TOPIC: AREA OF A TRIANGLE

SUBJECT: MATHEMATICS

LEVEL/AGE: 12-13 years

FOREKNOWLEDGE: The concept of territory. The unit of measurement of the area. Calculate the area of a rectangle and square.

LENGTH: 8 PAGES (DURATION: 50 MINUTES)

LEARNING OUTCOMES

At the end of the lesson, the student should know:

- How to calculate the area of a triangle;
- How to calculate the data missing from the area formula of the triangle, knowing the rest of the data;
- How to apply area calculation in practice

RESOURCES

Table of spatial formulas.

Revisional worksheet.

Discovery worksheet.

knowledge deepening task sequence in projectable form.

TEACHING METHODS

Lecture, use of discovery worksheet, game, exercises

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ACTIVITIES

INTRODUCTION (2 minutes)

Autumn has arrived and the garden vegetables are all ripe. After harvesting, the gardener wants to grass the empty beds. He needs to calculate the area of the beds so that he knows approximately how many lawn bricks he needs to buy.

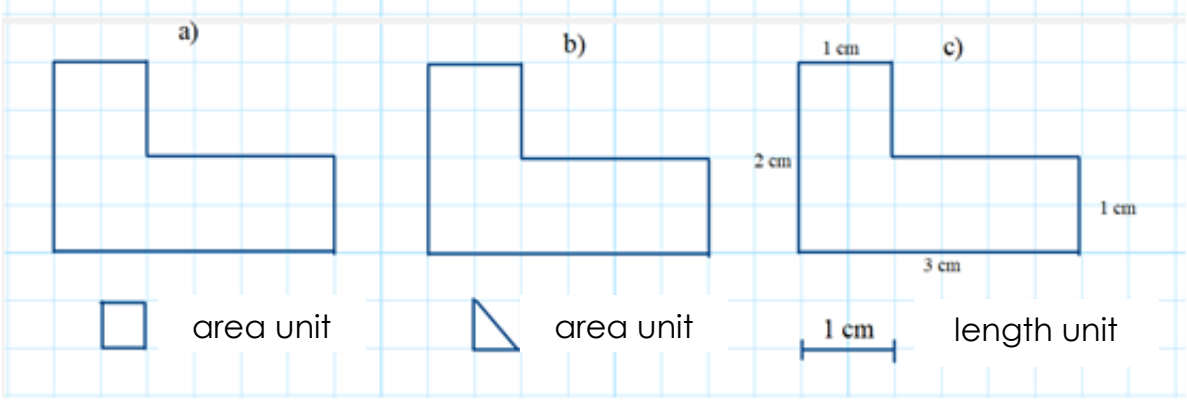
The challenge lies in the fact that the beds have a triangular shape.

In the future, you will understand and learn how to calculate the area of a triangle.

REVISION (10 minutes)

Area – revisional worksheet

1) Define the areas in the figures below, using the units given.



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2) Specify what unit of area to use in the expression of the following areas:

a) book cover interface	
b) area of a yard	
c) Black Sea surface	
d) wheat field area	
e) memory card interface	

Students perform the exercises of the above worksheet in group work. When comparing the results of the groups, we discuss, clarify and describe the previous knowledge that will serve as the basis for the curriculum of today's lesson.

Keep in mind!

- **Area is the metric that shows how many units of area a plane can be covered.**
- **The basic unit of measurement of the area is square meters, the symbol of which is m2.**
- **Depending on the size of the area, it is worth using fractions of m2: mm2, cm2, dm2, or multiples: dkm2 (price), hm2 (hectare), km2.**
- **Area of rectangle T = a x b , where a and b are the dimensions of the rectangle.**
- **The area of the square $T = a^2$, where a – is the side length of the square.**

