

Quality Education Fund (QEF)

Priority Themes

Part C: Project Details

Project Number:	2024/0226
Name of School:	中華基督教會銘基書院 CCC Ming Kei College
Project Title:	Empowering Learning and Teaching: Interactive Smartboards as Tool for Innovation Education
Beneficiaries:	Secondary
Estimated Number of Direct Beneficiaries:	Students: 760 Teachers: 66

1. Project Needs

1.1 Project aim(s)

This project aims to increase interactivity and facilitate interactions among teachers and students by utilizing Interactive Smartboards to be set up in all classrooms in the school. We believe this project can achieve the following goals.

- (a) To enhance the motivation and effectiveness of teaching by using Interactive Smartboards.
- (b) To promote a collaborative and interactive learning culture by projecting students' responses on the Interactive Smartboards, enabling teachers to provide instant feedback and exchange ideas with students to facilitate Knowledge Building.
- (c) To enhance the connections between students and teachers, allowing for more effective peer and teacher assessments.

1.2 School-based innovative element(s)

(a) Enhances Cognitive Engagement

Using Interactive Smartboards in the classroom can encourage collaboration and dialogues among teachers and students, promoting deeper understanding through shared reasoning. Students can generate new ideas by integrating new information with their prior knowledge, which leads to better knowledge retention. Learning becomes more engaging through vivid presentations.

(b) Facilitates Active Learning

In different classroom tasks, such as group projects or interactive quizzes, students using Interactive Smartboards can easily share their thoughts with their classmates. Other students listening to the presentation can also generate knowledge through interaction with materials presented on the board.

(c) Improves Classroom Dynamics

Teachers can foster an environment conducive to real-time collaboration by asking students to work together on the Interactive Smartboards, sharing ideas and solutions while receiving immediate feedback from peers and teachers. Not only can teachers enhance students' understanding but also their social skills through prolific discussion.

1.3 Meeting school-based/students' needs

(a) Relevance to the school development plan of this cycle

'Provide differentiated learning materials and assessments to cater for self-directed learning and diverse learning needs' is one of our strategies in achieving Major Concern 1 in our school development plan (2024-2027). Teachers can utilize Interactive Smartboards to create various interactive and formative assessments in the classroom, facilitating students to learn more effectively.

After the implementation of the Interactive Smartboards, we also aim to train students to treat the Interactive Smartboards in every classroom with care, embracing the new learning tools without damaging them intentionally. This also echoes with another strategy (Promote wise and ethical use of information technology for learning) in Major Concern 1 in our school development plan.

(b) Relevance to students' needs in the future

The use of Interactive Smartboards in the teaching process can enhance students' academic achievement, particularly in the fields of mathematics and language subjects, where the impacts are especially significant.

Interactive Smartboards can also equip students with the skills needed for the next century as suggested on the OECD learning compass 2030, like Data handling skills, Higher-order thinking skills, Communication and collaboration skills, Proficiency in using electronic learning tools and Self-directed learning abilities.

2. Project Feasibility

2.1 Key concept (s)/rationale(s) of the project

According to the Executive Summary of the 2015 Report on the Research Study of the Pilot Scheme on E-Learning in Schools by the Education Bureau, effective use of technology and thoughtful pedagogical design enabled teachers to integrate e-learning within the classroom context and hence to support positive student learning outcomes, accommodate learner diversity, foster critical thinking, and promote peer collaboration. As a result, students demonstrated increased motivation to learn and improved 21st-century skills, including collaboration and computational thinking competencies.

Our school primarily relies on traditional blackboards and computers as the fundamental teaching tools. These tools serve mainly as one-way mediums through which teachers present information. While students can ask questions verbally, they cannot directly interact with the board's content. Additionally, traditional blackboards limit teachers to writing basic texts and simple drawings with chalk, making it challenging to project images, videos, or digital media while simultaneously providing additional information. Since the Education Bureau released its report on pilot schemes for Interactive Smartboards in 2007, the approach of the 2030s presents an ideal and urgent opportunity to install Interactive Smartboards in every classroom. This would enhance interactions, integrate multimodal content, encourage collaborative learning, and further engage our students.

2.2 School's readiness

In August 2016, with the provision of the "WiFi900" project granted by the Education Bureau, a WiFi system offering full coverage in all classrooms was successfully installed to support e-learning. Teachers and students are now able to access the Internet seamlessly in all classrooms. Our school has also implemented the BYOD (Bring Your Own Device) policy for over six years, with all students equipped with their own devices for learning. These devices are leveraged for educational tasks such as note-taking, completing assignments, collecting information, and delivering presentations.

In the evaluation of our last School Development Plan (2021-2024), the average rating of the strategy "*To maximise the use of information technology to enhance learning and teaching effectiveness*" was 4.22 out of 5, which is the highest among all targets of Major Concern 1. Various e-learning tools and online platforms are employed by teachers to facilitate teaching and learning in class, as well as to provide

opportunities for learning beyond the classroom. Teachers are more than ready to take the next step in incorporating new information technology tools into classrooms, elevating the effectiveness of teaching and learning to a higher level.

2.3 Principal and teachers' involvement

(a) Principal

Duties: Monitor and supervise, Process funding

(b) Vice and Assistant Principals

Duties: Monitor and supervise, Coordinate/collaborate, Process funding

(c) Chairperson of the Information Technology Committee

Duties: Monitor and supervise, Coordinate/collaborate, Process funding, Provide Teachers' Training

(d) Members of the Information Technology Committee

Duties: Coordinate/collaborate, Provide Teachers' Training

(e) Subject panel heads

Duties: Formulate plans, Coordinate/collaborate, Plan curriculum/ activities, Conduct / participate in activities, Consolidate learning and teaching materials

(f) Subject teachers

Duties: Plan curriculum/activities, Conduct / participate in activities, Consolidate learning and teaching materials

(g) IT technicians

Duties: Collaborate with equipment retailers to carry out installation and construction work, Resolve teachers' technician issues

2.4 Parents' Involvement/ participation (if applicable)

Nil

2.5 Roles of collaborator(s) (if applicable)

Nil

2.6 Implementation timeline

Time Period	Activity / Task	Details / Description	Responsible Party
Jan - Mar 2026	Project Kickoff & Planning	- Convene a project launch meeting - Finalize project plan and roles - Develop different subject-oriented brief pilot lesson plan(s) - Establish communication channels and set preliminary milestones	ITC, Subject Panels, School Administration
	Procurement & Design Confirmation	- Initiate the tendering process with potential service providers - Finalize technical specifications & equipment list - Secure budget approval for equipment and services	Service providers, ITC
Apr 2026	Pre-Installation Assessment	- Complete classroom site surveys - Assess existing IT infrastructure - Develop a detailed installation blueprint	Service provider, ITC

Time Period	Activity / Task	Details / Description	Responsible Party
		(based on the actual classroom setting restrictions) and wiring/network connection plan	
Jul - Aug 2026	Installation & Initial Setup	- Based on the actual classroom setting restrictions, install interactive smartboards in 30 classrooms - Connect systems to the school network - Conduct preliminary testing for system integration	Service provider, IT Support
Aug - Sept 2026	Teacher Training & Pilot Testing	- Organize hands-on instructional workshops for teachers - Run pilot lessons to test interactive features - Collect early feedback and adjust the configuration as needed	Service provider, Selected Teachers
Sept 2026– Aug 2027	Full Implementation & Ongoing Monitoring	- Roll out regular interactive teaching sessions across all classes - Provide on-site technical support and troubleshoot any issues in real time	Teaching Staff, IT Support, Service provider
Aug 2027– Dec 2027	Evaluation, Dissemination & Project Closure	- Distribute questionnaires & conduct lesson observations for outcome measurements - Hold sharing sessions (either by face-to-face or recorded videos) - Submit final reports	ITC, School Administration, Selected Teachers

2.7 Details of project activities

a. Student activity, if applicable

Activity	Content	No of sessions (duration)	Expected learning outcomes
1. English Language Subject Activities (An example of lesson plan at Appendix I refers.)			
Activity 1: Senior Form Persuasive Writing Development	• S.5 students explore argumentative essay writing on the motion "Sending students to study overseas is beneficial" • Pre-writing reading tasks analyze genre features and cohesion techniques • Interactive mind mapping using smartboard for collaborative argument development • Real-time annotation and peer feedback on displayed student work • Teacher modeling of editing techniques directly on student work	4 lessons (40 minutes each)	• Students develop well-structured persuasive essays with logical organization • The interactive smartboard enables visualization of argument structure impossible with traditional boards, helping students clearly see relationships between claims and evidence • Enhanced peer learning through immediate visual feedback and collaborative editing • 80% of students demonstrate improved organization in writing tasks compared to pre-implementation assessments

