附件四：

新北市109年度教師跨領域全英語授課教案設計
（參考範例-課程實施後）

設計者 / 服務學校	新北市淡水區淡水國民小學	
教案名稱	Learning Geometry in Math-Triangles（用英語學幾何-三角形）	
教學年級：國小三年級	預計課程上使用之英語比例： 100 % （使用英語比例係指教師以英語授課之時間佔總授課時間之比率）	
學生人數:27人	教學總節數:4節	預計公開授課內容為第2節
預計公開授課之時間：109年11月19日	預計公開授課之地點：新北市淡水區淡水國小英語教室	預計公開授課之教師： 姓名：羅文珠 服務學校：淡水國小 專長領域：英語教學

說明: 撰寫教案一開始，我任教四年級，找同學年的數學領域老師共備，寫的是四年級的教案，也經過導師同意，邀請某即將升上四年級的班級(該班由其他英語教師任教)，參與公開觀課，才參加甄選。後來得知第一階段入選，但該班導師與英語教師提出困難，經過協調，改由我自己目前任教的三年二班參與公開觀課。這個轉折頗大，我自己需要調適，但為了尊重各班導師與英語教師的職責，欣然接受挑戰，大幅改寫教案，期待盡量符合三年級學生的學習狀況，在教案中也加入三年級用兩個角度重疊，比較角的大小的單元（同附件五，B.教學省思與修正建議，1）。

核心素養	**總綱**	A2 系統思考與解決問題 B1 符號運用與溝通表達 C2 人際關係與團隊合作
	領綱	數學領域 數-E-A2 具備基本的算術操作能力、並能指認基本的形體 與相對關係，在日常生活情境中，用數學表述與解決問題。 數-E-B1 具備日常語言與數字及算術符號之間的轉換能力，並能熟練操作日常使用之度量衡及時間，認識日常經驗中的幾何形體，並能以符號表示公式。 數-E-C2 樂於與他人合作解決問題並尊重不同的問題解決的想法。 英語領域 英-E-A2 具備理解簡易英語文訊息的能力，能運用基本邏輯思考策略提升學習效能。 英-E-B1 具備入門的聽、說、讀、寫英語文能力。在引導下，能運用所學、字詞及句型進行簡易日常溝通。

		英-E-C2 積極參與課內英語文小組學習活動，培養團隊合作精神。
學習重點	學習表現	數學領域 s-II-3 透過平面圖形的構成要素，認識常見三角形。 s-II-4 在活動中，認識幾何概念的應用，如旋轉角、展開圖與空間形體。 英語領域 ◎1- II-7 能聽懂課堂中所學的字詞。 ◎1- II-10 能聽懂簡易句型的句子。 ◎3- II-2 能辨識課堂中所學的字詞。 ◎6- II-1 能專注於老師的說明與演示。 ◎6- II-2 積極參與各種課堂練習活動。 ◎6- II-3 樂於回答老師或同學所提的問題。 ◎9-II-2 能綜合相關資訊作簡易的猜測。
	學習內容	數學領域 S-4-7 三角形：以邊與角的特徵認識特殊三角形並能作圖。如正三角形、等腰三角形、直角三角形、銳角三角形、鈍角三角形。 S-4-1 (部分)角度：「度」(同 N-4-10)。 量角器的操作。實測、估測 與計算。以角的合成認識 180 度到 360 度之間的角度。「平角」、「周角」。 指定角度作圖。 S-4-2(部分)以具體操作為主，並結合計算。以鐘面 為模型討論從始邊轉到終邊所轉的角度。旋轉有兩個 方向：「順時針」、「逆時 針」。「平角」、「周角」。 S-4-5(部分)垂直與平行：以具體操作為主。直角是 90 度。直角常用記號。垂直於一線的兩 線相互平行。平行線間距離處處相等。作垂直線；作平行線。 英語領域 ◎ Ac-Ⅱ-2 簡易的生活用語。 Ac-Ⅱ-3 第二學習階段所學字詞。 B-Ⅱ-1 第二學習階段所學字詞及句型的生活溝通。
具體學習目標		數學領域 1. 能辨識四種三角形(銳角三角形、正三角形、直角三角形、鈍角三角形)。 2. 能辨識以上圖形的特徵。 3. 能用直尺、量角器等工具畫出相關圖形。 英語領域 1. 能聽懂，並辨識相關的數學用語。 2. 能用簡易英語回答問題(例如: There are three sides. There are three angles. It is 90 degrees. It is more/less than 90 degrees. The sum of the degrees is 180.)
與其他領域/科目/議題的連結		品德教育: 專注、秩序、尊重、互助合作
教學資源/設備需求		電腦、投影機、實物投影機、幾何釘板、時鐘、教師用大型量角器、學生用小量角器、尺、紙

