



## Design of learning Outcomes Framework, Associated Learning and Assessment Programmes

ESF Project 1.228

# Physical Science

educators feedback



Operational Programme II - Cohesion Policy 2007-2013  
*Empowering People for More Jobs and a Better Quality of Life*  
Project part-financed by the European Union  
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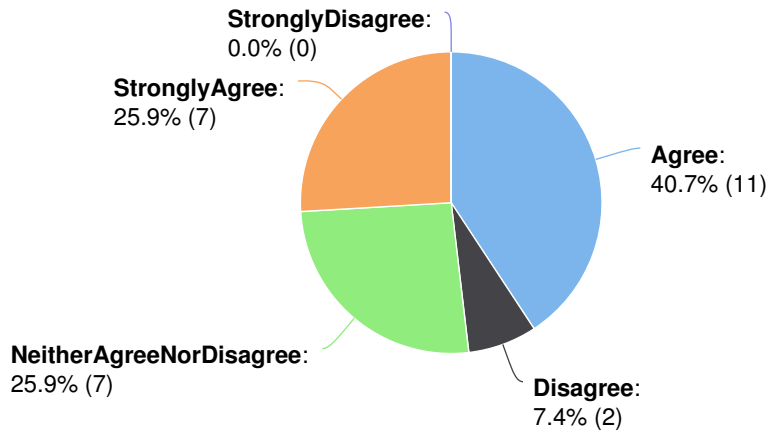


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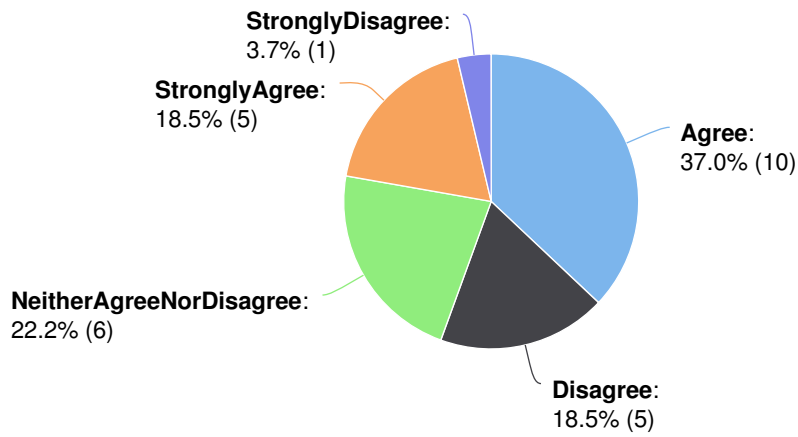
## Number of respondents

Education Officers	0
Head / Assistant Head of school / Deputy Heads	0
Head Of Departments	4
Inclusion Coordinators	0
Learning Support Assistants	0
Other	0
Subject Specialists	0
Teachers	22
University Lecturers	1
Vocational Education Training Lecturers	0

