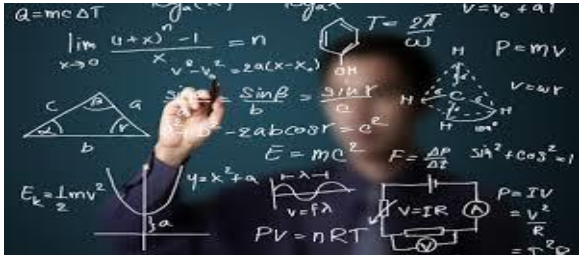
LEARNING MATHS

First steps into CLIL



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Generació Plurilingüe

First Year
2017-2018

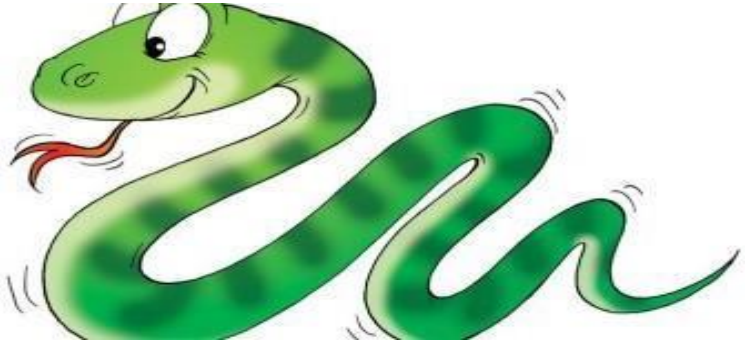
Generalitat de Catalunya
Departament d'Ensenyament

MARC PER AL PLURILINGÜISME

A FAVOR DE L'ÈXIT ESCOLAR

GEP session	Session 2 - The multicoloured layers of CLIL input: Fostering cognitive skills.
Title of the lesson or topic	FUNNY ALGEBRA
Course / year / age	2 ESO 2017-2018
Timing	2 hours
Short description of the session/s ● **What is the session about?** ● **What do I want my students to do today?**	This session is about Algebra. The purpose of Algebra is to make it easy to state a mathematical relationship and its equation by using letters of the alphabet or other symbols to represent entities as a form of shorthand. Algebra then allows you to substitute values in order to solve the equations for the unknown quantities. I want that my students learn how to solve equations and they are able to analyze simple graphs while they are working in english.
In terms of academic content, what are the students learning and what are they learning to do?	The students are learning to solve an equation to get the variable by itself on one side of the equation and a number on the other side of the equation.
In terms of language, what are the students practicing or learning to do?	In the task 1, they are practising the concepts of math keywords. In the task 3, they are practising the comprehension in order to relationate the variables x and y in the graph.
In what way is this 2-hour lesson plan a good example of what we learnt in the GEP course session?	The lesson plan includes one important factor that Lynn tell us many times. Explain the instructions of the activity to make very clear what our students have to do. In every task, I put " step by step lesson" to make easy and understable the activity in order to hep my students.
Other important information	

1 ACTIVITY WORD SNAKE



Explanation:

1 - Reading: students have to find the best way to explain the word –

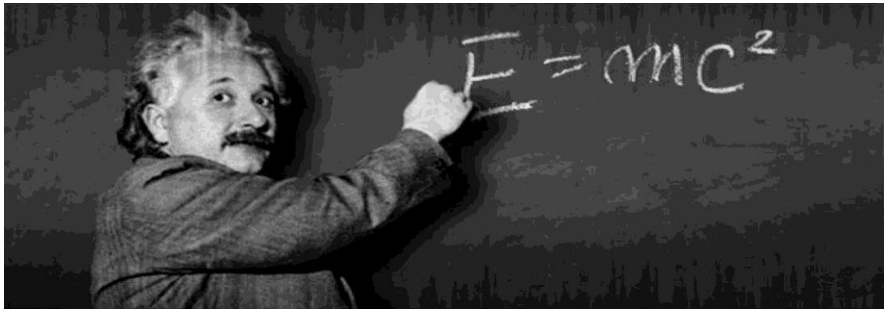
2. Writing: students have to write the word, obviously, but also have to think about other words to 'make up' this final word –

