Secondary School Focus on Learning Collaboration:

Subject Area: Science

Purpose: The purpose of this collaborative exercise is to establish one Critical Learner Need (CLN) in a grade level and to develop an action plan to address that CLN. The CLN for a grade level might not apply to all students.

Steps:

1. **Dig into Student Data:** *What is the Critical Learner Need?* Reflect upon all relevant data collected over the assessment period to establish the CLN. Look for the 'story' behind the data to establish the CLN. Data can be quantitative or qualitative.
2. **Examine Instruction:** *What are we doing at the moment to address the CLN?* Reflect critically upon our practices in light of CLNs. Are our practices effective in addressing this CLN?
3. **Develop an Action Plan:** *What are we planning to do differently to address the CLN?* List the practices that we are going to introduce, refine, innovate, do more of, etc. to address the CLN.
4. **Plan to Assess, Act, and Assess:** *How will we know our Action Plan is working?* How and when will we assess progress?
    a. *How will we respond when some students do not learn?* List what we might do to further support students who are still struggling with the CLN? What are our next steps?
    b. *How will we respond when some students have already learned?* List what we might do to extend students who have resolved the CLN. What are our next steps?

Outcome: Please work with your teaching partner(s) to fill out the form below. Add a row for each course.

2024-2025

Course (incl. Grade)	**CRITICAL LEARNER NEED**	**TEACHER PROBLEM OF PRACTICE**		
	Dig Into Student Data *What is the Critical Learner Need (CLN)?*	**Examine Instruction** *What are we doing at the moment to address the CLN?*	**Develop an Action Plan** *What are we planning to do differently to address the CLN?*	**Plan to Assess, Act and Assess** *How will we know our Action Plan is working?*
PreK and KG				

1	Maybe tudents ability to ask questions? They are curious, but require a lot of explicit instruction and scaffolded learning before they can inquire independently.	We find that we are-teaching concepts that were naturally covered in Q1 and Q2..	Teach communities units in Q1 and Q2 to enhance connection and depth of knowledge.	
2	Increase reflection	Giving a lab report to fill out, went through the design cycle. Often incorporate math, reading, and writing during science.	Could we choose one experiment to reflect on, and what could be changed? Then have them try it and record.	Students will begin to reflect naturally on the science process.
3				
4	Conducting the scientific method Developing inquiry from units of learning Integrating science with reading and writing	Ask a question Form a hypothesis Conduct an experiment Record observations Analyze results Draw conclusions Use a graphic organizer for ● Observations ● Hypothesis writing ● Data collection ● Reflection	Use of Science journals to record hypotheses, questions, procedures, observations, and conclusions Data collection templates during experiments Collaborative science inquiry tasks	Teacher checklists for: Participation in inquiry Use of scientific vocabulary Peer feedback after group investigations Rubrics for: ● Scientific writing ● Use of the scientific method ● Group collaboration
5	Physical Science is the lowest performing strand as shown in MAP data. (Properties of Matter & Materials is last unit of the year) Analyzing Data Supporting an argument using Claim-Evidence-Reasoning (CER	Earlier start date for the unit Students analyzed data and supported written arguments during “Making Rain” and “Mold Terrarium” investigations. Will also do it during their Methos/Diet Coke Investigations.	Incorporate more physical science earlier in the school year. Incorporate regular data talks in math and science instruction. Use Building Thinking Classroom techniques to get students to collaborate and discuss their claims, evidence, etc.	Take the opportunity to have students take a formal written assessment to make them more “assessment-ready.” Gallery walks, individually written Claim-Evidence-Reasoning for investigations
Grade 6	In general they are low. Particularly life science and science skills are low. They had difficulty making tables and asking questions.	Focusing on skills with building content off skills. More hands on experiences and using knowledge to support their explanations of the investigations.	More direct instruction with cells and cell processes. The first unit is mainly dedicated to how to conduct labs and behaviors needed.	Not sure yet. Need more time to reflect the last weeks.

Grade 7	Earth and Space Science is the grade 7 class's lowest performing strand as shown in MAP data.	In Grade 6 there is one section. In Grade 7 we do a geology unit and then the Earth, Moon, and Sun cycle unit. The units were rewritten so they should show more growth.	Last year the Grade 7s had an online simulation unit. There was not much direct instructions and hand- on activities . The units were rewritten to include these.	Not sure yet. Need more time to reflect the last weeks.
Grade 8	Earth and Space Science is the grade 8 class's lowest performing strand as shown in MAP data but is not taught in this grade.	Currently, we only teach these topics in grades 6 and 7 in middle school. And then it's not focused on in high school.	We'd like to do a mini-unit review for grade 8s so that they have a final way to share their knowledge of Earth and Space Science for their final year of middle school, rather than skipping it entirely. Also, this might be a fun way to incorporate a hands-on small project rather than too much text review.	Collaborative Group work and project grades. MAP data
Grade 9	Students struggle with independent thinking and making connections between concepts. Many students rely heavily on teacher-directed instructions and are hesitant to engage in problem-solving on their own. They often wait for step-by-step guidance and find it challenging to make connections between new material and what they already know. This leads to difficulties in applying concepts in unfamiliar situations or synthesizing multiple ideas. When tasked with open-ended problems, students may feel unsure of where to start, instead of thinking critically and exploring possible solutions on their own. This challenge is rooted in a tendency for students to focus more on memorization and following clear instructions rather than developing deeper, more flexible thinking skills. To address this need, students must be given more opportunities to think independently, ask questions, and connect ideas across different topics in a way that encourages active problem-solving.	Currently, I am encouraging students to engage in labs where they are not given explicit instructions on what is happening. Instead of providing step-by-step guidance, I'm prompting students to explore the data they collect and make their own connections to the concepts learned in class. This approach is designed to foster independent thinking by encouraging them to analyze their results, identify patterns, and draw conclusions based on evidence. I'm also guiding them to reflect on how the lab connects to the larger scientific principles we've discussed, rather than just following a prescribed process. While this method challenges students to think critically and make connections, it also requires a shift in mindset, as many students are used to being told exactly what to do and what the outcomes should look like. The goal is to help them develop a deeper understanding of the material and build their problem-solving skills through discovery.	To address this need, we will shift toward more inquiry-based learning, encouraging students to generate their own questions and explore solutions with guided autonomy. This could involve: Promoting problem-solving: Use more open-ended problems and scenarios where students must draw upon previous knowledge and make connections to new topics. Encouraging self-explanation: Have students explain their thinking and reasoning aloud or in written form after completing tasks to help them clarify and reinforce their learning. Collaborative learning: Foster small group discussions where students brainstorm solutions and share their thinking with peers, encouraging them to engage with the material from different perspectives.	Assess: We will conduct formative assessments such as exit tickets or quick reflection questions at the end of lessons, where students share how they approached a problem and the connections they made. This will gauge their ability to make connections independently. Act: Implement more inquiry-based tasks and collaborative group work, where students are given more opportunities to think independently. We will adjust these activities based on feedback and reflections. Assess: After a few weeks, we will review student performance on assessments, quizzes, and projects to see if they show improved independence in making connections. Additionally, self-assessments or peer assessments will help us see if students are becoming more confident in their ability to think critically and make connections without relying solely on direct instruction.
Grade 10	Students struggle with independent thinking and making connections between concepts.	Currently, I am encouraging students to engage in labs where they are not given explicit instructions on what is	To address this need, we will shift toward more inquiry-based learning, encouraging students to generate their	Assess: We will conduct formative assessments such as exit tickets or quick reflection questions at the end of

