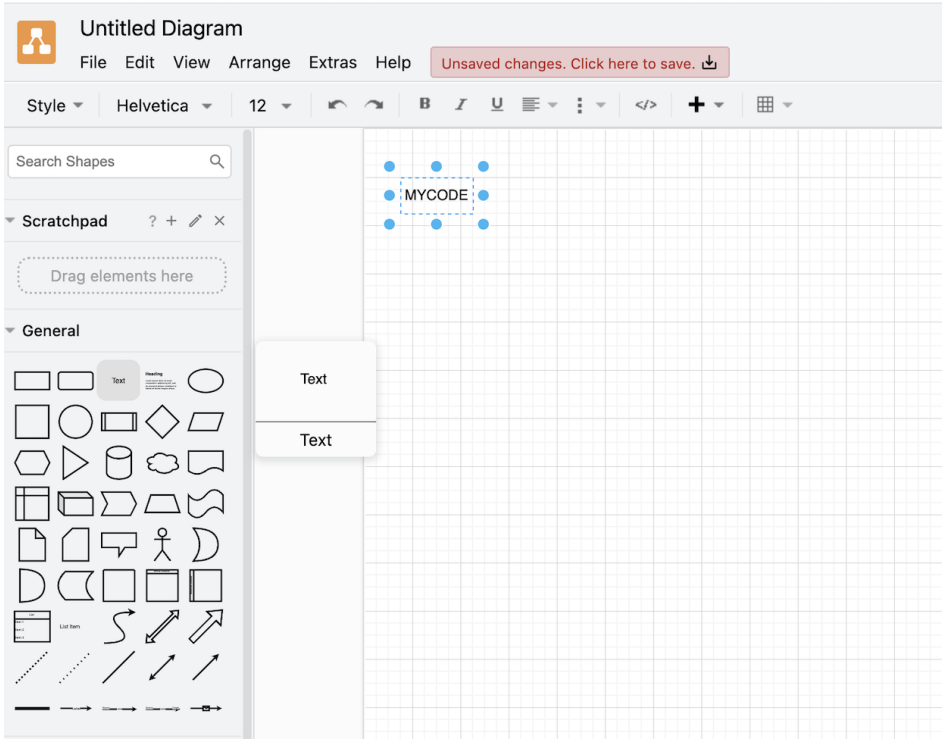
4. For practice, recreate this concept map:



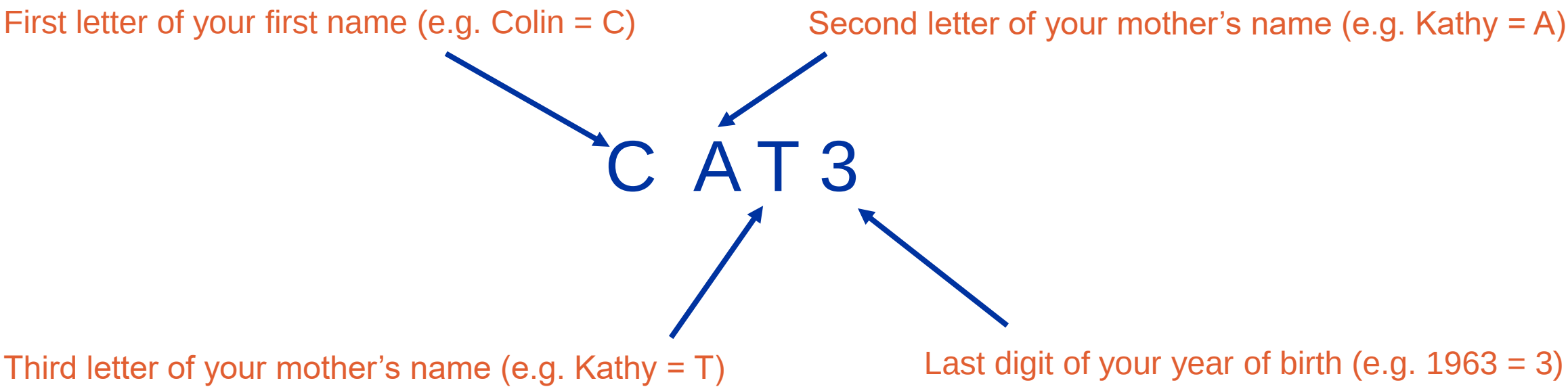
5. Please select all the elements.
6. Click the delete button:



7. Drag and drop the text icon anywhere



8. Double click on the text icon to write your personal code



What would you like your students to know about PARTICLE PHYSICS and CERN?

