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Unit Description

Title	*RELATIVE INTEGERS*
Age of students/grade	10 years old / Primary School
Length of the unit	3 hours
Mathematical topic	• *Mathematical areas relating to numbers and measurement (transactions)* • *Representing numbers on the oriented straight line*
Prerequisite knowledge	Natural numbers
Materials needed	• Usual stationery • IWB or Interactive Whiteboard
Objectives	• Interpreting negative integers in real contexts • Representing numbers on the oriented straight line and using scales in important contexts for Science and Technology
Notes on work with migrant students	- Presentation of the lexicon through flashcards in terms of contents, actions and tools. - The lexicon of the **tools** to be presented is: ▪ About mind maps ▪ About questionnaire

Lesson plan:

STEP 1

The teacher explains to the pupils some problems where natural numbers aren't enough to describe and to solve situations. (ATTACHMENT 1)

STEP 2

The class is divided into groups by the teacher, each group receives a problem. After about 15 minutes, every group has to give a possible solution and, at the end of the lesson, the teacher will guide the students into the discovery of relative integers.

SEE ATTACHED MATERIAL

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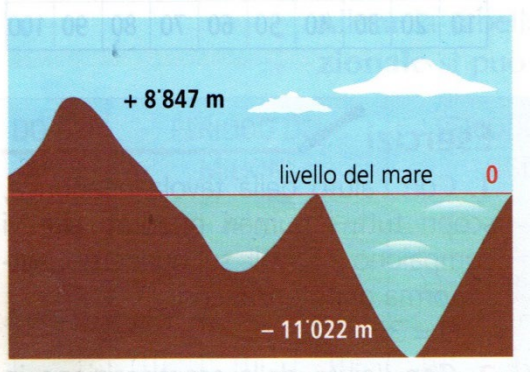
ATTACHED MATERIAL

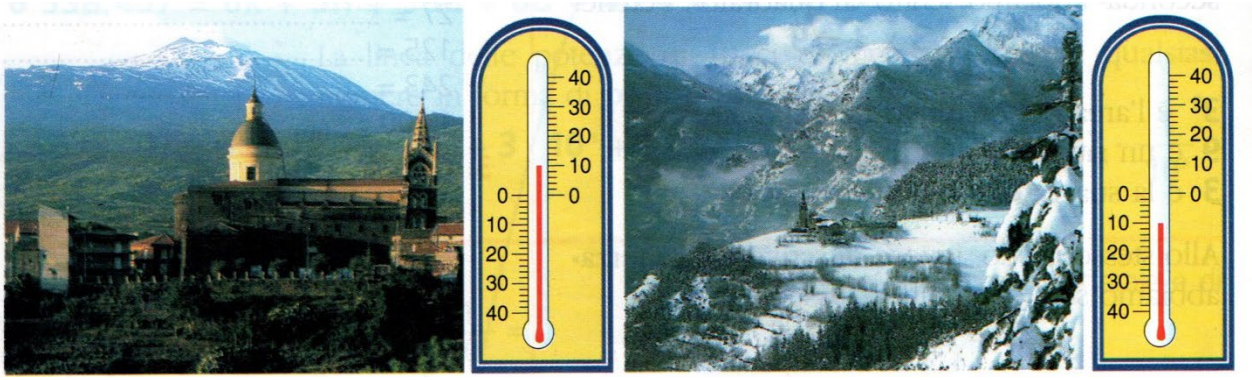
Situation 1
HEIGHT AND DEPTH



LIVELLO DEL MARE = SEA LEVEL

In Geography we use sea level as a reference to measure height, so we know that Mount Everest is 8847 m above sea level and that the Marianas Trench has a maximum depth of 11.022 m below sea level.
How can I express these 2 measurements? Do we know any numbers with the sign – before them?
In a correct way we say that Mount Everest's height is + 8847 m and Marianas Trench's height is -11.022 m

Situation 2
TEMPERATURES
In Sicily in January the thermometer stands at +10°C, while in Valle d'Aosta, on the same day, the thermometer stands at -10°C.

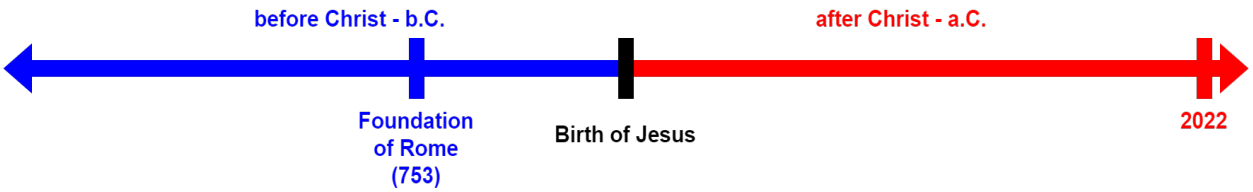


As you can see, the thermometer stands at 10°C in both Sicily and Valle D'Aosta, but the temperature is not the same at all.
Temperature in Sicily: 10°C above 0
Temperature in Valle D'Aosta: 10°C below 0
Is there a difference?
Even when we deal with climate and temperature we need relative numbers.

Situation 3
HISTORICAL EVENTS
In History, in our country we count years, as an accepted custom, starting from the Birth of Jesus, about 2022 years ago, which we consider the zero year.

Rome was founded in 753 B. C.
When was Rome founded?

2775 years ago.