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IB Chem	Many students find applying concepts and skills in unfamiliar situations difficult even when they understand the content. They often have difficulty identifying the scientific ideas the problems relate to and identifying the important & relevant information from tables of data, graphs or diagrams. This is often compounded by not knowing the meaning of non-scientific "everyday" English vocabulary. Continuing to help students build these skills will allow them to better demonstrate what they know. This links closely to several	Students prepare for class by reading the textbook or study guide, watching videos, taking notes, and defining unfamiliar terms to build scientific vocabulary. Exemplar answers to IB-style questions are provided and analysed. Exemplar IAs are also analysed with scaffolding provided for IA and lab report writing. IB-style questions are practiced in all topics. Unit tests are based on IB questions and done under timed conditions to improve exam skills.	Focus on Vocabulary Development: Continue to emphasize key terms and their meaning in the presentations & packets with the addition of some short quizzes. Key terms for each unit will be provided in the topic packets and continue to be reviewed throughout our lessons to strengthen their scientific language. Use More Exemplars: We will analyze high-quality IA examples in class, highlighting both strengths and areas for improvement to guide student work. Use of checklists: particularly in the writing of lab reports. Encourage students to use them by including them as part of the lab report submission. Continue to Practice with Command Terms focusing on exercises that help students identify and effectively apply	We'll continue to look at recent assessments and student feedback to pinpoint where they're struggling. As we move forward, we'll track progress through tests, lab reports, practice questions/quizzes, and oral checkins. Success will show in improved performance on unit tests and lab reports, better use of command terms, and written responses that use appropriate vocabulary. We'll check in with students and review their IA progress to make adjustments as needed.

	Approaches to Learning (ATL) skills: Thinking Skills – Learning how to unpack questions, connect them to core concepts, and interpret data or results thoughtfully. Communication Skills – Practicing how to explain ideas clearly using the right scientific terms and structure. Self-Management Skills – Building strategies to stay calm, manage time, and tackle questions step by step under pressure. Research Skills – Being able to pull relevant information from unfamiliar sources like tables, charts, or short texts and apply it to the question at hand, including understanding relevant vocabulary.		command terms in different types of exam questions. More Timed Practice Assessments: We will incorporate timed quizzes and exams throughout the course to help students manage their time and improve their exam performance.	
IB Bio	Many students find it difficult to make sense of long or complex IB Biology questions, even when they understand the content. They need more support learning how to break down what the question is really asking, identify the key scientific ideas, and pick out the important information from data, graphs, or case studies. Helping them build these skills will give them more confidence and allow them to show what they truly know. This links closely to several Approaches to Learning (ATL) skills: Thinking Skills – Learning how to unpack questions, connect them to core concepts, and interpret data or	Students prepare for class by reading relevant articles, taking notes, and defining unfamiliar terms to build scientific vocabulary. We analyze exemplar IAs, provide scaffolding for report writing, and regularly practice IB-style questions with a focus on command terms and structure. Unit tests are based on IB questions and done under timed conditions to improve exam skills. Study groups are encouraged to support peer learning and review.	Focus on Vocabulary Development: We will provide students with a list of key terms for each unit and review them throughout our lessons to strengthen their scientific language. Use More Exemplars: We will analyze high-quality IA examples in class, highlighting both strengths and areas for improvement to guide student work. More Practice with Command Terms: We will focus on exercises that help students identify and effectively apply command terms in different types of exam questions. Support Writing Structured Responses: We will break down the process of answering complex questions into manageable steps, with clear guides to help students structure their responses. Peer Review and Collaborative Feedback: We will establish regular peer review sessions to encourage students to give each other feedback	We'll start by looking at recent assessments and student feedback to pinpoint where they're struggling. As we move forward, we'll track progress through writing tasks, vocabulary quizzes, and peer feedback. Success will show in improved performance on unit tests, better use of command terms, and more structured responses. We'll check in with students and review their IA progress to make adjustments if needed.

	results thoughtfully. Communication Skills – Practicing how to explain ideas clearly using the right scientific terms and structure. Self-Management Skills – Building strategies to stay calm, manage time, and tackle questions step by step under pressure. Research Skills – Being able to pull relevant information from unfamiliar sources like tables, charts, or short texts and apply it to the question at hand.		on the clarity and accuracy of their answers. More Timed Practice Assessments: We will incorporate timed quizzes and exams throughout the course to help students manage their time and improve their exam performance.	
IB Phys	Students are not able to apply concepts and skills in unfamiliar situations. They often have difficulty identifying the scientific ideas the problems relate to and identifying the important & relevant information from tables of data, graphs or diagrams. This is often compounded by a lack of the mathematical skills required to solve the physics problems. Continuing to help students build these skills will allow them to better demonstrate what they know. This links closely to several Approaches to Learning (ATL) skills: Thinking Skills – Learning how to unpack questions, connect them to core concepts, and interpret data or results thoughtfully. Communication Skills – Practicing how to explain ideas clearly using the right scientific terms and structure.	Students prepare for class by reading the textbook, guidebook, taking notes, and defining unfamiliar terms to build scientific vocabulary. We analyze exemplar IAs, and regularly practice IB-style questions with a focus on command terms and structure. Unit tests are based on IB questions and done under timed conditions to improve exam skills. Study groups are encouraged to support peer learning and review.	Focus on practising IB style questions in class in addition to short quizzes. Key terms for each unit will be provided in the topic packets and continue to be reviewed throughout our lessons to strengthen their scientific language. Use More Exemplars: We will analyze high-quality IA examples in class, highlighting both strengths and areas for improvement to guide student work. Use of checklists: particularly in the writing of lab reports. Encourage students to use them by including them as part of the lab report submission. Continue to Practice with Command Terms focusing on exercises that help students identify and effectively apply command terms in different types of exam questions. More Timed Practice Assessments: We will incorporate timed quizzes and exams throughout the course to help students manage their time and improve their exam performance.	We'll continue to look at recent assessments and past papers as well as student feedback to pinpoint where they're struggling. As we move forward, we'll track progress through tests, lab reports, practice questions/quizzes, and oral check ins. Success will show in improved performance on unit tests and lab reports, better use of command terms, and written responses that use appropriate vocabulary and the mathematical steps required. We'll check in with students and review their IA progress to make adjustments as needed.

