HKU-NCS sharing

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荃灣商會學校

（青衣邨第一期）

Student background

- Distribution of students in classroom:

10 Chinese Students,

11 Non-Chinese Students

(Pakistani and Nepalese)

- Class size: 21
- Lesson format: Partly zoom real-time lessons and partly live face to face lesson

Problems that the NCS students face with

NCS students

- cannot read and speak English at all;
- do not pay much participation in class;
- are lack of previous knowledge in Maths;
- always feel shy to talk or express ideas in front of people;
- are not willing to think of how to solve a problem

Teaching plan

- Right-angled triangle (from rectangle)
- Formula of the area of the right-angled triangle (combine/dissect the triangle)
- Triangle with the same base and same height.
- Introduce the height of the triangle and the relationship between base and height.
- By induction, we get the formula of the right-angled triangle can be used for any kinds of triangle with the same base and height.
- Bisect the parallelogram into 2 identical triangles. Find the base and the height of the triangle and derive the formula.
- Use the same principle to introduce the area of trapeziums.

Lesson preparation

Teaching strategies:

- Use more colour to highlight the key words;
- Reword/rephrase/scaffold questions;
- Simplify the calculation and focus on the learning objectives;
- Design more activities;
- Use more open-ended questions

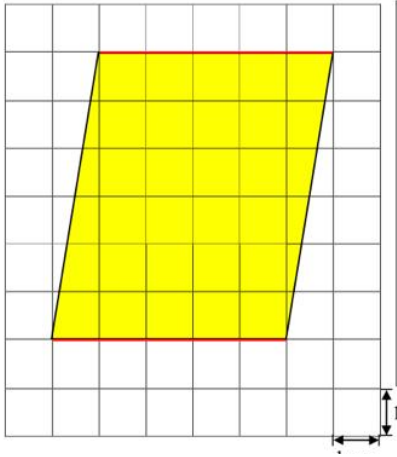
Use more colour to highlight the key words

1. Find the area of the parallelogram below.

Hint: we know:
Area of rectangle = Length X Width

Area of square = Length of one side X Length of one side

Area of triangle = $\frac{\text{Base X Height}}{2}$

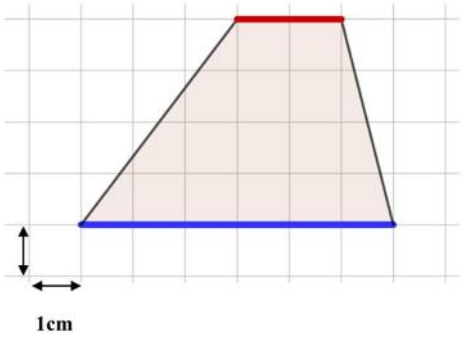


Show your work here.

Find the areas of the following trapeziums.

Area of trapeziums = $\frac{(\text{Upper base} + \text{Lower base}) \times \text{Height}}{2}$

1.