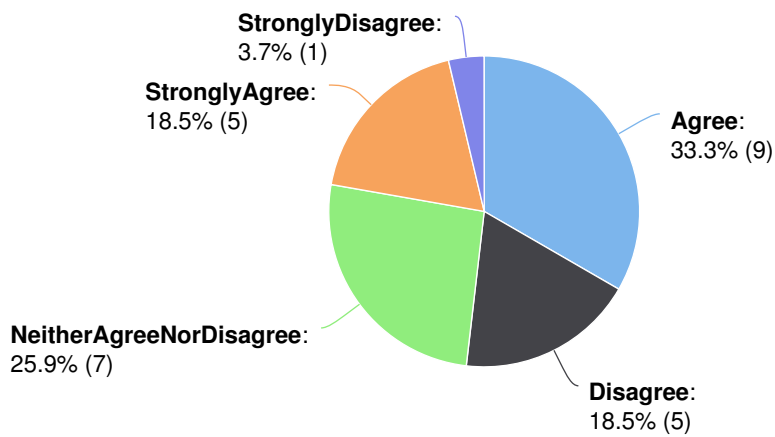
## Focused on the learner



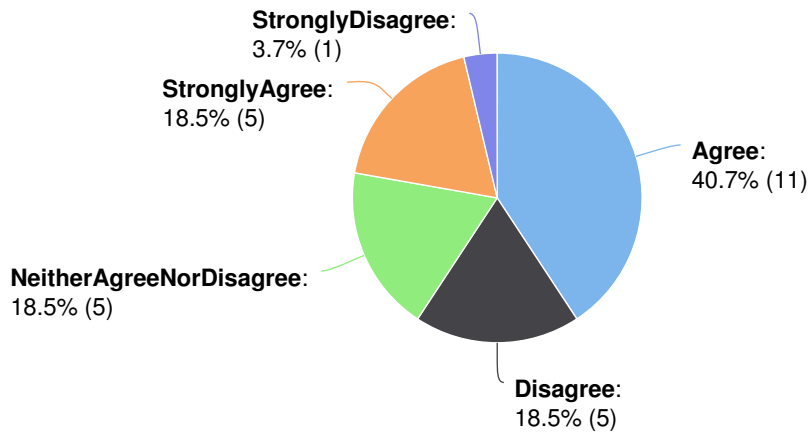
## Comprehensive



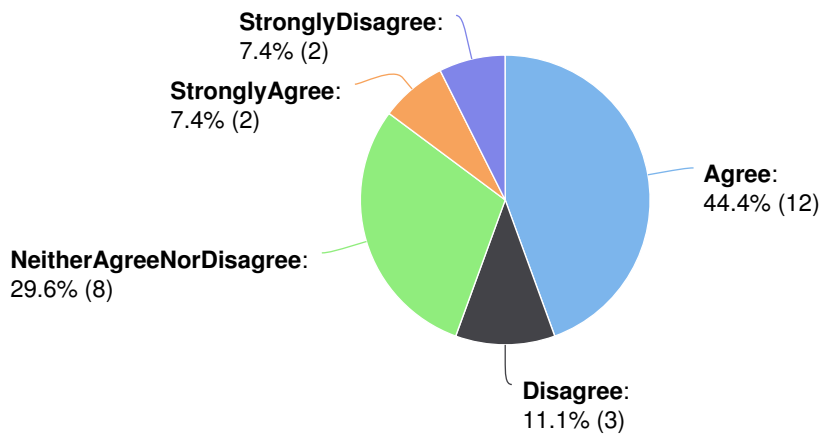
## Clear



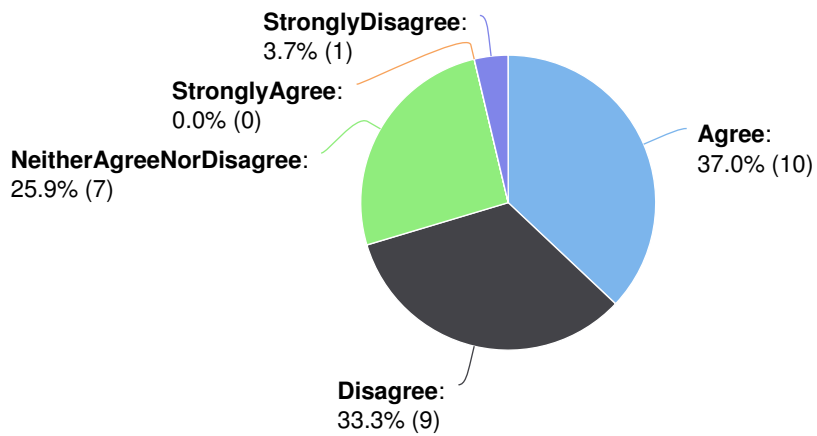
### Articulate



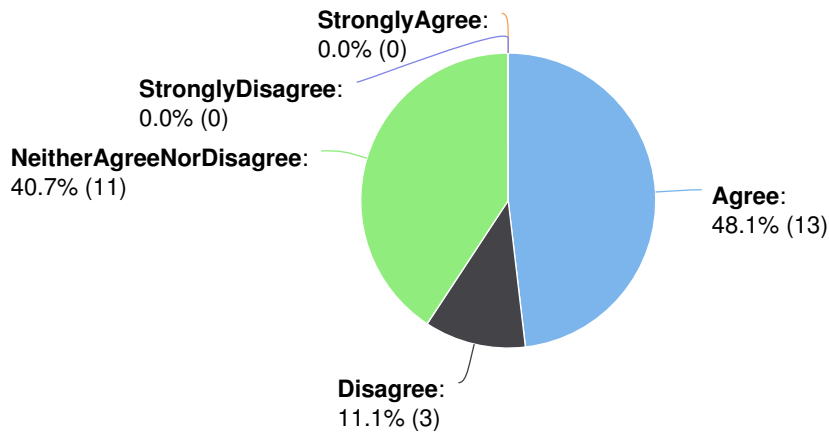
### Good for providing direction for learning activities



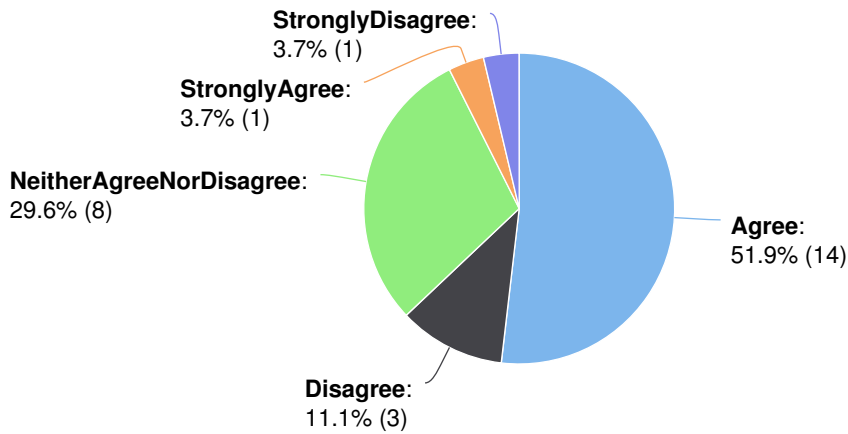
### Good guidelines for teaching and assessment