What would you like your students to know about PARTICLE PHYSICS and CERN?

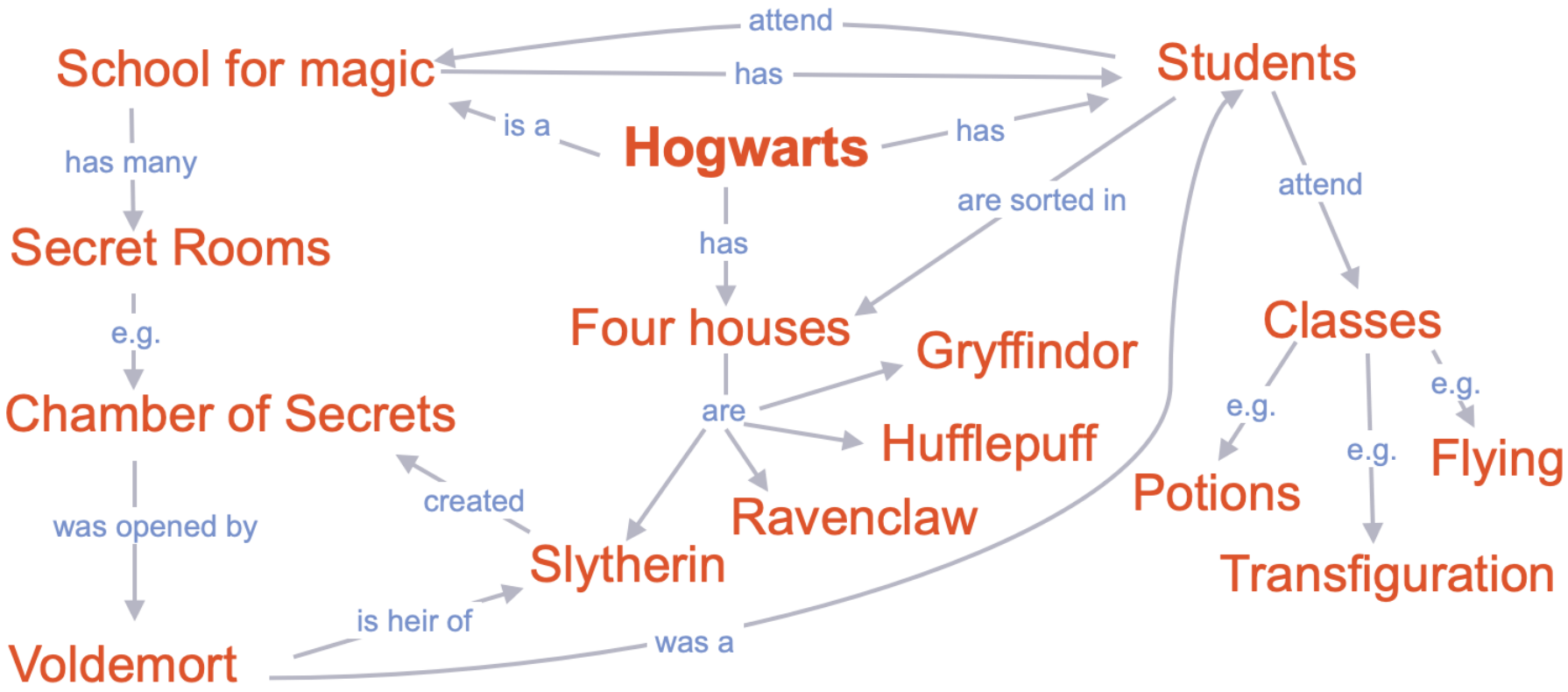
1. Stop and think about the focus question
2. Chose your starting concept
3. Then chose 2 – 5 key concepts to start your m
4. Connect concepts with arrowed lines and linking words
5. Expand

➢15 minutes

QUESTIONS?

