FOOD AND CONSUMER EDUCATION
TEACHING AND LEARNING SYLLABUS
Lower Secondary

Implementation starting with
2022 Secondary One Cohort

Ministry of Education
SINGAPORE

CONTENTS

SECTION 1:
INTRODUCTION

The design of the Food and Consumer Education (FCE) syllabus considers the changing social and economic landscape in Singapore and technological advancements in food and consumer products. With changing lifestyle and attitudes towards health, environment, and financial management, it is important for students to be equipped with the knowledge and skills to discern the impact of these changes on themselves and their community.

The study of FCE contributes to efforts by Singapore towards a smart nation and sustainable living. The push from the government for businesses to accept digital payment[1] in Singapore has also contributed to more people embracing cashless transactions. With this move, educating our students to be financial literate is even more important. In 2021, Singapore announced the Singapore Green Plan 2030 to advance the national agenda on sustainable development. These plans will impact every Singaporean and students as stewards of the environment to practice sustainable consumption.

Students develop 21st century competencies[2] as they apply knowledge in nutrition and health, food literacy, consumer literacy and food science to the Singapore context. Students learn to be discerning consumers when interpreting information found on food and product labels. Students also become more cognisant of how consumer behaviour may impact the climate. The FCE syllabus nurtures students to become concerned citizens who make responsible decisions. With e-commence becoming increasingly popular, students will need to practice financial prudence when making online purchases.

Social and emotional competencies will prepare our students to navigate the challenges in the future. The learning experiences in FCE will encourage students to consider sound principles and values when making food and consumer decisions. Students will appreciate how technology impact their lives and the opportunities and challenges that it brings. Opportunities for social mixing in the common curriculum classroom will help students develop social skills to interact with others confidently. These social and emotional learning competencies play important roles in preparing our students to be concerned citizens and active contributors beyond the context of school.

NFS CURRICULUM FRAMEWORK

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[1] Enterprise Singapore ("ESG") and the Infocomm Media Development Authority ("IMDA") are partnering the Housing and Development Board ("HDB"), JTC Corporation ("JTC") and National Environment Agency ("NEA") to accelerate the roll-out of the Unified e-Payment Solution nationwide in HDB coffee shops, NEA hawker centres and JTC industrial canteens. https://www.imda.gov.sg/programme-listing/smes-go-digital/Hawkers-Go-Digital

[2] MOE 21st Century Competencies: Communication, Collaboration and Information skills; Civic-literacy, Global Awareness and Cross-cultural skills; and Critical and Inventive Thinking.

A framework (Figure 1) has been developed for all the NFS subjects' syllabuses (includes Food & Consumer Education and Nutrition & Food Science). It shows the curriculum strands (green), mindset (blue) and desired student outcomes (red). The framework is used to guide the development of the syllabuses content. The mindset in the NFS framework serves as a guide to help our students integrate their learning of the concepts in the three curriculum strands, thereby achieving the desired student outcomes.
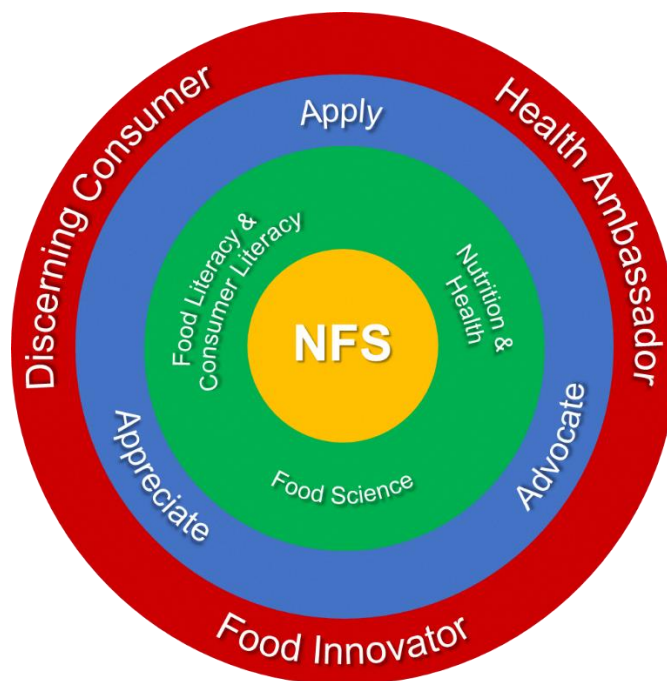

Figure 1: NFS Curriculum Framework

Through the NFS curriculum, students would advocate nutrition and health for self, family and the community. They will better appreciate how a variety of food, including consumer literacy like financial literacy, is used in food management and the issues of food security, including food safety and sustainable food consumption. They will also apply scientific principles during food preparation and cooking. With the appropriate knowledge and skills, they will become a health ambassador, discerning consumer and food innovator, which are the student outcomes articulated in the curriculum framework in Figure 1. Table 1 provides an elaboration on the student outcomes.

Table 1. Elaboration of NFS Student Outcomes

NFS Student Outcomes	
Health Ambassador	Advocate nutrition and health for self, family and the community.
Discerning Consumer	Appreciate how a variety of food is used in food management and take into consideration the issue of food security, which includes food safety and sustainable food consumption.
Food Innovator	Apply scientific principles during food preparation and cooking.

Alongside the framework, the big ideas provide an overview of the knowledge and skills students should acquire from the curriculum. Table 2 provides an overview of the NFS Big Ideas.

Table 2. NFS Big Ideas

Strand	Big Idea
Nutrition & Health	● Right amount of nutrients is essential for proper growth and development. ● Excessive or deficiency in nutrient intake can lead to diet-related health problems.
Food Literacy & Consumer Literacy	● A balanced diet is achieved through proper meal planning. ● Appropriate food choices contribute to sustainable food consumption. ● Good money management habits help to build savings and meet needs and wants. ● A discerning consumer makes informed decisions for self, family and the community.
Food Science	● Sensory qualities of food are altered during preparation and cooking. ● Food will deteriorate in quality if not handled or stored properly. ● Application of food science principles can culminate in unlimited combination of food possibilities that can meet human nutritional needs.

GOAL OF FOOD AND CONSUMER EDUCATION

The FCE syllabus is designed to empower students to be health-conscious and discerning consumers, enabling them to better manage their lives for the present and the future. Students who offer FCE should develop attitudes and skills that will help them stay relevant in the ever-changing world they live in.

FOOD AND CONSUMER EDUCATION SYLLABUS AIMS

- Understand the importance of nutrition and food safety and lead a healthier lifestyle proactively.

- Apply basic culinary science in preparing healthier food to meet the needs of target groups.

- Manage resources optimally and sustainably.

- Make responsible and informed decisions for self, family and the community.

Food and Consumer Education Attitudes

Confidence	Curiosity	Empathy	Open-mindedness
Prudence	Resilience	Respect	Responsibility

Food and Consumer Education Skills

Analytical	Communication	Creative Thinking
Decision Making	Reflective Thinking	Culinary Skills

DESIGN OF FOOD AND CONSUMER EDUCATION
The design of the FCE syllabus took into consideration the Nutrition & Food Science (NFS) Curriculum Framework and NFS Big Ideas. Reference to the change in Singapore's

demographics related to health issues, such as the war on diabetes, an ageing population; new lifestyles and the current consumer trends were also considered.

STRUCTURE OF FCE

The FCE syllabus is organised around the Core Areas of Study and an Applied Module. The Applied Module is infused into the curriculum to demonstrate the integration of knowledge and skills across the two core areas of study.

Core Areas of Study

The two Core Areas of Study include the following:
1. Food Studies
2. Consumer Studies

The core learning content equips students with the core knowledge and practical literacies that provide a strong foundation for everyday living in the future. This includes the knowledge and skills of food, nutrition and consumerism.

The foundational knowledge and skills allow progression to the upper secondary level when the students take Nutrition and Food Science as one of their elective subjects, and even to food/nutrition-related courses at the tertiary level. In addition, the basic knowledge and skills also provide the extension of learning in the Applied Module.

1. Food Studies

With more families eating out and the young making more food choices while parents are busy at work, this Core Area of Study will equip students with the knowledge of diet and health. This develop them to be discerning in choosing nutritious food and maintaining a balanced diet for good health. Students will also be equipped with culinary skills to be self-sufficient in planning and preparing healthier meals for themselves and their family. At the same time, students will also learn to be appreciative of the diversity of food from different cultures in Singapore and around the world as they go through the food and culture aspect in the syllabus. There are two broad topics in this Core Area of Study:
   i) Diet & Health – consists of *Balanced Diet* and *Meal Planning*, where students learn the importance of having a balanced diet and how to plan healthier meals or modify meals using meal planning factors and *My Healthy Plate* to meet their individual and family's dietary needs and reduce the risk of diet-related health problems.
   ii) Food Management – consists of *Food Safety & Cooking of Food*; *Food & Culture*; and *Culinary Skills,* where students demonstrate safe food preparation in various culinary skills and methods of cooking to create innovative dishes and appreciate Singapore's diverse food culture.