各節教學活動設計			
節次	教學活動流程	教學資源	教師語言
第一節	【引起動機】 **Review shapes. [10']**	**Geometric boards**	Let's review all the shapes taught last time. Use the geometric board. Show me a triangle/square/ retangle/pentagon/hexagon. Raise your board, if you are finished. How many sides/angles are there in a triangle/square/ rectangle/pentagon/hexagon? Let's play a guessing game. Who am I? I have four sides and four angles. All my sides have the same length. All my angles have the same degree. I am a square.
	【發展活動】 **1. Introducing a horizontal line, a vertical line and the relevant observations in daily life. [5']**	**PPT, monitor and projector**	What is it? It is a horizontal line. A horizontal line is the same on sea or ground level. Can you see any horizontal lines in this classroom? Point to a horizontal line for me. What is it? It is a vertical line. A vertical line is from a horizontal line to 90 degrees. Can you see any vertical lines in this classroom? Point to a vertical line for me.
	2. Draw a horizontal line and a vertical line: using rules [5']	**Pencils, paper and rules**	Great! Now let's draw. Fold your A4 paper in half. Use the pencil and ruler to trace the central line. Raise your paper, if you are finished. Good job! Is it a horizontal line or a vertical line? Yes, it is a horizontal line. Now fold your paper in half from the other side. Do you see a cross? You drew one of the line of the cross already. Trace the other line with your pencil. Raise your paper, if you are finished. Well done. Is it a horizontal line or a vertical line? Great! It is a vertical line.
	3. Demonstrate a 90-degree angle in PPT and introducing the symbol ° for degrees and ∟for 90-degree angle. [5']	**Monitor, object projector and Protractors**	L This is an angle 90 degree. We use the symbol, "∟", to represent it. Please draw this right angle sign, "∟".
	4. Draw, cut and compare triangles [10]	Paper, scissors	Everybody, take a piece of paper. Use your ruler to draw a triangle for me. Great! Now cut your triangle. When you finished, raise your triangle to let me see it. I want to compare two triangles. Mark the three angles of your triangle, A, B and C. Find your partner. Put the point of your angle A together. Overlap one side of angle A. Then, tell me, whose angle A is bigger?

	【統整與總結】 **Demonstrate the understanding of a horizontal line, a vertical line, a 90 degree angle, a small angle, a big angle, ° and ∟. [5']**		Well, what have we learned today? Use your finger to show me a horizontal line, a vertical line, an angle, a right angle, a small angle and a big angle. What is the symbol of degrees? What is the symbol of 90 degree?
第二節	【引起動機】 **Turn the hands of a clock to understand "clockwise" and "anticlockwise". 轉動時鐘，認識順時鐘與反時鐘。[7']**	Small clocks PPT Quiz 1	Take the clock on your desk. Two people share one clock. Now, turn the hands of your clock to twelve o'clock. Then, go to the one o'clock, two o'clock and three o'clock. When you turn the clock this way. It is called clockwise. If you turn the clock in the other way wrong, it is called anti-clockwise. Show me your hand, what is clockwise. Great! What is anti-clockwise? Very good. Take the quiz booklet on your desk. Turn to the first page. Write your class, number, English name and Chinese name. Then, tick the right box. Raise the page one when you finished.
	【發展活動】 **1. Introducing an angle and the parts of it, including line A, line B, vertex, degrees (from line A to line B)** **介紹角與角的各部分: 起始線、終點線、頂點與角度。[3]**		What is this? It is an angle. Let me introduce you the parts of an angle. What is this part? This is the Arm A. This is the Arm B. This is the vertex. From Arm A to Arm B, this is the degree.
	2. Comparing angles by gestures and clocks. **用手勢和小時鐘比較角的大小。[5']**	PPT Small clocks	how me an angle with your two hands. Great. Could you show me a bigger angle? An angle bigger than these? Now, could you show me a small angle? An angle smaller than this? Great! Now show me a small angle on your clock. An angle bigger than this?
	3. Introduce protractors **介紹量角器。[5']**	The Giant protractor	How can we know how much bigger is this angle than that angle? We use protractors. Here it is.
	4. How to use the protractors to measure angles. **使用量角器測量角度的大小。[15']**	Small protractors Worksheet	Let's read the outside circle from the left to the right. The color is black. Zero, ten, twenty….one hundred and eighty. Is this clockwise or anti-clockwise? Yes, it is clockwise. This time, let's read the inside circle from the right to the left. The color is red. Zero, ten, twenty….one hundred and eighty. Is this clockwise or anti-clockwise? Yes, it is anti-clockwise. Firstly, you find the vertex of an angle, and overlap the central point of the protractor with the vertex of the angle. Secondly, you overlap the Arm A with the zero line. Third, you count the number, zero, until you see the Arm B.