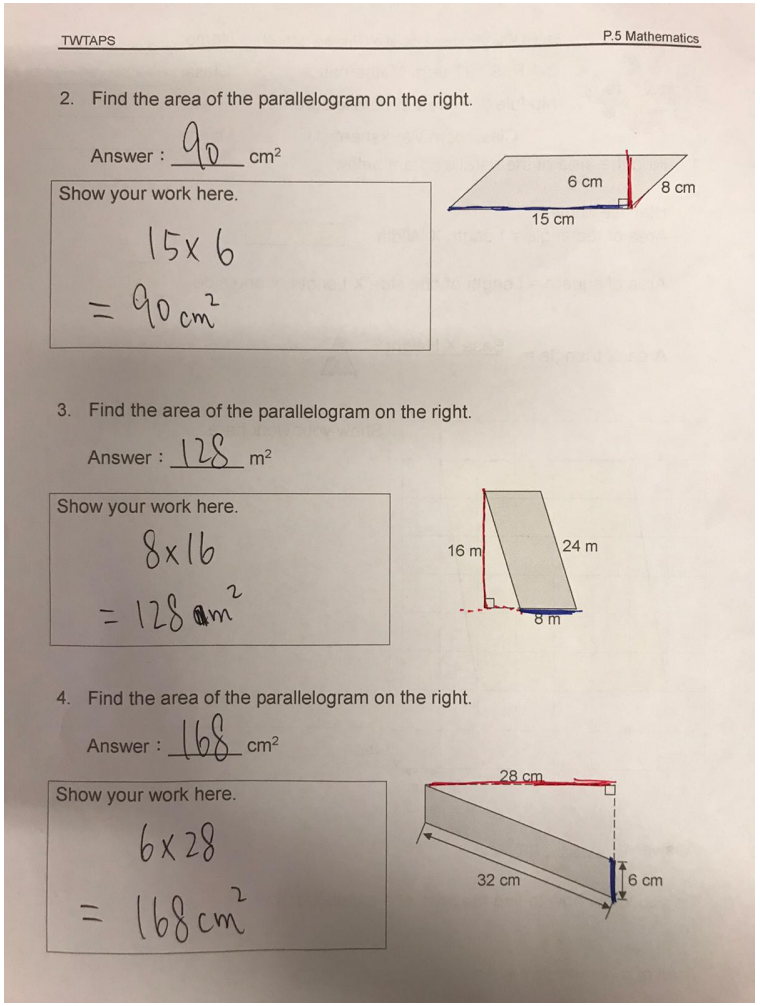
Upper base: _____cm

Lower base: _____cm

Height: _____cm

Area =

Use more colour to highlight the key words



TWTAPS P.5 Mathematics

2. Find the area of the parallelogram on the right.

Answer : 90 cm^2

Show your work here.

15 x 6

= 90 cm^2

3. Find the area of the parallelogram on the right.

Answer : 128 m^2

Show your work here.

8 x 16

= 128 m^2

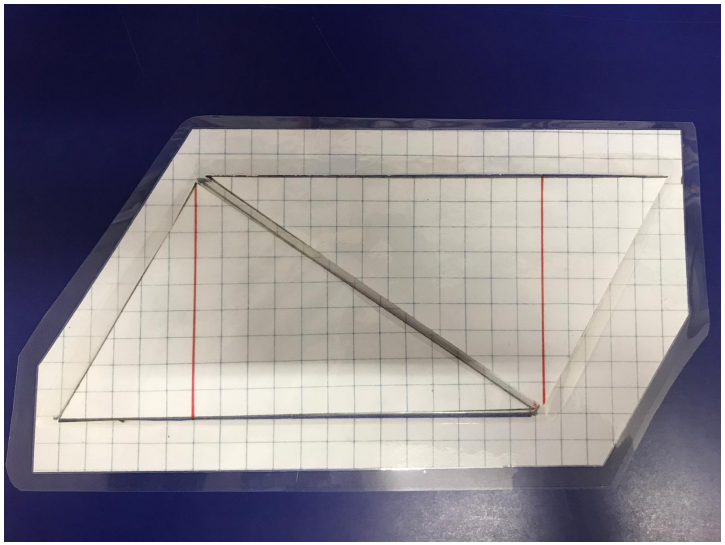
4. Find the area of the parallelogram on the right.

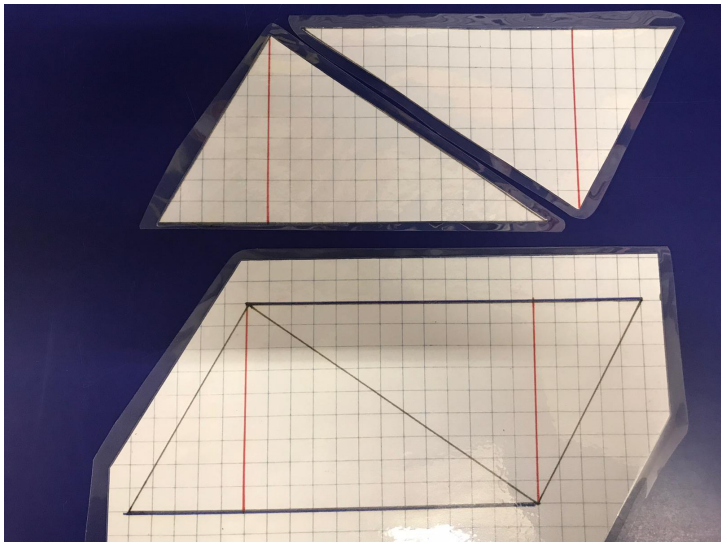
Answer : 168 cm^2

Show your work here.

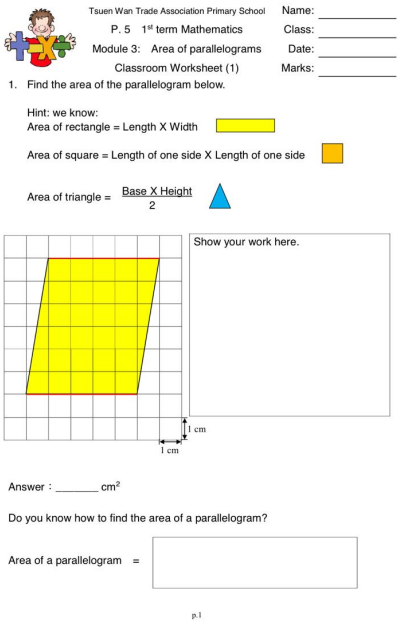
6 x 28

= 168 cm^2





Reword/rephrase/scaffold questions



Tsuen Wan Trade Association Primary School
P. 5 1st term Mathematics
Module 3: Area of parallelograms
Classroom Worksheet (1)

Name: _____
Class: _____
Date: _____
Marks: _____

1. Find the area of the parallelogram below.

Hint: we know:
Area of rectangle = Length X Width

Area of square = Length of one side X Length of one side

Area of triangle = $\frac{\text{Base X Height}}{2}$

Show your work here.