2. Consumer Studies

This Core Area of Study centres around Basic Resource Management where students learn to manage their money and resources. They learn to identify their needs and wants, the importance of budgeting and saving, to live within one's means, different methods of payment, and using credit responsibly. These are knowledge and skills in Basic Money Management (Tier 1) of Financial Literacy under the MoneySense Framework, Monetary Authority of Singapore. These areas are age-appropriate for the lower secondary level. Table 3 shows the focus and objectives of Tier 1 in the MoneySense Framework.

Table 3. Focus and Objectives of Tier 1 (MoneySense Framework[3])

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[3] *Extracted from: http://www.moneysense.gov.sg/about-us/moneysense-framework*

Level of Financial Literacy	Focus of MoneySense Programme	A MoneySense consumer will be able to:
Tier I: Basic Money Management	In this foundational tier, basic money management skills, such as budgeting and saving, and tips on the responsible use of credit, should be covered.	- Establish simple financial goals and budget - Manage day-to-day finances prudently - Use credit responsibly

Students also learn about consumer rights and responsibilities, seeking redress and be smart shoppers by interpreting information and exercise comparative shopping before making a purchase. They will also practice sustainable consumption in line with the increased global drive towards sustainable living.

Applied Module

An **Applied Module** (AM) is introduced in FCE for students to extend their learning from the two Core Areas of Study. It gives opportunities for students to deepen and apply the knowledge acquired from the two core areas of study and is designed with skills in mind. Core competencies such as creative thinking, needs analysis, decision making, and reflective thinking would be developed through the AM.

SECTION 2: CONTENT

Teaching Syllabus
Curriculum Time
Framework for 21st Century Competencies and Student Outcomes in FCE

FOOD AND CONSUMER EDUCATION LEARNING OUTCOMES
FOOD STUDIES
Diet & Health
1   Balanced Diet   1.1 Define the term 'balanced diet'   1.2 State the function(s) of different nutrients: ● carbohydrates   ● proteins   ● fats   ● vitamins (A, B-group, C, D)   ● minerals (calcium, iron, sodium chloride)   ● water   ● dietary fibre   1.3 List the food sources for the above nutrients, water and dietary fibre
2   Meal Planning   2.1 Define the term 'energy balance'   2.2 Explain the effects of energy balance and energy imbalance   2.3 Explain the guidelines from My Healthy Plate with relevant food examples: ● Fill half of your plate with fruit and vegetables   ● Fill a quarter of your plate with whole grains   ● Fill a quarter of your plate with meat and others   ● Use healthier oils   ● Choose water   ● Limit intake of salt   ● Limit intake of sugar   ● Focus on calcium   2.4 List ways to reduce the following diet-related health problems: ● coronary heart disease   ● high blood pressure   ● obesity   ● type 2 diabetes   2.5 Explain guidelines for choosing healthier food choices when eating out   2.6 Explain the following factors to consider when planning, preparing and serving meals: ● budget   ● nutritional needs (schoolchildren, teenagers, adults, seniors)   ● religion   ● time
Food Management

3 Food Safety and Cooking of Food

3.1 State the causes of food contamination

3.2 State the reasons for cooking food

3.3 State the advantages and disadvantages of the different methods of cooking:
- dry heat (baking)
- hot fat (deep-frying, stir-frying)
- moist heat (boiling, steaming)
- microwave cooking

4 Food & Culture

4.1 Identify dishes that represent local ethnic groups (Chinese, Malay, Indian, Eurasian) and festivals (Chinese New Year, Hari Raya Puasa, Deepavali, Christmas)

4.2 Identify local dishes that are popular in Singapore

4.3 Identify international cuisines and examples of their dishes available in Singapore

4.4 Explain the importance of the hawker culture as part of the Singapore identity

5 Culinary Skills (not tested in theory)

5.1 Demonstrate good practices when preparing, cooking and storing food to ensure food safety

5.2 Practise safety in the food lab to prevent accidents

5.3 Create healthier dishes through recipe modification

5.4 Demonstrate different methods of cooking:
- dry heat (baking)
- hot fat (deep-frying, stir-frying)
- moist heat (boiling, steaming)
- microwave cooking

5.5 Demonstrate culinary skills:
- knife skills (slice, dice, chop)
- batter
- dough making
- one-stage / creaming
- rubbing-in
- sauce making
- shaping / wrapping

5.6 Describe sensory properties in food products:
- colour (e.g., golden brown, pale yellow)
- shape (e.g., asymmetrical, dome-shaped)
- taste (e.g., salty, sweet, bitter, sour)
- texture (e.g., smooth, tender, crumbly)

5.7 Investigate the effects of using different ingredients / cooking methods on a dish

CONSUMER STUDIES

Basic Resource Management

6	**Basic Money Management (Tier 1 of Financial Literacy under MoneySENSE)**
	6.1 Define the terms 'needs' and 'wants'
	6.2 Identify factors that distinguish needs and wants
	6.3 Define the terms 'budgeting' and 'savings'
	6.4 Explain the importance of budgeting and savings, to live within one's means
	6.5 Describe the following modes of payment: • paper-based payment (cash) • e-payments (debit and credit)
	6.6 List the advantages and disadvantages of the following modes of payment: • paper-based payment (cash) • e-payments (debit and credit)
	6.7 State the importance of using credit responsibly (to avoid debt)
	6.8 State ways to use credit responsibly
7	**Sustainable Consumption of Goods & Services**
	7.1 Define the term 'sustainable consumption'
	7.2 Explain the importance of sustainable consumption
	7.3 Explain ways to practice sustainable consumption: • use 3Rs (reduce, reuse, recycle) • look out for eco-labels (Energy Label, Singapore Green Label, Water Efficiency Label)
8	**Being a Discerning Consumer**
	8.1 Define the term 'discerning consumer'
	8.2 Explain consumer rights
	8.3 Explain consumer responsibilities
	8.4 Identify possible circumstances for redress
	8.5 State appropriate ways to seek redress for goods and services
9	**Smart Shopping**
	9.1 Interpret information found on food and nutrition labels
	9.2 Explain the advantages and disadvantages of different modes of shopping: • in-store • online

CURRICULUM TIME

To better plan and manage the curriculum time for the Core Areas of Study, the learning outcomes (LOs) have been scoped for the different topics using the Bloom's Taxonomy. The

scoping of LOs reflects the different emphasis and depth of coverage and learning. This would help schools apportion curriculum time accordingly and cover all topics within the recommended time frame. Table 4 below shows the number of weeks over two years for the teaching and learning of the FCE.

Table 4. Recommended Curriculum Time Over Two Years

Total Curriculum Time	Curriculum Time	
	Core Areas of Study	Applied Modules
24 weeks	19 weeks	Up to 6 weeks

It is recommended that all parts of the Core Areas of Study required in the AM task are covered before proceeding with the AM. This will ensure that students are endowed with the core knowledge and skills before they can apply their learning to the AM.

For development of culinary skills, which are core and specific to FCE, it is recommended that schools organise their timetable with an allocation of 3 consecutive periods per lesson[4]. This would allow sufficient time for practical sessions.

FRAMEWORK FOR 21ST CENTURY COMPETENCIES AND STUDENT OUTCOMES IN FCE

The FCE syllabus is designed to prepare students for the 21st Century. The development of 21st Century Competencies (21CC) is inherent in the content, learning process and assessment tasks of the syllabus. FCE provides an important platform in preparing students to live in a world marked by changing lifestyles, globalisation and consumer patterns. The Framework for 21CC and Student Outcomes is shown in Figure 2 below.
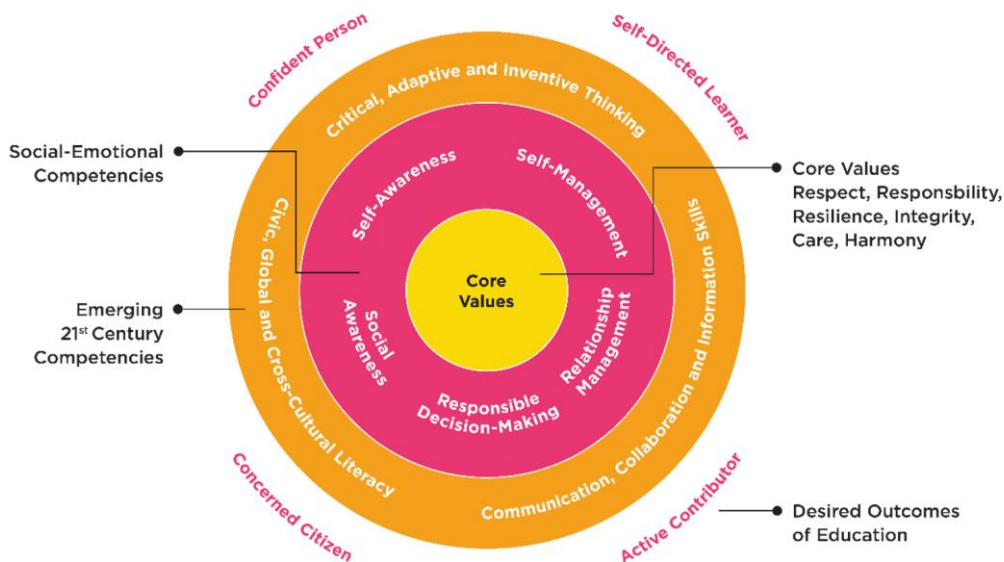

Figure 2: Framework for 21CC and Student Outcomes

Through effective teaching strategies, such as Inquiry-based Learning and Activity-based Learning, students can develop these competencies through FCE.

