# LESSON 1. THE CARTESIAN COORDINATE SYSTEM

## AIMS

Using and understanding the Cartesian coordinate system.
Understanding teacher’s instructions
Reading and listening to the rest of the class
Learning to work in pairs/group
Giving instructions to work in pairs (teacher’s notes)

## TEACHING OBJECTIVES

### CONTENTS
- To distinguish x-axis and y-axis
- To Graph points in the Cartesian coordinates system
- To identify the coordinates of a point

### CULTURE
- To associate the contents of the lesson with real world situations
- To be aware of the relation between Cartesian coordinates and Navajo rugs
- To be aware of the relation between Cartesian coordinates and Urban Graffiti.
- To be respectful with partners when working in groups/in the plenary

### COMMUNICATION
- To learn vocabulary related to the lesson
- To interact in English when working in pairs.
- To give instructions
- To listen and understand instructions
- To read and construct sentences
- To ask questions
- To give short answers
- To read a short text
- To give conclusions/results of the activities in the plenary
- To learn position vocabulary
- To pronounce correctly the main vocabulary
- To compare
| COGNITION | To locate the position of a point  
To remember which are the coordinates of a point  
To identify the sign of the x or y-coordinate depending on the quadrant  
To plot a point  
To locate points in a map  
To do a research task and put intro practice the learnt concepts  
To discus and give recommendations about the power-point presentations of the classmates. |

<table>
<thead>
<tr>
<th>LEARNING OUTCOMES: learners will be able to:</th>
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<tbody>
<tr>
<td>Plot and identify the coordinates of a point</td>
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<tr>
<td>Identify the sign of the coordinates depending on the quadrant</td>
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<tr>
<td>Work in pairs</td>
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<td>Understand and give instructions</td>
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<td>Understand and asking questions</td>
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<tr>
<td>Talk in English in the plenary, giving answers or conclusions</td>
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<table>
<thead>
<tr>
<th>ASSESSMENT</th>
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<tbody>
<tr>
<td>The outcomes and participation of the students in the different activities, and the final activity.</td>
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</table>
## LESSON 2. GRAPHS AND FUNCTIONS.

### AIMS

- Interpreting and drawing graphs
- Identifying the dependent and independent variable
- Identifying a function
- Giving instructions to solve word-problems

### TEACHING OBJECTIVES

#### CONTENTS

- To identify constants and variables
- To distinguish the dependent variable from the independent variable, and locate them in the x and y-axis
- To define a function
- To learn the different ways of expressing a function
- To interpret and draw graphs of functions

#### CULTURE

- To be interested in finding real-life situations related to mathematics
- To be aware that real life situations can be represented by a graph or a function: a trip, a movement, a walk…
- To understand the distance-time-speed relation
- To be aware of the climate conditions of a dessert (The saharawis of western Sahara and their situation)
- To be aware of the different temperatures around the world
- To be aware of the existence of equations to predict the eruption of a geyser (Geysers in Kamchatka and discovering the peninsula)
- To be respectful with partners when working in groups/in the plenary

#### COMMUNICATION

- To pronounce in an accurate way the new vocabulary
- To learn new vocabulary related to the lesson
- To give answers (sentences)
- To read short texts
- To build sentences
- To give reasons
- To learn vocabulary of movement/changes used in graphs
- To write short texts
- To ask questions from sentences given previously.
- To look for information on the net
- To be motivated enough to start to talk in English
**COGNITION**

To distinguish a variable from a constant in a real-life situation
To analyse an algebraic expression, and identify the variables, constants, dependent and independent variables, and identify the functional relation.
To associate a text with a function, and vice versa
To learn to draw a function
To identify in which way the function is expressed
To read and interpret graphs related to real-life situations
To understand word-problems, and solve them (Translate words into mathematic language).
To discuss and give recommendations about the power-point presentations of the classmates.

**LEARNING OUTCOMES: learners will be able to:**

- identify relationships between variables, and decide if they are a function
- draw and interpret graphs
- express a text as an algebraic expression, table, and graph
- express a table as a graph, an algebraic expression, and a text
- express a formula as a text, graph or algebraic expression
- express a graph as a text, algebraic expression or table of values
- understand and solve word-problems
- write short texts and sentences
- give reasons
- ask questions

**ASSESSMENT**

The outcomes and participation of the students in the different activities, and the final activity.
**AIMS**

<table>
<thead>
<tr>
<th>AIMS</th>
<th>Identify linear relations, and direct variations.</th>
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<tbody>
<tr>
<td></td>
<td>Graphing linear functions, direct variation functions, and constant functions</td>
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<td>Giving the algebraic expression of a linear function, direct variation function, and constant function.</td>
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</table>

**TEACHING OBJECTIVES**

<table>
<thead>
<tr>
<th>CONTENTS</th>
<th>To draw the graph of a linear function, direct variation function and constant function</th>
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<tbody>
<tr>
<td></td>
<td>To write the algebraic expression of a linear function, direct variation function, and constant function</td>
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<td>To understand the meaning of gradient or slope, y-intercept and x-intercept</td>
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<th>CULTURE</th>
<th>To associate the contents of the lesson with real world situations</th>
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<td>To be respectful with partners when working in groups/in the plenary</td>
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<td>To be aware of the currencies of different countries (dollar, pound, euro,….) and work with them.</td>
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<td>To learn to estimate the height of a person from the length of the femur.</td>
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<td>To understand that functions can be used to calculate the cost of a product or service</td>
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<td>To be aware that there is a direct variation relation between the weight in Venus and the Earth.</td>
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<td>To be aware of the most two common systems for measuring temperature: Celsius and Fahrenheit.</td>
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<td>To choose a job through mathematics: studying and working with the wages of a job in U.S.A</td>
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<td>To be aware of the different wages in Developed, Developing and non-developed countries, and working conditions.</td>
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<th>To talk in English: the learners will interact in English when working in pairs.</th>
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<td>To give reasons/justify a choice</td>
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<td>To read a word-problem, and understand what they are reading.</td>
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<td>To make predictions</td>
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<td>To ask questions</td>
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<td>To show agreement/disagreement</td>
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<td>To prepare questions for an interview</td>
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<td>To summarize the conclusions of a research task</td>
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<td>To express conditions</td>
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### COGNITION

- To identify the slope in an algebraic expression
- To calculate the slope from the graph of a line
- To guess when the slope is positive or negative
- To identify increasing and decreasing functions
- To distinguish the algebraic expression of a linear function, direct variation function, or constant function.
- To build the algebraic expression from a graph (calculating the slope and y-intercept if it is necessary)
- To distinguish between linear relation and direct variation
- To calculate the constant of variation
- To associate equations with graphs
- To make predictions or estimations
- To discuss and give recommendations about the power-point presentations of the classmates.

### LEARNING OUTCOMES: learners will be able to:

- Talk in a comfortable and relaxed way, putting the mistakes aside
- Read and understand word-problems
- Identify graphs and equations of linear functions, direct variation functions, and constant functions.
- Identify word-problems with linear functions, direct variation functions and constant functions.
- Learn to use graphs for units conversion

### ASSESSMENT

The outcomes and participation of the students in the different activities, and the final activity.

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Mª Luz Esteve Crespo  
IES Andreu Nin. El Vendrell