			Fourth, you write down the number of the degree. Let's try on the worksheet. Let's check the answers.
	【統整與總結】 **1. Presenting how to use a protractor.** **展現使用量角器測量角度的大小 [3']** **2. Review the Word Bank [2']**	Word bank	Who can show me how to use the protractor? Come over here to measure this angle. Who else can do it? Great. Come over here. Let's review all the words we learned today.
第三節	【引起動機】 **Introduce the right angle** **複習直角 [5']**	PPT The giant protractor	Do you remember? How many degrees are this angle? Right 90 degrees. What is this angle called? Right, a right angle. Let measure this right angle with the protractor. Is it a 90-degree angle?
	【發展活動】 **1. Introduce the obtuse angle and acute angle.** **介紹鈍角與銳角[5']**	**PPT** **The Giant protractor** Quiz 2	If an angle is bigger than 90 degree, we call it an obtuse angle. If an angle is smaller than 90 degree, we call it an acute angle. Is it an acute triangle or an obtuse triangle? Now match the angles with their names.
	2. Demonstrate how to use the protractor and ask students to measure different angles and write down their degrees. [15] **示範如何使用量角器量角度，並引導學生自行測量**	Small protractors WS Quiz 3	Eyes on me. Firstly, overlap the vertex of the angle and the central point of your protractor. Secondly, overlap the zero line of Arm A. Thirdly, count the numbers utile you see the Arm B. Now use your protractors to measure the angles on your worksheet and write down their degrees.
	3. Introduce and recognize the right triangle, obtuse angle and acute angle. **介紹並辨識直角、鈍角與銳角三角形 [5']**	PPT Quiz 4	A triangle has a right angle, which is 90 degree. It is a right triangle. A triangle has an obtuse angle, which is bigger than 90 degree. It is an obtuse triangle. A triangle has three acute angles. It is an acute triangle. Match triangles with their names.
	【統整與總結】[10'] **1. Introduce the regular triangle.** **2. Guessing Game: Tell the features of a right angle, an obtuse triangle, an acute triangle and a regular triangle.** **3. Q and A: The relationship among the above four types of triangles** **4. Review the word bank of triangle**	**PPT** **Cards for guessing game** **Word Bank**	A regular triangle has the same three angles. The degree of each angle is 60. The length of the sides are the same. Guess what it is. I have three angles and three sides. My one angle is 90 degree. I have three angles and three sides. My one angle is bigger than 90 degree. I have three angles and three sides. My three angles are smaller than degree. I have three angles and three sides. My three angles are 60 degree. Let's see. The is the relationship among these four types of triangles. Is a regular triangle a right triangle, an acute triangle or an obtuse triangle? Let's review the words we learned today.

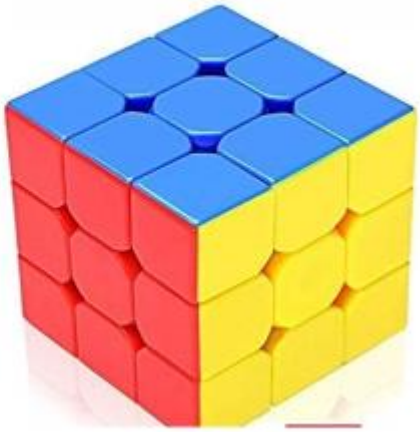
第四節	【引起動機】 **Review four different triangles taught [5']**	PPT	**Who can tell me? What is the feature of a(n) right/acute/obtuse/ regular tringle?**
	【發展活動】 **1. Guide every students draw an right triangle, an acute triangle and an obtuse triangle. Measure the angles of each triangle and write down the degrees.** **2. Add up the sum for the degrees of three angles in each triangle.** **3. Talk about each other's triangles in pairs. [5']** **4. Present the pair talk in the entire class. [5']**	Paper Rules Small Protractors	**Everybody, draw an right triangle, an acute triangle and an obtuse triangle.** **Take your protractor. Measure and write down the degree of each angle in your triangles.** **Add the numbers of all three angles. Write the sum in the in the middle of your triangle.** **What is the sum?** **Yes, the sums of degrees for all three angles in a triangle is always 180.** Show your triangles to your partner. Tell your partner how many degrees are there for each angle in triangle. Is it a right triangle, an acute triangle or an obtuse triangle. Who wants to present and talk about your triangles? Come up here.
	【統整與總結】 **1. Review all the word bank of triangles.** **2. Guessing Triangles [5']**	Word Bank PPT	Let's review all the words we learned today. Guess which kind of triangle it is?

附錄(Updated)

1. PPT

Can you see triangles in your daily life?

Can you see squares in you daily life?

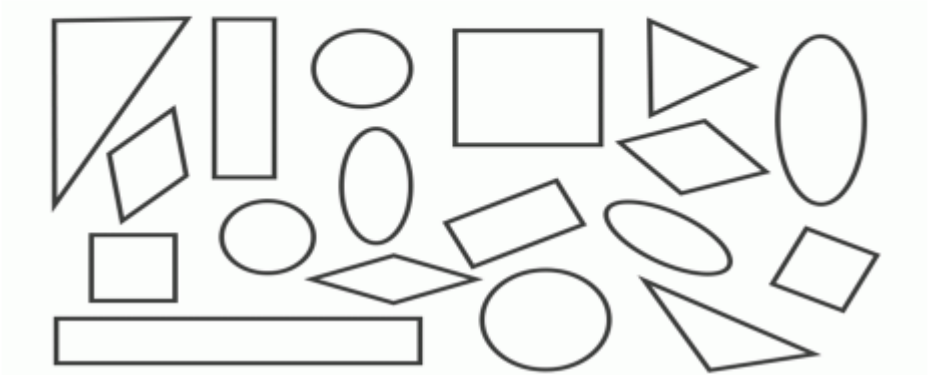


Can you see rectangles in your daily life?