- **Critical, Adaptive and Inventive Thinking** enables students to use sound reasoning and metacognitive skills to inform decision-making, generate novel and useful ideas to

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[4] Each period being 35-40 minutes long.

address issues, and manage complexities and ambiguities to adapt to changing contexts with agility.

• **Communication, Collaboration and Information Skills** enable students to communicate information, ideas and feelings clearly, engage in effective collaboration with others, and manage, create and share information thoughtfully, ethically and responsibly.

• **Civic, Global and Cross-Cultural Literacy** enables students to contribute constructively to their community and nation, interact respectfully and empathically with others in diverse communities, and act as responsible citizens of Singapore and the world.

Examples of the link between the LOs of FCE and the corresponding 21CC are shown in Table 5 below:

Table 5: Link between examples of FCE Learning Outcomes and 21CC

Examples of Learning Outcomes in FCE	Corresponding 21CC
● Identify international cuisines and examples of their dishes available in Singapore ● Explain the importance of the hawker culture as part of the Singapore identity	Civic, Global and Cross-Cultural Literacy

● Explain the following factors to consider when planning, preparing and serving meals:
   ○ budget
   ○ nutritional needs (schoolchildren, teenagers, adults, seniors)
   ○ religion
   ○ time
	Civic, Global and Cross-Cultural Literacy

● Explain the importance of sustainable consumption ● Explain ways to practice sustainable consumption	Civic, Global Literacy and Cross-Cultural Literacy
● Investigate the effects of using different ingredients / cooking methods on a dish	Critical, Adaptive and Inventive Thinking
● Create healthier dishes through recipe modification	Critical, Adaptive and Inventive Thinking
● State appropriate ways to seek redress for goods and services	Communication, Collaboration and Information Skills

SECTION 3: PEDAGOGY

Inquiry-based Learning
Activity-based Learning
Differentiated Instructions
e-Pedagogy
Blended Learning

Inquiry-based Learning

Inquiry-based learning (IBL), according to Skills Future for Educators, is defined as a constructivist approach to teaching and learning to explore a problem, an issue, a phenomenon or an idea. This learner-centered approach allows students to think deeply and foster learning, thus helping students construct and retain knowledge better. IBL in FCE lends itself well in the way knowledge, skills, values and disposition are acquired and constructed. The role of the teacher is seen as that of activators and facilitators of learning through inquiry to achieve intended student learning outcomes.

IBL Strategies

1. Engage, Explore, Apply (EEA)

The teaching action 'Engage, Explore, Apply' found under the teaching area of 'Encouraging Learner Engagement' found in the Singapore Teaching Practice (STP) can be translated into an IBL lesson.

Table 6: Engage, Explore, Apply

Process	Explanation
Engage	Provide students with an interesting context which is authentic Select context that students have some prior knowledge in so that they can connect to it
Explore	Students work in groups, pose questions and search for solutions regarding the given context Through the discussions and research, new knowledge is constructed about the given context
Apply	Students can demonstrate understanding of the new knowledge through various modes (hands-on experimentation/case study etc.) Students can then reflect if their solutions are feasible

2. Scenario Analysis, Team Inquiry, Apply, Reflect (STAR)

Found in the Singapore Teaching Practice, Teaching Area, this teaching action is an authentic inquiry approach that engages students' interest.

Table 7: STAR

Process	Explanation	Example
Scenario Analysis	Students are: • provided with authentic scenario/problem • to analyse and identify questions and area of inquiry	Susan has just joined a student centre and is in charge of meal planning. She knows that children are at a fast-growing stage and require protein. Assist Susan to plan an interesting protein-rich one dish meal and a dessert to be served.
Team inquiry	Students go through collaborative inquiry	Students to explore: • nutritional needs of children • protein-rich one dish meals and desserts • ways to prepare and serve interesting meals
Application	Students apply what they had explored and propose explanation / solutions to address scenario	Prepare and present a protein-rich one dish meal and a dessert, demonstrating at least 2 skills and 2 methods of cooking
Reflection	Students to reflect on their learning and the learning process	A reflective component where students reflect the outcomes of the application and how well they addressed the issue presented.

Designing meaningful learning experiences are vital for effective teaching and learning. The BSCS 5Es (developed by Biological Sciences Curriculum Study in 1987) IBL instructional model remains the anchor pedagogy for the teaching and learning of the FCE. Figure 3 illustrates the IBL model for the teaching of FCE.
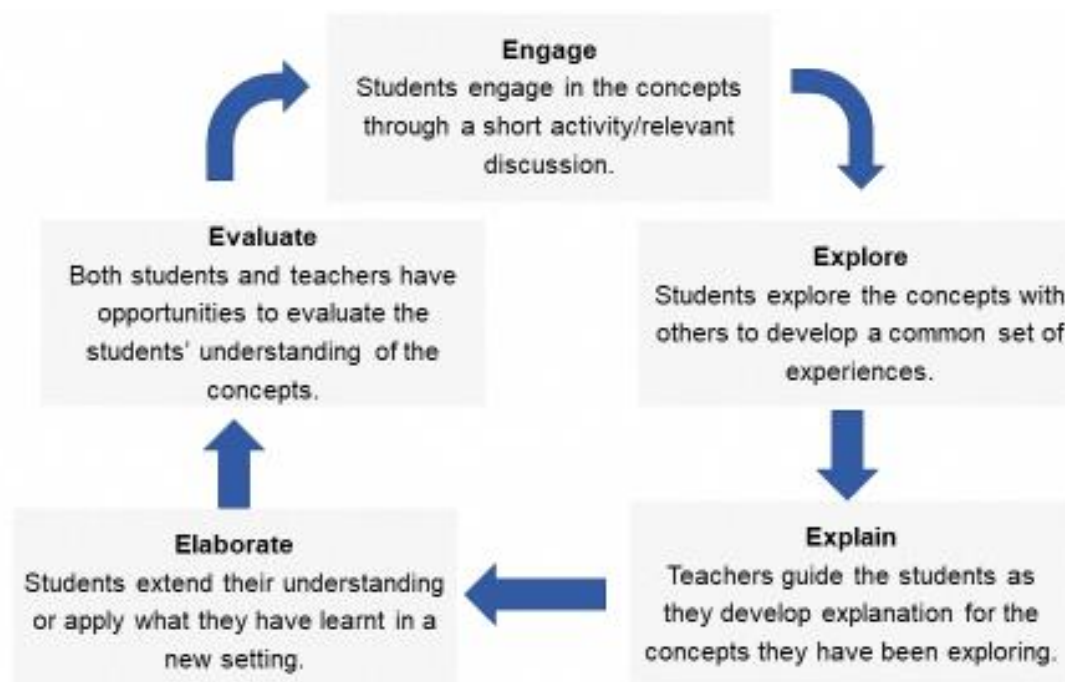

Figure 3: IBL Model for Teaching of FCE

The 5E instructional model is based on **E**ngagement, **E**xploration, **E**xplanation, **E**laboration and **E**valuation. When students are engaged, it will lead them to wanting to explore more on the topic introduced. This in turn leads to generating an explanation for the phenomenon. Students will then understand more about the phenomenon as they construct their own knowledge through elaboration. In evaluation, students can assess their own understanding by showing the other applications of the phenomenon in other settings.

Table 8 gives an explanation on how the IBL model can be used in a FCE lesson.