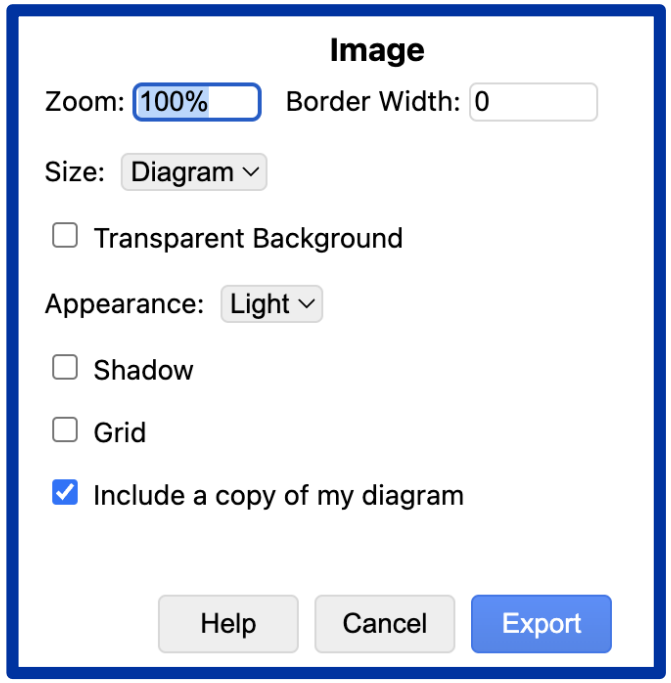
What would you like your students to know about PARTICLE PHYSICS and CERN?

1. Stop and think about the focus question
2. Chose your starting concept
3. Then chose 2 – 5 key concepts to start your map
4. Connect concepts with arrowed lines and linking words
5. Expand

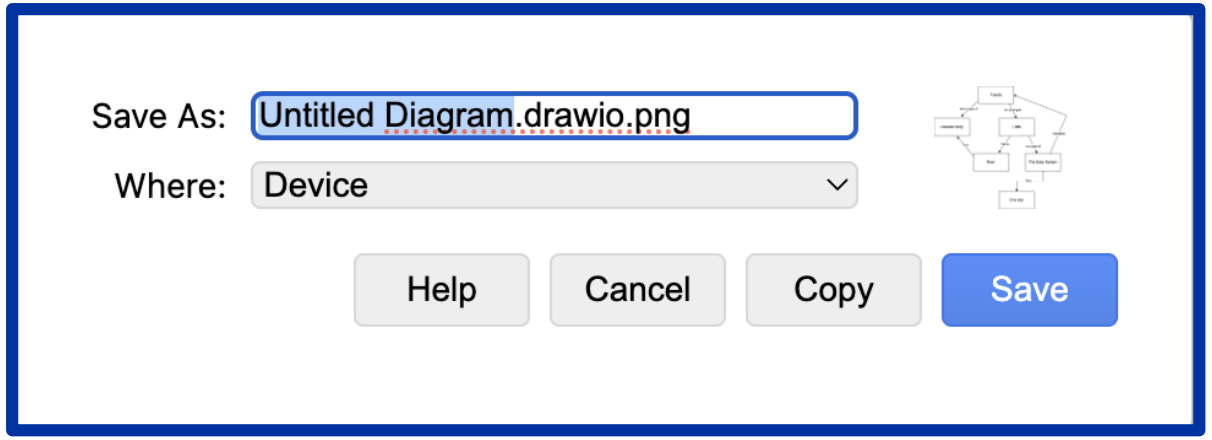


Time to save your work!

1. Memorise your code
2. Go to **File** and click **Export as**
3. Chose **PNG**
4. Tick ‘Include a copy of my diagram’ and then **Export**