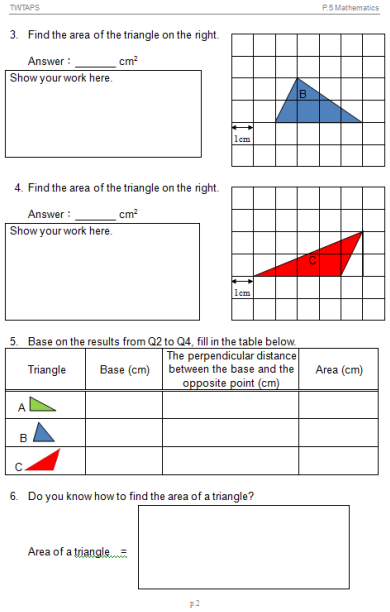
1 cm
1 cm

Answer : _____ cm²

Do you know how to find the area of a parallelogram?

Area of a parallelogram =

p.1



TWTAPS P.5 Mathematics

3. Find the area of the triangle on the right.

Answer : _____ cm²

Show your work here.

B
1 cm

4. Find the area of the triangle on the right.

Answer : _____ cm²

Show your work here.

C
1 cm

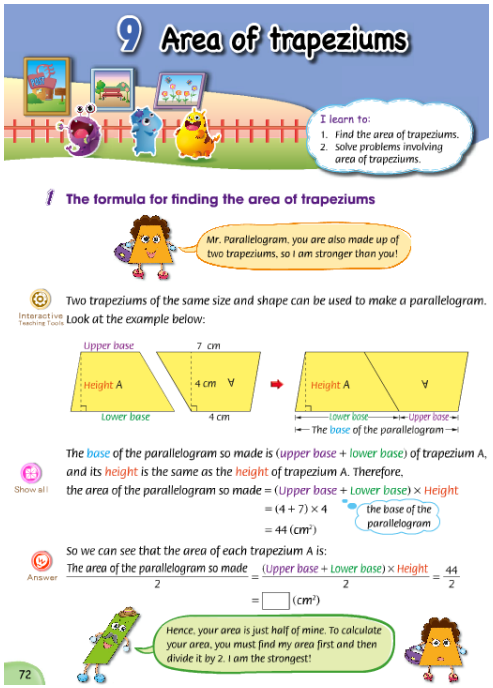
5. Base on the results from Q2 to Q4, fill in the table below.

Triangle	Base (cm)	The perpendicular distance between the base and the opposite point (cm)	Area (cm)
A			
B			
C			

6. Do you know how to find the area of a triangle?

Area of a triangle =

p.2



9 Area of trapeziums

I learn to:
1. Find the area of trapeziums.
2. Solve problems involving area of trapeziums.

1 The formula for finding the area of trapeziums

Mr. Parallelogram, you are also made up of two trapeziums, so I am stronger than you!

Interactive Teaching Tools

Two trapeziums of the same size and shape can be used to make a parallelogram. Look at the example below:

Upper base 7 cm
Height A
4 cm
Lower base 4 cm
∀

Height A
Lower base
Upper base
The base of the parallelogram

Show all

The base of the parallelogram so made is (upper base + lower base) of trapezium A, and its height is the same as the height of trapezium A. Therefore,
the area of the parallelogram so made = (Upper base + Lower base) × Height
= (4 + 7) × 4
= 44 (cm²)

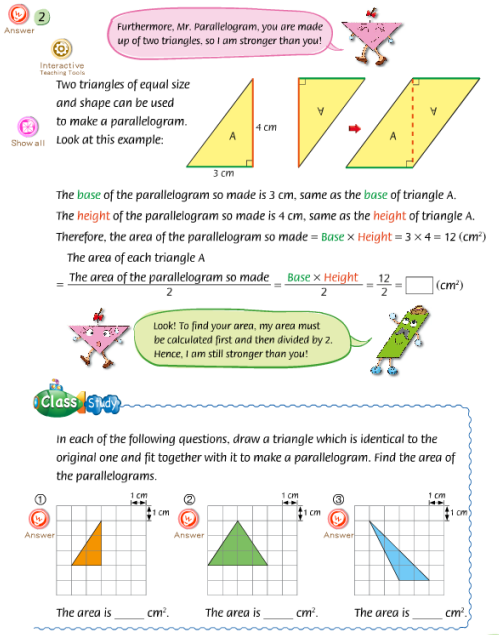
the base of the parallelogram

Answer

So we can see that the area of each trapezium A is:
$\frac{\text{The area of the parallelogram so made}}{2} = \frac{(\text{Upper base} + \text{Lower base}) \times \text{Height}}{2} = \frac{44}{2}$
= ☐ (cm²)

Hence, your area is just half of mine. To calculate your area, you must find my area first and then divide it by 2. I am the strongest!