Table 8: Example of IBL in a FCE Lesson

Process	Explanation	Examples
Engage	● Provide an interesting context ● Reveal student's prior experience and understanding ● Teacher's encouraging / modelling questions	● Get students to taste *Nasi Lemak* and ask the reasons why it tastes good ● Get students to focus on the saturated fats content of the dish using effective questioning ● Students to list other local dishes that are high in saturated fat content
Explore	● Students formulate own questions to find out more on the given context ● Find the answers to the questions ● Compare ideas / collaborate / record thoughts ● Teacher's encouraging / modelling questions	● Students to explore the effects of high saturated fats intake on health ● Students to explore ways to reduce and replace the saturated fats content of *Nasi Lemak* using healthier options ● Students to explore different methods of cooking for the condiments e.g., to prepare anchovies using a microwave oven instead of deep-frying, etc.
Explain	● Students share updated understanding ● Teacher asks questions to guide student explanation ● Teacher clarifies misconceptions ● Teacher adds to missing information to ensure further understanding	● Students present findings to the class on the health risks associated with high saturated fats intake ● Teacher asks questions to assess students' understanding ● Teacher provides specific feedback to the students' presentation
Elaborate	● Students demonstrate their own knowledge gains ● Students demonstrate new knowledge / skill	● Students apply knowledge by preparing the healthier *Nasi Lemak*
Evaluate	● Teachers and students evaluate the students' understanding of the concepts	● Students evaluate the sensory qualities of the healthier dish and seek ways of improvement

Effective Questioning Techniques in IBL

Effective questioning techniques should also be incorporated to complement the IBL to scaffold the development of critical thinking skills in students.

There are 6 types of Socratic Questions[5] (SQ6). Examples of how these can be used during the FCE lessons are shown below in Table 9.

Table 9: Six Types of Socratic Questions

No.	6 Types of SQ	Examples of SQ6

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[5] *Adapted from R.W. Paul, (2006)*

1	*Assumption* Probing Questions *Questions that allow students to examine their assumptions underlying an issue*	How did you arrive at these assumptions? How would you support your assumptions? What would happen if you boil/fry/bake a potato? Can you explain the effect of different cooking methods on meat?
2	*Reasons and Evidence* Probing Questions *Questions that seek to examine the reason and evidence supporting an issue*	Why do you think this information is true/useful and necessary for your task? How can I be sure of what you are saying? What evidence is there to support your hypothesis?
3	*Implications and Consequences* Probing Questions *Questions that seek to examine the perspective taken on an issue*	How does this affect the overall quality of the food? How does this contribute to an interesting and healthy dish/meal? Are you implying that other methods of cooking are not as good as frying? How does this decision relate to the research information earlier?
4	*Clarifying* Questions *Questions that seek to clarify the issue at hand by removing ambiguity and vagueness*	Could you explain that further? Why do you think frying produces the best result? How does this relate to our task? What do you mean by the term '*unique*'? Can you give me an example of a *food commodity*? What do we already know about this?
5	*Perspective/Viewpoints* Questions *Questions that seek to examine the perspective taken on an issue*	What other ways can you look at this? Why do you choose these dishes? What are the differences and similarities between the two samples? Why is this way better than the other? What are the strengths and weaknesses of your product/execution process?
6	*Questions* about the Question *Questions that seek to examine the very question/issue itself*	Is the question clear? What is the question asking us to do? Why do you think I asked this question? Why is this question important? To answer this question, what questions do you have to answer first?

How to use Socratic Questioning in the Classroom[6]

Role of the Teacher
- Respects students' viewpoints, probes their understanding and shows genuine interest in their thinking
- Poses questions that are more meaningful than those a novice of a given topic might develop on his or her own
- Creates and sustains an intellectually stimulating classroom environment and acknowledges the value of the students in that environment

Tips for the Teacher
- Wait Time: Maintain silence and wait at least 5 to 10 seconds for students to respond
- Phrase the questions clearly and specifically
- Keep the discussion focussed

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[6] *Adapted from http://serc.carleton.edu/introgeo/socratic/index.html*

- Do not pose questions that are vague, ambiguous, or beyond the level of the students
- Do not pose yes/no questions, as they do little to promote thinking or encourage discussion
- Follow up on students' responses and invite elaboration

Activity-based Learning

To better engage students, the use of Activity-based Learning[7] (ABL) is promoted. ABL could be done in pairs/groups, which promotes collaborative learning and social interaction. In an ABL lesson, students are actively engaged in activities, they are more proactive in knowledge construction. This leads to better knowledge acquisition. In FCE, ABL lessons would comprise a juxtaposition of LOs across topics to illustrate the interconnectedness of various topics.

An example of ABL could be seen in the topic 'Sustainable Consumption of Goods & Services', where instead of a chalk-and-talk approach, students would engage in bus-stop activities in groups to hunt for eco-labels (e.g., Energy labels on refrigerators, Green labels on detergents etc.), repurpose eco-friendly tote bags from old t-shirts and watch a video on how sharks were killed at unsustainable rates and making a pledge not to consume shark's fin.

Differentiated Instruction

Understanding and applying the principles and practice of "Differentiated Instruction" (DI) is vital to ensuring that all students [8] have access to a quality curriculum. To understand Differentiated Instruction (DI), we need to explore the overarching philosophy that undergirds DI:
1. Believe that every child wants to and can learn, and the goal of schooling is to develop independence and confidence in learning.
2. Expect every child to grow and support their continual growth by recognising and responding to student differences.
3. Design learning experiences that are meaningful, engaging and appropriately challenging for the child.
4. Value every child's 'personal best' that is achieved through effort in work.
5. Assure inclusion and equity of access to quality curriculum by guiding and facilitating student success.

The practice of Differentiated Instruction can be seen as encompassing three core areas:
1. Knowing a quality (challenging, engaging, purposeful) core curriculum built around important and essential understanding, skills, and dispositions.
2. Knowing the learner so as to address student diversity and to meet student needs informed by assessment.
3. Knowing different approaches so as to appropriately scaffold and extend students' learning and provide a variety of tasks that are responsive to student needs[9].

In any differentiated classroom, it is important to keep in mind the common learning destination. The means to arrive at this common learning destination, however, is differentiated to provide relevant and meaningful learning experiences for students. Some students can reach the learning destination with relative ease, and hence need to be challenged to go beyond; other students need more guidance and support to get to the learning destination. What is important, then, is that all students are appropriately challenged. In a differentiated classroom, there are

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[7] Activity-based Learning: activity or activities used in an educational process where students explore the subject by performance of real-world tasks. Through this, students play an active role in their own learning where they learn by doing. This helps students construct their own knowledge and boosts self-esteem in their developmental years.
[Halil, CC. (2018) "The Effects of Activity Based Learning on Sixth Grade Students Achievement and Attitudes towards Mathematics Activities." Research Paper, Siirt University, Turkey (2017)]

[8] Including students with Special Educational Needs (SEN).

[9] UDL principles is one of the strategies for planning and preparing DI lessons (refer to page 36)

many ways to achieve this - teachers can differentiate by modifying the content, process, and product to meet and, where appropriate, extend learning goals.

Content, Process, Product Differentiation

Differentiating the Content

Content differentiation refers to what is taught, which can include facts, skills, concepts, principles, and subject matter that students should have an understanding of[10]. Differentiating the content can mean that students learn different concepts or skills at the same time, or alternatively teachers can have all students work on the same key understandings at different breadths and depths, which take into account students' skill and competency levels[11]. An important question for the teacher is: What is this topic all about? What are the key understandings that all students should have?

It is important to remember that content can be presented in different ways, such as books, websites, demonstrations, outdoor learning journeys and teacher talk. This, then, opens up myriad opportunities for teachers to consider when differentiating content.

In planning a lesson, a teacher should ask himself/herself what the appropriate levels of challenge would be for different groups of learners for a particular outcome. How should he/she support, enrich, or extend their learning?

Differentiating the Process

Process refers to how students are able to access the curriculum, through the activities that have been designed, which could include elements such as scaffolding and pace of work[11, 12] as well as also different grouping combinations. It is how students engage and make sense of the content presented.

Some teachers may think that in a differentiated classroom, there can only be group work. That is not the case. The teacher needs to decide which of the different approaches and modifications will help learners access, understand and apply key ideas and concepts more thoroughly as a result. In fact, there will be times when the teacher decides that the lesson objectives are better served by whole class teaching, followed by group work; hence, that would be the most appropriate approach to take. Furthermore, having whole class teaching and activities can help build a strong learning community. Whole class teaching, group work, pair work and individual work all have their place and purpose in any classroom.

