Diploma Programme subject outline – Group 4: sciences			
School Name	High Point Central High School	School Code	0875
Name of DP Subject	SL IB Chemistry		
Level	Higher [ ] Standard completed in two years [X] Standard completed one year [ ]		
Name of teacher who completed this outline	Karen Martin-Jones	**Date of IB Training**	**Martin-Jones:** Online November 2015
Date when outline was completed	1/15/2019	**Name of workshop**	DP – IB Environmental Systems

1. Course outline

	Topic (as identified in the IB subject guide) *State the topics in the order you are planning to teach them*	Contents	Allocated Time One class is: 90 minutes In one week there are: 2-3 classes	Assessment instruments to be used	Resources *List the main resources to be used, including information technology if applicable*
Year 1	1: Quantitative Chemistry	1.1-1.5	10 classes	Test, practice internal assessments, interactive notebooks, Rubric-based assessment of practice internal assessments	Computers, scientific calculators, basic scientific equipment (balances, graduated cylinders, beakers, etc..), personal protective equipment
	2: Atomic Structure	2.1 - 2.3; 12.1	7 classes		
	3: Periodicity	3.1 – 3.3 and 13.1 -13.2	5 classes		
	4: Bonding	4.1-4.5 and 14.1-14.3	8 classes		
	5: Energetics	5.1 - 5.4 & 15.1	5 classes		
	6: Kinetics	6.1 - 6.2	5 classes		
	7: Equilibrium	7.1 - 7.2	5 classes		
	8: Acids and Bases	8.1 - 8.4	5 classes		
	9: Oxidation Reduction (Redox)	9.1 – 9.5	6 classes		
	10: Organic Chemistry	10.1 - 10.6	8 classes		
	11: Measurements and data	11.1- 11.3	2 classes		
Year 2	12: Atomic Structure	12.1	2 classes		
	13: Periodicity	13.1 -13.2	5 classes		

	14: Bonding	14.1 - 14.3	5 classes	Rubric-based assessment of practice internal assessments. Tests based on DBQs, short response and multiple choice. computers, basic scientific equipment and personal protective equipment
	15: Energetics	15.1 – 15.4	10 classes	
	16: Kinetics	16.1 - 16.3	5 classes	
	17: Equilibrium	17.1 - 17.2	7 classes	
	18: Acids and Bases	18.1 - 8.5	8 classes	
	19: Oxidation Reduction (Redox)	19.1 – 19.2	6 classes	
	20: Organic Chemistry	20.1 - 20.6	12 classes	
	Option C: Chemistry in Industry and Technology	11.1- 11.3	10 classes	

2. The group 4 project

As the IB guides say, "The group 4 project is a collaborative activity where students from different group 4 subjects work together on a scientific or technological topic, allowing for concepts and perceptions from across the disciplines to be shared in line with aim 10 – that is, to 'encourage an understanding of the relationships between scientific disciplines and the overarching nature of the scientific method." Describe how you will organize this activity. Indicate the timeline and subjects involved if applicable.

The Group 4 project is preformed collaboratively between IB Chemistry and IB Biology. Each group of students will consist of a mixture of disciplines with a minimum of Chemistry and Biology in every group. All of the teachers involved work together to determine an appropriate topic that can be examined within their disciplines (for example, this year we are doing Biochemistry). Teachers then determine the groups and the students work to create and present an original research project. This project begins in the middle/ end of May during the junior year. Students have 8 class periods to work on the project and 1-2 days of presentations at the start of June.

3. IB practical work and the internal assessment requirement to be completed during the course

Name of the topic	Experiment	Any ICT used? *Remember you must use all five within your programme*
Topic 1: Stoichiometric relationships	Empirical formulas from mass change Titration and standard solutions Molar mass of a gas from ideal gas equation	Yes
Topic 2: Atomic structure	Model mass spectrometer	Yes
Topic 3: Periodicity		Yes
Topic 5: Energetics/ thermochemistry	Calorimetry experiment	Yes
Topic 4: Chemical bonding and structure		Yes

Topic 6: Chemical kinetics	Investigation of rates of reaction experimentally and evaluation of results	Yes
Topic 8: Acids and Bases	Acid–base titration with different indicators Use of pH meter and universal indicator	Yes
Topic 9 Redox Processes	Experiments using a typical voltaic cell Single replacement reactions in aqueous solution	Yes
Topic 10: Organic Chemistry	Construction of 3D models of organic molecule	Yes

4. Laboratory facilities

Describe the laboratory and indicate whether it is presently equipped to facilitate the practical work that you have indicated in the chart above. If it is not, indicate the timeline to achieve this objective and describe the safety measures that are applicable.

