Math and Science IB/Honors Essential Standards

Due back to your site principal by September 8, 2023

PLC Members

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Subject Area/Area of Focus (please list grade levels and subject areas as applicable)

IB Biology SL and HL, IB Chemistry SL and HL, IB Physics SL and HL, IB Math SL and HL

Essential Standards (please select 5-10 standards/skills that you've selected from materials provided, or materials you have discovered. Please note: the standards you choose must allow for frequent data collection, in other words, you will need to create assessments that evaluate the progress your students are making towards these standards)

1. HS-ETS1-2 and IB IAs: Students will design their own lab/math topic
2. IB IA Standards (Science only): Students learn the process of accurate data collection.
3. IB IA Standards: Students will write a lab conclusion/mathematical inferences
4. IB IA Standards: Students will combine results of design, research and conclusion to produce a coherent, college-level research paper
5. IB Group 4 Project (Science only): Students collaborate in groups of four to investigate current science research on a common theme, presenting the results in a science fair format. Project also requires a reflective paper from each student
6. HS-ETS1-2 and IB IAs: Students will research their own lab/math topic

Our Rationale (this will be used for future discussions and also for your support personnel to help you along the way to achieve these goals)

Supporting students in their efforts to learn the process of independent research.

Deconstructing Essential Standards

DUE: September 28, 2023. PLEASE SHARE THIS WITH SARAH G.

As a PLC you've selected at least 5 essential standards for the year, hurray! To support the work of creating SMART goals that focus on specific essential standards, here's an exercise that helps identify the targets of each standard you selected.

Taking each of the 5 (or more) standards you selected, examine what the standard is asking students in terms of: a) knowledge b) reasoning c) performance skill and/or d) product. In student friendly language ("I can" statements) reword the standard to address what it targets. See ELA & Math examples for details. **Please note** the standards you selected may or may not address all four categories. My example demonstrates that. If none of your standards address one specific target, please consider adding and/or replacing for a standard that does.

PLC WORKSHEET

Use as many of these as needed, please delete the ones you don't need.

1 STANDARD DECONSTRUCTED			
CCSS: HS-ETS1-2 and IB IAs: Students will design their own lab/math topic			
Knowledge Targets	**Reasoning Targets**	**Performance Skill Targets**	**Product Targets**
What must students know? What is the underpinning knowledge needed	How are students using knowledge to solve a problem, make a decision, etc.	What must students be able to do? How are they using knowledge and reasoning to perform a task	What are students asked to produce or create
Understanding of the math/science involved in the lab/paper	Students use reasoning to develop a feasible lab or math topic, one which has room for correct investigation methods and/or mathematics which are achievable at their knowledge leel	Students design a lab which can be carried out/use logic and math reasoning to develop an argument	IA lab design (checked by teacher before actual measurement) or math topic (partially researched and reviewed by teacher for viabvility)

2 STANDARD DECONSTRUCTED			
CCSS: IB IA Standards (Science only): Students learn the process of accurate data collection.			
Knowledge Targets	**Reasoning Targets**	**Performance Skill Targets**	**Product Targets**

What must students know? What is the underpinning knowledge needed	How are students using knowledge to solve a problem, make a decision, etc.	What must students be able to do? How are they using knowledge and reasoning to perform a task	What are students asked to produce or create
Students must know how to evaluate the validity of a source and create tables and figures to organize data	Students must find only the relevant data that supports an answer to their research question	Students must collect or find reliable data, and synthesize and present the data in a coherent manner	Data tables, graphs, figures

3 STANDARD DECONSTRUCTED			
CCSS: IB IA Standards: Students will write a lab conclusion/mathematical inferences			
Knowledge Targets	**Reasoning Targets**	**Performance Skill Targets**	**Product Targets**
What must students know? What is the underpinning knowledge needed	How are students using knowledge to solve a problem, make a decision, etc.	What must students be able to do? How are they using knowledge and reasoning to perform a task	What are students asked to produce or create
Science: Essentials of experimental design Math: Ability to make a reasoned mathematical argument	Form question, hypothesis, design experiment following scientific standards	Science: Students analyze results and write a conclusion, including error analysis and ways in which the investigation can be improved. Math: conclusion of paper shows understanding of results	Science: Lab report for internal assessment (IA) Math: IA paper

4 STANDARD DECONSTRUCTED			
CCSS: IB Group 4 Project (Science only): Students collaborate in groups of four to investigate current science research on a common theme, presenting the results in a science fair format. Project also requires a reflective paper from each student			
Knowledge Targets	**Reasoning Targets**	**Performance Skill Targets**	**Product Targets**
What must students know? What is the	How are students using knowledge to solve a	What must students be able to do? How are they using knowledge and	What are students asked to produce or create

underpinning knowledge needed	problem, make a decision, etc.	reasoning to perform a task	
Literature search, professional collaboration, scientific communication	Apply understanding of biology to real-world issues, use knowledge to comprehend scientific literature	Decision making, leadership, literature search, collaboration, effective communication and understanding	Trifold on subject and written reflection on own work and others' collaboration, oral examination of tri-fold understanding

5 STANDARD DECONSTRUCTED			
CCSS: HS-ETS1-2 and IB IAs: Students will research their own lab/math topic			
Knowledge Targets	**Reasoning Targets**	**Performance Skill Targets**	**Product Targets**
What must students know? What is the underpinning knowledge needed	How are students using knowledge to solve a problem, make a decision, etc.	What must students be able to do? How are they using knowledge and reasoning to perform a task	What are students asked to produce or create
Students must know how to find reliable and relevant sources	Students must be able to broaden or narrow their search to find a topic of the appropriate difficulty	Use search engines, narrow parameters of the search	A measurable and thorough research question, potentially with a hypothesis

If you have more than 5 standards, please make a copy of the table and repeat for any additional standards.