72



Answer 2

Furthermore, Mr. Parallelogram, you are made up of two triangles, so I am stronger than you!

Interactive Teaching Tools

Two triangles of equal size and shape can be used to make a parallelogram. Look at this example:

Show all

A
4 cm
3 cm
∀

The base of the parallelogram so made is 3 cm, same as the base of triangle A.
The height of the parallelogram so made is 4 cm, same as the height of triangle A.
Therefore, the area of the parallelogram so made = Base × Height = 3 × 4 = 12 (cm²)
The area of each triangle A
= $\frac{\text{The area of the parallelogram so made}}{2} = \frac{\text{Base} \times \text{Height}}{2} = \frac{12}{2} =$ ☐ (cm²)

Look! To find your area, my area must be calculated first and then divided by 2. Hence, I am still stronger than you!

Class Study

In each of the following questions, draw a triangle which is identical to the original one and fit together with it to make a parallelogram. Find the area of the parallelograms.

① Answer 1 cm 1 cm
② Answer 1 cm 1 cm
③ Answer 1 cm 1 cm

The area is _____ cm². The area is _____ cm². The area is _____ cm².

Reword/rephrase/scaffold questions

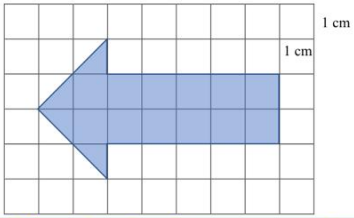
Tsuen Wan Trade Association Primary School
P. 5 1st term Mathematics
Module 4: Area of polygon
Classroom Worksheet (1)

Name: _____
Class: _____
Date: _____
Marks: _____

Revision:

Area	Formula
	side x side
	length x width
	$\frac{\text{base} \times \text{height}}{2}$
	base x height
	$\frac{(\text{upper base} + \text{lower base}) \times \text{height}}{2}$

1. Find the area of the polygon below.

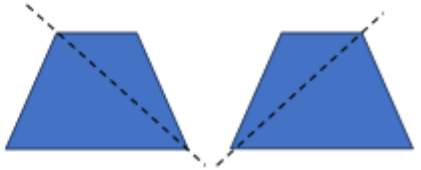
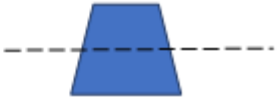


Hint: Dissect the polygon into a _____ and a _____. Then calculate the total of the areas of these shapes.

Area of the polygon is _____ cm^2

In conclusion, if we dissect the polygon into several shapes, calculate the total areas of these shapes. This method is called the dissection method.

p.1

Cut it into two triangles	Cut it into two triangles 
Cut it into two trapeziums and form a parallelogram	Cut it into two trapeziums and form a parallelogram 
Cut it into one parallelogram and one triangle	Cut it into one parallelogram and one triangle 

Reword/rephrase/scaffold questions

- Videos

Simplify the calculation and focus on the learning objectives

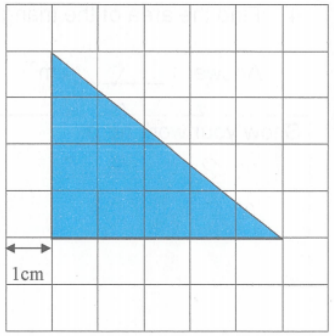
leg

1. Find the area of the right-angled triangle on the right.

Answer : 10 cm^2

Show your work here.

$4 \times 5 \div 2$
$= 20 \div 2$
$= 10$

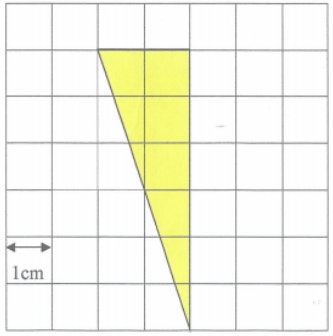


2. Find the area of the right-angled triangle on the right.

Answer : 6 cm^2

Show your work here.