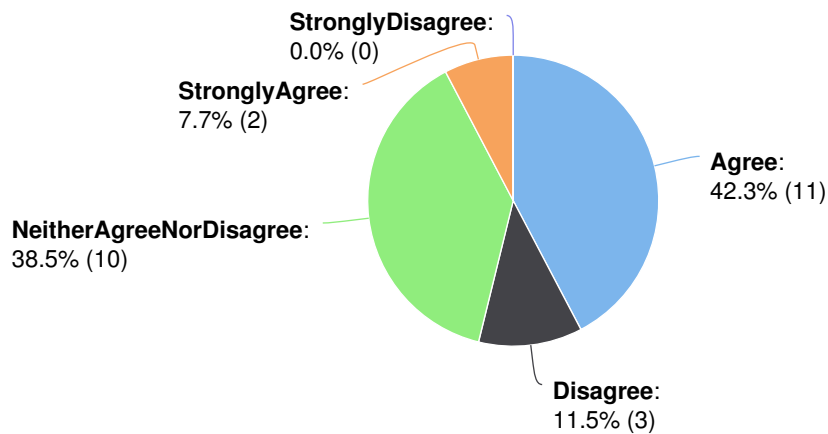
### Measurable



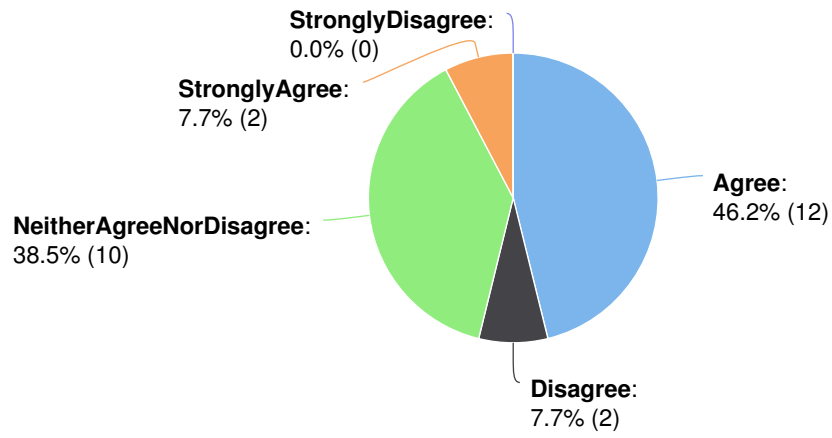
### Suitable for providing progression



### I feel that the Learning Outcomes approach will help me in my teaching



I feel that the Learning Outcomes approach will enhance my teaching practice



# Feedback

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#483

teacher physical-science secondary church\_school

## **General comments or concerns about the subject:**

There quite a lot of extra details which need not be present. Some of the material, example the stress - strain relationship are usually covered at an intermediate level. Students struggle to understand Hooke's Law graphs, let alone being able to understand what is stress and what is strain.

## **Are there any Learning Outcomes you (respondants) would take out? Specify which and why.**

11. I can discuss the different scales used for temperature and the relationship between them, e.g. Celcius and Kelvin from a historical perspective.

Using the Kelvin scale at the secondary level is not ideal. This can be introduced at intermediate level.

16. I can recognise and construct heating and cooling curves for different substances including the different states of matter and correctly identify the melting and boiling points.

Students struggle to even plot straight line graphs. They will not be able to plot curves and analyse them.

24. I can explain with reasons how particles diffuse / spread from high concentration to low concentration.

25. I can use ideas of diffusion to describe how gaseous exchange occurs in a plant leaf during photosynthesis.

I don't think it is necessary to introduce photosynthesis, when it is covered in Biology.

There are many more which can be omitted.

## **Are there any Learning Outcomes you (respondants) would include? Specify which and why.**

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#489

head\_of\_department physical-science secondary church\_school

## **General comments or concerns about the subject:**

1. Spelling in point no. 1: "acceleration"; point no. 2: "unbalanced"; no. 7 "acceleration"

2. Will momentum be denoted by the letter p (low caps) or in full "Momentum"?

3. Maybe point 25 reworded: "I can use the term terminal velocity to describe the fastest speed a car can travel at, when the forces acting on it are balanced and there is no resultant force."