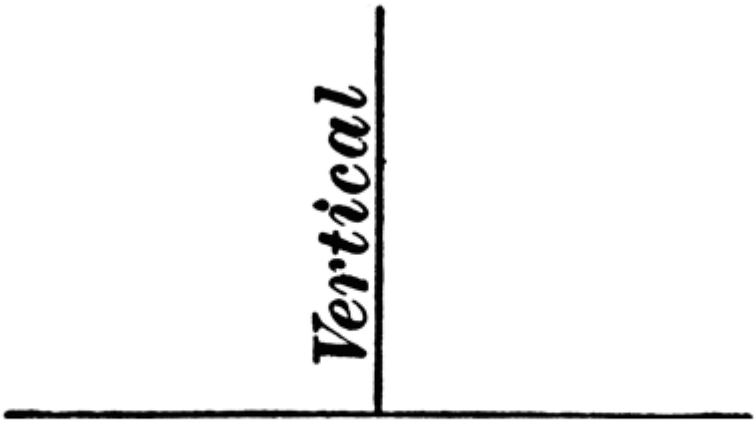
Can you see pentagons in your daily life?

Can you see hexagons in your daily life?

Task: How many ____ are there?
Write down a number on each shape.



Horizontal Line



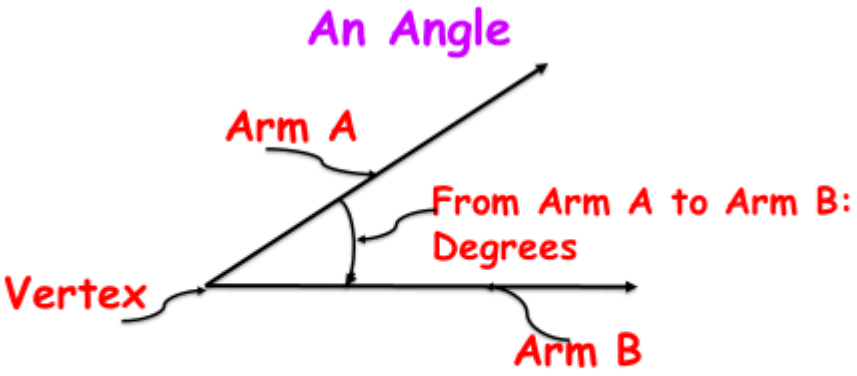
If the angle of two lines is 90 degree, they are vertical.

The symbol of 90 degree is...

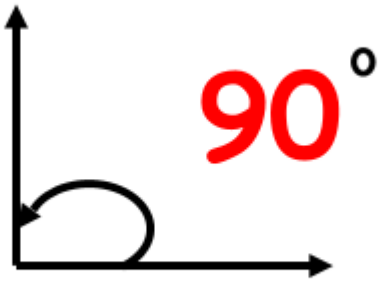
Clockwise and Anti-Clockwise

Clockwise

Anti-Clockwise

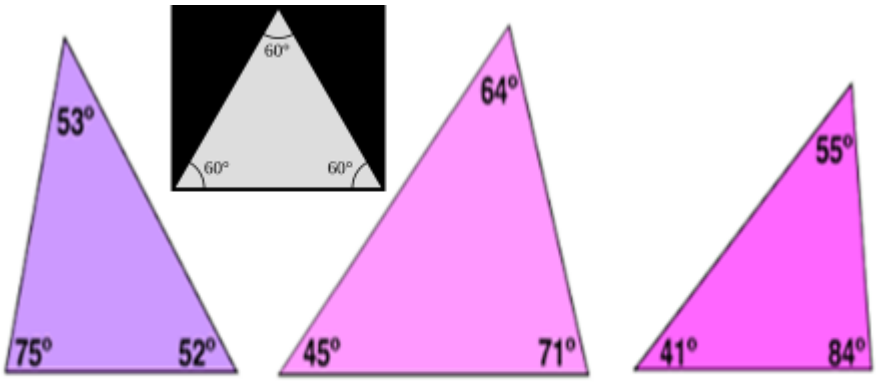


A Right Angle = 90 degree = 90°



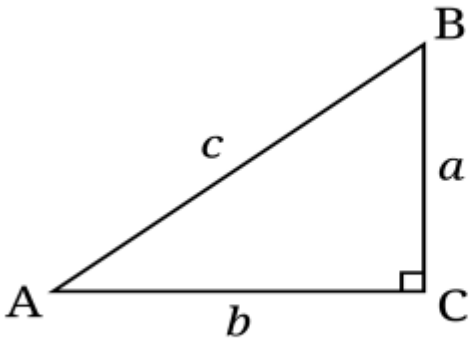
Angles

90°	Bigger than 90°	Smaller than 90°	180°	360°
Right Angle	Obtuse angle	Acute angle	Flat angle	Round angle



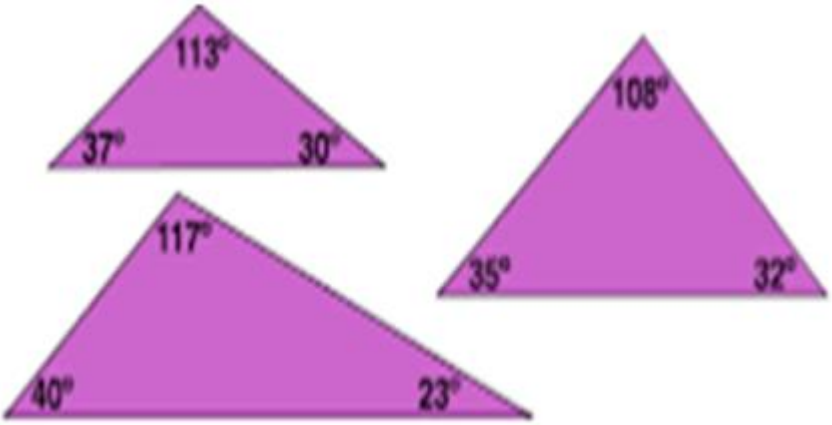
Acute Triangle: All three angles are less than 90 degrees.

