PERCORSO 01

Polygons

di Cinzia Masia

- **Riferimento al testo base:**

  A. Acquati, *Mate.com*, volume 1B, capitolo 4, p. 132

- **Destinatari:**

  scuola secondaria di primo grado, classe 1ª

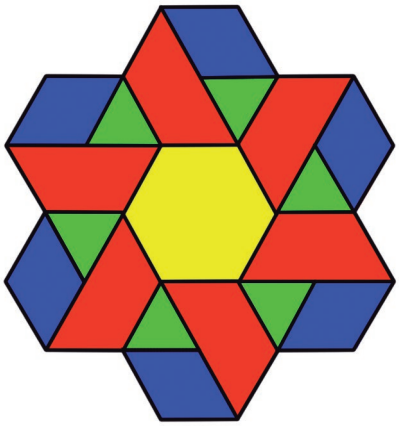
- **Liv. linguistico:**

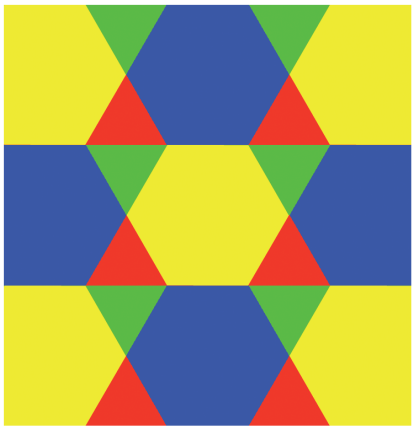
  A2

UNITÀ 1

Eliciting

1a. **Pair work – Look at the picture and guess the topic.**

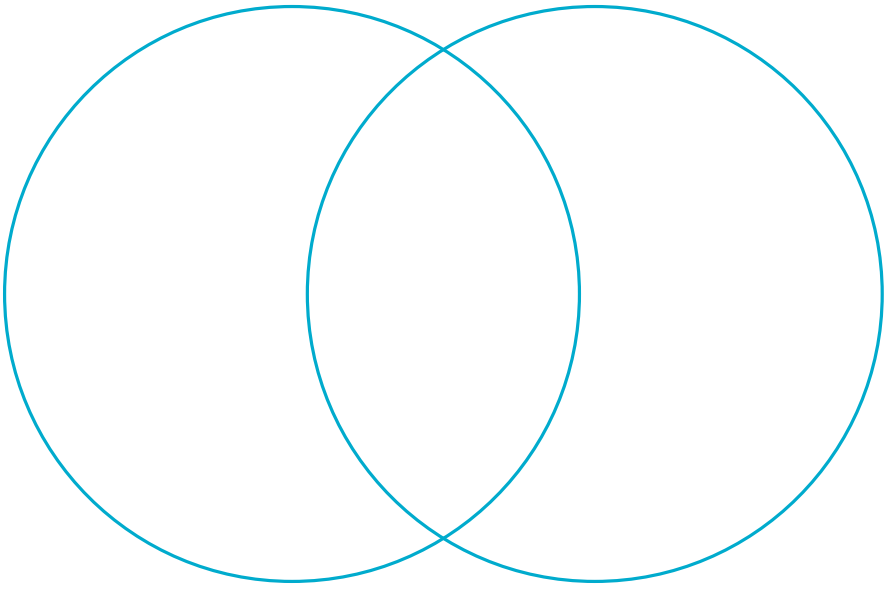




What can you see? .....

How many shapes can you spot? .....

1b. **Fill in the Venn diagram. Compare the two pictures and draw the shapes in common in the middle space and the different shapes in the outer spaces.**

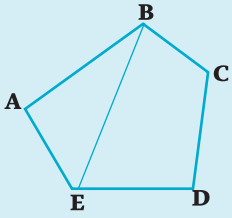


All these geometric shapes are:

- segments ☐
- polygons ☐
- lines ☐

Reading / comprehension

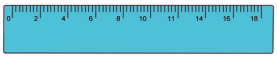
2a. **Group work – Read the text and answer true or false. Use the word box to help you.**



Polygons are made of straight lines and the shapes are "closed" (all the lines connect up). These lines are called sides (AB, BC, CD, DE, EA). Sides are segments connected by vertexes (A, B, C, D, E). Two sides (AB, BC) with a common vertex (B) are called consecutive. Polygons have a flat surface and no thickness. Examples include triangles, quadrilaterals, pentagons, hexagons and so on. Polygons can have from 3 to 20 sides. In the polygons the diagonal is a straight line inside a shape that joins two vertexes (A, D) but not a side. **The perimeter of a polygon is the sum of the lengths of its sides.** There are flat shapes with curves so they are not polygons. A circle is not a polygon because it has curved sides.