5. Instead of ‘Untitled Diagram’, write your **Personal Code** and click **Save**



Let’s talk! ☺

1. Did you find the interface intuitive and easy to understand?

2. Did you encounter any challenges or difficulties while using the software?

3. Do you have any comments or suggestions?

Using concept maps in the classroom

Teaching new concepts/topics

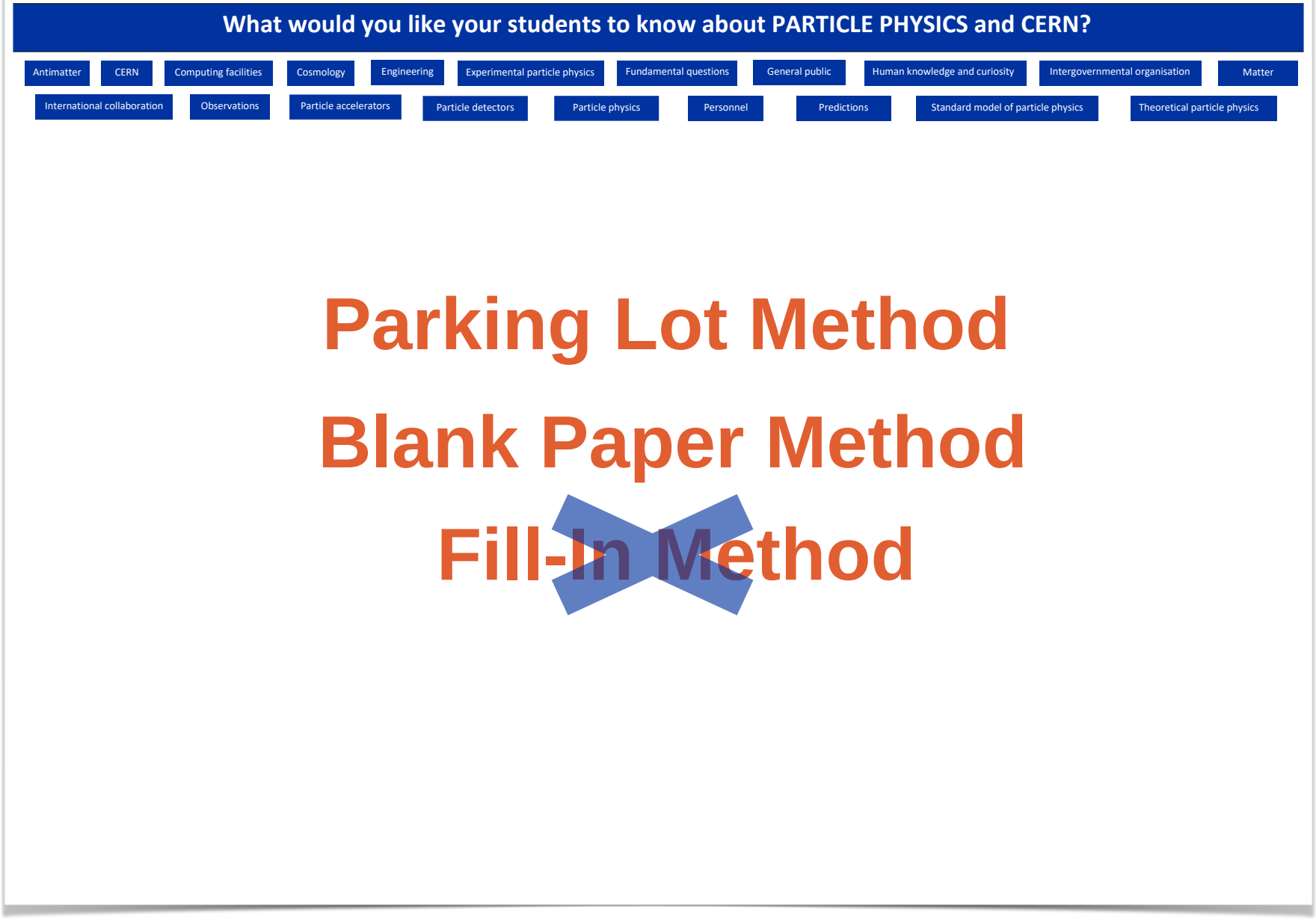
Assessment of your students' understanding

Teaching new concepts/topic

1. Teacher creates a map → and shares with class → with students' help

2. Your students create a map

- Individually or in small groups
- Analog or Digital


What would you like your students to know about PARTICLE PHYSICS and CERN?
Antimatter
CERN
Computing facilities
Cosmology
Engineering
Experimental particle physics
Fundamental questions
General public
Human knowledge and curiosity
Intergovernmental organisation
Matter
International collaboration
Observations
Particle accelerators
Particle detectors
Particle physics
Personnel
Predictions
Standard model of particle physics
Theoretical particle physics
Parking Lot Method
Blank Paper Method
Fill-In Method