4. Point no. 32 is beyond the average student and would therefore be recommended for the Gifted and Talented.

5. Point 47, though interesting, is too difficult at this level.

6. I do not agree that the notation of PE and KE should change to  $E_p$  and  $E_k$ . This is easily done at a higher level and is distracting to students at level 9 in a mixed ability setting.

## **Are there any Learning Outcomes you (respondants) would take out? Specify which and why.**

Point no. 47

The complexity of the terminology and or process makes it difficult for teachers to explain the concept in the mixed-ability classroom at this level.

## **Are there any Learning Outcomes you (respondants) would include? Specify which and why.**

I suggest that point no.1 is reworded as "I can investigate that all objects fall to the ground with the same acceleration as discovered by Galileo Galilei."

This would enable our students to discover this gravitational phenomenon for themselves, which some students could only learn using a Hands-On Approach. In the present scenario when Space Exploration is ever so interesting to our students, teachers could then elaborate this in a wider context, i.e on Earth and beyond. Footage of the Hammer and Feather experiment on the Moon is a case in point.

In this way, students could come to terms on the role of air resistance on Earth in various systems and later elaborate on associated motion in terms of terminal velocity.

#490

teacher physical-science secondary church\_school

**General comments or concerns about the subject:**

Some learning outcomes are vague and do not explain to what extent and depth subject content is required

Example: "I can investigate and discuss how air conditioning units operate to keep rooms and buildings cool by transferring heat from hot to cool areas." Would this statement refer to convection currents or to the actual heat pump (air conditioner) and the laws of thermodynamics?

Clear guidelines of complexity of calculations expected- to what extent are the students required to solve problems? what equations are expected of students

**Are there any Learning Outcomes you (respondants) would take out? Specify which and why.**

"I can find out how different people from different cultures use different construction techniques." - optional...it would be more relevant if local technologies are introduced

"I can research Galileo's use of pendulums to successfully argue against the Aristotelean view that heavier objects fall to the earth faster than less heavy objects." to much emphasis on acceleration due to gravity (Newton previous level and now Galileo and Aristotle)

"I can investigate the factors that affect circular motion including mass, velocity and the radius of the circle traced by the motion." Circular motion could be too advanced at this level. This is usually covered at intermediate and A level

**Are there any Learning Outcomes you (respondants) would include? Specify which and why.**

#491

teacher physical-science secondary church\_school

**General comments or concerns about the subject:**

**Are there any Learning Outcomes you (respondants) would take out? Specify which and why.**

**Are there any Learning Outcomes you (respondants) would include? Specify which and why.**

#492

teacher physical-science secondary



*General comments or concerns about the subject:*

*Are there any Learning Outcomes you (respondants) would take out? Specify which and why.*

Periodic table should be included in material science

*Are there any Learning Outcomes you (respondants) would include? Specify which and why.*

#493

teacher physical-science secondary private\_school

*General comments or concerns about the subject:*

*Are there any Learning Outcomes you (respondants) would take out? Specify which and why.*

*Are there any Learning Outcomes you (respondants) would include? Specify which and why.*

#496

teacher physical-science secondary state\_school

*General comments or concerns about the subject:*

I am writing this feedback with reference to the LOF project. I shall only express my opinion regarding Physical Science area, which is my subject of competence in the light of my teaching experience.

Every fair criticism must contain the positives and the negatives. One immediately notes that the website is very well organised and easy to follow. The aesthetics are also very appealing. Furthermore, the intention of breaking down knowledge into learning outcomes is a noble one and as an educator, I cannot but acknowledge its importance at every phase of the learning and teaching process.

On the other hand, I find that the way in which this exercise is being carried out leaves much to be desired. From the point of view of anyone involved, who is doing his\her best my criticism may sound harsh. On the other hand, I wouldn't have a clean conscience if I am not honest about what I think. Here are the points to ponder:

*Are there any Learning Outcomes you (respondants) would take out? Specify which and why.*

1) Putting an 'I can' in front of syllabus items does not make the syllabus item instantly 'student-centered'. Unfortunately, this is undeniably the current state of these learning outcomes. It is easy to cross-check. In the light of this fact, the feedback inquired looks ridiculous. Obviously, some brainwashed university student might check all the 'I agree', but those of us who are able of independent thinking with a certain degree of intelligence would tell you that such cosmetic exercise will lead to nowhere. It is more likely that they conceal even further the true problems behind the sick patient we call education.