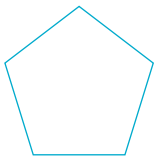
equal

curve

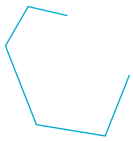


length

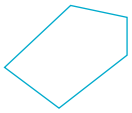
straight line



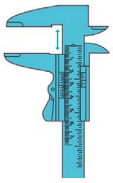
flat surface



open



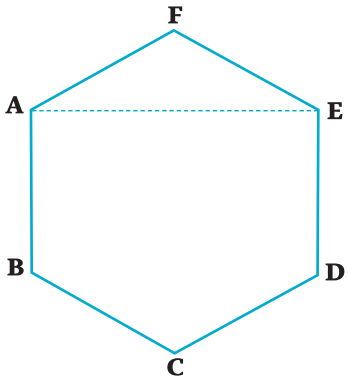
closed



thickness

	T	F
1. Polygons have a thick surface.		
2. Polygons have sides, vertexes and angles.		
3. Diagonals join 2 vertexes and a side.		
4. Flat shapes with curves are polygons.		
5. Polygons are made of segments.		
6. Sides are consecutive with a common diagonal.		

2b. **Group work – Look at the polygon and complete.**



1. AB, ..., ..., DE, ..., FA are .....
2. Vertexes are , ..., ..., ..., ..., ..., ...
3. BC and CD are ..... sides.
4. AE is the .....

Homework

3. **Make some polygons following the instructions in your course book (chapter 4) ex. 1 page 132.**