3. Speaking: when solving each other's' word snake, students have to read out aloud the descriptions –

4. Listening: when trying to solve the word snake, students have to listen to the description and come up with the word

1 .A 3-D shape that is not transparent	**SOLID**
2. A shape with four angles	**QUADRILATER**
3. A single quantity regarded as a whole in calculation	**UNIT**
4. The distance between two half lines	**ANGLE**
5. 90 degrees	**RIGHT**
6. When things are the same	**EQUAL**

2 ACTIVITY LINEAR EQUATION IN ONE VARIABLE



Step by Step Lesson

1. **How many solutions does this equation have?**
   12x-4= 11x
   a) **No solution**
   b) **One solution**
   c) **Infinitely many solutions**

Explanation:

We know that if solving an equation yields a statement that is false, like 5=3, then the equation has no solution.

If we can produce an equation solving a statement that is true for a single value, like x=2, the equation will have one solution. An equation statement that is always true, like 2=2, has many solutions.

12r – 4 = 11r

-4 = -r

4 = r

The statement 4 = x has a single value. So, the equation has one solution.

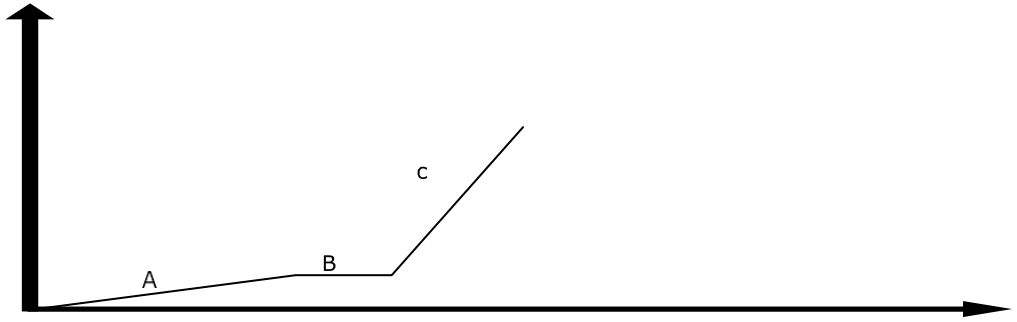
Activity: Try to calculate the following equations according to the before instructions:

A) **4x+3=5x**
B) **6x-6=8x+3**
C) **2x+5=11x-6**
D) **7x-5=12x-2**

3 ACTIVITY Analyzing Functional Relationships by Graphing

STEP BY STEP LESSON:

Elisa made a graph to show his trip to the office. She walks to his friend Rosa's house and, together, they hire a taxi to the office. The taxi stops at the Serveis Territorial's Office.



Explanation:

The graph has three stages that go along with the story we have been presented with.

a) Elisa is walking to Rosa's house at a constant rate.

b) Elisa gets to Rosa's house and hired a taxi.

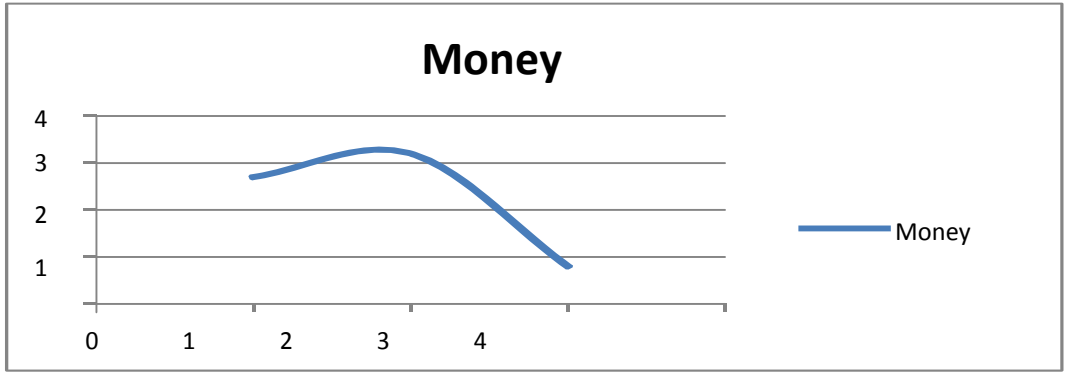
c) **Elisa and Rosa are sitting in the taxi and the taxi is moving at a constant rate. If we compare the speed of the taxi (c) to Elisa's walking (a), the taxi moves at a much faster rate.**

INDEPENDENT PRACTICE

Complete all the problems.