Different Kinds of Triangles (3 sides)



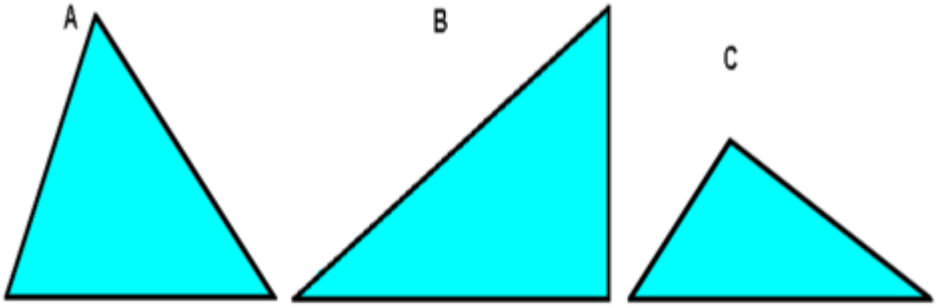
Task 5: Using a protractor

Right Triangle: One angle is 90 degree

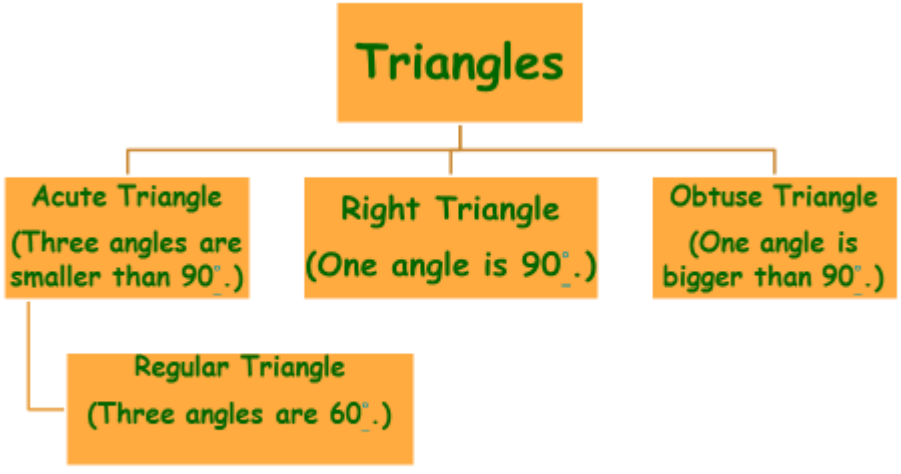


Obtuse Triagnle: One angles is bigger than 90 degrees.

Review



Acute Triangle Right Triangle Obtuse Triangle



Who am I?

I have three sides.
I have three angles.
All my three angles are 60°.

Who am I?

I have three sides.
I have three angles.
All my angles are smaller than 90°.

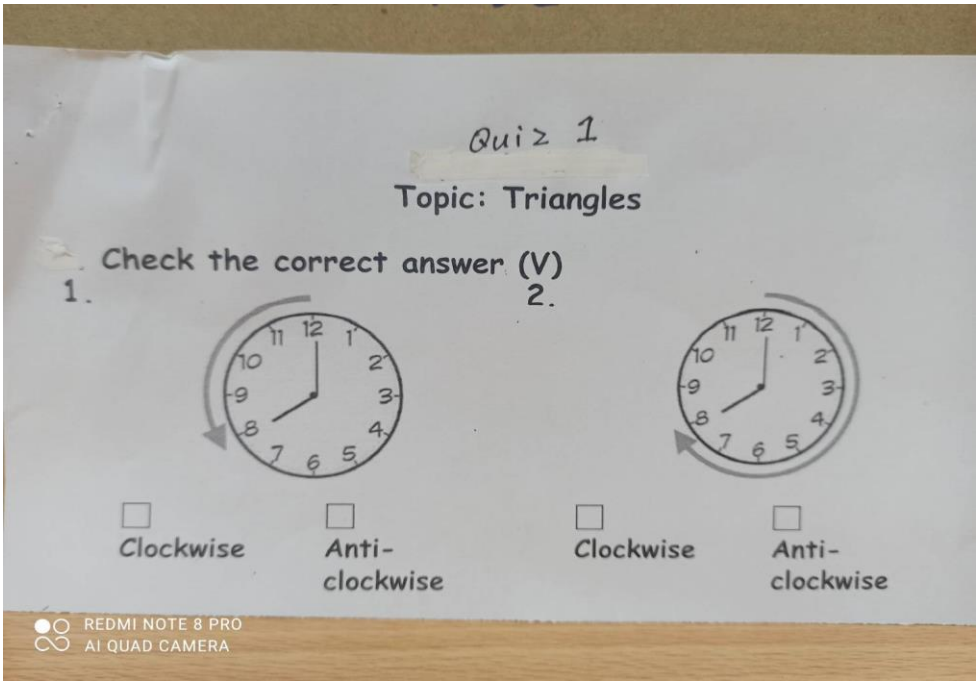
Who am I?