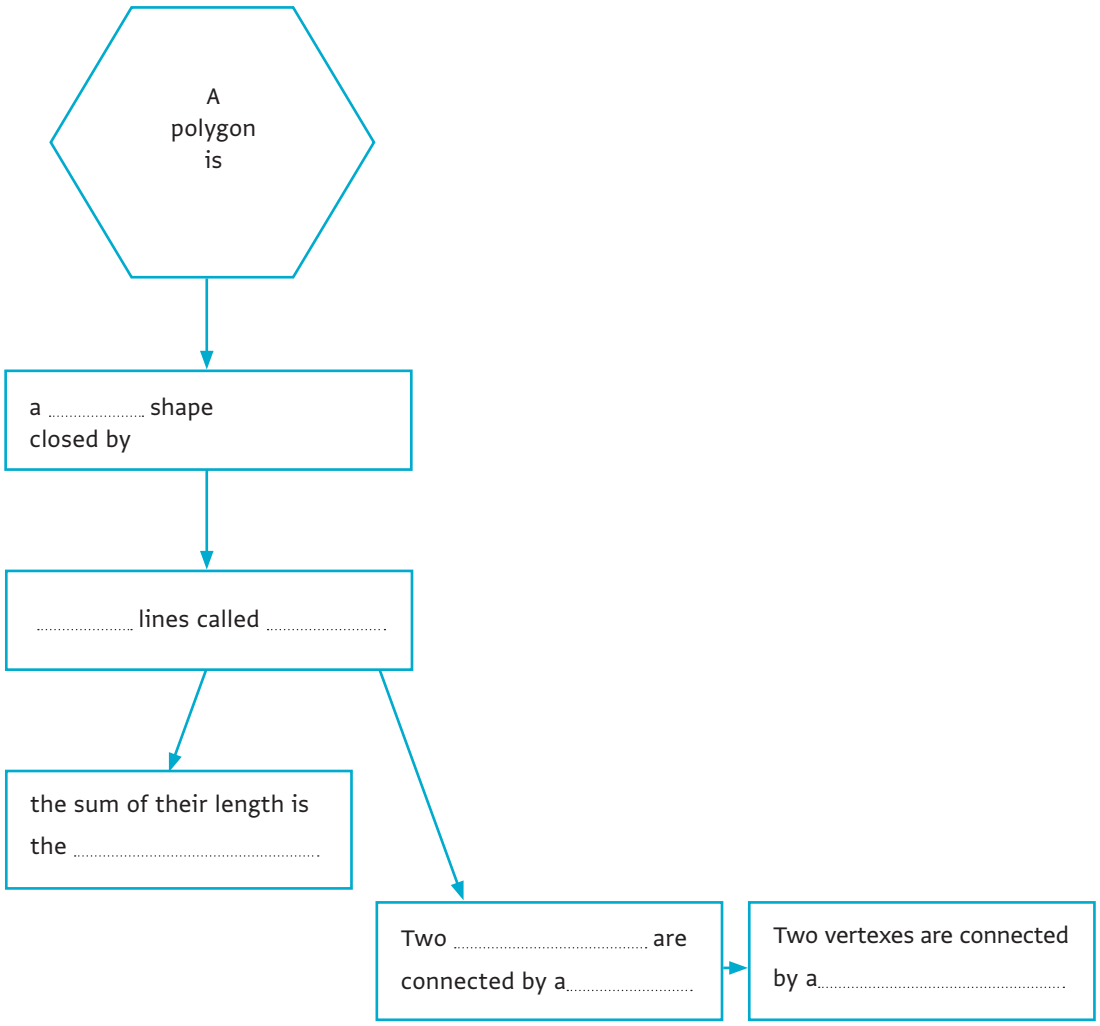
Warm up

1a. **Show and describe a polygon you made at home following the prompts.**

It has ..... sides, ... vertexes, ... angles and ..... diagonals.

1b. **Group work – Complete the diagram with the corresponding word.**

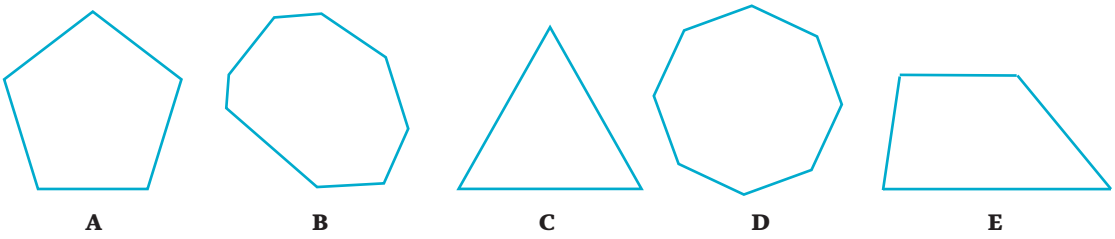
vertex-vertexes / straight / diagonal / sides / flat / perimeter



1c. **In plenary – Report the description to the class.**

Pre-reading

2a. **Pair work – Spot the differences: observe the polygons, discuss with your mate and answer the questions.**



A B C D E

Es: How many angles has polygon **B** got? Polygon **B** has got **8** angles.

1. How many angles has polygon ..... got? .....
2. Are the angles equal or different in polygon ..... ? .....
3. How many vertexes has polygon ..... got? .....
4. How many sides has polygon ..... got? .....
5. Are the sides of equal or different length in a polygon? .....
6. Do all polygons have the same number of angles and sides? Y N

2b. **In plenary – Express your observation to the rest of the class using the following prompt.**

We think/ In our opinion some polygons have .....

Reading / comprehension

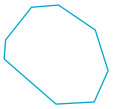
3a. **Read the text and write the missing words.**

sides / irregular / equal / angles / polygons

Polygons can be regular or ..... . A regular polygon has .....

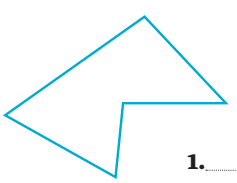
of equal length, and all its interior angles are of ..... size es: 

otherwise they are irregular. Irregular ..... can have sides of any length and

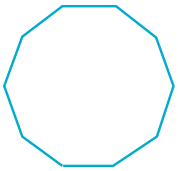
..... of any size  . An irregular

polygon is any polygon that is not a regular polygon.

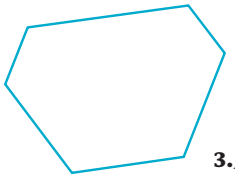
3b. **Write regular or irregular below each polygon.**



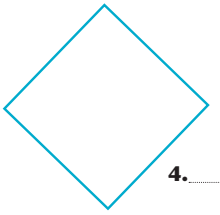
1. .....



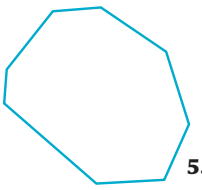
2. .....



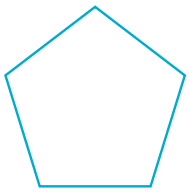
3. .....



4. .....



5. .....

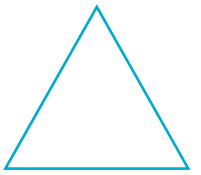


6. .....