1. **Lynn is going to the playground. First, he walks to church. He stays there for few minutes. Then he hires a taxi to drive him to the playground. The taxi stops at a coffee shop and then the playground. Draw the graph representing Lyn's trip to the playground.**

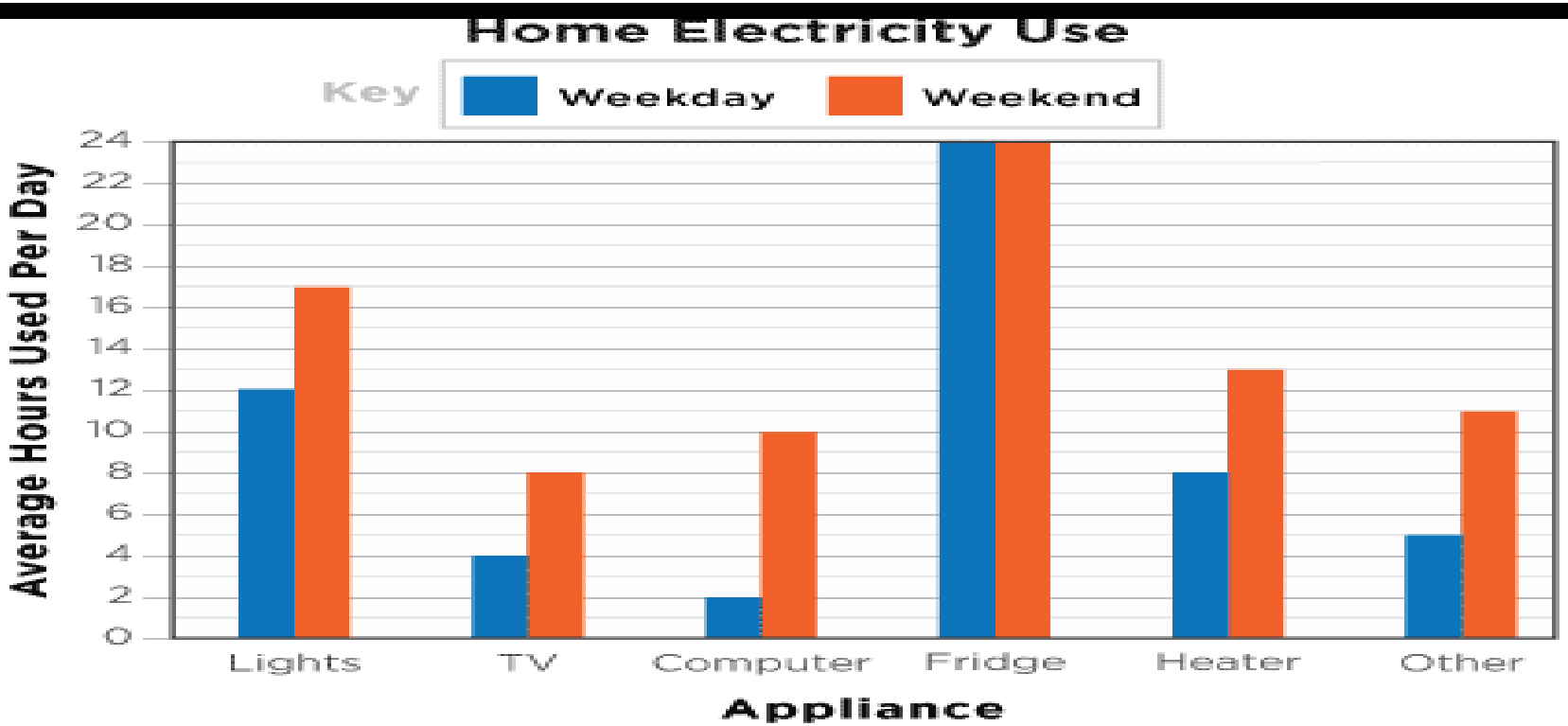
2. Describe the graph of the function.