	Self-Management Skills – Building strategies to stay calm, manage time, and tackle questions step by step under pressure in order to not make any mathematical mistakes. Research Skills – Being able to pull relevant information from unfamiliar sources like tables, charts, or short texts and apply it to the question at hand, including applying the required mathematics.			

IB ESS	In IB ESS, students often struggle with unpacking complex, real-world questions that blend environmental content with systems thinking. They need support in learning how to break these questions down—recognizing what perspective is being asked for, what concepts are involved, and how to use data or case studies effectively in their answers. Without these skills, students may miss the point of the question or overlook opportunities to show deeper understanding. This connects directly with key Approaches to Learning (ATL) skills: Thinking Skills – Strengthening their ability to think holistically, make connections between ideas, and evaluate cause-and-effect relationships in environmental systems. Communication Skills – Learning how to clearly express arguments, use ESS terminology appropriately, and organize responses logically. Self-Management Skills – Practicing how to plan, pace, and approach longer data-response and essay questions with confidence. Research Skills – Developing the ability to interpret graphs, maps, case studies, and stakeholder perspectives, and use them as evidence in their responses.	To support students in understanding and responding to IB-style questions, we've built in several strategies. Students complete pre-lesson readings and define unfamiliar terms to strengthen their content knowledge. In class, we practice breaking down exam questions, identifying command terms, and reviewing sample answers to understand markschemes. Scaffolds and planning tools are used to help structure responses. All unit tests include real IB questions and are done under timed conditions to build exam confidence. Study groups also give students a space to review and prepare together.	Focus on Vocabulary Development: We will provide students with a list of key environmental terms for each unit and revisit them throughout our lessons to enhance their scientific vocabulary. Use More Exemplars: We will review high-quality responses and case studies in class, pointing out effective techniques and areas for improvement. More Practice with Command Terms: We will guide students through exercises focused on identifying and applying command terms in various ESS exam questions. Support Writing Structured Responses: We will break down the process of answering complex ESS questions into clear, manageable steps to help students structure their responses. Peer Review and Collaborative Feedback: We will set up peer review sessions where students can exchange feedback on each other's answers, focusing on clarity and depth. More Timed Practice Assessments: We will incorporate more timed quizzes and exams based on IB-style questions to improve students' time management and exam readiness.	We'll begin by reviewing student assessments and reflections to see where the biggest gaps are. Along the way, we'll monitor progress with writing tasks, vocabulary exercises, and peer review. Success will be seen in improved performance on timed questions and more organized, clear answers. We'll use student feedback and IA progress to guide next steps.
IB Comp. Sci.				

	WS CRITICAL LEARNER NEED	WS TEACHER PROBLEM OF PRACTICE		
	Dig Into Student Data *What is the Critical Learner Need (CLN)?*	**Examine Instruction** *What are we doing at the moment to address the CLN?*	**Develop an Action Plan** *What are we planning to do differently to address the CLN?*	**Plan to Assess, Act and Assess** *How will we know our Action Plan is working?*
	Independent Inquiry - Asking questions - Making Observations - Recording & analysing data		Have each grade level focus on one aspect Grade 1: Asking questions Grade 2: Making Observations Grade 3: Recording data including numbers in tables Grade 4: Finding patterns (analysing data) Grade 5: Research questions & hypotheses (Supporting arguments) Grade 6: Variables & measurement Grade 7: Experiment design Grade 8: Conclusions & Evaluation Grade 9: Design, conduct & write up experiment independently from teacher-demonstrations Grade 10: Design, conduct & write up experiment independently	

2023-2024

Course (incl. Grade)	CRITICAL LEARNER NEED	TEACHER PROBLEM OF PRACTICE		
	Dig Into Student Data *What is the Critical Learner Need (CLN)?*	**Examine Instruction** *What are we doing at the moment to address the CLN?*	**Develop an Action Plan** *What are we planning to do differently to address the CLN?*	**Plan to Assess, Act and Assess** *How will we know our Action Plan is working?* *How will we respond when some students do not learn?* *How will we respond when some*

				students have already learned?
PreK and KG	Exploring Transformations and Hypothesizing.	Asking what will happen questions. Open- ended questions. Asking for predictions.	Formal hands-on activities and experiments. Hypothesizing beforehand.	Observations, conversations, testing and anecdotal notes on the children
1	Lack of prior knowledge in relation to animals in the Plant and Animal unit resulted in the unit taking more time than planned. Students quickly discerned that the needs of plants and animals were similar in many ways to our own (food, water, shelter,air, etc.), but knowledge of animals beyond their name was unknown. Students thought mammals were feathered or scaled and were unfamiliar with classifications and of the habitats they inhabit.	Lessons on animal classification were had and through learning activities like sorting animals according to their look and behaviors, illustrating and labeling parts of animals,etc., students learned about the different classifications respective attributes. Small group rotations about animals were implemented as the unit progressed as well. This included the introduction of educational technology as well.	Pretest students on their knowledge of animals prior to the unit. This was not done as 1st graders customarily have good (not perfect) prior knowledge of animals and some of their key attributes. Teaching Science earlier in the day when students are more focused and alert. Small group rotations Also, a visit to the Yangon Zoological Gardens would be helpful in developing and reinforcing knowledge and understanding thereof.	***How will we know our Action Plan is working?*** *If students are fully engaged in the material. Ilgf key information is shared and discussed by students in whole or small group sessions.* *If student responses to informal assessments, like exit tickets or quick verbal quizzes (individual and group) demonstrate understanding.* *If tasks given, e.g, sort animals by their respective characteristics, labeling of animal parts are largely correct.* ***How will we respond when some students do not learn?*** *Review and reinforce key concepts using different teaching methods, such as hands-on activities, videos, or interactive games.* *Utilize more visual aids like charts, diagrams, or images to help students visually grasp the differences between animal classifications.* *Provide targeted support through small group instruction or one-on-one sessions to address individual learning needs.* *Engage students in interactive activities (learning apps like Seesaw and Freckle) where they can sort and classify images or objects representing different*

				animals *Relate animal classifications to real-life examples, such as a visit to the Yangon zoo to make the concepts more tangible. To students.* *Differentiate instruction to cater to different learning styles and abilities within the classroom, using varied approaches to accommodate individual needs.* *Encourage parental Involvement. Communicate with parents about the challenges students are facing and suggest activities or discussions they could have at home with their children to reinforce learning.* ***How will we respond when some students have already learned?*** Provide additional, more challenging tasks or projects that allow high-performing students to delve deeper into the content, e.g., independent research, creative projects, or presentations.Provide access to resources such as advanced reading materials, documentaries, or online resources that offer more in-depth information about animals (and plants if this is where the focus is needed). Offer collaborative projects where high-performing students can work together and thus challenge and support each other as they delve deeper into a given or chosen topic. .
2	Asking open ended questions, record questions, checking for new understanding.	Questions are asked or developed throughout daily lesson. Jenny has a question board in her classroom.	Schedule into Scope and Sequence	Students answers are visible on question board or in notebooks.