Homework

4a. **Read the definitions and label the regular polygons.**

a. **hexagon**: a six-sided figure with six inner angles.
b. **triangle**: a three-sided shape with three vertexes and three inner angles.
c. **octagon**: an eight-sided shape with eight inner angles.
d. **square**: a four-sided shape in which each side is the same length with four vertexes and with four interior angles.
e. **pentagon**: a five-sided shape with five inner angles.
f. **heptagon**: a seven-sided shape with seven inner angles.



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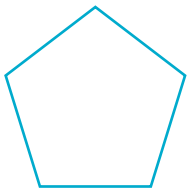

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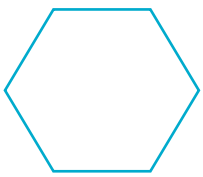

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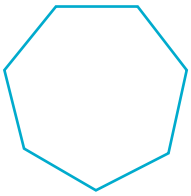

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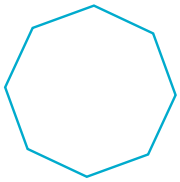


.....

4b. **Arrange the polygons in the increasing order of the number of their sides.**

decagon, triangle, pentagon, hexagon.

.....

4c. **Arrange the polygons in the decreasing order of the number of their sides.**

quadrilateral, hexagon, pentagon, octagon.

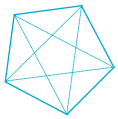
.....

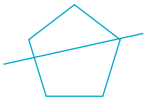
4d. **Go to page 137 of your course book and carry out "Ora prova tu".**

Reading / comprehension

1a. **Group work – Read and answer.**

Polygons can be **convex** or **concave** but all concave polygons are irregular because the interior angles cannot all be the same.

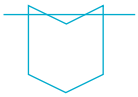
A **convex polygon** is a polygon with all its interior angles **less** < than 180°. All the diagonals of a convex polygon are inside the polygon  .

A line  through a convex polygon will intersect the polygon twice, as can be seen from the figure  and divide the polygon into exactly two pieces.

A convex polygon is the opposite of a concave polygon.

A **concave polygon** is a polygon with one or more interior angles **greater** > than 180°.

A line through a concave polygon can intersect the polygon in more than two places.

 Here the line can divide the polygon into three pieces.

Some of the diagonals of a concave polygon are outside the polygon. The diagonal at the top of this polygon is outside the polygon's interior space  .

1b. **Group work – Choose and circle the correct statement.**

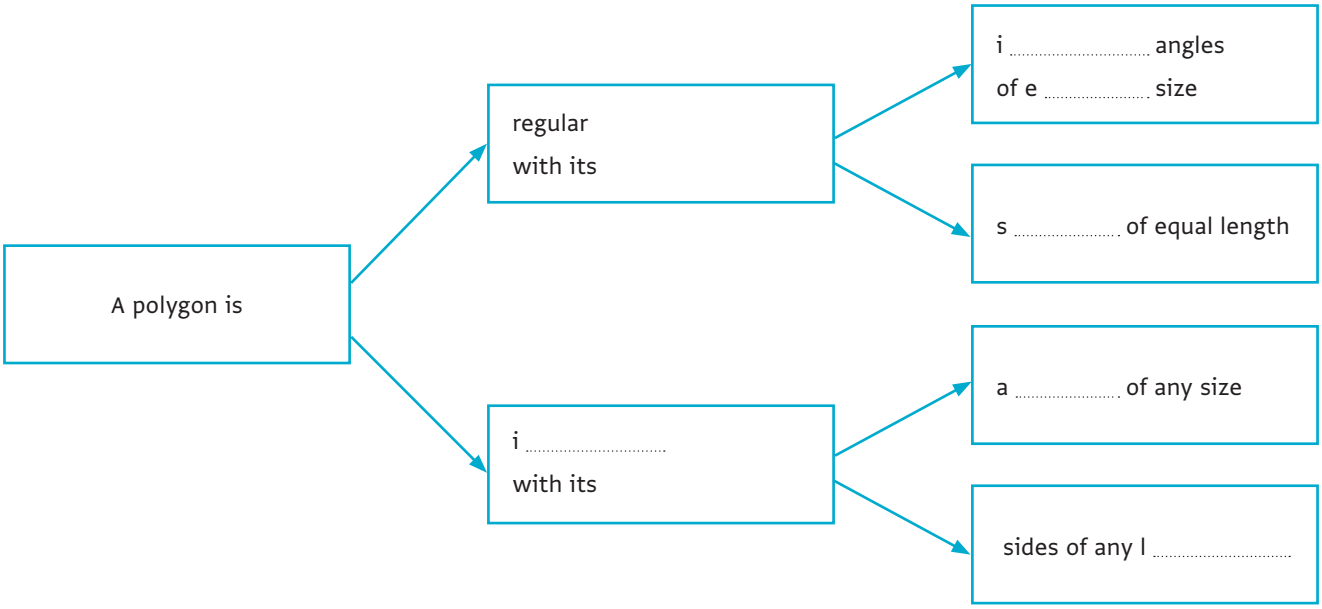
1. Concave polygons are *regular / irregular* because of the interior angles.
2. All the diagonals of a convex polygon are *inside / outside* the polygon.
3. A line through a convex polygon *doesn't divide / divides* the polygon into two pieces.
4. A line through a concave polygon *doesn't divide / divides* the polygon into three pieces.