3. Describe the graph of the function between y = 2 and y = 4.

GEP session	Session 2 - The multicoloured layers of CLIL input: Fostering cognitive skills.
Title of the lesson or topic	Statistics
Course / year / age	2 ESO 2017-2018
Timing	2 hours
Short description of the session/s • **What is the session about?** • **What do I want my students to do today?**	This session is about statitics. The purpose of statistics is to make it easy to state a mathematical relationship and bar graphs are useful in representing data with distinct units, such as years and months. They are also valuable in showing the differences, or making comparisons, between different variables. Bar graphs are valuable when countable variables, facts and data are to be demonstrated. Bar graphs show these, and other comparative values, in a distinct and comprehensive manner, giving a clearer, more understandable picture of data distribution.
In terms of academic content, what are the students learning and what are they learning to do?	The students are learning to analize a bar graph in order to determine the categories or values that are to be placed along the horizontal and vertical axes; making the scale that is to be used to determine the numerical data; and setting the type, style and length of each bar.
In terms of language, what are the students practicing or learning to do?	In the task , they are practising the concepts of math keywords. Also, they are practising the comprehension in order to relationate the variables x and y in the graph.
In what way is this 2-hour lesson plan a good example of what we learnt in the GEP	The lesson plan includes one important factor that Lynn tell us many times. Explain the instructions of the activity to make very clear what our students have to do. In every task, I put “

course session?	step by step lesson” to make easy and understable the activity in order to hep my students.
Other important information	



Look at the bar graph.

1.Can you tell what the bar graph measures?

- Kilowatts used by appliances
- Hours appliance used per day
- Total electricity per year

Hours appliance used monthly

2. What do the numbers in the vertical axis of this graph represent?

Hours in a day

Days of the week

Types of appliances

Amount of electricity used

3. Now read what's on the horizontal axis, the line that runs along the bottom of the graph from left to right. It is labeled Appliance. Each appliance in the graph has two bars. What is measured by the blue bar?

Amount of electricity used

Weekday: hours of use

Number of appliances used

Weekend: hours of use

4. Which appliance has the most total usage?

Fridge

Heater

Lights

Television

5. On average, how many hours is the computer used on a weekday?

8

16

2

10

6. How many hours a day on average is the heater used on weekends?

5

8

13

14

7. Which appliances are used for an average of 5 hours a day more on weekends than on weekdays?

Lights and Television

Television and Other

Lights and Heater

8. Which appliance is used twice as many hours on the weekends as it is on weekdays?

Lights

Computer

Refrigerator

Television

In worksheet on bar graph we will practice different questions on representing the bar graph from the following data given in the questions.

1. The number of bed-sheets manufactured by a factory during five consecutive weeks is given below.

Week	First	Second	Third	Fourth	Fifth
Number of Bed-sheets	600	850	700	300	900

Draw the bar graph representing the above data.

2. The number of students in 7 different classes is given below. Represent this data on the bar graph.

Class	6^{th}	7^{th}	8^{th}	9^{th}	10^{th}	11^{th}	12^{th}
Number of Students	130	120	135	130	150	80	75

3. The number of absentees in class VIII was recorded in a particular week. Represent this data on the bar graph

Days	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.
Number of Absentees	130	120	135	130	150	80

(a) On which day the maximum and minimum students were absent?

(b) How many students were absent on Wednesday and Friday?

(c) On which days the same number of students was absent?

4. The number of trees planted by Eco-club of a school in different years is given below.

Year	2005	2006	2007	2008	2009	2010
Number of Trees to be Planted	150	220	350	400	300	380

Draw the bar graph to represent the data.

GEP session	Session 6 - . Cooperative and collaborative learning in CLIL.
Title of the lesson or topic	Don't be lost
Course / year / age	2 ESO 2017-2018
Timing	2 hours
Short description of the session/s • **What is the session about?** • **What do I want my students to do today?**	This session is cooperative learning working with operations numbers. The purpose of ooperative learning is more than merely having students sit together, helping the others do their work. Directing students who finish their work early to assist others isn't a form of cooperative learning either. Neither is assigning a group of students to "work together" UNLESS you assure that all will contribute their fair share to the product.
In terms of academic content, what are the students learning and what are they learning to do?	The students are learning to work in a collaborative way at the same time they are learning how to operate with numbers.
In terms of language, what are the students practicing or learning to do?	In the task , true cooperative learning experience for students requires that a number of criteria be met. They are: -Division of labor among students in the group -Face-to-face interaction between students -Assignment of specific roles and duties to students -Group processing of a task -Positive interdependence in which students all need to do their assigned duties in order for the task to be completed -Individual accountability for completing one's own assigned duties -The development of social skills as a result of cooperative interaction -Provision of group rewards by the teacher
In what way is this 2-hour lesson plan a good example of what we learnt in the GEP course session?	The lesson plan includes one important factor that Eloida said to us during the session today. The implementation of collaborative learning **.** Explain what will occur. Explain the rules which include; contributing to the team effort; listening to teammates; helping other team members; and asking the teacher for help only if it is a question of everyone in the group. Previous to this, you should have devised a way to eliminate groans and complaints from high achievers and socially