3	Constructing thorough responses to express science learning.	Answer science questions as a class. Working slowly to craft a complete response that reflects a depth of understanding.	The Writing Revolution suggests bringing targeting sentence practice into all content lessons. We could introduce quick 5-minute sentence routines into our science lessons.	*How will we know our Action Plan is working?* Students will independently use those sentence structures in their written science responses. *How will we respond when some students do not learn?* Provide them with sentence starters when tasked with writing about science. *How will we respond when some students have already learned?* We could create science writing partnerships, so their advanced writing skills could serve as exemplars for their partners.
4	Struggles with: Construct arguments with evidence, analyze and interpret data to make sense of phenomena using logical reasoning	Hands-on experiments and data analysis Jigsaw learning where students explore topics and then present their findings and understanding. Education Technology included where applicable to aide in learning and understanding	Interactive Simulations: Introduce computer-based simulations that allow students to model scientific processes and observe outcomes in real-time, enhancing their understanding of complex concepts Science Inquiry Projects: Implement inquiry-based projects where students formulate their questions and conduct investigations, encouraging deeper engagement with scientific methods. Collaborative Learning Labs: Develop labs where students can work in teams to solve problems and conduct experiments, fostering collaboration and critical thinking skills.	Tests and Quizzes: Regular assessments to measure understanding and retention of scientific concepts. Presentations: Students will present on scientific topics, demonstrating their ability to construct arguments and use evidence Peer and Teacher Feedback: Utilizing feedback mechanisms to gauge the depth of student understanding and their ability to communicate scientific ideas effectively. MAP Test Scores (Spring)
5	Scientific Inquiry/Process: (Asking questions, working with models, constructing explanations, engaging in argument from evidence) due to lack of experience with hands-on investigations and experiments.	Teach the Question Formulation Technique and continue having students add questions to wonder charts. Modeling as part of each science unit (share exemplars).	Set up opportunities for students to follow the process in an investigation of their choice.	Use rubric to self-assess and peer assess. We attempted to make our units interdisciplinary which helped us continue progressing with science and social studies concepts. As a Grade

				Level, students' median percentile on MAP was 89. A lot of emphasis was placed on modeling, but we need to continue developing the hands-on scientific inquiry process including writing a scientific lab report. The plan is to target this during our Matter unit after the completion of the Compassion Project.
Grade 6	Writing a CER that is concise and clear.	Conducting investigations and using the data and the knowledge to write a CER. Modeling the process and quality pieces.	Conducting investigations with students clearly understanding they will produce a claim supported by evidence and backed up with scientific reasoning.	We will know it's working when students can write it in three parts and they can identify the quantitative and qualitative data. When students are struggling with it, give them a minimum to write so they develop stamina. Students can always expand on their reasoning when they have mastered the format.
Grade 7	Writing a CER that is clear and concise.	Modeling it. Revisiting it often and adding more qualitative and quantitative evidence. Showing three distinct parts.	Using mentor CERs to show the format and identify the evidence and the reasoning tied to that evidence. Students use their own observations and evidence to list it, then find the reasoning behind the evidence.	When students can write in three parts with a combination of observations and data and explain it with scientific reasoning. Students that will need more support can look at the student examples and use that together. Also, they will be teamed up with higher students. Students that got the format, can always include more specific scientific reasoning to give more support to their claims.
Grade 8	Creating models to represent situations	Using physical materials and templates to guide students	Offering multiple submissions and resubmissions with feedback for improvement	Neatness and accuracy will increase on the bottom chunk of achievers. Meet individually with students to give verbal and visual feedback Additional challenges with more in-depth situations
Grade 9	Asking good scientific questions that can be answered with an investigation.	Modeling how to ask questions, assessing our questions. Using a question wall to categorize questions into different cross cutting concepts.	Having more assessments to provide students with meaningful feedback.	We will know it is working when we collect data from assessments. When students do not learn I will be regrouping them with those that do and have them continue to practice. I will also provide them with sentence starters to help further model the process. Additional aids to help them

				will include asking questions to material not related to what we are talking about. Having them work in an area they are interested in that might not be science related. Prefer to do science questions first however.
Grade 10	There is a critical need to enhance organizational skills to better prepare for the transition to working independently at a Grade 10 level, including proficiency in lab skills. This development involves mastering the ability to manage time and resources efficiently, conducting experiments effectively, and addressing gaps in understanding core academic content.	**Independent Projects**: Students engage in independent projects and research that challenge them to manage their own time and resources, enhancing their grasp of academic content and fostering their ability to work autonomously. **Supervised Lab Sessions**: In these sessions, students practice essential lab techniques, use lab equipment correctly, and develop skills in data analysis and interpretation, all under the guidance of educators. **Use of Organizers**: The use of organizational tools such as planners and digital apps helps students better manage their study schedules and project deadlines. **Continuous Feedback**: Implementing feedback mechanisms allows students to monitor their progress in developing these skills and identify areas where further improvement is needed.	Enhanced Digital Tools Integration: I'll incorporate advanced digital tools for project management and time tracking, designed to help students organize their activities more effectively and gain real-time insights into their progress. Peer Mentoring Programs: I'm establishing peer mentoring systems where experienced students guide younger ones, enhancing both parties' organizational, communication, and leadership skills through collaborative learning. Interactive Lab Simulations: To improve lab skills, I plan to introduce interactive simulations that allow students to practice various techniques in a safe, scalable virtual environment. Regular Assessment and Adaptive Feedback: I aim to implement frequent assessments aligned with real-time feedback mechanisms to provide continuous, adaptive support for students' learning progress.	**Supplementary Resources:** Provide additional learning materials that can help reinforce difficult concepts. This might include visual aids, interactive tools, or hands-on learning opportunities that cater to different learning styles. **Regular Check-Ins**: Increase the frequency of check-ins with students who are struggling, offering them opportunities to discuss their challenges and progress. Regular feedback can help adjust their learning plan as needed. **Advanced Assignments**: Offer more challenging assignments that encourage deeper exploration of topics and allow students to apply their knowledge in new or complex situations. **Mentorship Opportunities:** Involve these students in peer teaching or mentorship roles, where they can help classmates who are struggling with the material.
IB Chem	Our science department IB critical learning need: Based on the results in Paper 2: improve/develop students comprehension of application questions that are often wordy, so that they can read the question, work out what it is asking, and extract relevant information in a timely manner.	Have students do pre-class prep by reading relevant sections of the textbook, writing notes and including definitions/explanations of terms that are unfamiliar. Exemplar IAs are provided and analysis of some is done. Scaffolding and suggested structure of the report is provided. Doing example questions in class that emphasise the command terms, identifying the topic and examining approaches to answering the question. This also includes exemplar answers. Unit tests and exams are based on IB questions from the beginning of year 1. Exam time keeping standards are being applied to unit tests and assessments.	Continue to provide scaffolding tasks leading up to the IA with feedback given based on the IA rubric. Providing feedback on the actual IA report, following on from one-on-one meetings throughout the process.. Will continue to do example questions in class including exemplar answers and a focus on command terms. The use of IB questions in tests and exams will be continued as will the time keeping standards.	Results in unit tests and IB exams & final IA grades after moderation although neither of these are a very good indicator when comparing years due to the small class sizes and the variation between abilities in different grade levels.