$6 \times 2 \div 2$
$= 12 \div 2$
$= 6$



p.1

3. Find the area of the polygon below.

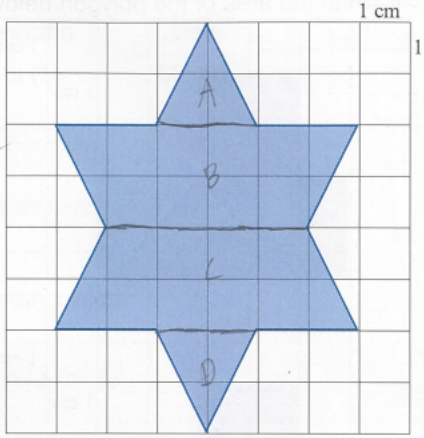
Method 1:

Dissect the polygon into 2 triangles and 2 trapeziums.

Area of A and D $= \frac{(2 \times 2)}{2} \times 2$
$= 4\ cm^2$

Area of B and C $= \frac{(4+6) \times 2}{2} \times 2$
$= 20\ cm^2$

Area of the polygon is 24 cm^2

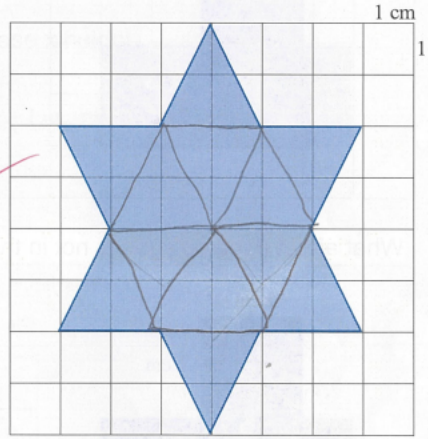


Method 2:

Dissect the polygon into 12 triangles.

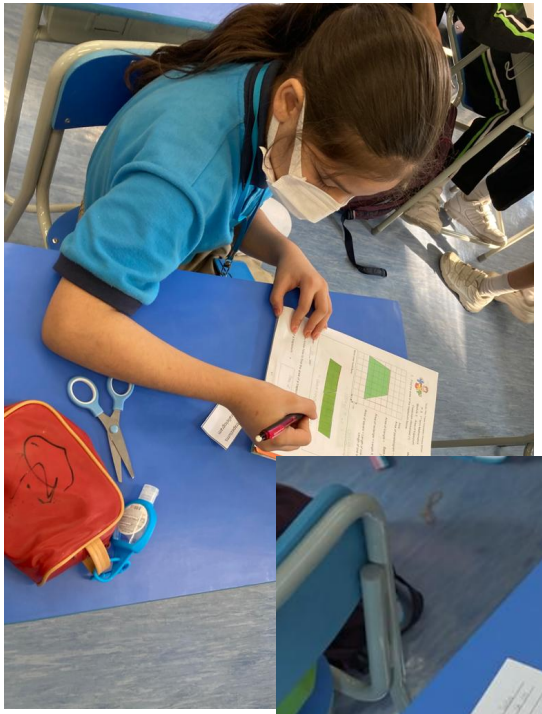
Area of the polygon $= \frac{2 \times 2}{2} \times 12$
$= 24$

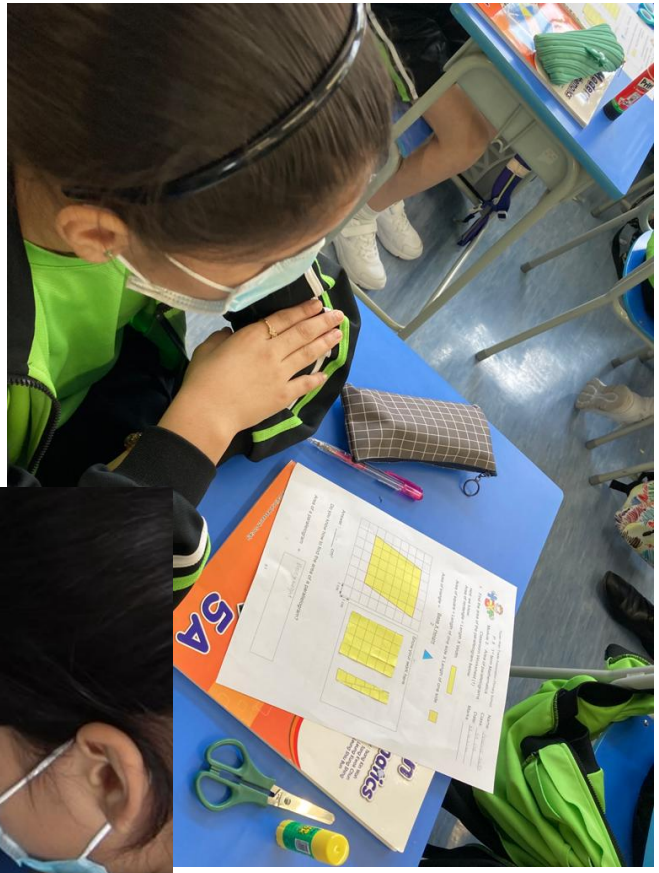
Area of the polygon is 24 cm^2



Any other methods??