Differentiating the Product

Products are the platforms that provide students with opportunities to demonstrate their understanding[11, 12]. Products can take myriad forms. It is precisely this range and flexibility that make it suitable for addressing student variance. Product differentiation could also include making available a range of media or product formats, such as performance-based tasks that encourage application of what has been learnt. Such options can serve to assess student learning as well as extend student learning beyond that needed in formal school assessments. However, it is important to keep in mind that the options provided need to be guided by clear learning goals. Hence, by differentiating the content, process and product, the teacher and students work flexibly together, with the teacher reorganising groupings and approaches as circumstances change, using different strategies as appropriate in order to achieve the lesson

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[10] Gartin, B.C, Murdick, N.L, Imbeau, M, & Perner, D.E. (2002). *How to use differentiated instruction with students with developmental disabilities in the general education classroom*. Council for Exceptional Children: Arlington, VA

[11] Tomlinson, C. A., & Eidson, C. C. (2003). Differentiation in practice: A resource guide for differentiating curriculum. Grades K-5. Alexandria, VA: Association for Supervision and Curriculum Development.; Tomlinson, C.A. (2017). *How to Differentiate Instruction in Academically Diverse Classrooms* (3rd ed.). Alexandria, Virginia.

objectives. Sometimes everyone uses the same material, sometimes different students use different materials. Sometimes the teacher decides, sometimes choices are provided, and the decisions are taken by the students.

While the three aspects of content, process and product modifications provide a structured way of thinking about how one can go about differentiating, it is important to remember that in the reality of teaching and learning in classrooms, it may not be helpful to separate these three areas as discrete elements. There is often a complex interplay among them. As such, it is also important to look at tasks more holistically. One can also differentiate by considering aspects such as complexity, pacing, degree of scaffolding provided and/or levels of abstractness. In a classroom, this could mean that while one student may require more opportunities for direct instruction, more structured and concrete activities and deliberate scaffolding, another student could benefit from less steps and more abstract, complex and advanced work. Hence, the different elements of content, process and product work in concert during the learning experience.

<u>Teaching Strategies</u>

Teachers can also use various strategies to facilitate the inquiry process. Some strategies[12] listed below can help teachers plan and deliver lessons that will engage students in meaningful learning experiences and cultivate their interest and curiosity in FCE. A brief description of these strategies is given below:

- **Brainstorming**
  Brainstorming is a strategy for generating creative ideas and solutions.

- **Concept Mapping**
  Concept mapping is a strategy to present meaningful relationships among concepts. Concept maps are useful in organising and linking concepts or ideas.

- **Cooperative Learning**
  In cooperative learning, activities (e.g., Jigsaw) are structured such that each student assumes certain responsibilities and contributes to the completion of tasks. In working with others, students are exposed to different points of views and solutions in accomplishing a common goal.

- **Games**
  Games engage students in play or simulations for the learning of concepts or skills. This is useful in helping students to visualise or illustrate objects or processes in the real world.

- **Mind mapping**
  A mind map radiates from a central image or keyword. The branches connect related concepts and ideas to the central image. Every word and image are itself a potential sub-centre of ideas or concepts. The visual presentation of related information enhances understanding. The association would be the facts as well as relationship between the facts.

- **Projects**
  Projects are learning activities that require students to find out about an object, event, process or phenomenon over a few weeks or even months.

e-Pedagogy

Teachers can leverage digital technologies to accelerate and deepen learning of FCE by making learning more active and personalised. e-Pedagogy is the practice of teaching with

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[12] *Adapted from Lower Science Syllabus, CPDD, MOE*

technology for active learning that creates a **participatory, connected, and reflective classroom** to nurture the future-ready learner.

Designing lessons with technology is intentional and principle-based, informed by what learning sciences tells us about how people learn. Figure 4 explains how the principles of learning sciences guide the way teachers design for **active learning with technology**.

Figure 4: How learning principles inform the lesson design processes

Teachers should continue to be cognisant of the FCE curricula intent when designing and developing lessons using technology. The four elements of e-Pedagogy (see Figure 5) serve as a good guide for:

a) Constructive Alignment
  Ensures that students are constructing meaning for themselves through relevant learning activities, and the learning outcomes, learning activities and assessment tasks are coherent.

b) Learning Experience
  Consider how the learning activities are pulled together meaningfully to achieve the intended learning outcomes.

c) Active Learning Processes and Interactions
  Learning sciences principles tell us that learning interactions are at the heart of the active learning processes, where the focus is on how students learn with teachers, peers, community and resources.

d) Key Applications of Technology
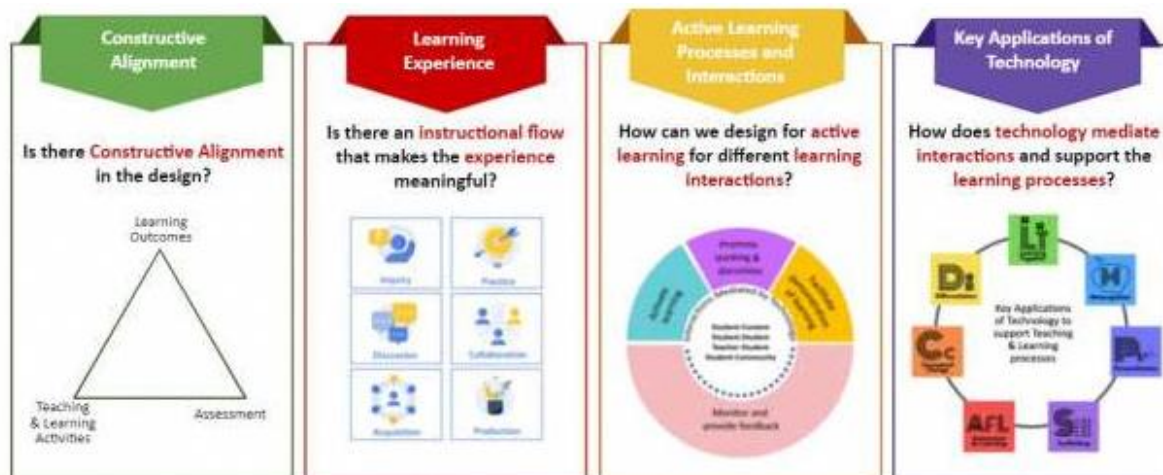 Consider the affordances of technology that can be harnessed to enhance the learning processes.

Figure 5: Elements of e-Pedagogy in EdTech PS

EdTech Pedagogical Scaffold

e-Pedagogy is the practice of teaching with technology for active learning that creates a participatory, connected, and reflective classroom to nurture the future-ready learner.

The EdTech Pedagogical Scaffold (PS) supersedes SLS PS 2.0 as the tool to guide teachers in applying e-Pedagogy. It translates e-Pedagogy into five key actions that guide teachers in designing and facilitating active learning with technology.

The following resources are provided for teachers' use:

- The online *Guide to e-Pedagogy* https://go.gov.sg/enedagogyguide (iCON login is required) provides details and examples for teachers who wish to learn more about the EdTech PS and is designed for navigation based on teachers' interest and readiness levels.

- The *Quick Guide to EdTech PS* https://go.gov.sg/edtechps helps teachers to understand and start applying the EdTech PS for lesson design.

Example of e-Pedagogy FCE Lesson

Figure 6 captures the relationship between the sequences of e-Pedagogy (e.g., acquisition) and STP teaching moves (e.g., activate learning) in a FCE lesson.
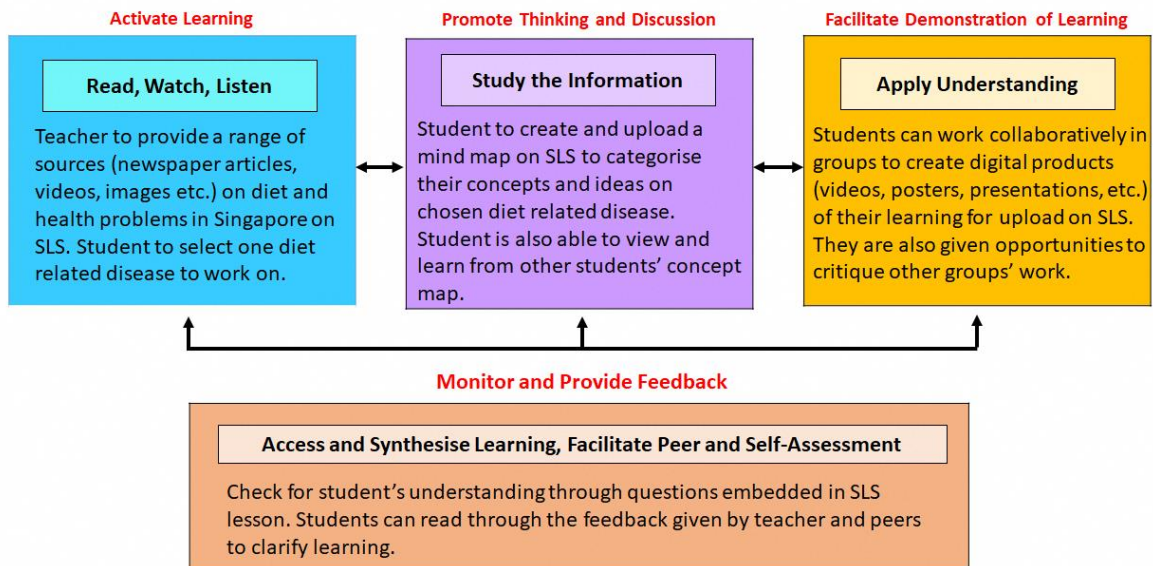
Figure 6: Elements of e-Pedagogy in a FCE lesson

Blended Learning

Why Blended Learning

Blended Learning in MOE's context transforms our students' educational experience by seamlessly blending different modes of learning. The key intents are to nurture (i) self-directed and independent learners; and (ii) passionate and intrinsically motivated learners.