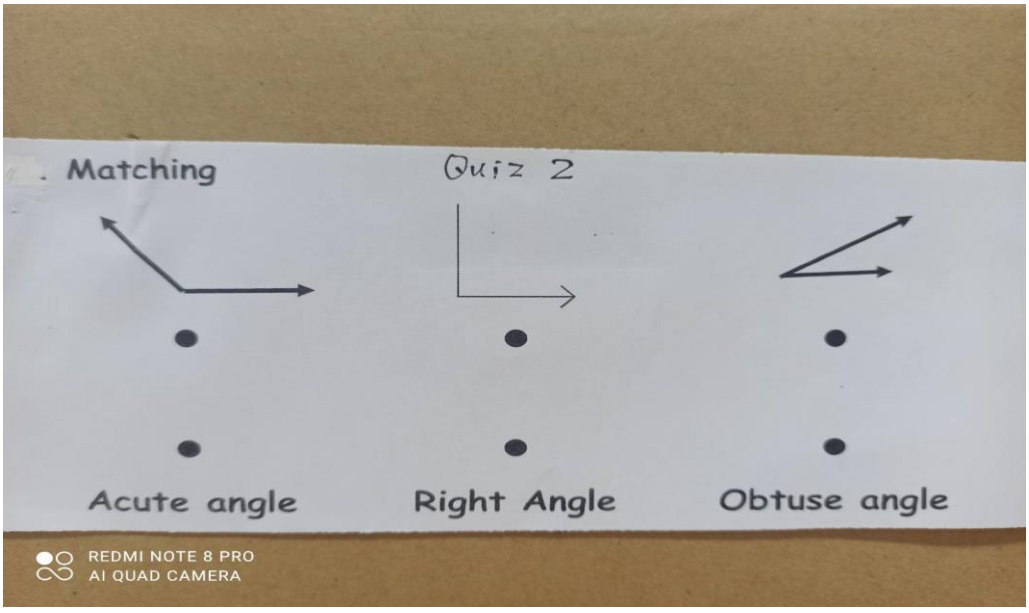
I have three sides.
I have three angles.
My one angle is 90°.

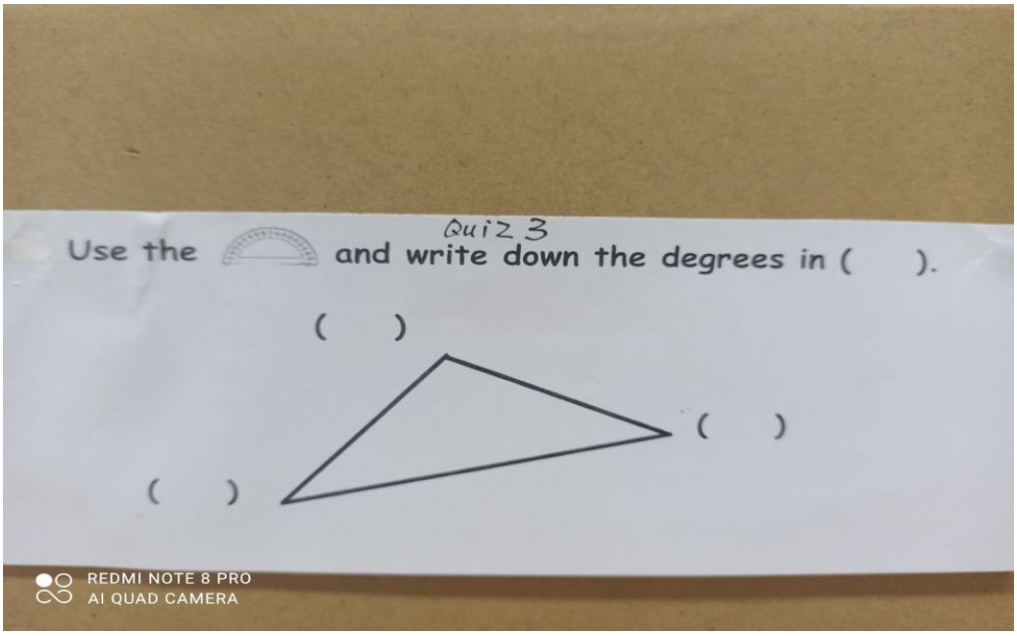
Who am I?

I have three sides.
I have three angles.
My one angle is bigger than 90°.

