IB Physics SL YEAR 2 - Unit 5 Planner

Teacher(s)	Thomas Shyamala	**Subject Group and Course**	Group 4 - Physics		
Course Part and Topic	Topic 8 - Energy Production	**SL or HL / Year 1 or 2**	SL Year 2	**Dates**	February/March (5 Weeks)
Unit Description and Texts		**DP Assessment(s) for Unit**			
Students will examine the fundamental parts of matter ● Bowen-Jones, Michael, and David Homer. IB Physics. Oxford: Oxford UP, 2014. Print.		● 8.1 paper 1 quiz, 8.2 paper 1 quiz ● Test (paper 1 + paper 2)			

INQUIRY: establishing the purpose of the unit

Transfer Goals

List here one to three big, overarching, long-term goals for this unit. Transfer goals are the major goals that ask students to "transfer" or apply their knowledge, skills, and concepts at the end of the unit under new/different circumstances, and on their own without scaffolding from the teacher.

Phenomenon: The Earth will run out of non-renewable energy much sooner than we think if we do not adapt and change methods of energy production.

Statement of Inquiry: Some energy will be lost to surroundings and will not be used to perform useful work.

1. Students will discuss energy transformation and uses.
2. Students will determine the average temperature of a planet.

ACTION: teaching and learning through inquiry

Content / Skills / Concepts - Essential Understandings	Learning Process *Check the boxes for any pedagogical approaches used during the unit. Aim for a variety of approaches to help facilitate learning.*
<u>Students will know the following content:</u> • ***Specific energy and energy density of fuel sources*** • ***Sankey diagrams*** • ***Primary energy sources*** • ***Electricity as a secondary and versatile form of energy*** • ***Renewable and non-renewable energy sources*** • ***Conduction, convection and thermal radiation*** • ***Black-body radiation*** • ***Albedo and emissivity*** • ***The solar constant*** • ***The greenhouse effect*** • ***Energy balance in the Earth surface–atmosphere system*** <u>Students will develop the following skills:</u> • **Solving specific energy and energy density problems** • **Sketching and interpreting Sankey diagrams** • **Describing the basic features of fossil fuel power stations, nuclear power stations, wind generators, pumped storage hydroelectric systems and solar power cells** • **Solving problems relevant to energy transformations in the context of these generating systems** • **Discussing safety issues and risks associated with the production of nuclear power** • **Describing the differences between photovoltaic cells and solar heating panels** • **Sketching and interpreting graphs showing the variation of intensity with wavelength for bodies emitting thermal radiation at different temperatures** • **Solving problems involving the Stefan–Boltzmann law and Wien's displacement law** • **Describing the effects of the Earth's atmosphere on the mean surface temperature** • **Solving problems involving albedo, emissivity, solar constant and the Earth's average temperature**	Learning experiences and strategies/planning for self-supporting learning: ☒ Lecture □ Socratic seminar ☒ Small group/pair work ☒ PowerPoint lecture/notes ☒ Individual presentations ☒ Group presentations ☒ Student lecture/leading □ Interdisciplinary learning Details: *Students will learn through a combination of presentations, small group work, practice problems, and lab work.* ☒ Other(s): *practice problems* **Formative assessment(s):** *Paper 1 quizzes at the end of each subtopic.*

	Summative assessments: *Topic test consisting of questions from P1 and P2*
	Differentiation: ❑ Affirm identity - build self-esteem ❑ Value prior knowledge ✓ Scaffold learning ✓ Extend learning Details: ● *SWD/504 – Accommodations Provided* ● *ELL – Reading & Vocabulary Support* ● *Intervention Support* ● *Extensions – Enrichment Tasks and Project*

Approaches to Learning (ATL)

Check the boxes for any explicit approaches to learning connections made during the unit. For more information on ATL, please see the guide.

✓ Thinking
❑ Self-management
❑ Social
✓ Communication
✓ Research

Details:

Students will be continuously challenged to develop higher-order thinking skills as they take prior knowledge, combine it with new content, and analyze the data they collected to reach a conclusion.

Students will communicate their findings to their peers in the form of small-group presentations.

Language and Learning *Check the boxes for any explicit language and learning connections made during the unit. For more information on the IB's approach to language and learning, please see the guide.*	**TOK Connections** *Check the boxes for any explicit TOK connections made during the unit*	**CAS Connections** *Check the boxes for any explicit CAS connections. If you check any of the boxes, provide a brief note in the "details" section explaining how students engaged in CAS for this unit.*
✓ Activating background knowledge ✓ Scaffolding for new learning ✓ Acquisition of new learning through practice ✓ Demonstrating proficiency Details: *Concepts throughout topic 7 build into understanding final concepts.* *Students will complete practice problems*	✓ Personal and shared knowledge ❑ Ways of knowing ❑ Areas of knowledge ❑ The knowledge framework Details: The use of nuclear energy inspires a range of emotional responses from scientists and society. How can accurate scientific risk assessment be undertaken in emotionally charged areas?	❑ Creativity ❑ Activity ❑ Service Details:
Resources *List and attach (if applicable) any resources used in this unit*		
• Textbooks (see page 1) • Online notes and videos (Schoology)		

REFLECTION: considering the planning, process, and impact of the inquiry

What worked well *List the portions of the unit (content, assessment, planning) that were successful*	**What didn't work well** *List the portions of the unit (content, assessment, planning) that were not as successful as hoped*	**Notes / Changes / Suggestions** *List any notes, suggestions, or considerations for the future teaching of this unit*