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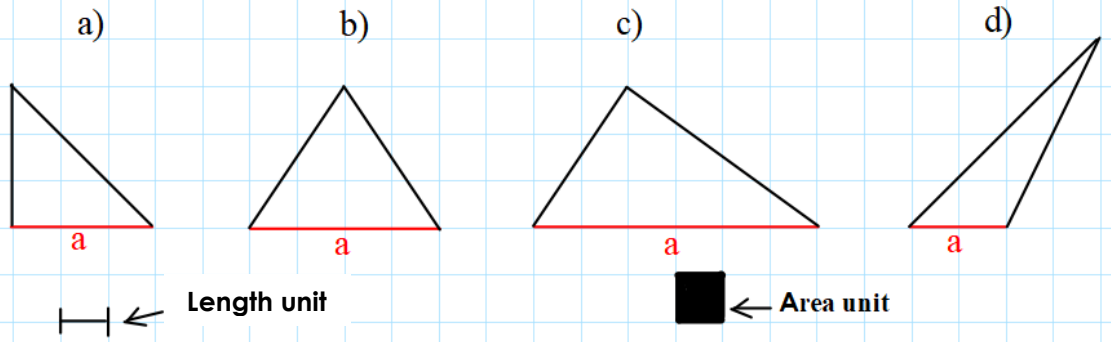
THEORY PART (10 minutes)

Let's discover it together!

Area of the Triangle - worksheet



1. In the diagrams above, draw the heights for the sides **a** and denote them by **m**.
2. Based on the figures above, fill in the following table.

	a)	b)	c)	d)
Area (an area unit is a small square)				
$\frac{a \cdot m}{2}$ (a lenght unit is the side of a small square)				

We can draw the following conclusions:

Keep in mind!

- ✓ **The area of a triangle is equal to half the product of one side length and its corresponding height.**

Area of the triangle: $$T = \frac{a \cdot m}{2}$$

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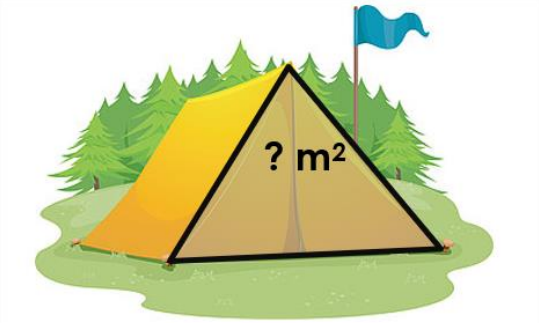
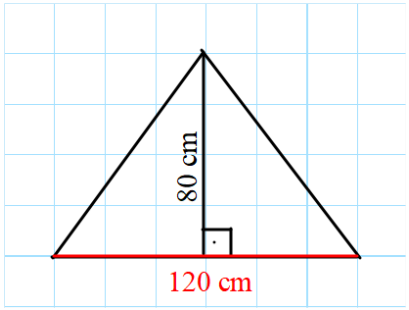
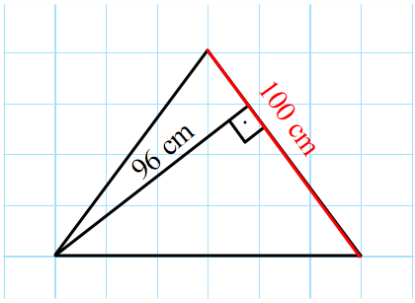
HANDS-ON PART (10 minutes)

Consider the following!

Agnes and Dani calculated the area of the same tent sheet.



Agnes's calculations	Dani 's calculations
Agnes made the following measurements   a = 120 *cm* and m = 80 *cm* A area: $T = \frac{a \cdot m}{2}$ $T = \frac{120\,cm \cdot 80\,cm}{2} = 4800\,cm^2 = 4{,}8\,m^2$	Dani made the following measurements.   a = 100 *cm* and m = 96 *cm* A area: $T = \frac{a \cdot m}{2}$ $T = \frac{100\,cm \cdot 96\,cm}{2} = 4800\,cm^2 = 4{,}8\,m^2$
Who has solved the problem correclty? Is it a coincidence that the result of the calculations of two children is equal?	

Let's draw the conclusions:

Agnes and Dani calculated the area of the same triangle differently and both procedures are correct.

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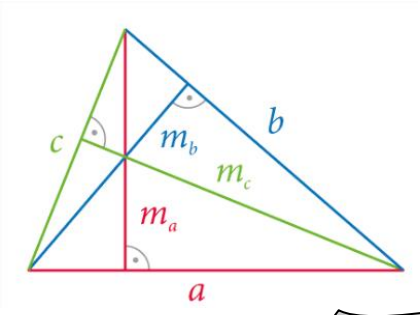
Keep in mind!