Activity 2: Digital Media Creation for S.4	• S4 students create blog entries about popular culture phenomena • Analysis of blog genre features through interactive annotation • Collaborative brainstorming with real-time idea sharing on the smartboard • Peer feedback provided directly on displayed work • Integration of multimedia elements into digital compositions	4 lessons (40 minutes each)	• Students produce engaging blog entries with appropriate digital features • The interactive smartboard transforms writing instruction by enabling seamless integration of text, images, and feedback in a shared visual space • Enhanced digital literacy through direct interaction with multimodal composition tools • Greater student engagement through technology-mediated composition visible to peers
Activity 3: Junior Form Charity Project	• S.3 students analyze product description • Interactive identification of language patterns for description and persuasion • Group creation of product description using collaborative planning tools • Digital voting on the best product and description with real-time results display • Teacher-guided annotation highlighting effective language use	3 lessons (40 minutes each)	• Students effectively use connectives to elaborate points with reasons and expected results • The interactive smartboard facilitates real-time collaborative proposal development impossible with traditional resources • Enhanced understanding of persuasive writing techniques through visual comparison of multiple approaches • Development of audience awareness through immediate peer feedback
Activity 4: Travel Sequencing for S.1	• Students reconstruct scrambled travel text using sequence adverbs • Interactive arrangement of text segments with visual connections • Collaborative planning of a school event using digital tools • Integration of maps and images into sequenced presentations • Real-time statistics of student responses for immediate assessment	2 lessons (40 minutes each)	• Students accurately use sequence adverbs in speaking and writing • The interactive smartboard transforms sequencing exercises by enabling physical manipulation of text segments impossible with paper-based methods • Enhanced spatial understanding of text organization through visual mapping • Improved presentation skills through integration of visual and verbal elements
Activity 5: Listening and Integrated Skills Enhancement	• Teacher demonstrates effective note-taking strategies for DSE-style listening tasks • Split-screen display of audio script and annotation space • Real-time highlighting of key information in complex texts • Guided practice in synthesizing information from multiple sources • Recording of teacher demonstrations for student review	6-10 sessions per level throughout the year (40 minutes each)	• Students demonstrate enhanced listening comprehension strategies • The interactive smartboard revolutionizes listening instruction by making thinking processes visible through real-time annotation • Significant improvement in students' ability to organize information from multiple sources • Particular benefits for students with reading and writing difficulties through visual learning approaches

2. Mathematics Subject Activities (An example of lesson plan at Appendix II refers/)

Activity 1: 3D Geometric Visualization for S.1	• Exploration of 3D figures (prisms, circular cylinders, pyramids, circular cones, polyhedra, and spheres) in KS3 Learning Unit 17 • Interactive demonstration of different cross-sections of 3D figures using smartboard visualization tools • Real-time rotation and manipulation of solid shapes to demonstrate spatial relationships • Visual clarification of key geometric terminologies including “base”, “vertex”, “uniform cross sections” and “slant edge” • Student interaction with 3D models through direct manipulation on the smartboard • Collaborative exploration of geometric properties through guided discovery	Two 40-minute lessons per class	• Students develop enhanced spatial reasoning and 3D visualization abilities • The interactive smartboard transforms abstract geometric concepts into manipulable visual models, allowing students to physically interact with 3D figures impossible with traditional teaching tools • Improved comprehension of key geometric terminologies like “uniform cross-sections” through dynamic visual demonstrations • Enhanced engagement with geometric content through hands-on digital manipulation • Stronger geometric foundation for advanced mathematical concepts in later years • Development of critical spatial reasoning skills essential for future STREAM applications
Activity 2: Collaborative Linear Programming for S.5	• Exploration of inequalities and linear programming in KS4 Learning Unit 8 • Step-by-step demonstration of solving systems of inequalities using precision drawing tools • Multi-student collaborative graphing with simultaneous drawing of constraint lines • Real-time visualization of feasible regions through shading and highlighting features • Immediate correction capabilities for student errors without disrupting the entire solution • Interactive optimization through identification of vertices and testing objective functions	Ten 40-minute lessons per class	• Students solve linear programming problems through graphical methods • The interactive smartboard revolutionizes inequality graphing by enabling precise, error-correctable constraint visualization impossible with traditional boards • Enhanced collaborative learning through group graphing activities with immediate visual feedback • Development of peer teaching and assessment skills as students identify and correct errors • Improved ability to connect algebraic inequalities with their graphical representations • Greater engagement with complex mathematical concepts through interactive visualization • Strengthened problem-solving abilities through visual optimization techniques

3. Science (S1-S3) Subject Activities (An example of lesson plan at Appendix III refers.)			
Activity 1: Virtual Laboratory Exploration	• Interactive simulations of experiments for junior forms (S.1-S.2) • Manipulation of variables with immediate display of results • Visualization of microscopic processes impossible to observe directly • Collaborative hypothesis testing and data collection • Integration of real data with predictive models	S.1: 3 sessions (40 minutes each) S.2: 4 sessions (40 minutes each)	• Students develop enhanced scientific inquiry skills • The interactive smartboard transforms science instruction by making invisible processes visible and manipulable • More experimental iterations possible in limited class time • Deeper conceptual understanding through visualization of abstract phenomena
Activity 2: Human Body Systems Exploration	• Multi-layered visualization of human anatomical structures • Interactive exploration of biological system interconnections • Students' direct annotation on anatomical displays • Comparison of healthy and pathological states • Integration of 3D models with explanatory text	S.1: 4 sessions (40 minutes each) S.2: 6 sessions (40 minutes each)	• Students demonstrate comprehensive understanding of body system interactions • The interactive smartboard revolutionizes anatomy instruction by enabling layer-by-layer exploration impossible with static models • Enhanced spatial understanding of anatomical relationships • Stronger retention of complex biological concepts through visual interaction
4. Economics Subject Activities (An example of lesson plan at Appendix IV refers.)			
Activity 1: Interactive Market Analysis for S.4	• Students explore the law of demand and supply using dynamic graphical tools • Creation of interactive demand schedules that update in real-time based on student inputs • Collaborative graphing of demand curves with students directly manipulating points on the smartboard • Visual differentiation between movements along a curve versus shifts of the entire curve • Simulation of market conditions with students observing immediate effects of variable changes • Integration of real-world examples with multimedia case studies displayed on the smartboard	8 sessions across the academic year (40 minutes each)	• Students accurately interpret and create supply and demand graphs • The interactive smartboard transforms abstract economic concepts into manipulable visual models, allowing immediate visualization of cause-effect relationships impossible with static diagrams • Enhanced understanding of market equilibrium through direct observation of dynamic adjustments • Improved ability to predict market outcomes under various scenarios • Development of critical thinking skills through observation of real-time graphical changes

Activity 2: Macroeconomic Modeling for S.5	• Interactive exploration of the Aggregate Supply-Aggregate Demand (AS-AD) model • Multi-colored layering to distinguish between short-run and long-run effects • Simulation of policy interventions with immediate graphical representation of outcomes • Collaborative scenario analysis with students making predictions and testing them in real-time • Integrated data visualization connecting theoretical models with actual economic indicators • Side-by-side comparison of different macroeconomic schools of thought	10 sessions across the academic year (40 minutes each)	• Students demonstrate comprehensive understanding of macroeconomic equilibrium concepts • The interactive smartboard revolutionizes macroeconomics instruction by enabling simultaneous display of multiple economic scenarios impossible with traditional boards • Enhanced ability to predict effects of fiscal and monetary policy interventions • Stronger connections between theoretical models and real-world economic conditions • Development of evidence-based economic reasoning through visual pattern recognition
Activity 3: Production Possibilities Analysis for S.6	• Dynamic construction of Production Possibility Frontiers (PPFs) with precision drawing tools • Interactive demonstration of economic concepts including scarcity, opportunity cost, and efficiency • Comparative analysis of PPFs for different economies displayed simultaneously • Visualization of economic growth and technological advancement through shifting frontiers • Integration of real-world production data to connect theory with actual economic performance • Collaborative problem-solving of resource allocation challenges	6 sessions (50 minutes each)	• Students accurately analyze production tradeoffs using PPF models • The interactive smartboard transforms production analysis by enabling precise curve manipulation and immediate visualization of concept relationships impossible with static diagrams • Enhanced understanding of efficiency concepts through clear visual representation • Improved ability to apply theoretical models to real-world economic scenarios • Development of economic decision-making skills through interactive scenario testing

5. Geography Subject Activities (An example of lesson plan at Appendix V refers.)			
Activity 1: Interactive Landscape Exploration Activity for S.1 - S.3	- Using applications such as ARGeo, students recognize the relationship between the physical landscapes in China and their major river flows. E.g. Northwestern China is mountainous whereas Eastern China has a lower relief, resulting in the west-to-east river flows in China. - Through case studies on Xibei, Dongbei and Huanan regions, students virtually explore agricultural activities in China, and understand how the relief of China influences the soil fertility, water supply, flatland supply, etc. - Through interactive simulations, students familiarize themselves with the hilly landscapes in Hong Kong, and the development of landslides when the rainfall is heavy.	6 sessions across the academic year for each form (40 minutes each)	- Students become equipped with map-reading skills, particularly understanding contour lines and drawing cross-sections, with the aid of relevant application. - When sharing their own work on the Interactive Smartboard, students receive real-time feedback from peers and teachers - Enhanced national identity of students through better understanding of the relief of China, fostering national security education - Development of critical thinking skills through observation of real-time graphical changes