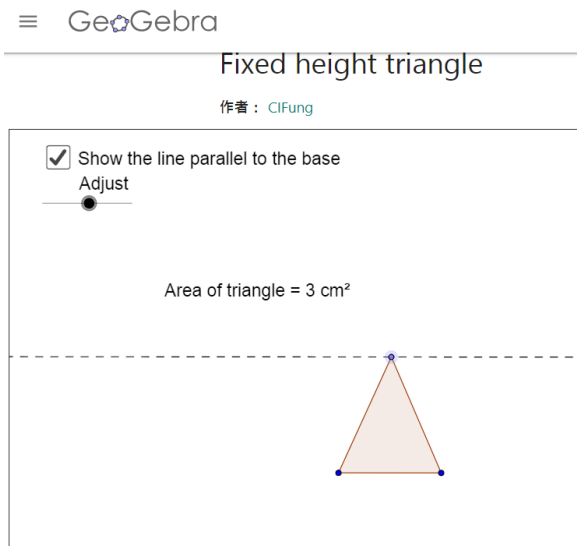
Design more activities

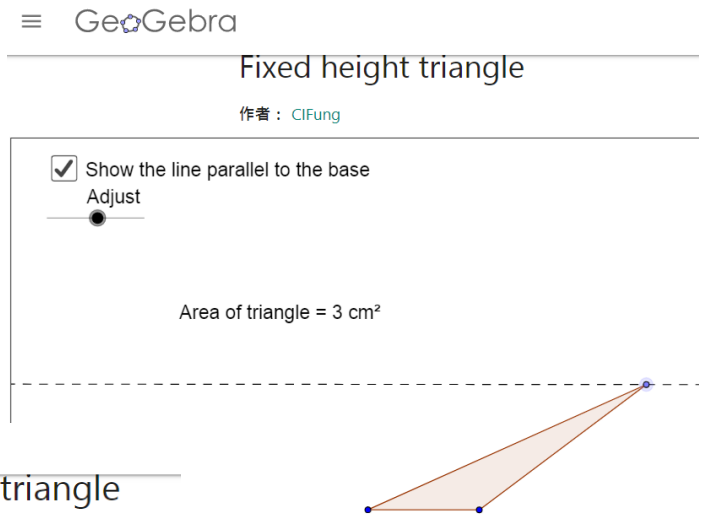


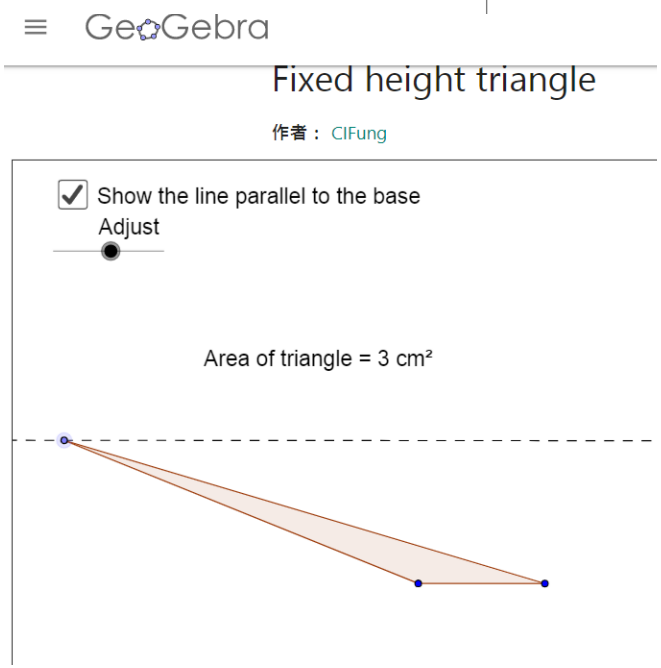


- Videos

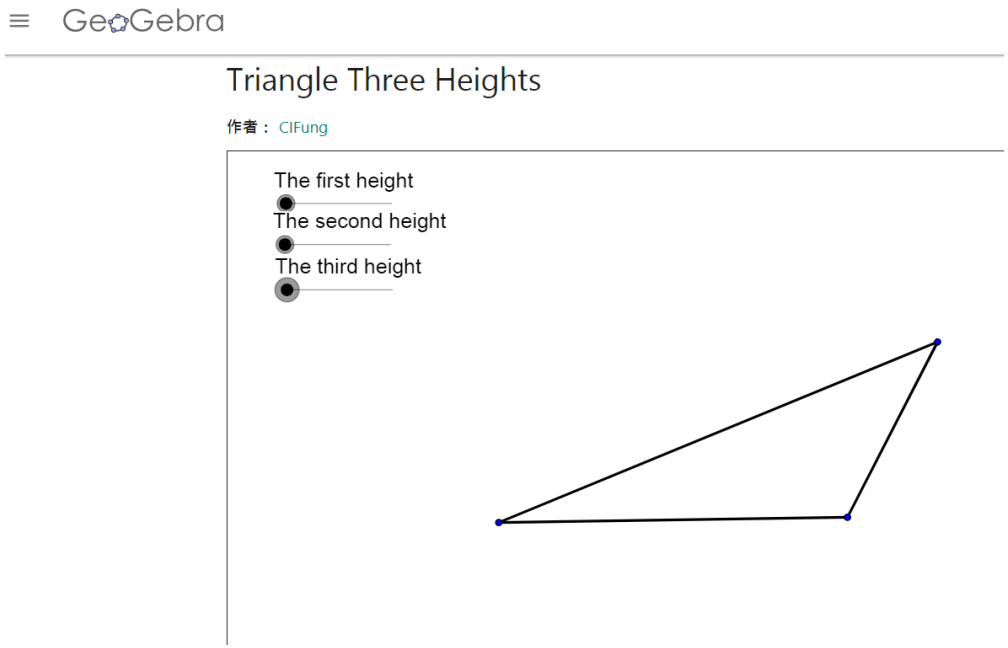
Design more activities





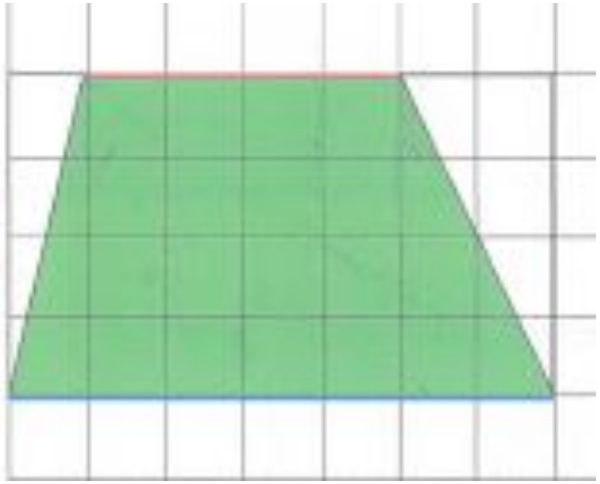


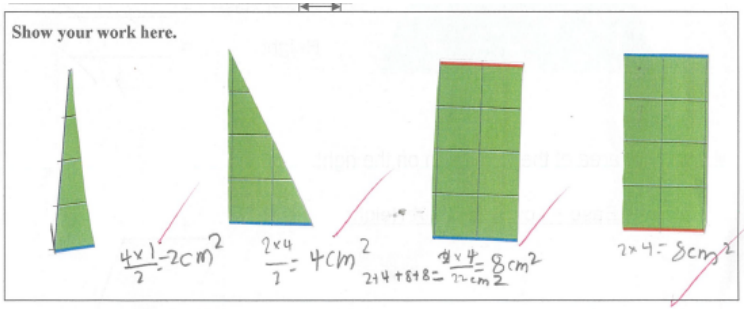
Design more activities



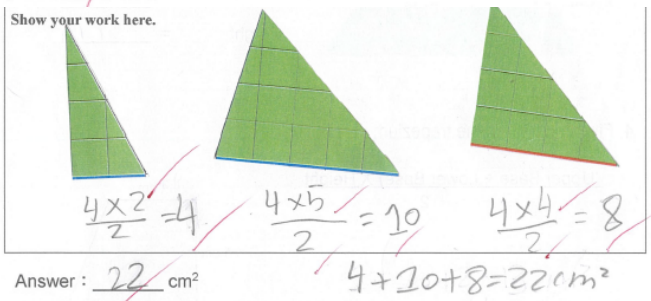
- https://www.geogebra.org/m/quz9wqbf

Use more open-ended questions

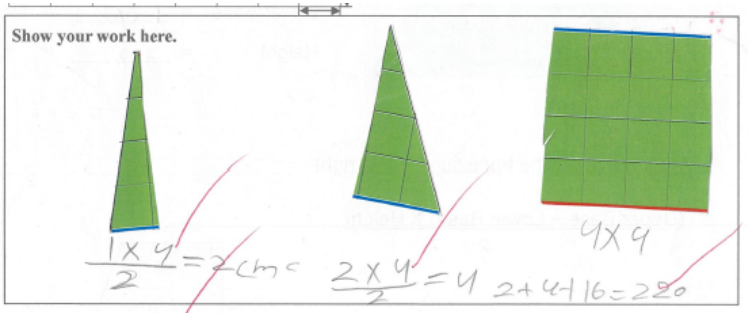




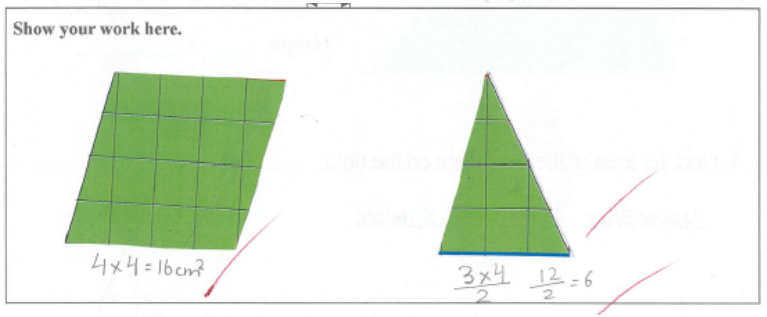
Answer : 22 cm²



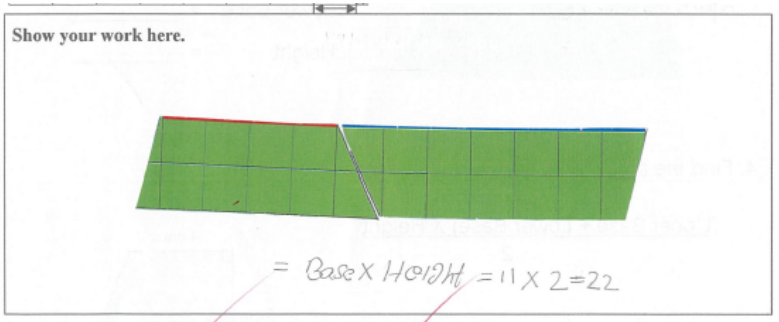
Answer : 22 cm²