2. **Quiz 1 -4**






Quiz 3
Use the and write down the degrees in ( ).
( )
( )
( )
REDMI NOTE 8 PRO
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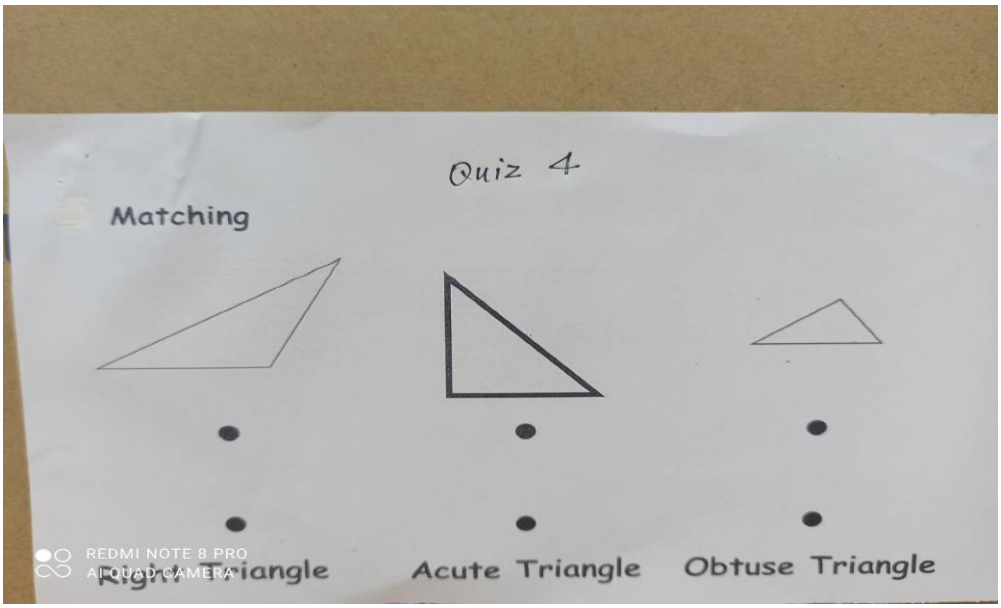
Quiz 4
Matching
Acute Triangle
Obtuse Triangle
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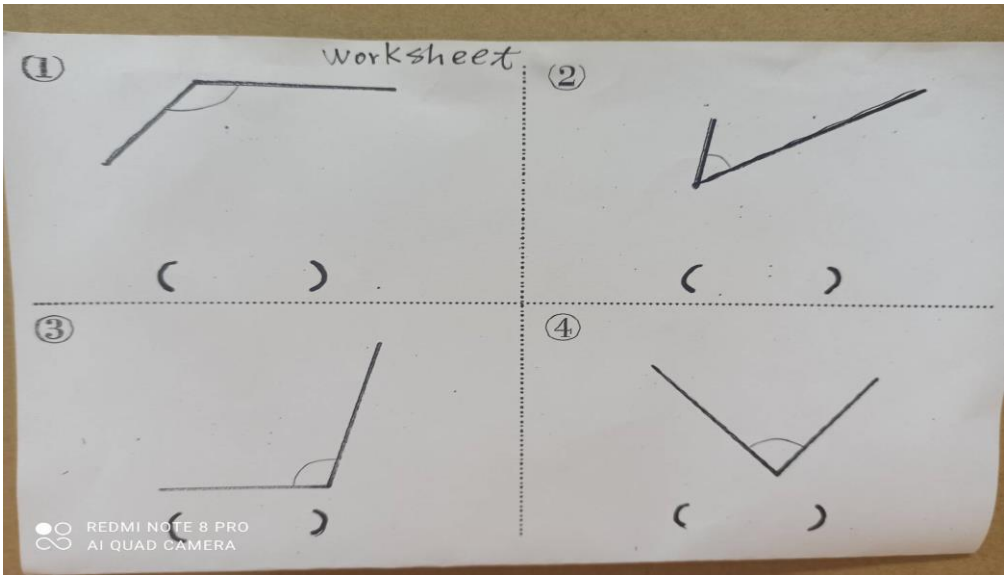
3. Worksheet


Worksheet
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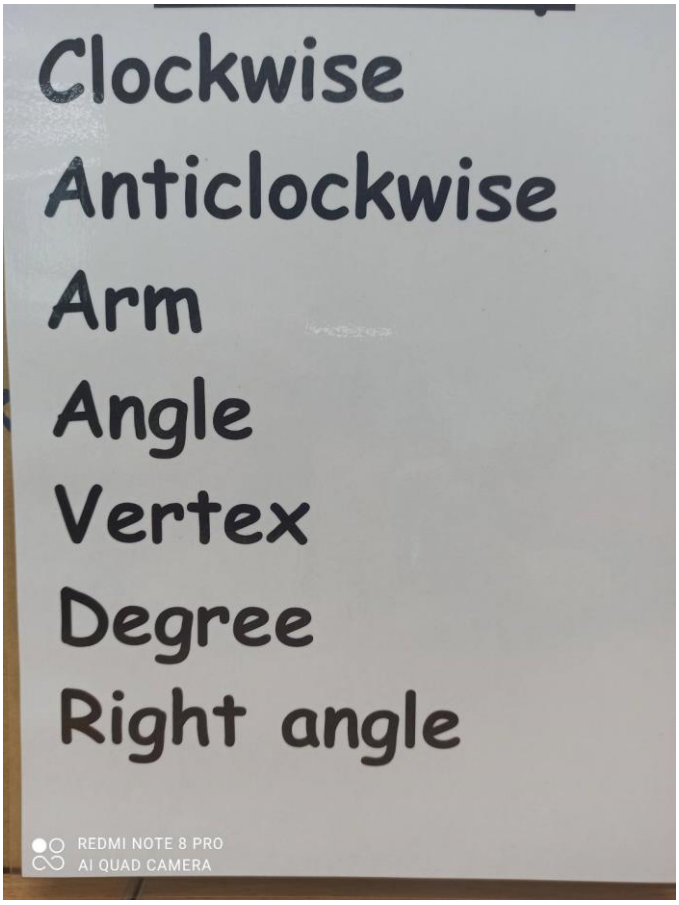
4. **Word Bank**