An aspect of Blended Learning is the integration of home-based learning (HBL) as a regular feature of the schooling experience. HBL can be a valuable complement to in-person schooling. Regular HBL can equip students with stronger abilities, dispositions and habits for independent and lifelong learning, in line with MOE's Learn for Life movement.

Blended Learning presents an opportunity to re-think and innovate on curriculum, pedagogies and assessment for a more effective and student-centric educational experience. It gives students more ownership and agency over how they learn, at a pace they are comfortable with. It also offers scope for teachers to tap the advantages of both in-person learning and distance learning to plan lessons best suited to each mode of learning opportunity.

What is Blended Learning

Blended Learning provides students with a broad range of learning experiences (see Figure 7).

Figure 7: Examples of Blended Learning experiences

Table 10. Elaboration of possible Blended Learning experiences

Possible Blended Learning Experiences	What this means
Structured/Unstructured learning	A combination of structured time for students to learn within a given time frame and unstructured time for students to learn at their own pace and exercise self-management.
Synchronous/Asynchronous learning	A combination of in-person schooling, live online lessons and online/offline learning where students learn remotely and at their own pace.
Within-curriculum/Out-of-curriculum learning	Opportunities for students to learn from and beyond the formal curriculum.
Distance/In-person learning	Opportunities for students to learn during face-to-face lessons with teachers and peers in school, complemented by out-of-school learning activities.
ICT-mediated/Non-ICT-mediated learning	Opportunities for students to learn through a combination of ICT-mediated and non-ICT-mediated learning experiences.

What are the Design Considerations for Blended Learning Experiences

For effective Blended Learning experiences, traditional in-class learning should be thoughtfully integrated with other learning approaches such as technology-based approaches. Teachers should be intentional and selective with the aspects of the curriculum to be delivered in school or at home, and leverage technology where it is meaningful and helpful for learning.

Some useful questions to consider when planning for Blended Learning include:
- *What do I want to teach and what are the learning outcomes?*
- *What is the prior knowledge or experience my students have?*
- *Is it safe to carry out the activity at home?*
- *Does everyone have access to the resources required for home-based learning?*
- *What is the best way to organise the learning experiences?*

- *How do I capitalise on the benefits of in-person and home-based learning? How can I plan the activities for classroom learning and home-based learning such that they complement or supplement each other? Which content is more optimally taught in-person, and which, remotely?*
- *Have I integrated Universal Design for Learning principles into my face to face and online lessons, activities and assessments to ensure that all students can access content and participate in the learning opportunities?*

- *How do I assess my students' learning?*
- *How can I provide my students with feedback on the lesson?*
- *How do I help my students organise their knowledge to form a rich set of connections across the Blended Learning experiences?*

Important point to note:
Do not support preparation of food and the conduct of food science experiments at home unless they are conducted under adult supervision. Safety is of utmost importance as these activities may involve open flame, high temperature, sharp objects and food safety.
Link to NFS OPAL2.0 wikipage on Blended Learning
(https://www.opal2.moe.edu.sg/csl/content/perma?id=162904)

Ensuring a Positive Classroom Culture for Blended Learning

As teachers consider how best to design meaningful learning experiences for Blended Learning, there is also a need to create a caring and safe environment for students, both in the physical and virtual spaces. Teachers can bear in mind the following considerations for a positive classroom culture in the Singapore Teaching Practice:
- Foster positive teacher-student and peer relationships through building a culture of care, trust and mutual respect.
- Use preventive and intervention strategies for effective behaviour management and discipline.
- Encourage and reinforce good behaviour by establishing and applying expectations and routines.
- Develop a sense of curiosity and inquiry for lifelong learning.
- Encourage students to take responsibility for their own learning, be involved in decision-making, regard mistakes as learning opportunities and express their views confidently.

For more information, teachers may refer to *The Singapore Blended Learning Guide for Educators* on OPAL2.0.

SECTION 4: ASSESSMENT

Formative Assessment
Summative Assessment
Assessment Objectives

Formative Assessment

In the FCE curriculum, teachers could adopt DI in setting assignments for the class. The Singapore Teaching Practice (STP) teaching action, 'Your Choice' empowers students to choose the type of assignment according to their readiness and preferences to increase engagement and ownership. For example, students could demonstrate their understanding on the impact of excessive and insufficient nutrient intake through a comic strip, a written story or a 'show-and-tell'. Teachers could then use the assessment information obtained to bridge any learning gaps.

Teachers could also use another STP teaching action called 'Comment Only Feedback' where annotations targeted at improving students' current level of understanding are given as comments, without the awarding of any marks or grades. Studies have shown that providing non-judgemental comment or feedback can improve students' learning. Refer to the below FCE example of 'Comment Only Feedback' teaching action.

Ms Tan teaches Food and Consumer Education to a Secondary One class. She tasks her students to provide a summary of what they have learnt about cooking of food using the following outline of key points:

- Reasons for cooking food
- Advantages and disadvantages of boiling, baking and deep-frying

Ms Tan gives specific task-level feedback on one of the summaries from her students.

- **Reasons for cooking food**

  The reason for cooking food is to make them easier to chew and digest.

  > Feedback:
  >
  > You have correctly identified one reason for cooking food. Could you provide an example to show your understanding of this statement?

- **Advantages and disadvantages of boiling, baking and deep-frying**

  Healthy as little/no oil used. Food needs to be monitored to prevent it from burning. Slow method of cooking.

  > Feedback:
  >
  > It will be clearer if you specify the advantages and disadvantages with sub-headings. Consider presenting your responses in a table for clarity.

Through the specific feedback provided by Ms Tan, she observes that her students are willing and eager to make improvements to their summaries by using the questions in the feedback provided to figure out how to close their learning gaps. She also observes that her students are open and willing to receiving such feedback from her so that they can understand how to improve on their work.

Summative Assessment

In Full SBB setting, a common assessment is administered to all students from different courses in FCE. Schools are to ensure appropriate pitching of the Lower Secondary curriculum and alignment to intended learning outcomes. Schools should design assessment as stipulated in the Lower Secondary syllabus documents and hence, refrain from bringing down content from Upper Secondary syllabus, or adopting assessment modes or formats that fully mirror the national examinations. Schools are to pitch the assessment at a level that:

- is **developmentally appropriate and accessible to all students** to support their learning of these subjects at Lower Secondary; and
- helps to inform students' Upper Secondary placement

Guiding principles[13]

- Guiding principle 1: Ensure manageable assessment load and demand on students
    - Set assessment load and demands at an appropriate level accessible to all students at the start of Secondary One and ensure that they are **gradually calibrated** based on the curriculum expectations (e.g., in terms of duration, number of items, assessment objectives[14]) over the two-year Lower Secondary programme. To increase accessibility to students of all levels, it is recommended that written paper be designed with around 50% lower demand questions.

- Guiding principle 2: Design assessment according to stipulated learning objectives in the subject syllabus
    - Pitch assessment at a level that is **developmentally appropriate**, **progressive** and **accessible to all students,** e.g., consider Universal Design for Learning (UDL) principles when designing assessment items.
    - Calibrate the pitching of assessment by varying assessment demands and marking standards, keeping in mind the **purpose of the assessment**.

- Guiding principle 3: Use assessment information to provide feedback to students, improve teaching and learning and make sound school-based decisions
    - Use multiple sources of assessment information to:
        - ✓ elicit what students know and can do, and thereafter provide feedback that supports student learning by identifying and closing learning gaps.
        - ✓ make sound school-based decisions e.g., consider other relevant indicators, either qualitative or quantitative, tied to the fundamental knowledge and skills required for students to offer NFS at Upper Secondary at G1/G2/G3 levels, rather than solely relying on overall marks at the end of Secondary Two.

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[13] Drawn from the Resource Guide for Enacting Sound Assessment Practices in Schools
[14] Schools may start with an assessment that has higher weighting in AO1 and overtime, increase the weighting of AO2 and AO3. This is illustrated in "Example of proposed assessment for FCE" in page 33.

Assessment Objectives

Assessment objectives (AOs)[15] are a set of determination statements that students need to demonstrate in response to the questions or tasks given in an examination/assessment. Each AO assesses different performance (e.g., memory, logic and reasoning) that appeals to learners of different profiles.