2) The mechanical exercise of copying from a syllabus and putting an 'I can' before the item, leads to a more serious problem, which is, I feel at the heart of the problems with many teachers and is ironically the opposite of what the scope of the learning outcomes framework is. Let me select one of the items which is very easy to break down. For instance Item 43 (Level 8)

*Are there any Learning Outcomes you (respondants) would include? Specify which and why.*

43. I can solve problems to calculate the specific heat capacity using  $E = mc\Delta T$ .

I chose this because it is of a mathematical nature and leaves less room for fancy interpretations, ifs and buts. In this case typical criteria would be:

- (i) understand what specific heat capacity is (this is excluded from the list of outcomes)
- (ii) understand that  $\Delta T$  is difference in absolute temperature and this is numerically equal to difference between initial and final temperatures expressed in degrees celsius (those of us with some teaching experience know that this is something the students must understand really well)
- (iii) Understand that  $E$  can be energy lost or energy absorbed (which is extremely important in the understanding of problems)
- (iv) Have the ability to change the subject of the equation (If the learning objective were to just find  $c$ , one might as well express the formula directly with  $c$  as its subject. As it is, it encourages ridiculous memorisation. If this is the attitude in secondary level, then what we deal with is no longer that surprising)
- (v) Substitute of numerical values expressed in compatible units.
- (vi) Have the ability to interpret answer and its units (which could double check (i))

Adding an 'I can' in front of each may make them sound friendlier, but in principle they remain the same thing. On the other hand, this is what I understand by learning objectives.

One has to break down syllabus items into criteria not leave them as they are.

One has to go at a deeper level. Obviously, it is a monumental task to carry out such an exercise and then gather common learning outcomes, but one cannot really do it in another way simply because it is more convenient and less time consuming.

3) Incorrect \ vague physics. This is quite serious. I need not go further than number 1 (Level 8) for an example.

#497

teacher

physical-science

secondary

state\_school

**General comments or concerns about the subject:**

**Are there any Learning Outcomes you (respondants) would take out? Specify which and why.**

1. I can explain how the Periodic Table is made up of elements that differ in the number of protons and their atomic mass.

Clearly this is very imprecise. Elements in the periodic table differ only in the number of protons (atomic number). Elements may have the same number of protons but a different atomic mass (mass number \ nucleon number); they would be isotopes of the same element.

2. I can identify different symbols of elements in the Periodic Table usually referred to in physics.

I think that whoever wrote this means that the student knows which symbol corresponds to a given element and the other way round, but anyways, idiom apart..... 'what do we mean by 'elements' usually referred to in physics'? Even as part of a syllabus that would be vague let alone as a description of a learning outcome. Is it so difficult to specify these elements? Maybe 'helium', 'mercury' ?

etc etc....

3. Then there are the funny ones (Those which start with 'I can research' and similar ones) :

3. I can research the development of the Periodic Table from John Newlands in 1863 to Dmitri Mendeleev in 1869 and to modern day additions.

12. I can model, through various means, how hotter objects expand due to an increase in the kinetic energy of the particles as a result of a transfer of energy

39 I can research how and why people in different countries use various methods of heating and cooling in their homes.

59. I can undertake an investigation using textbooks and online resources to explain the effect of balanced and unbalanced forces on the motion of objects.

**Are there any Learning Outcomes you (respondants) would include? Specify which and why.**

60. I can use the internet to compare the performance in terms of speed and range of electrical vehicles compared to conventional petrol/diesel engine cars.

and who is going to deny that?? The student? the teacher?

Anyways, I think I've written enough. I believe everything needs a serious re-thinking before loads of work is done in vain. It is best to focus on substance and get into detail rather than scraping the surface. There has been too many of that in the recent past and the result is extremely poor.

This is my point of view and in no way I mean to offend anyone. I took my time to write this because maybe there are ways to make something out of it.

#507

teacher physical-science secondary church\_school

**General comments or concerns about the subject:**

I like the fact that the list in this particular subject focus gives a very holistic approach to the subject. However, judging by what is listed, I get the feeling that the syllabus is going to be vast, since I can note that certain concepts which are currently out of the Physics syllabus are now included in this list. Currently it is already difficult to manage inquiry-based teaching and finish all the topics in time. Therefore, I am concerned that including more concepts without increasing the amount of subject hours would make it difficult to manage all the learning outcomes.

**Are there any Learning Outcomes you (respondants) would take out? Specify which and why.**

**Are there any Learning Outcomes you (respondants) would include? Specify which and why.**

#537

teacher physical-science secondary church\_school

**General comments or concerns about the subject:**

The change in name from Physics to Physical Science may be a problem in the world of work since the former is more recognized. Is A level going to be Physical Science as well?

**Are there any Learning Outcomes you (respondants) would take out? Specify which and why.**

1 to 6 since they are more to do with chemistry (sorry, materials science).

**Are there any Learning Outcomes you (respondants) would include? Specify which and why.**

momentum, collisions and explosions. PE and KE. Newton's second law and  $F=ma$ .

#546

head\_of\_department physical-science secondary church\_school

**General comments or concerns about the subject:**

In the conference held in December, it was made clear that most subjects are being downsized. This is not the case with what is being proposed in Physical Science. It is evident that there is not a good feel of the present situation at secondary level with the demands on the average teacher in a mixed-ability setting. The above material is beyond a good 40% of our students for whom Physical Science is already difficult!