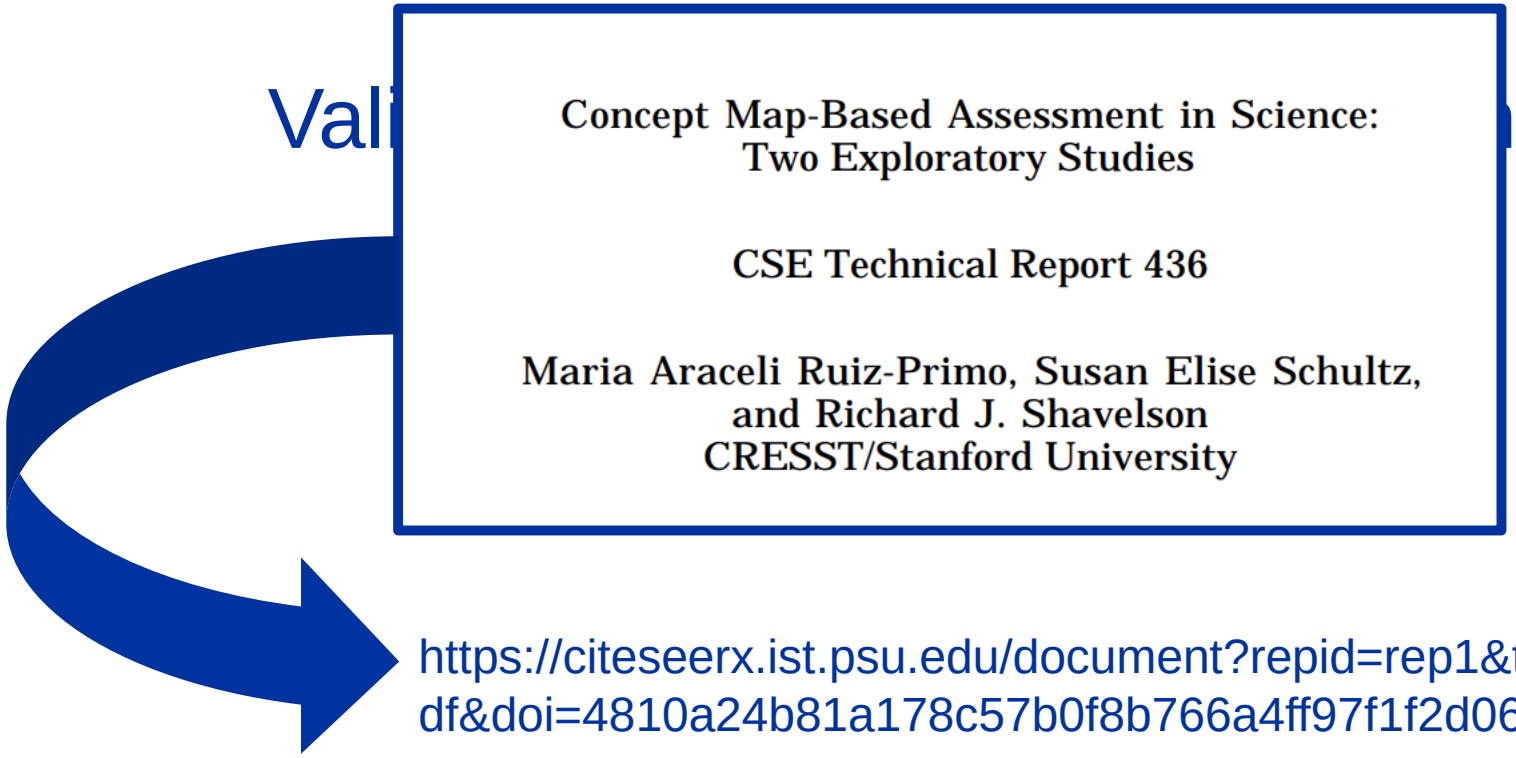
Using concept maps in the classroom

Teaching new concepts/topics

Assessment of your students' understanding

Assessment of your students' understanding

Vali ceptions



Concept Map-Based Assessment in Science:
Two Exploratory Studies

CSE Technical Report 436

Maria Araceli Ruiz-Primo, Susan Elise Schultz,
and Richard J. Shavelson
CRESST/Stanford University

https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=4810a24b81a178c57b0f8b766a4ff97f1f2d064c

Assessment of your students' understanding

Concept Mapping Technique 1 Instructions—Hierarchical Structure is Imposed

Name_____ Period _____

Examine the concepts listed below. They were selected from the chapter on Atomic Structure that you recently studied. Construct a hierarchical concept map using the terms provided below. Organize more general terms above the more specific ones. Draw a line between the terms you think are related. Label the line using phrases or only one or two words.

You can construct your map on the blank pages attached. When you finish your map check that: (1) you have all the concepts on the list in your map; (2) all the lines have labels; (3) your map is explaining atomic structure. After checking your map, redraw it so someone else can read it.

Staple your final map to this page.

LIST OF CONCEPTS

atoms
atomic mass
atomic number
atomic orbitals
electrons
elements
energy levels
isotopes
mass number
negative charge
neutral charge
neutrons
nucleus
p orbitals
positive charge
protons
s orbitals

Thank you for your participation!

milena.vujanovic@cern.ch