AO1
Knowledge with understanding
Students should be able to demonstrate knowledge and understanding of the following related to nutrition and health, food and consumer literacy and food science:
   i.   definition, vocabulary and terminology
   ii.   facts and concepts

AO2
Handling and applying information
Students should be able to handle and apply information related to nutrition and health, food and consumer literacy and food science:
   i.   locate, select and interpret information[16]
   ii.   present reasoned explanation

AO3
Application of skills, knowledge and understanding in different context
Students should be able to extend the learnt knowledge and skills related to nutrition and health, food and consumer literacy and food science:
   i.   making discerning decisions related to nutrition and health, needs and wants, and sustainable consumption
   ii.   budgeting and savings
   iii.   preparing, cooking, presenting and evaluating dishes

FORMAT AND WEIGHTING

By Semester-Basis

Secondary 1 & 2 FCE		
Purpose	**Term 1 / 3**	**Term 2 / 4**
Weighted	● Weighted Assessment 1 (WA 1)	● Weighted Assessment 2 (WA 2) ● Applied Module ^

^ This assessment forms the overall score of the End of Year Examination (EYE). It should comprise a report/collateral and a practical component.

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[15] Note that AOs are not in order of difficulty
[16] Information/data is provided, and students are expected to respond to the questions/tasks based on the information/data

Example of Proposed Assessment for FCE

Level	Components	Item Types with Marks	Weighting	Assessment Objectives[17]	UDL Principles[18]		
					Representation	Action and Expression	Engagement
Sec 1	WA 1	True/False/MCQ (11m) + Short-answer question (4m)	15%	AO1: 40% AO2: 55%[19] AO3: 5%	Graphics and media Multiple ways of questioning		Give choices for autonomy
	WA 2	MCQ / Fill in the blanks / Matching (15m) + Short-answers / Data-response (20m)	15%	AO1: 65% AO2: 25% AO3: 10%	Graphics Multiple ways of questioning		
	SA	Applied Module (70m)	70%	AO1 & AO2: 35% AO3: 65%	Verbal and written instructions	Allow different ways to approach tasks	Multiple means of engagement
	Assessment Weighting		**100%**				
Sec 2	WA 1	Food experiment (12m) + Sensory data collection (6m) + Short-answer questions (12m)	15%	AO1: 35% AO2: 5% AO3: 60%	Graphics Support vocabulary		Multiple means of engagement
	WA 2	MCQ / True-False / Fill in the blanks / Matching (5m) + Short-answers (25m)	15%	AO1: 35% AO2: 45% AO3: 20%	Multiple ways of questioning Graphics and media		Give choices for autonomy

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[17] Refer to specific breakdown of AOs found at the end of each Specimen Paper
[18] Reference from Specimen Papers of each assessment
[19] Information/data is provided within the assessment, there is no need to memorise the information/data

	SA	Applied Module (70m)	70%	AO1 & AO2: 35% AO3: 65%	Verbal and written instructions	Allow different ways to approach tasks	Multiple means of engagement
		Assessment Weighting	**100%**				

Using the principles of UDL to design assessment task
- Multiple means of Representation
  - Giving a variety of formats, e.g., multiple ways of questioning, use different media, using graphics and animations, supporting vocabulary, giving formulas
- Multiple means of Action and Expression
  - Giving options for presenting answers, allowing different ways to approach tasks
- Multiple means of Engagement
  - Multiple means of engagement, giving choices to fuel interest and autonomy

Table 11: Examples of Item types

Format	Examples
True/False	1. Watch the video below and answer the questions that follow. (https://www.facebook.com/watch/?v=410060339655373&extid=jpHqyfuoNKbAFFRw) a) Price Kaki is a useful tool for comparative shopping. True /False b) Price Kaki allows consumers to share information about prices of items from various retail shops with other users. True /False
Matching	Match the following statements with the correct term on the right by drawing a line to the correct answer. 1. This method of cooking requires water vapour produced by boiling ● water to cook food. ● Grilling 2. Food will be cooked quickly by this method of cooking which ● uses dry heat radiated directly from the heat source. ● Steaming
Multiple-choice questions	1. Diabetes is a diet-related disease. It is caused by: a) a diet high in protein b) a lack of calcium c) a diet high in fats and sugars d) a lack of protein

Fill-in-the-blanks	1. A good food source of calcium is _____. 2. Calcium is needed to build strong _____ and _____.

Structured questions	1. Nowadays people prefer cashless payment when purchasing products and services.
	
	    a) Name **two** cashless methods of payment.
	    b) Give **five** reasons to support the statement.

Data-response questions	**Nutrition Facts**
	 Serving Size 1 cup (236ml)
	 Servings Per Container 1
	
	 Amount Per Serving
	 Calories 80 Calories from Fat 0
	
	 % Daily Value*
	 Total Fat 0g 0%
	 Saturated Fat 0g 0%
	 Trans Fat 0g
	 Cholesterol Less than 5mg 0%
	 Sodium 120mg 5%
	 Total Carbohydrate 11g 4%
	 Dietary Fiber 0g 0%
	 Sugars 11g
	 Protein 9g 17%
	
	 Vitamin A 10% • Vitamin C 4%
	 Calcium 30% • Iron 0% • Vitamin D 25%
	 *Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.
	
	 1. Name the label.
	
	 2. Identify the following using data from the label:
	    a) Number of servings per container
	    b) Serving size
	    c) Total calories per serving

	1. Watch the following video and answer the questions that follows.
	
	 budget-2020-ensuring-a-sustainable-singapore.mp4
	 https://www.youtube.com/watch?v=S-a-iDQhOxA
	    a) Explain the importance of practicing sustainable consumption in Singapore.
	
	    b) Based on the video, give **one** reason why it is recommended to buy appliances that are energy-efficient

Open-ended question	Study this statement carefully and answer the question that follows: "*Cashless payment has allowed people to purchase items that they could not afford in the past.*" Discuss the statement in terms of the advantages and disadvantages of living in a cashless society.

Questions should be scoped with the revised Bloom's Taxonomy in mind and graduated in difficulty to allow students to show the extent of understanding of the content and skills. Table 12 shows the different categories of cognitive processes that determine the levels of learning.

Table 12: Revised Bloom's Taxonomy for Learning, Teaching and Assessing[20]

Categories	Cognitive Process	Examples
Knowledge	Recalling or retrieving relevant knowledge	1) Name two methods of moist heat cooking. 2) List the different methods of payment.
Understanding	Derive meaning from the information	1) Explain what will happen when a person consumes too much fats in the diet. 2) Explain consumer rights and responsibilities.
Application	Carrying out or using learnt information to a given context	1) Discuss the factors to consider when preparing and cooking meals for active teenagers. 2) Plan a nutritious plant-based meal for a teenager with a $8 budget.

Planning an Applied Module

Students are expected to show application of core content and knowledge from the Core Areas of Study through the Applied Module (AM) project.

In an AM, students would be presented with an authentic food and consumer issue where they would actively discuss and present a possible solution. Core competencies such as creative thinking, needs analysis, reflective thinking and decision making in students would be developed through the AM.

In line with the UDL principle of multiple means of action and expression, students are given a choice on the mode of presentation for AM e.g., poster, prose, video. Students have the autonomy to choose the mode of presentation based on their strengths to demonstrate their understanding. The following list of AM Skills specifies the core competencies students should demonstrate through the process of the AM.

AM Skills
- Communication (oral/written)
- Creative Thinking
- Analytical
- Decision Making
- Reflective Thinking

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[20] *Adapted from: Anderson, L.W. & Krathwohl, D.R. (Eds.) (2001). A taxonomy for Learning, teaching and assessing: A revision of Bloom's taxonomy of educational objectives. New York: Addison Wesley Longman*

In an AM, students are expected to

1. Work in pairs to meet the expectations of a task **(communication)**
2. Communicate ideas clearly through a written report
3. Analyse the needs of a target group **(analytical)**
4. Brainstorm for ideas and modify to suit the needs of a target group **(creative thinking)**
5. Decide and justify choice of dish(es)/product(s) with consideration to the task, including being a discerning consumer **(decision making)**
6. Execute the chosen dish(es) using a repertoire of cooking methods and culinary skills
7. Evaluate the sensory properties of the chosen dish/dish(es) and suggest reasons / ways to improve **(reflective thinking)**

Sample Question of Applied Module

Obesity is on the rise among teenagers. Plan, prepare and serve two healthier dishes suitable for teenagers.

