

# Lesson Plan

## Lessons 1 - 2

### Pre-lesson Tasks

1. Finish Pre-lesson Worksheet and learn about the use of ratio in daily life.
2. Students are arranged into groups of 3 to 4 students by teachers, matching students' Mathematical ability to the 3 sets of lesson worksheet [Set 1 – Easy, Set 2 – Medium, Set 3 – Hard]. Students can be seated according to this grouping at the beginning of the lesson.

### Procedure

Learning Focus (Time)	Activity / Content	Learning & Teaching Strategies	Elements of GE	Learning & Teaching Resources
<b>Introduction (10 minutes)</b>	<ol style="list-style-type: none"> <li>1. Teacher reviews Pre-lesson Worksheet and introduces the tasks in the lesson.</li> <li>2. Teacher asks students to present their answers on the Pre-lesson Worksheet.</li> </ol>			Pre-lesson Worksheet
<b>Fibonacci Sequence in Nature (15 minutes)</b>	<ol style="list-style-type: none"> <li>1. Lesson Worksheet Sets 1, 2, 3 are of different levels and are distributed to groups according to their Mathematical ability.</li> <li>2. Students study the scenario in Task 1 on the worksheets to write down the sequence. Teacher may provide hints to students if necessary.</li> </ol>	Ability Grouping	 	Lesson Worksheet
<b>Fibonacci Sequence and Golden Ratio (10 minutes)</b>	<ol style="list-style-type: none"> <li>1. Students investigate the ratio of successive terms in Fibonacci sequence by doing Task 2 and 3.</li> <li>2. Teacher may provide extra materials to groups that finish earlier.</li> </ol>	Ability Grouping	 	Lesson Worksheet Lesson Worksheet – Hint and Extra Materials
<b>Student Presentation (15 minutes)</b>	Three groups of students present their findings in Task 1, 2 and 3.	Presentation	 	Lesson Worksheet Lesson Worksheet – Hint and Extra Materials

Learning Focus (Time)	Activity / Content	Learning & Teaching Strategies	Elements of GE	Learning & Teaching Resources
<b>Exact Value of Golden Ratio (20 minutes)</b>	Students work in groups on Task 4 to find out the exact value of Golden Ratio using the quadratic formula or geometric construction.	Ability Grouping	 	Lesson Worksheet  Rulers and pairs of compasses
<b>Summary (5 minutes)</b>	Teacher gives a summary about the relation between Fibonacci sequence and Golden Ratio.			

### Extended Learning Activities

- Investigate on the use of Golden Ratio in design and architecture by doing Task 5 on the Lesson Worksheet. Students measure the lengths and check whether Golden Ratios exist in the logo or building.
- Finish the Extension Worksheet.