Answer : 22 cm²



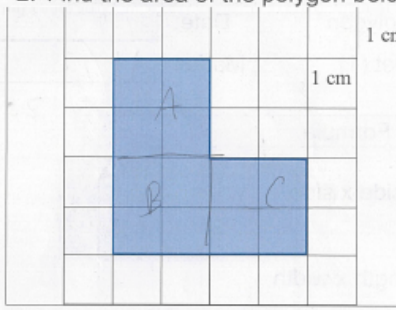
Answer : 22 cm²



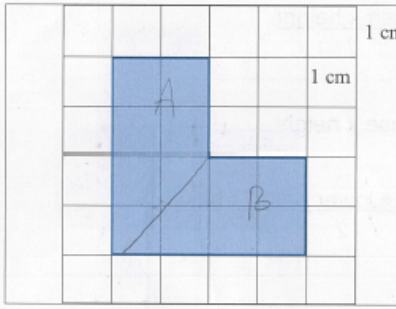
Answer : 22 cm²

Use more open-ended questions

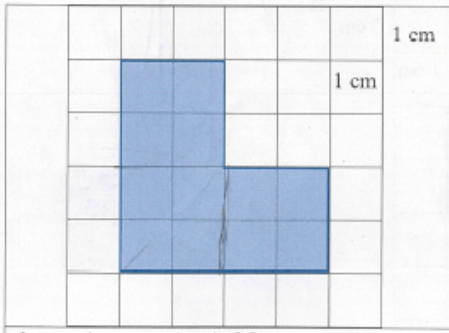
2. Find the area of the polygon below.



Method1:
Dissect the polygon into
3 Squares
Area of A : 2×2 = 4cm²
Area of B : 2×2 = 4cm²
Area of C : 2×2 = 4cm²
Area of the polygon is 12 cm²



Method2:
Dissect the polygon into
2 Trapeziums
Area of A = (4+2)×2 / 2 = 6
Area of B = (4+2)×2 / 2 = 6
Area of the polygon is 12 cm²



Method3:
Dissect the polygon into
1 Rectangel 1 squar
4×2 = 8
2×2 = 4
Area of the polygon is 12 cm²

Any other methods??
2 squares 2 Triangels.
2×2 = 4
2×2 = 4
2×2 / 2 = 2
2×2 / 2 = 2
Area of the polygon is 12cm².

Performance of students with low ability

- Be able to calculate the area of polygons;
- Pay more participation in class;
- Easy tasks and open-end questions make students be willing to express ideas;
- Willing to think of how to solve a problem throughout the activities

Modification for the lesson planning

- Design more teaching tools to help students to revise the previous knowledge
- Think of more activities to let students try to calculate the area of polygon by filling method.

Thank you