6. 中文科活動 (教案示例於附錄 VI)			
活動 1：中四級記敘抒情文寫作模組	- S.4 學生探討記敘抒情文寫作，題目為「這次切身經歷告訴我：父母的愛是永恒的。」 互動審題與概念建構：運用電子白板進行關鍵詞標示，並透過兩欄式表格視覺化對比「永恒」與「短暫」的情感，幫助理科生直觀理解立意。 協作取材與集體評鑑：學生利用 AI 生成圖像，並在電子白板上進行「數位藝廊」分享。師生可即時在圖像上註釋，共同建立優秀的取材標準。 敘事結構化分析：在電子白板上播放學生製作的短片，並利用暫停和註釋功能，直觀地分析事件的「起承轉合」，將抽象的敘事邏輯具象化。 協作潤飾與即時反饋：在電子白板上進行「公開手術」，將學生草稿與範文並列，師生共同用電子筆進行修改，清晰展示修改前後的對比。	2 節課 (每節 40 分鐘)	- 學生能準確審題，並寫出結構完整、立意明確的記敘抒情文。 電子白板將抽象的寫作思維過程轉化為可視化的協作活動，這是傳統教學無法實現的。學生能透過親身操作和集體討論，清晰地掌握從審題、取材到潤飾的完整寫作流程。 - 透過即時的視覺化反饋和協作修改，有效降低學生的寫作畏難情緒，並提升同儕間的互學互評能力。

7. Live Broadcasting Activities			
Activity 1: National Flag Raising Ceremonies	• High-definition broadcast to all classrooms simultaneously • Integration of explanatory materials alongside live video • Student moderators provide contextual information • Recording of ceremonies for educational follow-up activities • Involving Moral and Civic Education teachers and IT Committee members	Weekly throughout the school year (20 minutes each)	• Students develop deeper appreciation for national identity and citizenship • The interactive smartboard network creates a unified school experience impossible with traditional communication methods • Enhanced attention and engagement through high-quality visual presentation • Greater educational impact through integration of explanatory content
Activity 2: School Assembly/ school-based Broadcasting	• Integration of interactive response systems for student feedback • Real-time data collection on student understanding • Multi-feed display combining presenters, slides, and student responses • Archiving of content for student reference • Involving School administration team, Student Broadcasting Team and IT support personnel	Cycle-based throughout the school year (40 minutes)	• The interactive smartboards networks ensures consistent message delivery impossible with traditional assembly formats • Greater student engagement through interactive participation features • Improved retention of important school information through multimodal presentation

b. Teacher training, if applicable

Activity 1: Initial Interactive Smartboard Workshop

Implementation Period: Aug 2026 - Sept 2026

Content:

- Target Beneficiaries: All teaching staff
- Basic training on interactive smartboard operation and features
- Hands-on practice with core functions
- Introduction to subject-specific applications
- Technical troubleshooting guidance

Sessions:

- 3 sessions (30 minutes each)
- All sessions cover the same content to better accommodate colleagues' schedules

Training Personnel:

- External trainer/speaker (service provider)

Expected Outcomes:

- Over 80% of teachers able to confidently operate the interactive smartboards

- Teachers gain proficiency in basic functions including screen sharing, annotation, and digital resource integration
- Teachers understand how to incorporate the interactive smartboards into their existing teaching resources

Activity 2: School-wide Practice Showcase

Implementation Period: Dec 2026 - Jan 2027

Content:

- Target Beneficiaries: All teaching staff
- Showcase of exemplary interactive teaching practices
- Recognition of innovative approaches
- Cross-disciplinary sharing of successful strategies

Sessions:

- 1 face-to-face / recorded session (~30 minutes)

Training Personnel:

- School-based staff (teachers with outstanding implementation)

Expected Outcomes:

- Over 80% of teachers able to recognize and celebrate successful implementation
- Motivation for continued development
- School-wide alignment on effective practices
- Documentation of success stories for future reference

Activity 3: Advanced Applications Workshop

Implementation Period: Jan 2027 - May 2027

Content:

- Target Beneficiaries: All teaching staff
- Training on advanced features and applications
- Integration with other technologies (AI, VR, etc.)
- Cross-platform content development strategies

Sessions:

- 2 face-to-face / recorded sessions (~30 minutes each)

Training Personnel:

- Combined internal experts and external specialists

Expected Outcomes:

- Over 80% of teachers able to develop advanced skills in interactive teaching
- Integration of multiple digital tools into cohesive teaching approaches
- Preparation for long-term innovation beyond basic implementation

2.8 Budget

(a) Staff Cost

N/A

(b) Equipment

Item Description	Unit Cost (HKD)	Quantity	Total Cost (HKD)	Notes
Around 86" 4K Ultra HD Interactive Panel (with built-in PC and accessories)	31,500	24 units	756,000	Serves as the core equipment for multimedia interactive lessons.
Traditional Blackboard with Protective Door	8,000	24 units	192,000	Supports dual use with interactive panels.

(c) Services

Item Description	Unit Cost (HKD)	Duration/Unit	Total Cost (HKD)	Notes
Teacher Training Workshop	1,290	1 session (90 minutes)	1,290	Ensures teachers are fully skilled in using the interactive smartboards.

(d) Works

Item Description	Unit Cost (HKD)	Quantity	Total Cost (HKD)	Notes
Classroom Installation & Cabling Works	160,032	1	160,032	Includes dismantling of old boards, installation of Interactive Smartboards systems, relocation of noticeboards, wiring, and network connections.

(e) General Expenses

Item Description	Unit Cost (HKD)	Quantity	Total Cost (HKD)	Notes
Audit Fees	15,000	1	15,000	Appoints qualified auditor for verifying project expenditures.

(f) Contingency

Item Description	Calculation Basis	Total Cost (HKD)	Notes
Overall Project Contingency	not more than 3% of (Equipment + Services + Works)	33,278	Provides a buffer for minor unforeseen expenses in planning and execution.

Budget Summary Estimate:

- Equipment: 756,000 + 192,000 = 948,000 HKD
- Services: 1,290 HKD
- Works: 160,032 HKD
- Contingency: 33,278 HKD
- Audit fees: 15,000 HKD

Grand Total (**Approx.**): $948,000 + 1,290 + 160,032 + 33,278 + 15,000$
= 1,157,600 HKD

3. Expected Project Outcomes

3.1 Deliverables/Outcomes

Teaching and Learning Resources

- Development of subject-specific digital teaching materials (presentations, worksheets, interactive activities) stored on cloud servers and the Hong Kong Education City platform
- Creation of recorded lesson demonstrations (at least 3-5 per key subject) showcasing effective interactive smartboard pedagogy
- Production of sample interactive modules for mathematics (focusing on 3D visualization and linear programming) and other subjects
- Development of student presentation recordings demonstrating effective use of interactive features

3.2 Positive impact on quality education/ the school's development

Enhanced Learning Environment

- Improved classroom facilities with integrated technology supporting modern e-learning approaches
- Increased student motivation and engagement through interactive learning experiences
- Creation of a collaborative learning atmosphere where students learn to appreciate and accept different viewpoints
- Establishment of a platform for immediate feedback and assessment during lessons

Teacher Professional Development

- Strengthened cross-departmental collaboration through shared digital resources
- Enhanced curriculum design capabilities among teaching staff
- Formation of a professional learning community focused on e-learning pedagogy
- Long-term potential to establish inter-school networks for collaborative development of e-learning approaches

3.3 Evaluation

1. Classroom Observation

- Observing teachers' implementation and students' classroom performance
- Monitoring student engagement, participation levels, and learning outcomes
- Documenting effective teaching strategies and student responses

2. Survey Research

- Collecting feedback from teachers and students on implementation effectiveness
- Measuring satisfaction with technology integration and learning experiences
- Gathering suggestions for improvement

3. Focus Group Interviews

- Conducting in-depth discussions with core teachers about project impact
- Collecting qualitative insights for continuous improvement

Success Criteria

- Over 60% of lessons use the interactive smartboard to facilitate learning and teaching
- Over 80% of teachers and students agree the project enhances students' learning motivation and addresses diverse learning needs
- Over 80% of teachers and students agree the project increases teacher-student and student-student interaction
- Over 80% of teachers confirm the project enhances their e-learning teaching skills
- Over 80% of teachers and students recognize the interactive smartboards' effectiveness in improving learning efficiency
- Over 80% of teachers demonstrate improved classroom instructional design during the implementation phase

3.4 Sustainability of the project

- Continued implementation and refinement of curriculum after project completion
- Expansion to additional grade levels and subject areas
- Effective utilization of equipment and materials for ongoing learning and teaching activities
- Establishment of mentor relationships between experienced and new teachers
- Regular review and update of teaching materials to maintain relevance
- Regular professional sharing opportunities for teachers to ensure the project's sustainability as technology evolves over time

3.5 Dissemination

Sharing Sessions

- Organizing seminars and workshops to share experiences with the school sponsoring body and partner schools
- Hosting open days for interested schools to observe implementation
- Welcoming school visits for experience exchange and professional dialogue

Learning Community

- Documenting resources and insights from sharing sessions for all school teachers
- Uploading materials to the school website and Hong Kong Education City platform for wider teacher reference
- Creating an accessible archive of best practices and lesson demonstrations

Demonstration Lessons

- Inviting demonstration lessons by Chinese, English, and Mathematics teachers for showcasing effective interactive smartboard integration and extending to other subject areas as the skill level advances
- Participation in the Hong Kong Association of Heads of Secondary Schools' joint teacher development initiatives, including open classroom sessions and presentation segments

4. Details of Collaborating / Participating Organisations

Service provider and related vendors

5. Report Submission Schedule

The school commits to submit proper reports in strict accordance with the following schedule:

Project Management (Should be submitted via the “Electronic Project Management System” (EPMS))		Financial Management (Hard copy together with supporting documents should be submitted to the QEF Secretariat by mail or in person)	
Type of report and reporting period	Report due on	Type of report and reporting period	Report due on
Progress Report 01/01/2026 – 31/12/2026	31/01/2027	Interim Financial Report 01/01/2026 - 31/12/2026	31/01/2027
Final Report 01/01/2026 – 31/12/2027	31/03/2028	Final Financial Report 01/01/2027 - 31/12/2027	31/03/2028

6. Asset Usage Plan

Category	Item / Description	No. of Units	Total Cost	Proposed Plan for Deployment
Equipment	Interactive smartboards	24	\$756,000	The equipment will be used in school for various activities upon completion of the project.
	Traditional Blackboard with Protective Door	24	\$192,000	

7. School's Declaration

1. Our school will ensure that the teachers involved will master not only the use of the interactive panels, but also the pedagogy and lesson design to conduct relevant activities to encourage students' engagement.
2. Our school will ensure that learning activities conducted using interactive smartboards do not replace students' diverse and authentic learning experiences. Examples are inquiry-based 'hands-on' learning, on-site visits, and scientific experiments, which are essential for students' holistic development.
3. Our school will ensure that interactive smartboards are properly installed, regularly inspected, maintained, and repaired. Special attention will be given to the structural load-bearing capacity of the installation of relevant equipment. If necessary, our school will seek advice from an authorised professional to ensure the safety and stability of the installation.

4. Our school will ensure that all procurement of goods and services is conducted on an open, fair and competitive basis. Measures will also be taken to avoid any conflict of interest throughout the procurement process.
5. Our school confirms that the copyright of all deliverables and materials produced under this project will be vested with the QEF. Any reproduction, adaptation, distribution, dissemination, or public availability of these deliverables by the service provider(s) for commercial purposes is strictly prohibited.
6. Our school understands that the expenditure items funded by the QEF are one-off. Our school will assume responsibility for all recurrent expenditures incurred, including maintenance costs, daily operating costs, and any other possible consequences that may arise.
7. Our school will ensure that all learning and teaching materials developed as part of the project meet students' learning needs, levels, ages, and abilities. Additionally, the content and information provided will be accurate, complete, objective, and impartial.
8. If our school hires a service provider to conduct project activities, the required qualifications and experience of the provider will be clearly specified to ensure that their services meet the needs of the school and its students.
9. If the services procured by our school involve the appointment of external staff or tutors, our school will make appropriate arrangements in line with the requirements outlined in circulars, instructions, and guidelines issued by the Education Bureau. This includes compliance with the Sexual Conviction Record Check Scheme as stipulated in Education Bureau Circular No. 14/2023, to safeguard the well-being of students.

When writing this proposal, did the school refer to the sample proposal/project(s) approved with funding support at the QEF website?

Yes

Relevant sample proposal number:

1.	2020/0549	2.	2020/0569	3.	2021/1209	4.	2022/0064
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CCC Ming Kei College
S1 English Lesson Plan

Level: Secondary 1

Time: 40 minutes

Topic: Grammar Book Unit 17 Prepositions

Target Prepositions: in front of, between, opposite, behind, beside, near, above, on

Rationale for Smartboard Integration:

The Smartboard transforms prepositions from abstract to tangible, allowing students to visually manipulate objects and instantly see the difference between “opposite” and “in front of”. This dynamic, interactive approach makes complex spatial relationships clear and memorable, creating an engaging, game-like practice that is essential for mastering precision within a limited time.

Lesson Objectives:

By the end of this lesson, students will be able to:

1. **Differentiate** between commonly confused prepositions (e.g., *above* vs. *on*, *beside* vs. *near*).
2. **Construct** accurate sentences using prepositions to describe detailed spatial relationships.
3. **Interpret** written descriptions to manipulate objects correctly on the Smartboard.

Students' Characteristic:

- Varied Learning Styles: Visual (graphs, diagrams), auditory (explanations, discussions), and kinesthetic (interactive tasks).
- Existing Knowledge: Students already gained exposure of concerned prepositions in their primary school learning.
- Diverse Abilities: Mixed proficiency levels, with some students needing more support to form correct complete sentences in English.

Lesson Aids:

- Interactive Smartboard with digital images and scenes for the describes and drags activities.
 - Warm-up image
 - “Spot the Difference” scene
 - Draggable clipart images
 - “Memory Maze” scene and duplicated blank version for students’ recreation
 - School VR Map
 - Annotation Tools
- Post-lesson exit tickets: pre-printed slips for students to complete the “3-2-1 Exit Ticket” at the end of the lesson.

Key Pedagogies:

- **Task-Based Learning:** The core activity (“Memory Maze”) is a goal-oriented task where students use prepositions to achieve a real communicative purpose (describing and recreating a scene), moving beyond rote memorization.
- **Inductive Learning:** Students discover the precise rules of preposition usage through guided contrast on the Smartboard (“Spot the Difference”) rather than being given rules explicitly, leading to deeper cognitive processing.
- **Total Physical Response (TPR):** Students learn by physically interacting with the Smartboard (dragging, placing objects), kinaesthetically reinforcing the connection between language and meaning.
- **Communicative Language Teaching:** The lesson prioritizes using language for real communication, from the “Describe and Drag” game to the quick “Real-World Map” application, fostering genuine interaction.

Lesson Flow:

Section	Time	Type of interaction	Activity	Purpose	Tools	Alignment with School Concerns*
1. Hook & Link	8 mins	Teacher-student	Pre-lesson task: “The 2-Minute Challenge” (5 mins) ▪ Teacher display a detailed image (e.g., a messy room). 1. Give students 2 minutes to write down 3 sentences using the target prepositions. 2. Quickly invite 2-3 student to scribe the examples on the smartboard. The teacher corrects one common error on the spot.	▪ A fast, focused warm-up that immediately shows what students know and where they struggle. ▪ Engage students with real-life scenarios and emphasize the	Smartboard	1.1.1, 1.1.2, 1.1.3, 1.1.4

Section	Time	Type of interaction	Activity	Purpose	Tools	Alignment with School Concerns*
			After the “2-Minute Challenge” (3 mins) - Teacher: “Excellent work. You’ve shown you’re great observers. But what if your description was the <i>only clue</i> someone had to recreate this scene perfectly? What if a tiny word mix-up—like saying ‘opposite’ instead of ‘in front of’ and end up sending them to the wrong location entirely?” - Teacher continues after a short pause: “In many high-stakes jobs—from crime scene sketching to giving building instructions—precision with prepositions is everything. Your next mission is to become precision experts. We’re going to crack the code on these tricky word pairs so your descriptions are always 100% accurate.” - The teacher then shows the next image for “Spot the difference” activity.	significance of using prepositions with precision.		
2. Task 1: Spot the Difference	10 mins	Teacher-student	Mini-Lesson (5 mins): Use a simple street scene with a shop, bench, and lamp post. - Drag a character to be in front of the shop, then opposite the shop. Discuss the difference. - Place a ball above a bench, then on the bench. Contrast “contact” vs “no contact” to highlight the difference in usage between “on” and “above”. - Use the annotation tool to draw a “zone” for “near” vs a specific spot for “beside”. Quick Practice (5 mins): “Correct the Teacher” - Display 3 sentence descriptions of the scene on the board, each with one deliberate error (e.g., “The tree is opposite of the bench”). - Students come up and correct the mistake using the pen tool.	- Clarify key concepts interactively - Cater to diverse learners	Smartboard, digital scenes with draggable clipart, annotation tools	1.1.1, 1.1.3

Section	Time	Type of interaction	Activity	Purpose	Tools	Alignment with School Concerns*
3.Task 2: The Memory Maze: Describe and Drag Activity	10 mins	Teacher-Student, Student-Student	▪ Setup: Display a “classroom” scene with 6-8 objects (e.g., backpack, book, pencil case, water bottle, hat, phone). ▪ Round 1: Teacher-Driven (3 mins): ▪ The teacher gives a <i>two-part</i> instruction: “Put the pencil case inside the backpack and place it under the chair.” ▪ A student comes to the board to perform the action. ▪ Round 2: Student-Driven (7 mins): ▪ A student volunteer arranges the objects secretly. ▪ They then describe the scene (“The hat is on top of the bookshelf, between the plant and the clock.”). ▪ The class listens and another student tries to recreate the arrangement on a <i>duplicate, blank classroom scene</i> on the board. ▪ The class votes on accuracy.	▪ Encourage collaboration and peer learning ▪ Naturally engage students in speaking and listening exercises	Smartboard, annotation tools	1.1.5, 1.2.2, 1.2.5
4. Task 3 : Real-World Application: “The Quick Map”	7 mins	Whole class	▪ The teacher displays a VR map of the school area and provide them a context. ▪ Teacher: “You are a helper on the School Open Day and you have to help visitors to locate certain area at school.” ▪ Pose one question: “You are at the canteen. How do you get to the General Office using two prepositions?” ▪ Students pair up with a partner and brainstorm for 1 minute. ▪ Invite 1-2 pair(s) to scribe their answers on the smartboard (e.g., “Go to the 1/F, the General	▪ Reinforce learning by connecting grammar to daily life without a lengthy activity.	Smartboard, VR school map	1.1.2, 2.4.2

