





Lesson Plan


Lessons 1-2

Pre-lesson Tasks

1. Teacher chooses two to three students with good presentation skills as student presenters. They are given some resources about the proof to prepare for the presentation. Teachers can offer help to the group and rehearse with them if necessary.
2. Students are arranged into groups of 3 to 4 students with similar Mathematical ability by teachers . 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
Introduction (5 minutes)	Teacher shows a piece of paper with the corners removed and asks students to think of a way to get a right angle using the piece of paper. Students may fold it and justify by using the angle relations on straight lines.			A paper with the corners removed
Student-led Activity (15 minutes)	<ol style="list-style-type: none"> 1. Pre-chosen student presenters introduce the Pythagoras' Theorem. They demonstrate and guide the whole class to study a proof of the theorem by paper cutting and folding. 2. Other students follow the paper cutting and folding, and answer the questions raised by the presenters. 	Student-led Activity	 	A rectangular paper and a pair of scissors for each student
Examples and practice (15 minutes)	<ol style="list-style-type: none"> 1. Teacher leads the whole class to summarize the Pythagoras' Theorem and shows how to use it to find the unknown side in a right-angled triangle. 2. Students are then given time to do relevant textbook practice. 		 	

Learning Focus (Time)	Activity / Content	Learning & Teaching Strategies	Elements of GE	Learning & Teaching Resources
Proof Exploration Activity (15 minutes)	<ol style="list-style-type: none"> Students are arranged into groups with similar Mathematical ability. Each group use the tablets to view the GeoGebra materials. Worksheets are chosen according to the group's ability. Students view the GeoGebra which demonstrates a proof of Pythagoras' Theorem. They work out the details of the proof with the guidelines on the worksheets. Afterwards, they prepare a short presentation of the proof. 	<p>Ability Grouping</p> <p>E-Learning</p> <p>Tiered Assignment</p>		<p>Tablets</p> <p>GeoGebra materials</p> <p>Lesson Worksheets (8 sets)</p>
Proof Presentation (15 minutes)	<ol style="list-style-type: none"> Students are rearranged into group of mixed ability. Each student is provided with all other sets of worksheets and moves to a new seat. In each group, students take turns to present the proof they studied in the previous activity. During the presentation, students may raise questions or fill in the worksheets. Teacher walks through the classroom or sit in some groups to provide feedback to students' presentation. If time is allowed, teacher can choose a student to present to the whole class. 	<p>Mixed Ability Grouping</p>		<p>Tablets</p> <p>GeoGebra materials</p> <p>Lesson Worksheets (8 sets)</p>
Summary (5 minutes)	<p>Teacher conveys the message that a theorem can be proved in many ways and Mathematicians are always looking for a better solution. Teacher further introduces the contribution of Chinese Mathematicians related to Pythagoras' Theorem.</p>			

Extended Learning Activities

1. Teacher can assign textbook practices about the use of Pythagoras' Theorem.
2. For students who want to further explore, they can study the Extension Reading Materials and Worksheet – 中國數學家與畢氏定理, and the video 'How many ways are there to prove the Pythagorean theorem? - Betty Fei'. Teacher can also use the materials to tell them the contributions of Chinese mathematicians, who are less commonly known by students.
3. For students showing high Mathematical ability and strong interest in Mathematics, they can join the Level 2 Gifted Education Programme "Extension of Pythagoras' Theorem", which provided enrichment and extension knowledge related to the theorem such as Pythagorean Triple and Fermat's Last Theorem. It includes tasks that can train students' inquiry and Mathematical thinking skills.