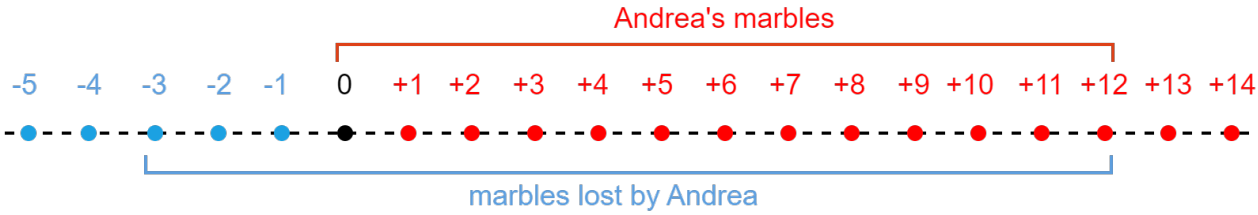


Situation 4

BALANCE BETWEEN INCOMES AND EXPENSES

Andrea has got 12 coloured marbles and while playing with Stefano he looses 15 of them. How many marbles has Andrea got at the end of the game?

Andrea has lost more marbles than the marbles he owns. We can represent this situation on the numbers' line.



As you can see, Andrea has lost more marbles than those he owned, that is, he ows 3 marbles to Stefano.
How can I express Andrea's debt?
The same thing happens in commercial activities, where we can have **assets**, that is a gain, or **liabilities**, that is a loss. We can expres assets by means of positive numbers and liabilities by means of negative numbers.

EVALUATION TEXT

Complete these sentences writng the right relative number:

1 Marco by playing has lost 4 picture-cards, so he has……..
2 Maria has won 12 marbles, she has…….
3 Mr Rossi has assets worth 40.000 Euros, his balance is……..
4 Mr Neri has los 3500 Euros, his balance is……..
5 Mediterranean Sea has a maximum depth of 5.120 m below sea level: that point has a height of …….
6 The highest mountain among the Pyrenenan ones is the Pico de Aneto, which is 3.404 above sea level: that mountain has a height of……
7 The medium temperature in Helsinki in last July was 5°C above 0, that is …….., in January it was 12°C below 0, that is ……

Calculate and answer writing the right relative number:

1 Stefano had 3 picture-cards and he has won 5 more. He has got…….
2. Carlo had 8 marbles, but he has lost 11. He has got ……..
3 A stationer has spent 250 Euros to buy notebooks, but after selling them he has only cashed 185 Euros. His balance now is ……..
4 Today at 2 o'clock in the afternoon the temperature was 9°C, after the sunset there was a fall of 15°C, so now it is…….
5 A scuba diver has reached a platform which is 10 m below sea level, then he has gone down 11 metres more, now he is at ……
6 There are still 8 schooldays, a Saturday and a Sunday before the beginning of Christmas holidays, so we are at …….
7 The age of the Roman empire started in Rome in 27 B. C. and it lasted 503 years. The Roman empire broke down in ……..
8 The Emperor Augusto ruled from 27 B. C. until 14 A. C. His empire lasted …….. years

Comparing numbers

Read and complete:

- If you have to compare two natural numbers which have a different number of figures, the highest one is the number which has more figures:

131 850 000 > 95 970 000

- If two natural numbers have the same number of figures, the highest one is the number which has the higher first figure on the left:

522 222 222 > 299 999 999

- If the first figure on the left is the same, we compare the second one or the third one and so on:

325 362 473 > 325 352 473

You can also compare two **relative numbers:**

+ 5 < + 8 because 5 < 8: you apply the rules to compare natural numbers;

— 9 < + 5 because a negative number is always smaller than a positive number;

— 7 < — 3 because — 7 comes before — 3 on the numbers' line

Complete with the symbols < or >.

-5 ……..12

+6 ……+2

-18 …….-5

+6 ……..-10

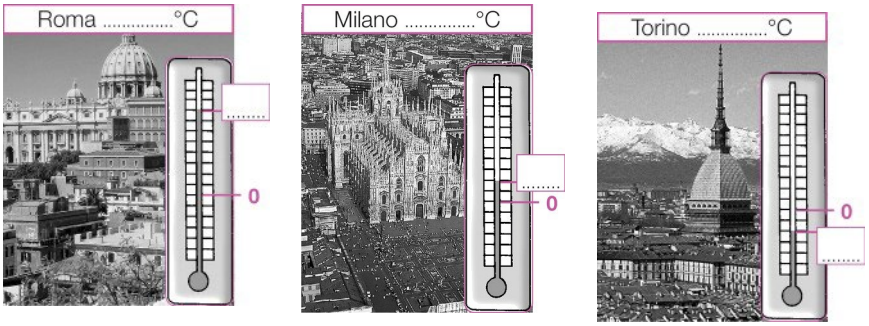
RELATIVE NUMBERS

Relative numbers are those numbers whose value depends on the sign + or – which goes before them.

+ 2 relative positive number

- 2 relative negative number

Observe and write the temperatures measured in the three cities at 8 o' clock



Please remember that each line is equivalent to a degree

Decide whether the following statements are T or F:

- + 16 is a relative positive number T F
- — 8 èis a relative positive number T F
- 16 is a relative negative number T F

Read and complete

Pisa	+18° C
Lucca	+15° C
Trento	-5°C

Today the warmest city is ……

Today the coldest city is …….

Dealing with Trento and Pisa there is a difference of ……. degrees.