Section	Time	Type of interaction	Activity	Purpose	Tools	Alignment with School Concerns*
			Office is near the meeting room and opposite to the school hall.”) and teacher leads the discussion.			
5. Wrap-up: 3-2-1 Exit Ticket	5 mins	Whole class	On a slip of paper, students complete: ▪ 3 prepositions they feel confident using. ▪ 2 prepositions they find tricky. ▪ 1 sentence about an object in the <i>actual</i> classroom using any preposition.	▪ Encourage self-assessment and gather instant feedback for teachers to review students’ progress	Pre-printed exit tickets	1.1.1, 1.1.5, 1.2.5, 2.2.4

CCC Ming Kei College
S5 Mathematics Lesson Plan

Topic: Chapter 4: Linear Programming

Class: Secondary 5

Duration: 40 minutes

Rationale for Smartboard Integration:

This chapter involves a lot of drawing and shading. Traditionally, students might find the region representing the feasible solutions on paper. However, smartboards can enhance this experience by enabling teachers to present activities that promote collaborative problem-solving. If students make mistakes while constructing the shaded region, the smartboard allows them to quickly erase the incorrect solution and shade the correct one. This technology encourages active participation and fosters a fast-paced and engaging learning environment. It also addresses our school's major concerns by improving learning effectiveness and creating a technology-driven atmosphere for our next generation.

Learning objectives:

By the end of the lesson, students will be able to:

1. Graphically represent systems of linear inequalities.
2. Identify the solution region for a system of linear inequalities.
3. Determine whether a pair of x and y can satisfy a system of linear inequalities.

Students' characteristics:

- **Receptive Yet Inquisitive Learning Styles:** Most students tend to listen attentively to their teachers and then complete the assigned tasks. While they are generally passive learners, they often become intrigued when presented with interesting and challenging questions.
- **Existing Knowledge:** Students already understand how to draw the half-plane to represent the solution of a given inequality.
- **Diverse Abilities:** Mixed proficiency levels, some students may need more support as they may still struggle in drawing straight lines when their equations are given.

Lesson Aids:

- Interactive Smartboard with pre-prepared slides (textbook, graph paper).
- Pre-lesson: Classwork problems from the previous lesson ; Flipped classroom online video.
- Post-lesson: Classwork problems; A cloud-based platform for education

Key pedagogies:

- **Interactive & Kinesthetic Learning:** Using dynamic Smartboard functions to allow students to physically manipulate graphs and variables, transforming abstract linear programming questions into hands-on graphing experiences.
- **Enhancing Learning Through Immediate Feedback:** Real-time collaboration, allowing students to instantly correct mistakes and explore how slight question changes can impact solutions in different scenario, fostering teamwork and deeper understanding.
- **Collaborative Knowledge Building:** Multi-student collaborative graphing with simultaneous drawing of constraint lines to allow students to co-create solutions, to engage in peer feedback, making learning a visible and social process.
- **Metacognition and Self-Directed Learning:** Integrating reflection and self-directed learning activities at the end of the lesson to empower students to assess their own comprehension, identify areas for improvement, and take ownership of their learning journey.

Pre-Lesson Task (Asynchronous)**Task:**

Students are asked to watch an online video.

Purpose:

- To consolidate their understanding of drawing half planes learnt in the previous lessons. (1.1.5)
- To promote self-directed learning and information literacy (1.1.2, 1.2.5).

Lesson Flow:

Section	Time	Type of interaction	Activity	Purpose	Tools	Alignment with School Concerns*
1. Greeting & Hook	3 mins	Teacher-student	Teacher shows some screenshots in the video from the pre-lesson again, recapping the main ideas from previous lessons and from the video.	Activating prior knowledge and to make sure students understand the video	Smartboard, online video	1.1.1, 1.1.5
2. 1 st Concept Building	10 mins	Teacher-student	Teacher shows a grid paper on smartboard. Using an example question to illustrate how to draw and construct the feasible region represented by the system of linear inequalities. Teachers can plot straight lines and shade	Step-by-step demonstration to clarify key concepts	Smartboard, grid papers in the interactive app	1.1.2

Section	Time	Type of interaction	Activity	Purpose	Tools	Alignment with School Concerns*
			different regions in different colours to help students better visualize the solutions. The procedures can also be recorded by the smartboard and later save to LMS for revision at home if necessary.			
3.Collaborative learning	12 mins	Group work & whole class	- Students are paired up into groups of two. Teacher gives out an exercise question for students to practice in pairs. Each student in each pair may be responsible for drawing 2 straight lines in the system of inequalities and then determine the shaded region in pairs. - Teacher invites a pair of students to do the exercise question on the smartboard. Teacher can showcase their attempt on smartboard and give praises to the correct components on the grid paper. In case students got the shaded region wrong on the smartboard, teacher can initiate a discussion in the classroom to see how to correct the mistake with the help of the whole class by erasing the wrong region and re-drawing the correct region.	- Assessing their Understanding - Encouraging collaboration and peer learning	Smartboard, grid papers in the interactive app, Students' tablets	1.1.2, 1.2.4, 1.2.6, 2.2.3, 2.2.4
4. Further Exploration and Challenge	12 mins	Group work & whole class	- Teacher uses the exercise question completed to introduce the understanding of counting the number of ordered pairs in a feasible region when x and y are both integers. - Teacher then extends to ask students how the number of possible ordered pairs may change if x and y are not necessarily integers. Students in pairs may get some time to do discussion. - Teacher then further challenges students that if the region is bounded by dotted lines instead of	- Group Learning - Promoting Problem-Solving on challenging questions	Smartboard	1.1.2, 1.2.2, 2.2.3

Section	Time	Type of interaction	Activity	Purpose	Tools	Alignment with School Concerns*
			solid line, how many ordered pairs can still remain possible in the previous exercise. Some students are invited to come out and erase the unattainable ordered pairs on the smartboards.			
5. Wrap-up	3 mins	Whole class	- Teacher consolidates and reiterates the idea mentioned, showing the main points of the lesson on the smartboard. Students are invited to ask questions. - Teacher provides students some classwork questions for practice, allowing them to reflect on the materials learnt. - Teacher asks students to do a post-lesson task.	- Consolidation of Learning - Clarifying and resolving confusion	Smartboard	1.1.1, 1.1.5, 1.2.4, 1.2.5, 1.3.1

Post-Lesson Task (Asynchronous)

Task:

Asking students to create a mind map or a flow chart to illustrate the steps and procedures involved in drawing the shaded region representing a system of inequalities using online tools.

Purpose:

- Encouraging self-reflection and reinforcing self-directed learning (1.1.5)
- Promoting self-directed learning and information literacy (1.1.2, 1.2.5).
- Integrating Mathematics and Visual Arts in the design of learning tasks (1.3.1)

Links to online resources:

- Interactive Graph Tool: An online graphing calculator
- Visual Creation Tool: A cloud-based platform for education

CCC Ming Kei College
S2 Science Lesson Plan

Level: Secondary 2

Time: 40 minutes

Topic: Book 2A Unit 8.5 Series and Parallel Circuits

Rationale for Smartboard Integration:

Due to the limited availability of the Science Laboratory, some Science lessons are conducted in the classroom. The Smartboard would enable students to gain hands-on experience using virtual simulations of electric circuit connection, to compare and contrast the two types of electric circuits, and to understand how to measure their currents and voltages respectively, before they manipulate the actual apparatus in the Laboratory. After experiencing such virtual simulations in the lesson, students could be encouraged to explore more into the topic at home, boosting their self-directed learning ability.

Lesson Objectives:

By the end of this lesson, students will be able to:

1. Understand the similarities and differences between a series circuit and a parallel circuit.
2. Utilize virtual simulations to connect different types of electric circuits.
3. Appreciate the applications of different types of electric circuits in the daily life.

Students' Characteristic:

- **Varied Learning Styles:** Visual (graphs, diagrams), auditory (explanations, discussions), and kinesthetic (interactive tasks).
- **Existing Knowledge:** Students already understood the concepts of electric current and voltage, and have connected basic electric circuits in previous lessons.
- **Diverse Abilities:** Mixed-ability class. Most students enjoy working on experiments but some are reluctant to investigate the principles behind the observation.

Lesson Aids:

- **Pre-lesson tasks** uploaded to LMS
- **Interactive Smartboard** with appropriate software and platforms.
 - Note-taking software
 - Virtual simulation platforms
 - Annotation tools

Key Pedagogies:

- **Task-Based Learning:** Given different scenarios and conditions, students design and connect electric circuits using virtual simulations. This would become a goal-oriented task where students could apply the concepts learnt in the lesson to solve daily life problems.
- **Interactive & Kinesthetic Learning:** Students physically interact with the Smartboard by dragging and adding components to modify their virtual electric circuit and observe how the current and voltage change in the circuit, transforming abstract concepts in the textbook into hands-on experience.
- **Collaborative Knowledge Building:** Students work in pairs to explore the virtual simulation platform, providing peer feedback to each other. Some students are then invited to share their work to the whole class through the Smartboard.