Year 1 – Rm 100: We have 6 lab sinks and 7 lab counters in the back of the room. The students perform most of their lab work in the lab area. The lab is also equipped with gas. There is an attached storage area and across the hall the storage area has a fridge, freezer, and chemical storage (101). Rm 100 is equipped to do all of the labs above.

Year 2 - Rm 100: We have 6 lab sinks and 7 lab counters in the back of the room. The students perform most of their lab work in the lab area. The lab is also equipped with gas. There is an attached storage area and across the hall the storage area has a fridge, freezer, and chemical storage (101). Rm 100 is equipped to do all of the labs above.

5. Other resources

Indicate what other resources the school has to support the implementation of the subject and what plans there are to improve them, if needed.

Computers are available for online labs to supplement any that cannot be done in the classroom due to a lack of supplies.

6. Links to TOK

You are expected to explore links between the topics of your subject and TOK. As an example of how you would do this, choose one topic from your course outline that would allow your students to make links with TOK. Describe how you would plan the lesson.

Topic	Link with TOK (including description of the lesson plan)
3.0 Periodicity	Finding patterns in the natural sciences Many scientists need to be able to repeat the same results (repeatability). This allows them to develop or build upon theories. In this activity students must attempt to guess the pattern that your teacher is using to accept or reject playing cards. I will split them into groups of 3 and a pack of cards (maybe 2) will be shared evenly between the groups. I will then rotate around the groups and offer one card to them. I can accept or reject the card depending on the pattern they have chosen. After 2 or 3 rounds, groups can suggest a hypothesis on their turn. After a successful hypothesis is stated, I will repeat the game with a more challenging pattern. I will then ask them the following questions and ask them how this method was used by Mendeleev and Moseley in his discovery of the Periodic Table. • If you were to describe the process you used to find the pattern in the format of a flowchart, what might it look like? • Can you make links from your flowchart to this version of the scientific method? • Two of the fundamental features of the scientific method are repeatability and falsification. How might you have used these in the game? Why are they important? • Do you think that theoretical research has a much better chance of being accepted by the scientific community if it is supported by empirical evidence? They would then create a timeline of the history of the periodic table and testing the facts using the scientific method flowchart.

7. Approaches to learning

Every IB course should contribute to the development of students' approaches to learning skills. As an example of how you would do this, choose one topic from your outline that would allow your students to specifically develop one or more of these skill categories (thinking, communication, social, self-management, or research).

Topic	Contribution to the development of students' approaches to learning skills (including one or more skill category)
8: Acids & Bases	Communication, self-management and research: Students will discuss the controversy over pollution factors affecting the coral reefs and global warming, students will independently conduct research in order to develop their own opinions. They will present their finding in class through both a presentation and class discussion platform. The emphasis of the activity is on effective communication in an academic environment using scholarly resources. It is expected that students are going to disagree and will feel some frustration, so the activity is preceded by a class discussion. Students are assessed on their ability to communicate respectfully with classmates, citing reliable sources and synthesizing information to make their own argument. These activities are self-paced, with a due date for the rough draft and the final presentation.

8. International Mindedness

Every IB course should contribute to the development of international-mindedness in students. As an example of how you would do this, choose one topic from your outline that would allow your students to analyze it from different cultural perspectives. Briefly explain the reason for your choice and what resources you will use to achieve this goal.

Topic	Contribution to the development of the attribute(s) of the IB learner profile
8: Acids & Bases	We discuss the impact of global warming on coral reefs. We watch part of the movie "Chasing Coral" and talk about the impact that increased acidification of the oceans as a result of an increase in dissolved carbon dioxide has on our aquatic ecosystem. We also discuss international policy governing the water pollution and conservation. To summarize the topic, we examine what we as individuals can do to protect the coral reefs.

9. Development of the IB learner

Through the course it is also expected that students will develop the attributes of the IB learner profile. As an example of how you would do this, choose one topic from your course outline and explain how the contents and related skills would pursue the development of any attribute(s) of the IB learner profile that you will identify.

Topic	Contribution to the development of the attribute(s) of the IB learner profile
8: Acids & Bases	Communicators, open-minded, caring, risk-takers, reflective Continuation of Coral Reef/Global Warming research activity: Students will be allowed to research, discuss, and present the risks associated with gaseous exhaust from factories, cars and technology junkyards globally impact everyone. By having a class discussion, students will have the opportunity to reflect on how their words are perceived by others and write a reflective summary on if the information they learned from their peers changed their perspective. This activity challenges them to think outside the box and allow them to step outside what may be uncomfortable (presenting and communicating in front of people).