IB Bio	**Enhance Reading Comprehension Skills**: Equip students with strategies to navigate and comprehend wordy application questions without feeling overwhelmed. **Develop Analytical Skills:** Foster the ability to break down questions to understand the underlying concepts and the specific information being requested. **Promote Efficient Information Extraction:** Train students to quickly identify and focus on relevant data and cues within the question that are essential for formulating accurate responses.	• Pre-class prep by reading relevant articles, writing notes and including definitions/explanations of terms that are unfamiliar. • Exemplar IAs are provided and analysis of some is done. Scaffolding and suggested structure of the report is provided. • Doing example questions in class that emphasize the command terms. • Identifying the topic and examining approaches to answering the question. This also includes exemplar answers. • Unit tests and exams are based on IB questions from the beginning of year 1. • Exam time keeping standards are being applied to unit tests and assessments. • Study groups were created for students to meet and review together.	**Comprehension Workshops:** Conduct sessions focused on reading strategies that aid in understanding complex texts and questions, such as skimming for main ideas, scanning for specific information, and recognizing keywords. Implement exercises that involve paraphrasing and summarizing long questions to distill essential elements. **Question Analysis Drills:** Regularly practice with sample application questions, dissecting each to identify what is explicitly asked and what is implied. Use think-aloud methods to demonstrate how to approach different types of questions, highlighting the thought process involved in analyzing and responding. **Targeted Practice with Timed Conditions:** Integrate timed quizzes that feature wordy application questions, encouraging students to apply their comprehension and analytical skills under exam-like conditions. Gradually reduce the time allowed for these practices to increase students' efficiency. **Peer Teaching Sessions:** Organize sessions where students take turns presenting their approach to dissecting and solving complex questions to their peers. This method reinforces their own understanding and provides exposure to various techniques and perspectives.	**<u>Monitoring and Evaluation:</u>** **Regular Assessments:** Utilize both formative and summative assessments to measure students' progress in comprehending and analyzing complex questions. This includes quizzes, in-class activities, and mock exams. **Feedback Loops:** Implement structured feedback sessions where students can reflect on their learning experiences and outcomes. This feedback should be gathered not only from assessments but also through direct student feedback and observation during class activities. **<u>Intervention Strategies:</u>** **Additional Support:** Provide extra help sessions or tutorials for students who struggle. This can include one-on-one mentoring, small group sessions focusing on specific skills, or additional practice materials tailored to their needs. **Differentiated Instruction:** Modify instructional approaches based on individual learning needs. For example, some students might benefit from visual aids or diagrams that break down complex questions, while others might need more practice with reading strategies. **Continuous Assessment and Feedback:** Keep a close track of the progress of students who are struggling and continuously provide constructive feedback to help them improve. Adjust learning strategies as needed based on their development and feedback. **<u>Enrichment Opportunities:</u>** **Advanced Challenges:** Offer more complex and challenging problems that extend beyond the typical curriculum to keep advanced students engaged. This could include deeper research projects, integration of interdisciplinary topics, or participation in science fairs and contests. **Peer Mentoring:** Encourage students who have mastered the material to help their

				peers who are struggling. This not only reinforces the advanced students' knowledge but also builds a supportive learning community. **Independent Study Options**: Provide opportunities for self-directed learning, where advanced students can explore topics of personal interest related to the curriculum. This could be facilitated through independent research projects or exploratory labs.
IB Phys	Our science department IB critical learning needs: Based on the results in Paper 2: improve/develop students comprehension of application questions that are often wordy, so that they can read the question, work out what it is asking, and extract relevant information in a timely manner.	Having students practice paper two style problems in the textbook. Providing students with IB past-paper questions and markschemes to practice solving these problems.	Integrate group work in order for students to learn/practice solving paper two questions into classwork. The challenge for introducing this will be the time that it requires. Assign web-based practice so students can get support in the areas they need. Scaffold the IA into smaller manageable chunks to make the IA less overwhelming for the students. Tutor students in the Kognity website to ensure that they use this resource in the areas where they need it. Assign Kognity reading and comprehension self checks.	Improvement in the results on unit tests and IB exams as well as the final IA grades after moderation. However due to the variation in abilities from year to year these are not reliable indicators. If students are still struggling,differentiation, scaffolding and one on one tutoring can be employed. Once students have mastered the content additional practice can be assigned in order for them to solidify their knowledge on how to transfer their skills to new and unfamiliar situations.

2022-2023

April 24, 2023: Instructions:

1. Please read through the Critical Learner Needs (CLN) that have been identified in your courses and grade levels.
2. **Group Dialogue:** Are there any CLNs that need to be addressed across the school (e.g. the CLN is appearing in multiple courses/grade levels or a CLN in younger grades needs to be addressed for success in older grades or there is another reason why a CLN needs to be prioritized for students to succeed in this subject)

3. **Identify CLNs:** Please record *up to* 3 CLNs that your group feels need to be addressed school wide (e.g. in a curriculum review). Please record these CLN is order of priority (CLN 1 being top priority).
4. **Draft Action Plans:** Please then spend the remaining time brainstorming Teacher Problem of Practice Action Plans for the CLNs you have identified. You may do this in a variety of ways:
    - The whole group could work on the action plans together. If so, please start with CLN 1.
    - The group can split into smaller groups that can each work on a different CLN. If so, once completed, please share your action plans with the whole group.
5. Each group shares their action plan addressing their CLN 1.