This sample implies a heavily-loaded curriculum that does not leave space for teachers to (i) try out more investigations in their classroom and (ii) plan for out of classroom activities which are enjoyable and hands-on whilst being educational. This is a serious concern that needs to be addressed.

**Are there any Learning Outcomes you (respondants) would take out? Specify which and why.**

No.2 is vague, no.3 is beyond the average Physics student; No.6 is again complicated and more of Chemical Science rather than Physical Science. No.9 is abstract and most students could not grasp the type of heat implied in the mixed-ability classroom. No.25 is just Life science and out of place for consideration in Physical Science.No.27 is beyond the average student.

Most of these ideas should go to level 10 in fact.

Use of notation  $dT$  in the equation  $E = mc^2dT$ , is beyond the secondary student's use of algebra in years 9 and 10.

**Are there any Learning Outcomes you (respondants) would include? Specify which and why.**

I would include details of how the Maltese old houses and town houses were built in such a way as to ensure good use of natural lighting around the house as well as being cosy in cold and warm weather across the year.

I would include a visit to a renewable energy shop /renewable energy centre / Engineering fair at UoM (in which students give details of a project to their interest in relation to physical science) / students building a modern house that uses renewables / hydroelectric model / an interview with an architect on a modern house building and why it is energy efficient / use of renewables in third world countries....

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#547

teacher physical-science secondary state\_school

**General comments or concerns about the subject:**

All the general comments will be forwarded to Mr Joseph Cutajar (EO Physics) since this space is not enough to include the feedback.

**Are there any Learning Outcomes you (respondants) would take out? Specify which and why.**

All the comments related to the Learning Outcomes will be forwarded to Mr Joseph Cutajar (EO Physics) since this space is not enough to include the feedback.

**Are there any Learning Outcomes you (respondants) would include? Specify which and why.**

All the comments related to the Learning Outcomes will be forwarded to Mr Joseph Cutajar (EO Physics) since this space is not enough to include the feedback.

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#548

teacher physical-science secondary state\_school

**General comments or concerns about the subject:**

I'm quite hesitant about all this being implemented in our schools. Things should be left as they are, bringing about too many changes in a short period of time is not helping us teachers.

**Are there any Learning Outcomes you (respondants) would take out? Specify which and why.**

**Are there any Learning Outcomes you (respondants) would include? Specify which and why.**

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#550

head\_of\_department physical-science secondary state\_school

**General comments or concerns about the subject:**

While I realise that syllabi have to change over time, my biggest concern is not the change in the content itself but rather the fact that the subject will have its name changed and at the same time it will become an option.

There will surely be a huge reduction in the number of students studying Physics at secondary, post secondary and tertiary sectors. What will the repercussion of this be in the long term when it comes to numbers of engineers and other technical professions? Would we need to get foreign workers just as in the case of the health sector?

Will the syllabi at Intermediate and A level change accordingly? Where will the redundant Physics teachers teaching at intermediate and A level be deployed? What kind of training will the secondary teachers receive? Are the learning outcomes taking into consideration the actual contact time in class?

**Are there any Learning Outcomes you (respondants) would take out? Specify which and why.**

The periodic table as it might put off some students from choosing the subject in the first place.

**Are there any Learning Outcomes you (respondants) would include? Specify which and why.**

I cannot comment here as the learning outcomes are not complete.

#551

teacher physical-science secondary church\_school

**General comments or concerns about the subject:**

The Physics syllabus for the SEC exam has been changed very recently - does this mean that the syllabus is to be changed again? There are far too many topics included especially for Grade 8, presumably equivalent to Form 3 when the subject is new to the students so teaching is at a lower rate.

Several new ideas, which had been previously removed from the syllabus, such as Chemical bonding, Brownian motion, finding the resultant of 2 perpendicular forces, period and length of a pendulum, car suspension etc

Other topics have just been erased such as Astrophysics, static and current electricity, electromagnetism and Optics

I have often used similar system in my teaching so I cannot see why and what all the fuss is about.

**Are there any Learning Outcomes you (respondants) would take out? Specify which and why.**

4, 5 and 6 (chemical bonding and mixtures and compounds) for grade 8 since this is basically chemistry unless this means that Integrated science is to be introduced.

47, Using vectors to calculate the resultant force of perpendicular forces since this needs higher level maths to be done, a subject many students find problems with.

**Are there any Learning Outcomes you (respondants) would include? Specify which and why.**

Astrophysics especially our Solar System which is a topic the students find very interesting and would help them to like Physics and so find it slightly easier to understand.

Static and current electricity as well as electromagnetism, which would be useful to the students especially when they leave school.

Optics especially optical fibres and lenses which explain a number of things the students are surrounded with.

Transverse and Longitudinal waves as well as electromagnetic waves.