Clockwise
Anticlockwise
Arm
Angle
Vertex
Degree
Right angle
REDMI NOTE 8 PRO
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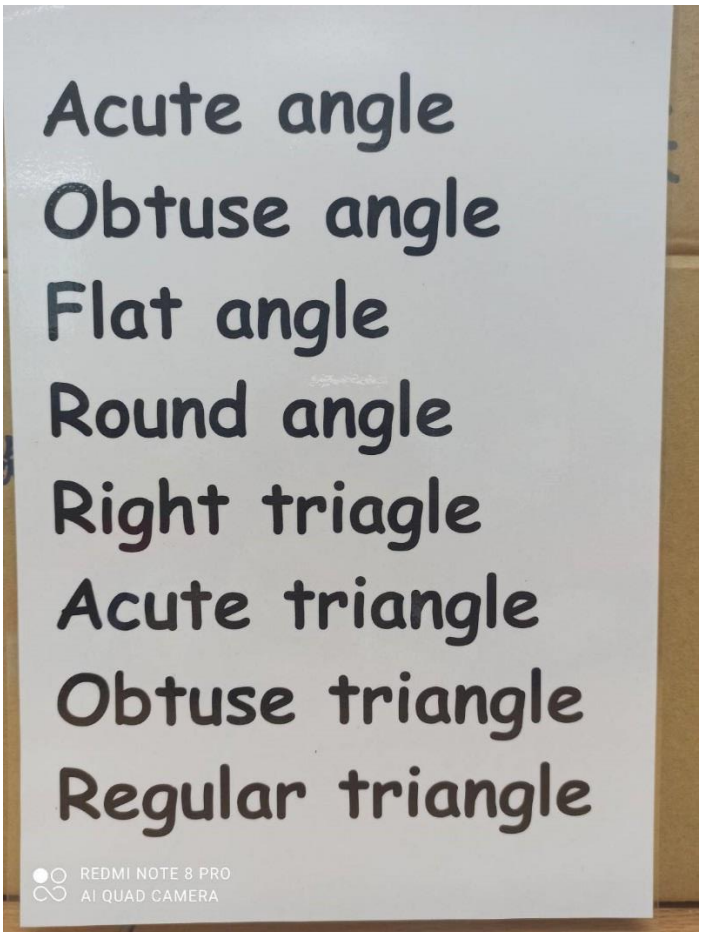
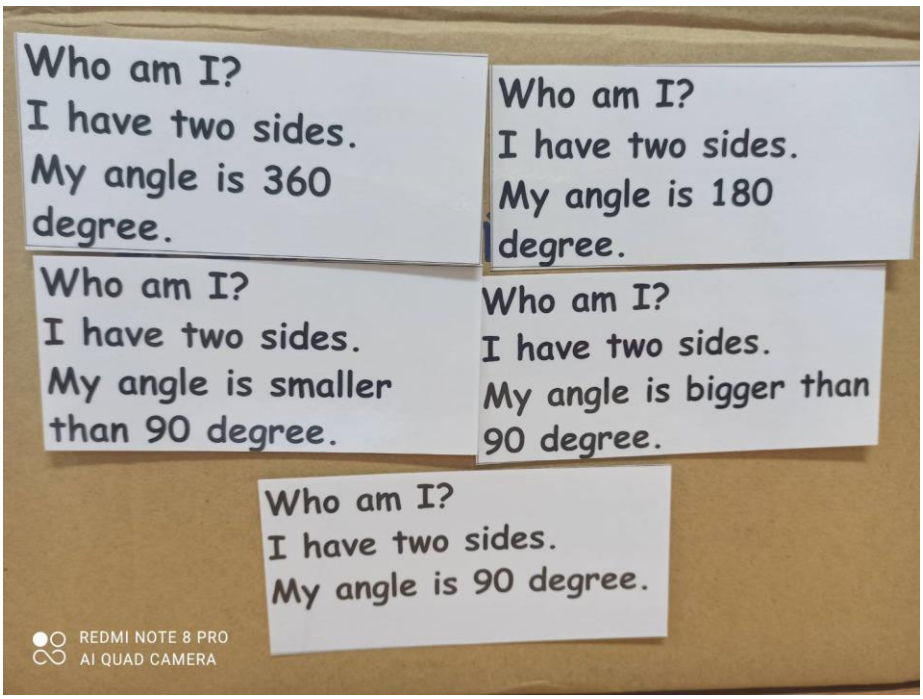

Acute angle
Obtuse angle
Flat angle
Round angle
Right triagle
Acute triangle
Obtuse triangle
Regular triangle
REDMI NOTE 8 PRO
AI QUAD CAMERA

5. Guessing Cards