Critical Learner Need	**CRITICAL LEARNER NEED**	**TEACHER PROBLEM OF PRACTICE ACTION PLAN**		
	Dig Into Student Data *What is the Critical Learner Need (CLN)?*	**Examine Instruction** *What are we doing at the moment to address the CLN?*	**Develop an Action Plan** *What could we do differently to address the CLN?* *What help and/or resources might we need?*	**Plan to Assess, Act and Assess** *How will we know our Action Plan is working?*
CLN 1	**asking questions**	Starting with phenomena → make observations and ask questions, a.k.a. Notice & Wonder; See-Think-Wonder; Question formulation technique Model asking questions, emphasis on approach rather than stating what you think immediately	Using common language: NGSS Science and Engineering Practices The Wonder of Science Scientific Process flowchart, rather than method Sentence starters/sentence stems for asking questions	
CLN 2	**engaging in argument from evidence**	Exemplars CER statement structures		
CLN 3	**interpreting data**	Do graphs by hand before using technology		
CLN 4	**decoding text**	Regularly introducing short texts Annotating text		

November 14:

- Please share the Critical Learner Needs (CLN) that you have identified in your courses and grade levels.

- As you share, are there any CLNs that need to be addressed across the school (e.g. the CLN is appearing in multiple courses/grade levels or a CLN in younger grades needs to be addressed for success in older grades or there is another reason why a CLN needs to be prioritized for students to succeed in this subject)
- Please record *up to* 3 CLNs that your group feels need to be addressed school wide (e.g. in a curriculum review). Please record these CLN is order of priority (CLN 1 being top priority).

CLN 1: Familiarity with lab reports and hands on skills. procedural knowledge, including following and writing down instructions.

CLN 2: Data collection, modeling, and analysis. Hand drawn graphs can help develop procedural knowledge and analytic understanding of graphs and visual representations.

CLN 3:

Course (incl. Grade)	**CRITICAL LEARNER NEED**	**TEACHER PROBLEM OF PRACTICE**		
	Dig Into Student Data *What is the Critical Learner Need (CLN)?*	**Examine Instruction** *What are we doing at the moment to address the CLN?*	**Develop an Action Plan** *What are we planning to do differently to address the CLN?*	**Plan to Assess, Act and Assess** *How will we know our Action Plan is working?* *How will we respond when some students do not learn?* *How will we respond when some students have already learned?*
PK	Observing visually attenenvironment • using all senses to gather information while observing • focusing their observation on details • increasing the time they spend observing • naming and describing the things that they have observed • using specialized sources and books as a means of extending their observationsding to things in their	Having materials for observational drawings. Using insects and items found to talk about observations. Drawing these to increase observations.	Continue and provide more opportunities for observations, using all senses with time to share what is observed.	Record observations during the day, especially when we look at a specific item. Anecdotal notes on children during the day.
KG	Observations during science topics is important in KG. "What do you	What they know seems to be a go to phrase at times so will try a different	Instigate "Lets make observation" What do we see or notice. At the beginning and end of topic work. Also during.	They are able to record their observations naturally or talk about them.

	notice". Rather than what to you know or think.	approach more often during an investigation.		
Grade 1	• Focus: staying on task through the lesson, making observations. Some students struggle with maintaining attention, others are accustomed to direct instruction all the time and so struggle exercising independence. • Asking questions	• Exercising an energetic, enthusiastic type of delivery through the lesson. Politely redirecting student attention toward the questions, concepts, and understandings of the lesson. Making lessons as hands-on as possible. • Marshaling students' thoughts by repeatedly asking what do you see, smell, hear, etc. What do you notice? • Employing Mystery Science to generate greater focus,	• Priming students interest / focus in lessons by providing how concepts studied are relevant to their lives and everyone's future. • Teaching Science in the morning when attentiveness is greatest.	***How will we know our Action Plan is working?*** • *When students are able to maintain focus throughout the course of a lesson and demonstrate their learning in their work. Currently, a few submit work that has nothing to do with the lesson or nothing at all.* • *Survey students' attitudes towards science and the lessons taught.* ***How will we respond when some students do not learn?*** • Meet with said students and inquire with them why this might be? • Address the issues stated if they are sensible. • Reteach? Break lessons into even smaller parts to be taught over multiple days. ***How will we respond when some students have already learned?*** When students already know the content, Encouraging students to extend their knowledge and thinking on a given topic by allowing them to independently (periodically check upon and assist) research the topic further (via texts or technology). This would enable them to extend their knowledge on the topic of study. Maybe have them present their findings to the class to reinforce the latter's understanding.

Grade 2	More understanding of the ISY learning cycle.	When making the Sand is Banned project, student were first introduced to it. In Q4 they are following the cycle in music as well as Q4 Science.	I want students to make more connections to how the learning cycle is applicable to other areas, and to highlight examples of it being used.	We will use Charlotte's Web as a resource to follow how the cycle is utilized to solve problems. We will follow the cycle along with Charlotte as she finds a way to save poor Wilbur.
Grade 3	Constructing thorough responses to express science learning.	Answer science questions as a class. Working slowly to craft a complete response that reflects a depth of understanding.	The Writing Revolution suggests bringing targeting sentence practice into all content lessons. We could introduce quick 5-minute sentence routines into our science lessons.	*How will we know our Action Plan is working?* Students will independently use those sentence structures in their written science responses. *How will we respond when some students do not learn?* Provide them with sentence starters when tasked with writing about science. *How will we respond when some students have already learned?* We could create science writing partnerships, so their advanced writing skills could serve as exemplars for their partners.
Grade 4	Scientific/enquiry process. Use of class experiments to answer questions and conduct investigations.	Class discussions on observations. Use of online Science resources and "wonder charts". Examining achor phenomenon as a group and developing questions	Use of lessons on "The human body" to teach science facts and encourage students to question as well as find answers when possible.	Use rubric to self-assess and peer assess. Observations, demonstrations, and share their findings Discussion around science prompts, section quizzes, building models, oral presentations
Grade 5	Scientific Inquiry/Process: (Asking questions, working with models, constructing explanations, engaging in argument from evidence) due to lack of experience with hands-on investigations and experiments.	Taught Question Formulation Technique and continue having students add questions to wonder charts. Modeling as part of each science unit (share exemplars).	Set up opportunities for students to follow the process in an investigation of their choice.	Use rubric to self-assess and peer assess.
Grade 6	Providing and evaluating evidence from data. Students are used to memorization and regurgitation and need to develop evaluation, analysis	Formative and Summative assessments have individual feedback but are also reviewed as a class so students can engage in discussion	Modify the scope and sequence to include more formative assessments that allow to practice critical thinking and higher level thinking skills.	Student scores in the demonstrate category should increase by an average of 1 point by the end of the year.

