Expected Value

Mathematics Secondary 3

Level 1: School-based Whole-class Teaching

Background and Notes

The design of the learning and teaching plan reflects the actual circumstances of the particular school at the time of implementation. As it is developed and tailor-made to meet the specific cognitive and affective needs of students, all learning and teaching resources are for reference only.

When adapting the materials, curriculum, instructional and assessment modifications can be made in accordance with the diverse needs and abilities, learning styles and aspirations of students, professional competence of teachers, and gifted education development of the schools.

Teachers are strongly recommended to read the introduction, theoretical background and summary of the resource package to have a better understanding of the principles of Gifted Education and strategies for implementation.

This unit includes 1 lesson plan, 1 presentation file and 2 worksheets.

With reference to our resources, educators can design suitable learning activities and implement the elements of Gifted Education, based on students' needs and interests, and teaching experience, so as to unfold students' potentials to the fullest.

Topic —— Expected Value

Subject: Mathematics
Grade: Secondary 3
No. of Lessons (Learning Time): 1 Lesson (55 minutes)

Prior Knowledge	- Students know how to use tree diagrams or tables to find probabilities - Students know how to solve problems involving geometric probabilities
Learning Objectives	- Students should be able to acquire Mathematical language in conveying information - Students should be able to develop reasoning skills through Mathematical reasoning - Students should be able to develop collaboration skills through working with others - Students should be able to recognize the meaning of expectation - Students should be able to make decisions based on expected value
Learning & Teaching Strategies	Questioning, Group Activity, Presentation
Operation Mode of Gifted Education	Level 1: School-based Whole-class Teaching
Core Elements of Gifted Education	Higher-order Thinking Skills Personal-social Competence

Lesson 1

Procedure

Learning Focus (Time)	Activity / Content	Learning & Teaching Strategies	Elements of Gifted Education	Learning & Teaching Resources
Definition of expected value (10 minutes)	Students convey meaning and help make sense of the world using the Mathematical language, based on daily life examples related to expected value (e.g. Booth games in a Carnival) given by the teacher. Students further deduce the definition and the presentation of probability and expected value.	Questioning Group Discussion	🧠🧑‍🤝‍🧑	PowerPoint (Daily life examples on expected value)
Application of expected value (15 minutes)	Students use expected value to determine whether a game is favourable to the players or not. There are two sets of questions with different games and rules, and thus levels of difficulty. Students answer either one set of questions which match with their ability. Students discuss the answers with their groupmates.	Individual Practice Group Discussion	🧠🧑‍🤝‍🧑	Lesson Worksheet 1 (Tiered Qs: Q.1A or Q.2A)
Adjustment of the rules of the games (20 minutes)	Consolidation of the concepts: to decide whether a game is favourable to the players or not by comparing the expected gains and the entrance fees. Students, in groups, try to adjust the rules of the games, so that the games will have the opposite outcome to the players. Students present their suggestions.	Group Activity Presentation	🧠🧑‍🤝‍🧑	Lesson Worksheet 2
Conclusion of findings (10 minutes)	Students conclude, with the help of the teacher, new ideas so that the games will become favourable / not favourable / more favourable / less favourable / a fair game to the players by adjusting the game rules. i.e. Expected value will be affected by the change in the outcomes' values or probabilities.	Questioning	🧠	