#552

teacher physical-science secondary state\_school

**General comments or concerns about the subject:**

Teachers specialised in Physics and without an o-level in Chemistry would definitely require training to teach the proposed LOF of the subject focus. However, I agree that certain ideas should be intertwined and in this proposed LOF it is evident that there was an effort in doing so. I agree with the historical approach to the teaching of science, which however should not only be limited to "telling stories". Some concerns/suggestions: Will there be obligatory experiments presented in a lab book? Also it would be ideal to indicate the ages in which certain concepts will be taught. For example the concept of diffusion and Brownian motion might be too abstract for students. And is there a particular reason why certain LOF are in bold? Does it mean that they are "more important". Indicate the amount of lessons for each focus subject, ie how long will it take to teach them.

**Are there any Learning Outcomes you (respondants) would take out? Specify which and why.**

1) There are certain learning outcomes related to an activity - will these be obligatory or suggested activities? I would agree more to be suggested activities and each teacher will feel free to develop his/her own creative ideas. I understand the inclusion of technology in learning, such as researching. However, I believe that they should only be "suggested ideas" so that every teacher is free to teach in the best way. For example no 25 and no 58.

2) No 47... I would leave out "Finding the resultant force of perpendicular forces". Personally I believe that resultant vectors would be beyond to the level of the students.

*Are there any Learning Outcomes you (respondants) would include? Specify which and why.*

I would include Newton's laws of motion - and not just the third law. First of all, students should appreciate that an unbalanced force causes an acceleration/deceleration which is explained by the second law. Apart from this, all Newton's laws of motion are interlinked and you cannot explain one law and leaving the other out. If we want to have more scientific literate students, we should include ideas about safety features in cars and thus the idea of "impulse".

Moreover, the idea of acceleration is included but v-t graphs are left out. If students know that the gradient of an s-t graph gives constant speed, then why not include v-t graphs?

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#555

teacher physical-science secondary state\_school

*General comments or concerns about the subject:*

At face value, these LOFs look quite reasonable in terms of content, and depth, and as a way to decompartmentalise physics with other science subjects. As usual, the problem arises with time to cover the material. Although some outcomes are written as a simple short sentences, students will need ample time to internalise the concepts. Despite all this, my main concern is the way LOFs are being introduced and presented to us teachers. As far as I know, we had never been formally introduced to the LOF system. I do not expect this to be carried out in writing. To be able to give a good evaluation of these outcomes, their purpose must be made fully clear, and the procedures it involves. Moreover, we should have been given time to ask questions directly to officials involved who would give an immediate reply.

*Are there any Learning Outcomes you (respondants) would take out? Specify which and why.*

*Are there any Learning Outcomes you (respondants) would include? Specify which and why.*

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#557

teacher physical-science secondary state\_school

*General comments or concerns about the subject:*

*Are there any Learning Outcomes you (respondants) would take out? Specify which and why.*

*Are there any Learning Outcomes you (respondants) would include? Specify which and why.*

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#558

teacher physical-science secondary state\_school

*General comments or concerns about the subject:*

*Are there any Learning Outcomes you (respondants) would take out? Specify which and why.*

*Are there any Learning Outcomes you (respondants) would include? Specify which and why.*

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#559

teacher physical-science secondary state\_school

*General comments or concerns about the subject:*

Are there any Learning Outcomes you (respondants) would take out? Specify which and why.

Are there any Learning Outcomes you (respondants) would include? Specify which and why.

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#560

teacher physical-science secondary state\_school

General comments or concerns about the subject:

Content training in Chemistry and Biology topics needs to be given to Physics teachers who have never studied these subjects.

Are there any Learning Outcomes you (respondants) would take out? Specify which and why.

No I don't think that there are any.

Are there any Learning Outcomes you (respondants) would include? Specify which and why.

Certain Learning Outcomes need to be related to everyday situations so that students, especially lower level ones, see the relevance of what they are studying in class.

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#563

teacher physical-science secondary state\_school

General comments or concerns about the subject:

Are there any Learning Outcomes you (respondants) would take out? Specify which and why.

Are there any Learning Outcomes you (respondants) would include? Specify which and why.

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#565

teacher physical-science secondary state\_school

General comments or concerns about the subject:

Are there any Learning Outcomes you (respondants) would take out? Specify which and why.

Are there any Learning Outcomes you (respondants) would include? Specify which and why.

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#568

head\_of\_department physical-science secondary state\_school

General comments or concerns about the subject:

Level 8:

No 1: No detail from Periodic Table is required but just mentioning that atoms have a proton and atomic mass number.

No 3: Not relevant for a student choosing Physics as an option.

No 4 to 6 : Too much Chemistry content to be included in a Physics syllabus. It is interesting but I think it needs too much lessons to be covered. Lessons that can be dedicated to more relevant Physics content.

No 13: Mentioning Pressure without any previous knowledge of the term, is not a good idea, especially at this level.