	and critical thinking skills.	about possible answers to questions and methods of evaluation and investigation.		
Grade 7	Comprehend and decode scientific text and vocabulary. Reading large articles and chunking information. Reading and writing in Science.			
Grade 8	Hands-on lab experiences are necessary for students to explore data gathering and lab report writing. Practice on data collection and analysis.	At least 1 lab experience is being given per unit of study, usually two.	Adapting resources to the needs of learners, emphasis on process and conventions when writing lab reports	We will know it is working when students are able to write proper if - then statements. Additional practice will be given to students who are unable to write a proper hypothesis. Additional depth can be explored with Freckle challenges
Grade 9	Students struggle most noticeably when it comes to supporting ideas with evidence. They struggle sometimes to be specific about the data they've collected, such as describing the general trend of a graph not doing so in specific mathematical terms. They also struggle to or don't attempt to connect their evidence to the original claim.	Students have written 5 lab reports this year. Specific descriptions about what distinguishes higher scoring lab reports is explicitly addressed in the rubric.	Using examples that students have written can be helpful. This can force students to use and understand the rubric, as it applies to someone else's writing, and see why certain students' communication is more effective.	Lab reports are assessed. Students are given rubrics that specify what would make a better argument, which would fall into the Demonstrate category. We could try to scaffold the skill by identifying the components of the argument: framing it as a Claim, Evidence, Reasoning statement could be helpful. We could challenge proficient students by asking them to find new ways to present or frame their evidence.
Grade 10 Integrated Science	This year's CLN would be to comprehend and decode scientific informational text and vocabulary. There was also an imbalance in the amount of time spent on the different science disciplines in the previous year. Lack of hands-on lab experiences, where students had to plan and conduct their own experiments, and do the write-ups on them.	Vocabulary is being taught before the start of each lesson. Scientific informational texts are being simplified for certain students. The planning is done in such a way that an equal amount of time is spent on each science discipline. Introducing lab-experiences and modeling what we expect of them.	Early emphasis is placed on the scientific method, as well as how to set up labs and write lab reports. Scaffolding of content, to allow all students to comprehend the work. Adapting resources to the needs of the learners in the class.	**We will know it is working when:** Students are able to independently set up labs, conduct the experiments, and write the lab reports. Students can use the resources and submit work that shows how they have improved and what they have learned. **Respond to students who struggle:** Add more resources based on the way the student learns. Remedial work to address shortcomings. **Students that have already learned:** Complex problem solving activities

				Collaborative learning
IB Chem	Focus on lab skills including conducting experiments, designing experiments and writing up experiments. Analyzing data including the propagation of uncertainties. Evaluation of experiments beyond "making mistakes". Using referencing/citation correctly. Comprehension of written IB questions that are often written in context.	**Grade 12 -** Providing sample lab reports & IAs. Providing a template for writing up design labs such as their IA with review material of how to treat uncertainties. **Grade 11 -** Introducing labs in a scaffolded manner, using modeling, which will lead to students designing their own labs. In quarter 4, they are designing, doing and writing up a lab in preparation for their IA. Encouraging students to read from the textbook rather than just watching videos to improve their English comprehension skills and their vocabulary.	**Grade 12 -** Individually read and assess a high scoring sample IA, identifying features of the report that make it high-scoring that they may be able to use themselves. One-on-one meetings about research skills, citations, and referencing before submitting the final IA. **Grade 11 -** Provide time for students to examine model lab reports rather than just providing them as a reference. Have the students self-assess and identify the skills/areas they need to work on prior to beginning the IA in grade 12. Vocabulary and short reading activities as an introductory class activity.	**We will know it is working when:** Students are able to independently set up labs, conduct the experiments, and write the lab reports. Students can write their IA, referencing and citing correctly. **Respond to students who struggle:** One-on-one meetings about research skills, citations, and referencing. Use of exemplars. **Students that have already learned:** To access the additional resources that are provided for them. To seek help outside of class.
IB Bio	Focus on lab skills and writing lab reports. Research skills, using citations, and referencing correctly. Identifying and developing appropriate statistical testing.	Introducing lab-experiences and modeling what we expect of them. IA packets, explaining and showing students how to use citations and references correctly.	**Grade 11 -** Spend a full unit on the Scientific Method. Breaking down the different steps, and giving students a chance to practice each step. Focus on hands-on lab skills and writing lab reports.	**We will know it is working when:** Students are able to independently set up labs, conduct the experiments, and write the lab reports. Students can write their IA, referencing and citing correctly. **Respond to students who struggle:** One-on-one meetings about research skills, citations, and referencing. Use of exemplars. **Students that have already learned:** Collaborative learning, where students that have already learned help struggling learners. There are additional study options available for a more in-depth understanding.
IB Phys	Due to the long absence from actual laboratory work, this is a skill that the students need to learn. Usually students will come to a DP class proficient in carrying out a lab and writing a lab report. This is currently not the case, so this is a definite critical learner need.	Having students do practicals; and in the process teach them important skills such as making a proper graph, use of error bars, writing a conclusion, what is a good evaluation, etc.	**Grade 12 -** Do all of the required practicals in the units we are studying. Strong support for the students during the internal assessment process not only in the practical aspects, but also in the writing of the IA. One-on-one meetings in order to define their research questions and determine if this is an investigation that can be done with the equipment that ISY has.	Focus on small parts of a lab report. For example, from a given practical they are required to produce a high quality graph or raw and processed data tables. Lab report results and Internal assessment marks will be telling.

			Grade 11 - Scaffolding the practicals and lab reports in order to bring the students up to IB standards for writing up a practical. At the moment they are writing a condensed lab report on specific heat capacity. This should prepare them to write their IA. Demonstrate hands on skills and give students the opportunity to practice them before using them in an experiment	

2021-2022

Course (incl. Grade)	CRITICAL LEARNER NEED	TEACHER PROBLEM OF PRACTICE		
	Dig Into Student Data *What is the Critical Learner Need (CLN)?*	**Examine Instruction** *What are we doing at the moment to address the CLN?*	**Develop an Action Plan** *What are we planning to do differently to address the CLN?*	**Plan to Assess, Act and Assess** *How will we know our Action Plan is working?* *How will we respond when some students do not learn?* *How will we respond when some students have already learned?*
Grade 6	The CLN for this year is to design and conduct experiments. The online program and school schedule had a big impact on the ability to perform labs.	Coordinated with science lab assistant to find a schedule to perform experiments when labs are not being used by other classes.	Hopefully next year schedule considers Science classes taking place in Science labs. We can also continue to work with the assistant to find when labs are not being used to use them with middle school classes.	We will have labs available to use for MS students.
Grade 7	The critical learning need for this year is hands-on learning through labs. Online learning and a hybrid program has made it difficult to provide inspiring lab experiences that serve both online and in person students.	Online interactive simulators have been used for some labs. There is no replacement for the hands-on aspect of being in a room and doing an experiment with materials in person.	Having in-person instruction for both students and teacher will address part of the need. The fact that the current classroom does not have designated space for lab experiments will ideally need to be addressed in order to compensate for the shortfall.	
Grade 8	Looking at the MAP scores for Language Arts and Math, a couple of things stand out. First, the percentage of students scoring at the	Being online and having a teacher out of country has definitely impacted the ability to deliver a full science curriculum. The room is also not set up	Being in-person (both students and teacher) should greatly help with delivering a full science program next year with labs and inquiry activities.	