Pre-Lesson Task (Asynchronous)

- **Task:** A short video providing the definitions and examples of series circuits and parallel circuits is uploaded to the LMS two days prior to the lesson. Students are instructed to watch the video at home and complete an online assignment, consisting of four multiple-choice questions with reference to the video.
- **Purpose:**
 - To activate prior knowledge about series circuits and parallel circuits.
 - To foster curiosity about how different types of electric circuits can bring out different functions.

Lesson Flow:

Section	Time	Type of interaction	Activity	Purpose	Tools	Alignment with School Concerns*
1. Greeting and introduction	5 mins	Teacher-student	Follow up on Pre-Lesson Task (2 mins): ▪ Teacher openly praises students who have got outstanding results in the pre-lesson online Form ▪ Teacher explains more challenging questions in the pre-lesson task, if any. (e.g. questions which only few students could answer correctly) Introduction to the lesson theme (3 mins) ▪ Teacher introduces that there are two types of electric circuits and asks students what they are. ▪ Teacher introduces the virtual simulation platform, and asks if any students have used the platform before.	• A quick warm-up to arouse students' interest in the topic.	• LMS • Statistics from Pre-Lesson Task • Smartboard	1.1.1, 1.1.2, 1.1.5, 1.2.2, 1.2.6

Section	Time	Type of interaction	Activity	Purpose	Tools	Alignment with School Concerns*
2. Task 1: Develop series and parallel circuits from a basic electric circuit	5 mins	Teacher-student, Student-student	- Teacher shows the photo of a basic circuit consisting of a dry cell, a light bulb, a switch and connecting wires to students. - Students try to connect the above circuit on the virtual simulation platform using their mobile device. Teacher selects one to two students to show their work to the whole class on the Smartboard. - Teacher: “If I would like you to add one more light bulb to the circuit, how would you modify your circuit?” - Students form groups of two to discuss their answers. Some students would be able to add the light bulb next to the original light bulb to produce a series circuit, while some may create a new branch in the circuit to produce a parallel circuit. - Teacher invites one student to show his series circuit, and another student to show his parallel circuit, in front of the whole class using the virtual simulation platform on the Smartboard.	- Cater to diverse learners. - Encourage peer and feedback.	- Smartboard - Mobile device - Virtual simulation platform	1.1.2, 1.2.2,
3. Task 2: Debate whether series circuit or parallel circuit is more useful	15 mins	Teacher-student, Student-student	- Teacher shows the series and parallel circuits created by the two students in the previous section using the Smartboard, and let students vote which circuit is more useful. - Teacher divides the whole class into two groups according to the vote result. - Students in the two groups spot out the differences of the two types of electric	- Encourage collaboration and peer learning. - Enable students express their views using scientific terms and proper English. - Highlight the	- Smartboard - Mobile device - Virtual simulation platform - Annotation tools	1.1.2, 1.1.3, 1.2.2, 1.2.4

Section	Time	Type of interaction	Activity	Purpose	Tools	Alignment with School Concerns*
			circuits, and debate which of them better. Teacher may provide them with the following guiding questions: ✓ Which circuit uses fewer connecting wires? ✓ Providing the same amount of electrical energy (i.e. the same number of dry cells), which circuit makes the light bulbs brighter? ✓ In which circuit can the light bulbs be turned on and off independently? ✓ If one of the light bulbs becomes faulty, will the other light bulb be affected in each circuit? ▪ Students take turns to come to the front of the classroom to express their views, with the aid of annotations on the Smartboard. ▪ At the end of the debate, teacher concludes “Both series circuits and parallel circuits have their advantages and disadvantages. They are designed to fulfill different purposes in our daily life.” ▪ Teacher asks students to predict the size of the currents flowing in the series and parallel circuits, based on the brightness of the light bulbs in each circuit.	advantages and disadvantages of series and parallel circuits respectively.		

Section	Time	Type of interaction	Activity	Purpose	Tools	Alignment with School Concerns*
4. Task 3: Measuring currents and voltages in series and parallel circuits	10 mins	Teacher-student, Student-student	- Teacher demonstrates on the Smartboard how to connect an ammeter and a voltmeter to the series circuit and the parallel circuit (created in Section 2) on the virtual simulation platform respectively. - Students work in pair to try to measure the current and voltage at different points of their virtual electric circuits using their mobile device. - Students may be able to figure out that, in a series circuit: ✓ The current in the same at all points, i.e. $I_1 = I_2 = I_3$ ✓ The sum of the voltages across each light bulb is equal to the voltage of the dry cell, i.e. $V_1 = V_2 + V_3$ - Students may be able to figure out that, in a parallel circuit: ✓ The current in the main loop is equal to the sum of the currents in the branches, i.e. $I_1 = I_2 + I_3$ ✓ The voltage across each branch is the same, i.e. $V_1 = V_2 = V_3$ - Teacher asks students to record their findings using note-taking software in their mobile device.	- Encourage collaboration and peer learning. - Enable students to understand the relationship between the currents and voltages at different points of an electric circuit.	- Smartboard - Mobile device - Virtual simulation platform - Annotation tools - Note-taking software	1.1.2, 1.1.5, 1.2.2
5. Wrapping-up	5 mins	Teacher-student	Teacher: “Very pleased to see some of your great findings! In the next lesson, we will try to put the real apparatus together to create series and parallel circuits. Let’s also use the ammeters and voltmeters in the Laboratory to	Encourage peer and discussion feedback.	Smartboard	1.1.1, 1.1.2

Section	Time	Type of interaction	Activity	Purpose	Tools	Alignment with School Concerns*
			verify whether your findings today are valid!” Teacher previews the content of the next lesson using the Smartboard.			

CCC Ming Kei College
S4 Economics Lesson Plan

Topic: Demand and Supply - Change in Demand vs. Change in Quantity Demanded

Class: Secondary 4

Duration: 40 minutes

Rationale for Smartboard Integration:

This lesson is specifically designed to leverage the interactive smartboard to transform a traditionally theoretical economics topic into a dynamic, engaging, and collaborative experience. It directly addresses the school's major concerns by using technology to enhance learning effectiveness (Concern 1) and foster a supportive, interactive classroom culture (Concern 2). The activities require the teacher to act as a facilitator, demonstrating mastery of both the technology and modern pedagogical approaches like inquiry-based learning and formative assessment.

Learning objectives:

By the end of the lesson, students will be able to:

1. Define and differentiate between a change in quantity demanded (movement along the curve) and a change in demand (shift of the curve) with 90% accuracy in the consolidation quiz.
2. Identify the correct factor (price vs. non-price) causing the change in various real-world scenarios.
3. Graphically illustrate these changes by manipulating curves and points on the interactive smartboard.
4. Collaborate with peers to analyze problems and co-create solutions, presenting their findings digitally.
5. Reflect on their own learning progress and set a tangible goal for improvement (self-directed learning).

Students' characteristic:

- **Varied Learning Styles:** Visual (graphs, diagrams), auditory (explanations, discussions), and kinesthetic (interactive tasks).
- **Existing Knowledge:** Students already understand the basic concepts of demand and can interpret a simple demand curve.
- **Diverse Abilities:** Mixed proficiency levels, with some students needing more support to apply theoretical concepts practically.

Lesson Aids

- Interactive Smartboard with pre-prepared slides (drag-and-drop activities, interactive graphs, and quizzes).
- Online tools for student engagement.
- Printable handouts for group work (as a backup).
- Pre-lesson: Online research task via LMS.
- Post-lesson: Reflection and real-world application task.

Key pedagogies:

- **Interactive & Kinesthetic Learning:** Using dynamic Smartboard functions to allow students to physically manipulate graphs and variables, transforming abstract economic theories into tangible, hands-on experiences.
- **Data-Driven Formative Assessment:** Employing real-time engagement tools to instantly gather data on student understanding, which enables the teacher to provide immediate, targeted feedback and adjust instruction on the spot.
- **Collaborative Knowledge Building:** Structuring activities around shared digital workspaces where students work in groups to analyze problems, co-create solutions, and engage in peer feedback, making learning a visible and social process.
- **Metacognition and Self-Directed Learning:** Integrating reflection and goal-setting activities at the end of the lesson to empower students to assess their own comprehension, identify areas for improvement, and take ownership of their learning journey.

Pre-Lesson Task (Asynchronous)

Task:

Students are asked to find one news article or advertisement from the past month about a product sold in Hong Kong (e.g., new iPhone model, concert tickets, face masks). They will post a link to a class through LMS and write one sentence hypothesizing why the demand for this product might have changed.

Purpose:

- Activates prior knowledge and connects economics to the real world (1.1.1).
- Promotes self-directed learning and information literacy (1.1.2, 1.5.2).
- Provides a pool of real-world examples for use during the lesson.