Use your knowledge

2a. **Group work – Complete the grid and show it to the class.**

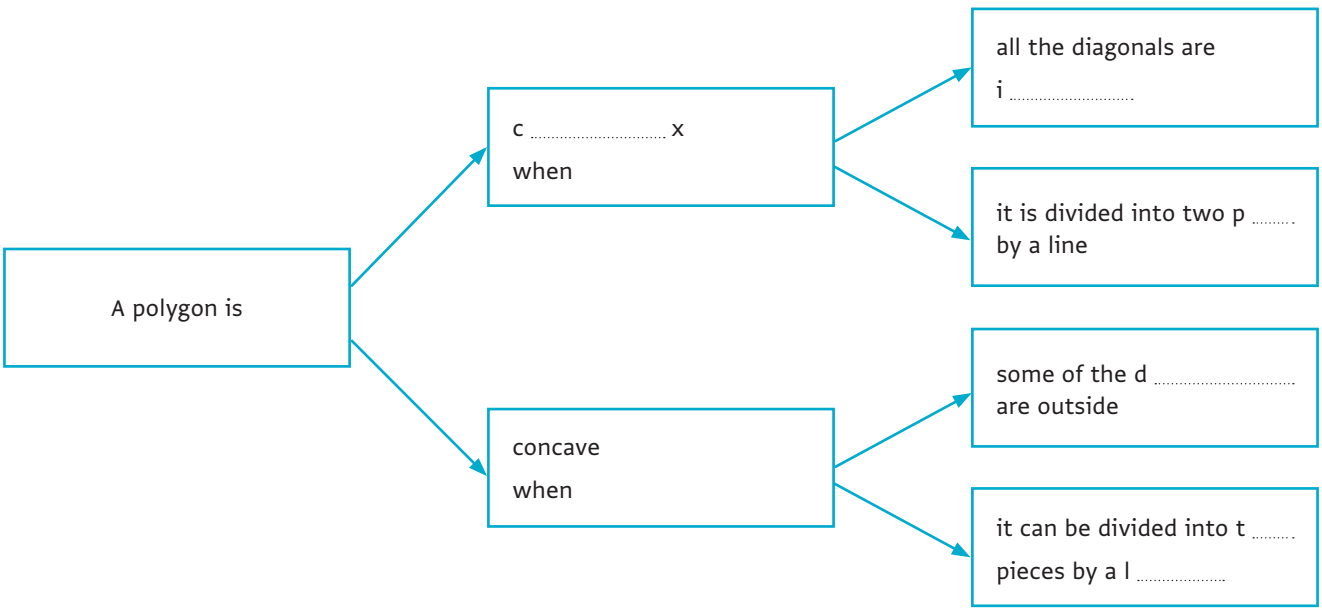
Group 1

Regular and irregular polygons.



Group 2

Concave and convex polygons.



2b. **Complete the grid.**

NAME OF POLYGON	NUMBER OF SIDES	DRAW THE SHAPE
	3	
quadrilateral	*4*	
	6	
octagon		
decagon		

2c. **Choose a polygon picture and write a simple paragraph following the layout.**

a. Type of polygon: regular/irregular; concave/convex
b. Number of sides; length of sides equal/different
c. Number of angles; equal/different
d. Diagonal inside/outside
e. Line of intersection

Test your knowledge

3a. **At the end of the Unit you should know:**

	I KNOW	I DO NOT KNOW
The different types of polygons		
The main characteristic of regular/ irregular polygons		
The main characteristic of convex/ concave polygons		
The definition / meaning of key-words like: line, diagonal, angle, side, shape, vertex, point, equal/same, different, segments, concave, convex, regular, irregular		

3b. **At the end of the Unit you should be able to:**

	I AM ABLE	I AM NOT ABLE
Identify and describe polygons		
Read a geometric text		
Use the dictionary/picture dictionary to understand a text		
Look for information in your book		
Describe a picture		
Complete a grid or a diagram		
Interview someone about polygons		
Converse with your mates		