No 42: It is better if we retain present symbols ; Q not E, and  $\Delta$  instead of d.

No 47: I would limit resultant Force to forces acting along a straight line, especially with Level 8 students.

Level 9

No 1: I hope that this learning outcome is aimed to enrich their general knowledge and not as information to be examined.

Writing articles in a Physics examination paper is not ideal.

No 9 to 10: Better if included in Level 8 since notion of Pressure and density are mentioned at this level.

No 13: Better use current symbol (K.E.) for Kinetic Energy.

No 16: Better use current symbol (P.E.) for Potential Energy.

No 20: I do not think it is necessary to include the relationship between period and length of pendulum. I would use the pendulum to explain point of maximum and minimum P.E. and K.E.

No 40: Calculation should not be limited to submarines.

No 44: Use of manometer is not necessary.

Level 10

No 3: Why concentrate on cost effectiveness of AC units only?

No 11: Why submarines?

No 15: Circular motion is not easy for an O' Level student. It requires much more depth to understand.

Note: Not much effort have been done in the other two science subjects to include Physics content.

***Are there any Learning Outcomes you (respondants) would take out? Specify which and why.***

Level 8: No 3, 4, 5, 6: not relevant to a student choosing Physics as an option. Much more interesting and relevant content can be included instead.

Level 9:

No 20: Relationship between period and length of pendulum not necessary.

No 44: use of manometer is not needed.

Level 10:

No 15: I would not include the notion of circular motion in Ordinary level. It needs much more depth to be understood.

***Are there any Learning Outcomes you (respondants) would include? Specify which and why.***

It is very difficult to specify any other Learning Outcomes since this is only a taster of the final project.

#569

teacher

physical-science

secondary

state\_school

***General comments or concerns about the subject:***

I am very pleased to observe the student approach used in writing these objectives. When I look at these learning objectives I honestly hope and wish that one day I will have the time to do all of it with my students. Last year I tried to take the best class of form 3 through the experience of discussing and writing an investigation. It took the best class 8 lessons. They were very proud of their work and the conclusions they drew. It would take much more with weaker classes and it is not possible. Teaching time/contact time with students is decreasing every year but the syllabi and the expectations on the students are not. I agree that the above LO should be the way forward but what is done now in level 8 and 9 must be done in levels 8, 9, 10. to leave space for exploration.

***Are there any Learning Outcomes you (respondants) would take out? Specify which and why.***

***Are there any Learning Outcomes you (respondants) would include? Specify which and why.***

If this is the whole of the LO for level 10 it would be magnificent to explore learn, research and and be active with the students would learn so much about the scientific method and exploration and investigation in every sense but unfortunately the syllabus for all 3 levels is so big that we have no time for basic discussion and it is during this time that they learn more.

#613



teacher

physical-science

secondary

state\_school

**General comments or concerns about the subject:**

I think it is very unfair on teachers to give this type of feedback as no one came to explain what's going to happen from the present system? What type of assessment do we have to use? are exams and matsec still going to be held? I think 1st there should be a clear explanation to everyone by doing a compulsory session so that it will be explained what's going to be changed or not. Another thing is that we are in our summer holidays and it is very difficult to meet with other colleagues and discuss it together? Remember that august is our official leave!!

Is physics still compulsory or is going to be offered as option?

Is there need to change the name of the subject as in other countries they still call it physics?

**Are there any Learning Outcomes you (respondants) would take out? Specify which and why.**

Although you have said that certain levels are for gifted students but i think gifted students will not be able to reach certain learning outcomes as they are far beyond their reach.

From what i can see in Earth and the Universe there topics which more geography topics than physics topics

I dont feel comfortable giving feedback on something that i dont know know nothing and i am not sure whats going to happen in the future!!!

Hope this feedback will be taken care and not see with blind eyes or deaf ears.

Thanks

**Are there any Learning Outcomes you (respondants) would include? Specify which and why.**

#621

university\_lecturer

None

**General comments or concerns about the subject:**

The problem here is that there is a disproportionate focus on high-end applications of Physics WITHOUT any indication on whether the student really and truly appreciates the underlying concepts. It is very good to relate Physical notions with grand applications, but one MUST COMMIT THE TEACHER to well beyond that.

eg: "How magnets are used in science from their use in the Large Hadron Collider"

Can it get any more detached from reality than this?

The LHC or Bullet Trains are such complex applications of electromagnetism that they become nearly irrelevant as guides for understanding basics principles, unless gross caricatures of electromagnetism are used.

Knowing that magnets are used in the LHC says nothing about whether we know what magnets are, and what the basic principles surrounding electromagnetism are. Magnetic fields are not even mentioned anywhere! And what happened with the visualisation of magnetic fields with iron filings? etc...

**Are there any Learning Outcomes you (respondants) would take out? Specify which and why.**

**Are there any Learning Outcomes you (respondants) would include? Specify which and why.**