	popular students who may not approve of the composition of their group. Arrange students into teams at tables or where desks have been pushed together.
Other important information	

Task 3 **Cooperative and collaborative learning in CLIL.**

Don’t be lost

Work in groups of 2,3,4,5 or 6. Cut out the 42 cards. Deal them all out. The player with the start card reads it out: "Three timesfive!" The player with the answer on one of their cards reads it "15!" and then reads the new question on that card: Add 9!

Lay all the cards face up and work together to put them in order.

Use a timer. See how fast you can do it.

Start

3 x 5

15

add 9

24

x 2

These follow me games are often used in whole class groups, but once a child has presented their answer and question they become spectators. If used in groups of four and all the cards are dealt, the children are engaged for most of the time, because they have to watch out for times when they have both the question and the answer cards. This makes it a more collaborative activity and probably leads to more exploratory talk. Our main aim of course is to get students to devise their own games to try out on each other.

This is really collaborative!

CollaborativeLearning

Basic principles:

1. Build on prior knowledge.
2. Move from concrete to abstract.
3. Ensure everyone works with everyone else.
4. Extend social language into curriculum language.
5. Provide motivating ways to go over the same knowledge more than once.

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Work in groups of 2,3,4,5 or 6. Cut out the 42 cards. Deal them all out. Each person lays their cards flat in front of them. The player with the start card reads out the question: "Three times five?"The player with the answer on one of their cards reads it out: "15!" and then reads out the new question on that card: "Add 9?".

Continue with questions and answers until you reach zero. The aim is to do this quickly and accurately. Now make your own game!

OR

Lay all the cards face up and work together to put them in order. See fast you can do it. Use a

Start 3 x 5	15 add 9	24 x 2	48 divide by 4	12 x 3	36 double
72 divide by 8	9 multiply by 11	99 divide by 3	33 add 9	42 add 9	51 double
102 subtract 9	93 divide by 3	31 add 39	70 divide by 10	7 multiply by 9	63 double
126 divide by 6	21 add 14	35 multiply by 3	105 divide by 21	5 multiply by 9	45 add 15
60 double	120 divide by 4 and multiply by 3	90 add 9x2	108 add 36	144 subtract 48	96 divide by 12
8 squared	64 add 9	73 subtract 19	54 divide by 3	18 add square root of 49	25 add 55
80 divide by 4	20 add 6 x 6	56 double	112 divide by 4	28 subtract 4x7	0 Time to make your own game!

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TO MAKE YOUR OWN GAME

Work in groups of 3,4,5 or 6. Cut out the 42 blank cards.

Make your own follow me game.

Generalitat de Catalunya
Departament d'Ensenyament

GEneració Plurilingüe 1

Geometry Game

It has got at least one pair of parallel lines.	It has no lines of symmetry	It has got two pairs of parallel lines.	It has four lines of symmetry.	It has got angles which are 90º.	It has got two sides equal.
It has got two sides equal.	It has got all sides equal.	It has got angles which are 90º.	It has got no lines of symmetry.	It has got two lines of symmetry.	There are two pairs of parallel lines.
It has got four lines of symmetry.	It has got all sides equal.	It has got at least one pair of parallel lines.	It has got adjacent sides equal.	It has got all sides equal.	It has got two lines of symmetry.

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GEneració Plurilingüe 1

HOW TO PLAY GEOMETRY GAME

You need 4 people, one gameboard and two sets of cards (different colours.)
Work with your partners to make two teams of two.
Each pair takes a set of cards
Teams shuffle their cards and place them in a pile facing down.
They take it in turn to turn over their top card and decide where to put it on the board.
The winning team gets four in row diagonally, vertically or horizontally.
Decide whether to have challenges or a checking system.