Lesson Flow:

Section	Time	Type of interaction	Activity	Purpose	Tools	Alignment with School Concerns*
1. Greeting & Hook	3 mins	Whole class	- Teacher: “Last week, the price of your favourite bubble tea dropped by HK\$10. What did you do?” - Students respond via QR code on the Smartboard: (A) Bought more, (B) No change. - Teacher: “Now, a famous celebrity endorses that same bubble tea. What happens to the shop's sales?” - Results are displayed instantly as a word cloud or bar chart on the Smartboard, creating a visual contrast between the two scenarios.	Engage students with a relatable example and activate prior knowledge.	Smartboard, online engagement tool	1.1.2, 2.4.2
2. Lead-in: Concept Clarification	7 mins	Teacher-student	- Teacher: Uses a pre-prepared interactive slide with two graphs. - Graph A (Quantity Demanded): The teacher drags a price point up and down the demand curve. The corresponding quantity on the x-axis changes automatically. The teacher annotates this as “Movement along the curve caused by price.” - Graph B (Demand): The teacher drags icons (e.g., a money bag for 'income', a 'group of people' for 'number of buyers') onto the graph. Each icon triggers an animated shift of the entire demand curve left or right. The teacher annotates this as “Shift of the curve caused by non-price factors.”	- Clarify key concepts interactively - Cater to diverse learners	Smartboard, interactive slides	1.1.1, 1.2.2
3. Collaborative learning	20 mins	Group work & teacher-student	- Students are divided into groups of four. The Smartboard screen is split into multiple quadrants (using a collaboration app or the Smartboard's native software). - Students work in groups of four via Smartboard quadrants. Each group receives a unique scenario	Encourage collaboration and peer learning	Smartboard, annotation tools	1.1.5, 1.2.2, 1.2.5, 1.3.1, 2.2.3

Section	Time	Type of interaction	Activity	Purpose	Tools	Alignment with School Concerns*
			(e.g., “Government subsidies electric cars,” “Hot weather increases demand for ACs”). ▪ In their quadrant, each group must: a. State their scenario. b. Decide: Change in Demand or Quantity Demanded? c. Draw the correct graph (movement or shift) using the Smartboard's annotation tools from their own devices or by sending a representative to the board. d. Write a one-sentence justification. ▪ Teacher: Facilitates, provides instant feedback by annotating directly on groups' work (e.g., circling a mistake, drawing a correct arrow), and encourages peer feedback (“Group A, look at Group C's graph. Do you agree with their shift?”).			
4. Consolidation	7 mins	Whole class	▪ The teacher launches a pre-made online quiz on the Smartboard. ▪ Questions are a mix of theoretical (“Which of these is a non-price factor?”) and scenario-based problems. ▪ After each question, the teacher uses the results distribution displayed on the Smartboard to address common errors immediately. For example: “I see 40% of us chose (B). Let's quickly review why that's incorrect...”	Reinforce learning and identify areas needing further explanation.	Smartboard, online quiz tool	1.2.5, 1.1.2

Section	Time	Type of interaction	Activity	Purpose	Tools	Alignment with School Concerns*
5. Wrap-up	3 mins	Whole class	- The teacher displays a final slide with two columns: “Key Takeaway” and “Remaining Questions.” Students can come up and write their thoughts or add them to LMS. - Teacher: “Based on today's quiz and activities, I want you to set one goal for yourself.” A simple poll/form is displayed: “My goal is to: (A) Review the 5 non-price factors, (B) Practice drawing shifts correctly, (C) Find more real-world examples.” - Students submit their goals, providing the teacher with data for future planning.	Encourage reflection and gather feedback for future lessons.	Smartboard, LMS	1.1.5, 1.2.5, 2.2.4

Post-Lesson Task (Asynchronous)

Task:

Students access a online form/Classroom assignment. It presents a new, slightly more complex scenario (e.g., involving substitute or complementary goods). They must:

- Identify the type of change.
- Explain their reasoning in 2-3 sentences.
- State whether they met the personal goal they set at the end of the lesson.

Purpose:

- Consolidates learning and assesses application skills (1.1.1).
- Encourages self-reflection and reinforces the cycle of self-directed learning (1.1.5).
- Provides the teacher with summative data on individual student performance.

CCC Ming Kei College
S2 Geography Lesson Plan

Topic: Chapter 5: China's Physical Landscapes - Relief and River Systems
Class: Secondary 2
Duration: 40 minutes

Rationale for Smartboard Integration:

This lesson addresses the challenge of teaching abstract geographical concepts like 'relief' and its impact on vast river systems. The interactive smartboard transforms this into a dynamic, visual, and inquiry-based experience. By using AR applications projected onto a large, touch-enabled surface, students can collectively explore, manipulate, and annotate a virtual globe. This approach directly fosters map-reading skills, enhances understanding of cause-and-effect relationships in physical geography, and promotes a sense of national identity through a deeper appreciation of China's geography, aligning with the school's focus on leveraging technology for effective and engaging learning.

Learning Objectives:

By the end of the lesson, students will be able to:

1. Describe the general relief feature of China as being high in the west and low in the east.
2. Use the AR application to identify the Tibetan Plateau and the approximate paths of the Yellow River and Yangtze River.
3. Explain how China's west-to-east relief directly influences the direction of its major river flows.
4. Collaborate with peers to present their findings on the interactive smartboard.

Student Characteristics:

- **Learning Styles:** Primarily visual and kinesthetic learners who benefit from hands-on interaction.
- **Existing Knowledge:** Students have a basic understanding of maps but little formal knowledge of contour lines or large-scale relief patterns.
- **Abilities:** Mixed-ability class. S.2 students are naturally curious but require clear structure and scaffolding to connect abstract concepts.

Key Pedagogies:

- **Inquiry-Based Learning:** Students are guided to discover the relationship between landforms and rivers rather than being told.
- **Visual-Spatial Learning:** Using interactive maps to make complex spatial relationships tangible and understandable.

- **Collaborative Knowledge Building:** Students work in groups to explore the AR app and then share their findings with the class on the central smartboard, allowing for peer feedback and teacher-led clarification.

Pre-Lesson Task (Asynchronous)

- **Task:** Students are given a link to a shared online interactive platform. They are instructed to use online maps (Satellite View) to find a significant hill or mountain range in Hong Kong (e.g., Tai Mo Shan, Lion Rock). They will post a screenshot and write one sentence describing where the water would go if it rained heavily on that hill.
- **Purpose:**
 - To activate prior knowledge about how water flows (from high to low) in a familiar, local context.
 - To build foundational skills in using digital map tools for geographical observation.
 - To foster curiosity about landforms and water, preparing them for the lesson’s main inquiry.

Lesson Flow:

Section	Time	Type of interaction	Activity	Purpose	Tools	Alignment with School Concerns*
1. Introduction & Hook	5 mins	Teacher-student	● Teacher displays a high-resolution satellite image of Asia on the smartboard and asks: “Look at the rivers in China. Why do you think most of the major ones flow in the same general direction?” Students offer initial ideas. ● Teacher: Introduces the key term for the lesson: “Relief” (the shape of the land’s surface).	▪ To engage students with a visually interesting puzzle. ▪ To activate prior thinking and introduce the core concept.	Smartboard	1.1.2, 2.2.4
2. Concept Building	10 mins	Teacher-Student	● Teacher uses a pre-prepared slide on the smartboard showing a physical map of China. i. Teacher circles the high-altitude western region (Tibetan Plateau) and the low-altitude eastern plains.	▪ To explicitly teach the concept of China’s west-high, east-low relief pattern. ▪ To build the foundational	Smartboard, Annotation Tools/ application	1.1.2, 1.1.3, 1.1.4

Section	Time	Type of interaction	Activity	Purpose	Tools	Alignment with School Concerns*
			ii. Using the smartboard's pen tool, the teacher draws a simple cross-section from west to east, illustrating the "three-step staircase" of China's relief. iii. Teacher explains how elevation is shown on physical maps (color coding).	knowledge needed for the main activity.		
3. Interactive Exploration	15 mins	Group Work & Whole Class	Students get into groups of 3-4 with at least one iPad. Task: Using the AR app, find China. Your mission is to: i. Locate the Tibetan Plateau. ii. Find and trace the path of the Yangtze River and the Yellow River from their source to the sea. iii. Be ready to show the class your findings. Sharing: Teacher invites one group to connect their tablets to the smartboard. They present their findings, tracing the river paths with their finger on the board. The teacher provides real-time feedback, annotating their screen to reinforce the west-to-east flow.	▪ To equip students with map-reading skills using modern tools. ▪ To foster collaborative problem-solving. ▪ To provide a platform for peer teaching and immediate feedback.	Tablets with AR, Smartboard (for screen mirroring)	1.1.2, 1.1.4, 1.3.1, 2.2.3, 2.4.2
4. Consolidation & Wrap-up	10 mins	Teacher-Student	With the AR map still on the board, the teacher leads a concluding discussion. Teacher: "So, let's answer our first question. Why do the rivers flow east?" (Students should now be able to connect it	▪ To solidify the main learning objective. ▪ To develop critical thinking	Smartboard	1.4.1, 1.4.2, 1.2.5

Section	Time	Type of interaction	Activity	Purpose	Tools	Alignment with School Concerns*
			to gravity and the high-west, low-east relief). Connection: The teacher briefly explains how this water flow is crucial for farming, cities, and electricity in Eastern China, linking geography to national development (a component of national security education). Summary: The main takeaway— “China’s relief shapes its river systems”—is written on the board. - To solidify the main learning objective. - To develop critical thinking by connecting physical geography to human impact. - To enhance national identity through understanding the country’s foundational	by connecting physical geography to human impact. To enhance national identity through understanding the country’s foundational geography.		