The area of the triangle is obtained if any side and associated height the product of its length is halved.

$$T_{\Delta} = \frac{a \cdot m_a}{2} = \frac{b \cdot m_b}{2} = \frac{c \cdot m_c}{2}$$



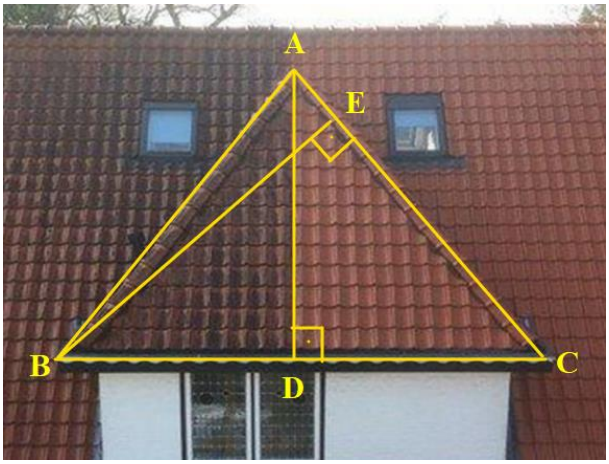
EXERCISE PART (14 minutes)

Let's practice!

1) Calculate the area of the triangle with a side length of 6.5 cm and a height of 80 mm for the side.

2) The area of a triangle is 80 cm^2. If a = 12 cm, m_a = ?

3)



ABC_{Δ}
$AD \perp BC$
$BE \perp AC$
BC = 6 m
AC = 5 m
BE = 4,8 m
AD = ?

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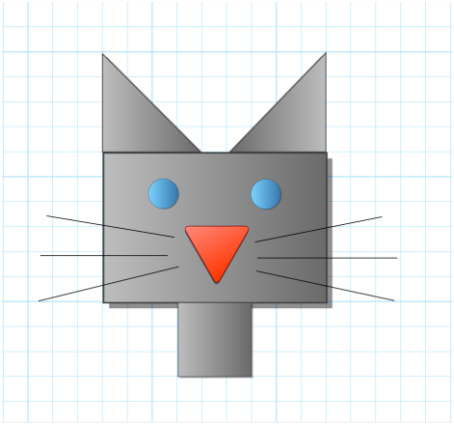
4) EXTRA TASK

At home, dani looked through the new mathematical concepts in her notebook. His little sister placed her magnetic geometric diagrams on Dani's booklet page as shown below. Dani smiled and stated, "I can tell you how much space your toy occupies on the page of my notebook. I assume that the side length of two small squares together is 1 cm."



What was dani's conclusion?

CONCLUSION (2 minutes)

Assess the work of the students.

Draw a conclusion for yourself about how effective the lesson has been.

SYNTHESIS/SUMMARY (2 minutes)

As homework, I invite you on an adventure!

During your adventure, you will be helped by the knowledge you have learned in today's class.

- Area is the metric that shows how many units of area a plane can be covered.
- The basic unit of measurement of the area is square meters, the symbol of which is m2.

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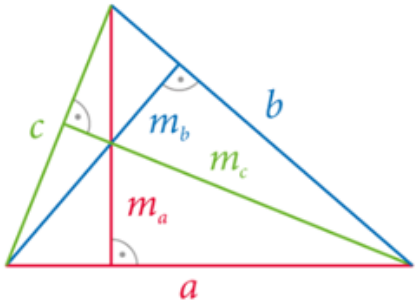
- Depending on the size of the area, it is worth using fractions of m2: mm2, cm2, dm2, or multiples: dkm2 (price), hm2 (hectares), km2.
- The area of the rectangle, $T = a \cdot b$, where a and b are the dimensions of the rectangle.
- The area of the square, $T = a^2$, where – is the side length of the square.
- The area of the triangle, $T = \frac{a \cdot m}{2}$, where is the length of one side of the triangle and m is the length of the height associated with the side.
- IN ANY TRIANGLE:

$$T_{\Delta} = \frac{a \cdot m_a}{2} = \frac{b \cdot m_b}{2} = \frac{c \cdot m_c}{2}.$$



Enjoy the adventure!!

BIBLIOGRAPHY

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- Orbán Julianna Enikő, Mértan Munkafüzet a VII. osztály számára, Corvin Kiadó, Deva, 2018
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