Key words: obesity, teenagers, two healthier dishes

Applied Module Process
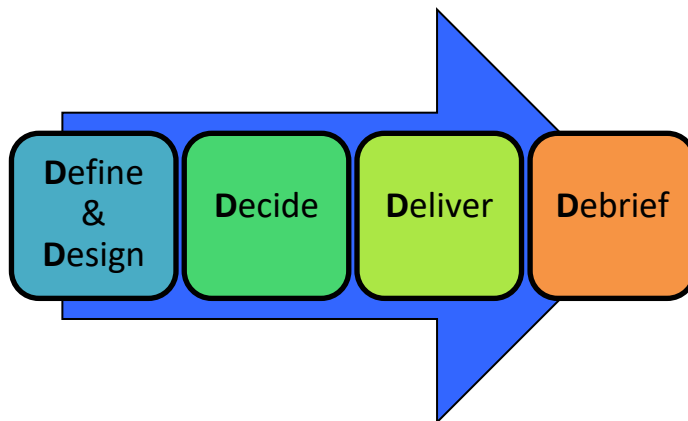
Figure 8 / Table 13: 5D AM Process

Process	Suggested Activity	AM Skill	Suggested Weighting	Suggested Duration
Define & Design	Research keywords	Needs Analysis Research Communication Creative Thinking	15%	2 weeks
Decide	Decide on a possible solution and provide justification	Decision Making Creative Thinking Communication	15%	2 weeks
Deliver	Execute the suggested solution	Creative Thinking Communication	30%	2 weeks
Debrief	Evaluation	Reflective Thinking	10%	2 weeks
		Total	70%	8^ weeks

^includes time taken by students for self-directed learning

A set of rubrics with criteria indicators is suggested in Table 14 for the marking of the AM project.

A set of rubrics with criteria indicators is suggested in <u>Table 13</u> for the marking of the AM project.

Table 14: Suggested Rubrics for Applied Module

TASK	DESCRIPTION			
	No marks	**Low**	**Medium**	**High**
Define & Design (15 marks)	No attempt/ submission **0**	Provide little definition on keywords Provide some/ brief/ little research/ elaboration/ explanation on the related factors Some information is accurate **1 – 5**	Provide some/ adequate definition on most keywords Provide adequate research/ elaboration/ explanation on most related factors Most information is accurate **6 – 10**	Provide comprehensive definition on all keywords Provide detailed research/ elaboration/ explanation on all related factors All information is accurate **11 – 15**
Decide (15 marks)	No attempt/ submission **0**	Recipes selected are irrelevant to the task Provides little/ no explanation for choosing/modifying the recipes in relation to the task **1 – 5**	Recipes selected are somewhat relevant to the task Provides some explanation for choosing/modifying the recipe in relation to the task **6 – 10**	Recipes selected are relevant to the task Provides sufficient explanation for choosing/modifying the recipe in relation to the task **11 – 15**
Deliver (30 marks)	No evidence of organisation and management **0**	Works in an organised manner when provided with assistance Shows poor use of time and resources **1 – 3**	Works in an organised manner with some initiative Shows fairly effective and economical use of time and resources **4 – 7**	Works independently with a high level of organisation and initiative Shows effective and economical use of time and resources **8 – 10**
	No evidence of manipulation **0**	Applies processes and methods appropriately when preparing food products but requires some assistance Handles equipment appropriately when provided with some assistance **1 – 3**	Shows a moderate level of proficiency in the selection, application of processes and methods in the preparation of food products Shows a moderate level of proficiency in the selection, use and handling of equipment **4 – 7**	Selects and shows a high level of proficiency in the application of processes and methods in the preparation of food products Selects and shows a high level of proficiency in the handling and use of equipment **8 – 10**
	No evidence of food products presented **0**	Produces food products that meet a basic standard Presents food products appropriately when provided with some assistance **1 – 3**	Produces food products that are of a satisfactory quality and standard Presents food products appropriately **4 – 7**	Produces food products that are well-prepared and of a high quality and standard Presents food products attractively and appropriately, meeting the requirements of the task question **8 – 10**
Debrief (10 marks)	No attempt/ submission **0**	Provides a weak review of the project **1 – 3**	Provides an adequate review of the project **4 – 7**	Provides a detailed review of the project **8 – 10**

Scoping of Summative Assessment

Teachers may use the following to scope Applied Module for Semestral Assessment.

AM Process	Sec 1	Sec 2
Define and Design	Scenario-based task that students can relate to a food/dish for an event e.g., cupcakes for birthday party	Scenario-based task: Meal planning for a target age group e.g., schoolchildren, teenagers, adults and seniors; or health issues e.g., obesity, coronary heart disease, high blood pressure or type 2 diabetes; while taking sustainable practices into consideration
Decide	Provide justifications for **one** selected dish with consideration to the budget given e.g., order food from local supermarkets, buying house brands	Provide justifications for **two** selected dishes with consideration of sustainable practices
Deliver	Prepare, cook and serve **one** dish within one hour	Prepare, cook and serve **two** dishes within one hour
Debrief	Sensory evaluation of dishes/ Review of project	Sensory evaluation of dishes/ Review of project

Frequently Asked Questions (FAQs)

1. **Our school is following the year-long approach with alternate weeks for FCE and D&T. What is the assessment weighting distribution?**
    You may refer to the examples of possible assessment weighting distribution (depending on the number of weighted assessments a school chooses to adopt across the year) as suggested by the Curriculum Planning Office.

2. **Can I implement a year-long approach by offering both FCE and D&T on a weekly basis, allocating equal curriculum time to both per week, i.e., 1.5 periods (each period being 30 minutes) for each subject?**
    Students would require sufficient time and space to engage in meaningful experiences of the subject. With only 1.5 periods per session, this would not be possible, for example, to conduct a practical lesson. As such, this is discouraged.

3. **If my school has scheduled teaching FCE on a per semester basis in Terms 1 and 2, can I have a MYE?**
    In tandem with MOE's move to remove MYE, it is not recommended for FCE that is taught on a semester basis to include a MYE in assessment. The Applied Module (comprise of report/collateral and practical) should constitute to the marks for EYE.

4. **Why is there no written paper recommended for EYE in FCE?**
    As FCE is applied and hands-on in nature, students should have opportunities to work on an authentic project, instead of a time-based written paper for the EYE. As such, schools should consider using the project (and possibly a practical examination) to constitute the marks for EYE. Schools, however, should set a time-based written paper which would be assessed via a WA instead.

5. **Why are written papers recommended to be assessed as a WA (versus the guidelines which were sent out in Oct 2018)?**
    For schools to be able to accurately assess whether students can offer the upper secondary elective Nutrition & Food Science, schools would need to include some written assessments to gauge students' competency levels, while also assessing them via the Applied Module.

6. **What level do I pitch my assessments, especially the written papers which would be done individually?**
    To ensure all students can manage the common assessments, assessment demands over the two years should be accessible to student from all courses. It should comprise a repertoire of question types and appropriate scaffold could be provided to aid students in comprehending the questions. Teachers may use the principles of Universal Design for Learning (UDL) to design the assessment task to keep assessment accessible to all groups of students.

7. **One of the WAs (WA 3 in the listed example) is an assessment on food experiments. Why is this so?**
As food experiments are a significant part of the upper secondary NFS syllabuses, assessing these skills (e.g., exploration / investigation, data collection) would help inform teachers of students' readiness/ability to offer upper secondary NFS.

8. **My Applied Module constitutes various components, e.g., Research, Decision Making and Planning. Can all the components form the overall weighting for EYE?**
Yes, for a project which comprises several components, the project is seen as a whole and therefore can be counted for the EYE.

9. **My students work in groups for the Applied Module (both in Sec 1 and 2). Can I consider their group mark for the MYE / EYE?**
Collaborative learning is encouraged where students are given the autonomy to research on the given task and find solutions as a team. You could use their group mark for the EYE, with weighting given for individual assessment in some components, for example, practical assessment, individual reflection / evaluation and peer evaluation (to ensure fairness in everyone playing their part and contributing to the Applied Module).

10. **Should I assess the practical component in the Applied Module?**
The practical component focuses on aspects of food safety, culinary skills and competency in the food laboratories. As such, it is an important component to assess. You may conduct the practical assessment for the students as part of the Applied Module. The practical assessment need not be conducted during the same period as EYE.

However, if you assess a practical for WA, you should not be assessing it again in EYE (Applied Module). This avoids assessing the same skillset.

11. **Other than the recommended WA tasks listed (written paper, investigative practical, etc.), can I assess other types of WA tasks?**
The list of WA tasks provides a variety of assessment types. You should select the appropriate type(s) best suited for your students. You may also assess other suitable tasks. However, do ensure the rigour of the WA task matches the weighting of the WA.

12. **Must the Applied Modules done in Sec 1 and 2 follow the format of the Upper Secondary Nutrition and Food Science coursework?**
The lower secondary project does not have to take full reference to the upper secondary coursework and could be adjusted to suit your lower secondary students' needs and abilities.