Post-Lesson Task (Asynchronous)

- **Task:** Students are asked to create a simple, one-page *digital poster* or a *single slide* using a tool like web-based designed platform or cloud-based presentation application. The poster must visually explain the main concept of the lesson. It must include:
 1. A simple, labeled drawing of China’s “staircase” relief (High West, Low East).
 2. A labeled arrow showing the direction of a major river’s flow.
 3. A title: “Why China’s Rivers Flow East.”
- **Purpose:**
 - To consolidate learning by having students synthesize and visually represent the core cause-and-effect relationship.
 - To serve as a formative assessment, allowing the teacher to quickly check for understanding.
 - To integrate visual arts and digital literacy skills, reinforcing the concept in a creative way.

中華基督教會銘基書院
中四 中國語文科 教案

課題：記敘抒情文寫作——以「這次切身經歷告訴我：父母的愛是永恒的。」為首句續寫文章

班級：中四理科班

時間：兩節課（共 80 分鐘）

電子白板整合理念 (Rationale for Smartboard Integration):

本教案旨在解決理科生面對記敘抒情文時的「未寫先怯」心態。傳統寫作教學過於抽象，而電子白板能將審題、立意、取材及修改等寫作內心活動，轉化為一個全班可視、可觸、可互動的協作過程。透過在電子白板上進行關鍵詞標記、概念視覺化對比、AI 圖像畫廊互評及「公開修改手術」，學生能親手操作、集體建構，使抽象的寫作思維變得具體。這不僅能有效提升學生的學習效能（關注點 1.1），更能透過科技營造一個支持性的互動學習氛圍，幫助學生建立寫作信心，並促進同儕間的和諧協作（關注點 2.2）。

學習目標 (Learning Objectives):

完成本課後，學生能夠：

1. 準確審題，確立文章的寫作任務與核心立意。
2. 從生活經驗中選取恰當素材，並運用細節描寫來突出「父母的愛是永恒的」這一主題。
3. 在協作與互動中，運用批判性思維評鑑及修改寫作材料。
4. 提升自主學習能力，並建立完成記敘抒情文的信心。

學生特點 (Student Characteristics):

- 學習風格：學生邏輯思維強，習慣具體、有結構的學習模式，但對抽象情感的表達感到困難。
- 既有知識：已掌握記敘文六要素；已學習相關文言篇章《論孝》及白話篇章胡燕青《雙層床》；具備三年以上使用平板及 AI 生成圖像的經驗。
- 學習能力：班級為數理科精英班，學習能力強，但對中文寫作普遍缺乏興趣和自信。

主要教學策略 (Key Pedagogies):

- 視覺化學習 (Visual Learning): 運用 AI 圖像、短片及兩欄式對比表格，將抽象的情感與寫作概念具象化。
- 協作知識建構 (Collaborative Knowledge Building): 透過分組討論、線上協作平台分享及電子白板上的集體評鑑，共同建構對題目的深刻理解。
- 鷹架式寫作 (Scaffolded Writing): 將寫作過程分解為審題、取材、構思、片段寫作及修改等步驟，逐步降低寫作難度，建立學生信心。
- 科技融入教學 (Technology Integration): 深度運用電子白板、AI 工具及線上協作平台，創造互動、高效且具吸引力的學習體驗。

課前任務 (Pre-Lesson Task) (異步 Asynchronous)

- 任務：每位同學運用豆包 AI 或同類型工具，生成一張最能代表你心中「父母的愛」的圖片，並上傳至班級的線上協作平台頁面。
- 目的：
 - 預先啟動學生對主題的思考，並將抽象概念轉化為具體圖像 (1.1.1)。
 - 鼓勵學生善用資訊科技進行學習與創作，培養資訊素養 (1.1.2)。
 - 為課堂的「數位藝廊」環節準備素材，促進自主學習 (1.1.5)。

課堂流程 (Lesson Flow):

環節	時間	互動模式	活動內容	目的	工具	對應學校關注點*
1. 導入與互動審題	15 分鐘	師生互動、全班討論	1. 關鍵詞標記：老師在電子白板上展示題目，邀請學生上台用電子筆圈出關鍵詞（如：「切身」、「永恒的」），並引導全班確立共識。 2. 「永恒」與「短暫」的視覺化對比： i. 老師播放流行曲（如：張信哲《不要對他說》）片段，引導學生思考「短暫的愛」。 ii. 在電子白板上開啟兩欄式表格（左：短暫的愛；右：永恒的爱），邀請學生上台寫下對應的感受詞（如：不安 vs 安心），將抽象概念具象化。	• 將被動聽解轉為主動分析，加深審題印象。 • 透過視覺對比，幫助邏輯思維強的學生直觀地理解題目核心立意。	電子白板、電子筆、線上短片平台	1.1.2, 1.4.1

環節	時間	互動模式	活動內容	目的	工具	對應學校關注點*
2. 視覺化取材與協作	20 分鐘	小組協作、全班互評	- 數位藝廊 (Digital Gallery)：老師將載有課前 AI 圖像的線上協作平台全螢幕投射在電子白板上。 - 分享與互評： - 各組派代表上台，指著自己組的圖片，解釋創作理念。 - 互評環節中，學生可直接用電子白板的螢光筆或註釋工具，在對方組別的圖片上圈出最能體現「愛」的細節，並加以說明。	- 聚焦討論核心，讓分享和評鑑過程更清晰。 - 鍛鍊學生的視覺解讀與批判性思維。 - 在互動中共同建立優秀取材的標準，實現同儕互學。	電子白板、線上協作平台、學生平板	1.3.1, 2.2.3, 2.2.4
3. 建構敘事結構	15 分鐘	師生互動、全班討論	圖像串連故事：老師引導學生思考如何用三張圖片串連成一個能體現「經歷」與「告訴我」的轉變過程。 短片觀摩與結構分析： - 老師選取一個學生的三圖短片，在電子白板上播放。 - 使用暫停功能，在關鍵畫面上引導討論：「從第一張圖到第二張圖，『我』的感受有什麼變化？」 - 老師直接在畫面上用電子筆標註「起、承、轉、合」，將敘事結構視覺化。	- 將學生腦中隱性的事件鋪排過程「顯性化」。 - 為理科生提供清晰、結構化的寫作框架，降低構思難度。	電子白板、學生創作的短片	1.1.1, 1.1.5, 1.2.5
4. 片段寫作與協作修改	20 分鐘	個人寫作、全班協作	- 片段寫作：學生選取一個事件，書寫約 400 字的片段。 「公開修改手術」： - 老師將一篇匿名學生草稿顯示在電子白板左側，右側展示精選範文片段。 - 引導全班對比分析，並邀請同學上台用不同顏色的電子筆，直接	- 將修改過程透明化、遊戲化，降低學生的寫作恐懼。 - 提供即時、具體的反饋，學習效果遠勝傳統書面批改。	電子白板、學生草稿	1.2.2, 1.2.4, 2.2.4

環節	時間	互動模式	活動內容	目的	工具	對應學校關注點*
			在草稿上進行修改（如：刪除冗詞、替換動詞、增加細節）。	培養學生的「作者意識」和自我修正能力。		
5. 總結與佈置任務	10 分鐘	師生互動、全班討論	- 成果總結：老師利用電子白板上「修改前後」的對比版本，總結修改的成功之處，鞏固學習重點。 - 連結評分準則：在白板上展示 DSE 評分準則，用電子筆高亮關鍵要求（如：「描寫具體細膩」），並將其與課堂活動連結。 - 佈置課後任務。	- 鞏固學習成果，建立清晰的邏輯鏈。 - 讓學生明確寫作目標和評核要求，為完成最終寫作任務作好準備。	電子白板	1.1.1, 1.2.5, 1.2.6

課後任務 (Post-Lesson Task) (異步 Asynchronous)

- 任務：
 - 根據課堂所學和同儕反饋，整理並優化自己的寫作材料（三圖故事線）。
 - 利用線上協作平台或雲端基礎簡報製作軟體等工具，製作一個簡單的寫作大綱（Mind Map 或流程圖），清晰展示文章的結構。
- 目的：
 - 鞏固課堂所學，並將其應用於自己的寫作準備中 (1.1.1)。
 - 鼓勵學生進行自我反思，並對自己的學習成果負責 (1.1.5, 1.2.5)。
 - 整合資訊科技與視覺藝術，以多元方式整理學習成果 (1.3.1)。

* Checklist of School Concerns

- 1.1.1 To design pre-lesson and post-lesson tasks which can facilitate and consolidate classroom learning
- 1.1.2 To promote wise and ethical use of information technology for learning
- 1.1.3 To enhance students' language competence for more effective learning
- 1.1.4 To provide enhanced support and guidance to S.1 and S.2 students for their acquisition of learning skills
- 1.1.5 To strengthen students' ability in self-management and foster a sense of responsibility for their own learning
- 1.2.2 To provide differentiated learning materials and assessments to cater for self-directed learning and diverse learning needs
- 1.2.4 To provide more learning support for low achievers
- 1.2.5 To enable students to understand their learning progress for self-reflection and goal-setting
- 1.2.6 To recognize students' achievements and improvement in studies
- 1.3.1 To encourage cross-subject collaboration in the design of learning tasks
- 1.4.1 To incorporate value education in the curriculum
- 1.4.2 To incorporate elements related to national security education in the curriculum
- 2.2.3 To build healthy and supportive relationships of students with others including peers, teachers and parents
- 2.2.4 To promote a growth mindset for students' self-improvement
- 2.4.2 To cultivate in students a sense of belonging to the school by engaging students to join different school events