	high level for math was 56% compared to 39% in reading and 46% in language usage. In reading, looking at the instructional areas, vocabulary had the lowest scores with only 29% of students scoring in the high range. Both vocabulary and informational text had 75% of students scoring high-average and above compared to 78% for literary text. In language usage, 36% scored at the high level in the grammar area, while 50% of students scored at the high level for writing and revising text, and understanding and editing mechanics. The majority of students are showing good scores, but about a quarter are showing low scores that may be impacting their grades in science since there is so much informational text and vocabulary that is content specific. When looking at science instruction in grade 8 there is a need for more science lab skills and more work with the engineering design standards.	for science labs, as there are no lab tables, sinks, etc.	In addition, time should be spent in each unit working on reading and vocabulary skills. Students do not always know how to read for understanding - the use of CK-12 in lieu of a physical textbook could help students practice reading for understanding.	
Grade 9	Grade 9 has two critical learner needs that are both laboratory based. First, students need to read and understand the rubric that will be used to evaluate their lab report. Second, students must organize the data collected in the laboratory in such a way that it is clear that it is data and that the organization of the data makes it clear to the reader what data represents.	Since the return to in person instruction, a half a dozen labs have been performed with lab reports being generated.	One course of action would be peer review of another student's lab report during an interview with the two students. A second course of action would be for the student to write a one or two sentence reflection on how they met each point of the rubrics.	The evaluation of the lab reports will play a major role in determining if the Action Plan is working.
10 Chem	10 Chem and 10 Phys are both experiencing the same critical learner need. Students are having difficulty generating Google/Excel/LoggerPro graphs of laboratory data and difficulty in evaluating the graphs that they produce.	Early in the trimester of 10 Phys, students completed home labs on pendulums (or were given acceptable data to work with) and completed graphs of their data in class. Two additional labs involving graphs were performed. In the 3rd trimester chemistry data needed to be graphed	Now that the instruction is again in person, additional lab experiences must be included in the curriculum. The graphs need to be accomplished in class so corrections can be offered in real time.	The evaluation of the lab reports will play a major role in determining if the Action Plan is working.

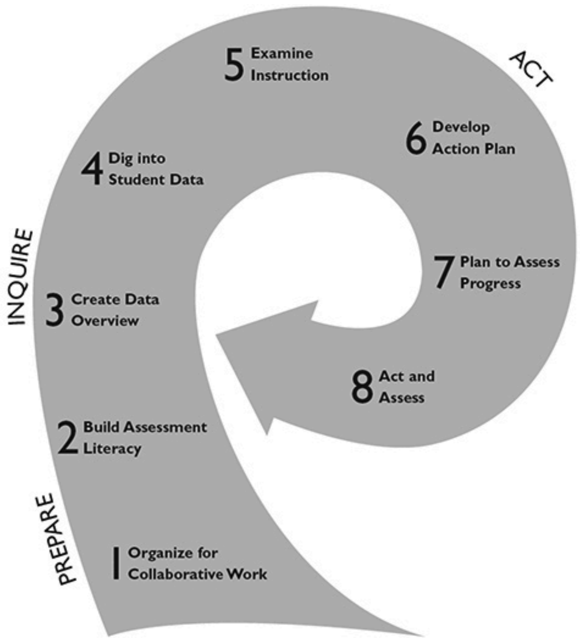
		so as to be able to better analyze the data. Students again had difficulty generating the graphs. Also, even when the graphs were produced, students did poorly on evaluating the graphs' scaling, labeling, and clarity of reading.		
10 Bio	MAP Science data was not collected for 10th graders.			
10 Phys	10 Chem and 10 Phys are both experiencing the same critical learner need. Students are having difficulty generating Google/Excel/LoggerPro graphs of laboratory data and difficulty in evaluating the graphs that they produce.	Early in the trimester of 10 Phys, students completed home labs on pendulums (or were given acceptable data to work with) and completed graphs of their data in class. Two additional labs involving graphs were performed. In the 3rd trimester chemistry data needed to be graphed so as to be able to better analyze the data. Students again had difficulty generating the graphs. Also, even when the graphs were produced, students did poorly on evaluating the graphs' scaling, labeling, and clarity of reading.	Now that the instruction is again in person, additional lab experiences must be included in the curriculum. The graphs need to be accomplished in class so corrections can be offered in real time.	The evaluation of the lab reports will play a major role in determining if the Action Plan is working.
IB Chem	In IB Chem1, students have not performed any laboratory experiments as they have moved through the curriculum this year. There is a gap between what students can symbolically show and understand and how it applies to novel, but related situations. In addition students know how to work with measurement uncertainty on a conceptual basis but do not know how to work with it in laboratory situations.	A few simulations have been used to help teach chemical concepts.	Laboratory instruction will need to become a key component in instruction for the Year 2 IB Chem students.	Early performance on lab work will indicate if this is successful or not. Increased use of exemplars and scaffolding may be required for students who are struggling. No students have done this yet but for those who grasp the concepts easily, it would be appropriate to have them start thinking about how their IAs will incorporate these concepts.
IB Bio	Similar to IB Chemistry, there has been a lack of laboratory instruction in IB Biology. In addition to the problems noted above, IB Bio students will need more practice in data analysis and statistics testing.	Simulations and a few at-home labs have been performed.	Laboratory instruction will also need to be a key component for Year 2 students. They will also need some help with identifying and developing appropriate statistical testing when it is IA time.	Early performance on lab work will indicate if this is successful or not. Increased use of exemplars and scaffolding may be required for students who are struggling. No students have done this yet but for those who grasp the concepts easily, it

				would be appropriate to have them start thinking about how their IAs will incorporate these concepts.
IB Phys	Examining this year's mock exam and the most recent lab reports, IB Physics student's this near additional instruction in data analysis with emphasis upon LoggerPro analysis of data. Additional learning needs to be accomplished with respect to graphical and analytical analysis of uncertainty.	Currently, there is a lack of laboratory, hands-on experimentation due to almost two years of remote classes.	At the beginning of the moving years, labs must again become a major piece of the classroom experiences for the students.	The evaluation of the lab reports will play a major role in determining if the Action Plan is working.

This protocol is based upon the Data Wise Improvement Process and Richard DuFour's 4 Essential PLC Questions:

- What do we expect our students to learn?
- How will we know they are learning?
- How will we respond when they don't learn?
- How will we respond if they already know it?

Data Wise Improvement Process 'Koru'



PREPARE
INQUIRE
ACT
1 Organize for Collaborative Work
2 Build Assessment Literacy
3 Create Data Overview
4 Dig into Student Data
5 Examine Instruction
6 Develop Action Plan
7 Plan to Assess Progress
8 Act and Assess