"PROBLEMS solved with EQUATIONS"

Structure of the lesson plan

Brief summary of the main activities: Individual students will test their knowledge by doing an initial math activity. Then, in groups, they will compete in two problem solving tests (resolution and problem design) of first-degree equations, which will provide them with ideas to elaborate a game based on problem solving and solving of equations.

Main methodologies: The main methodologies used will include co-operative learning and the learning scenarios

Total time: The total time for this learning unit should be 8 hours. However, this may vary according to the students' needs.

Competences:
Knowledge and skills
- Understanding a text in the context of problems.
- Translating the data of the problems into algebraic language.
- Rasing and solving problems.
- Verifying the accuracy of the solution obtained.

Soft skills - Collaborative skills
        - Respect each other

Learning outcomes:
Knowledge:

Raising and solving equation problems.

European Key Competences:
- C1: Communication in the mother tongue: Read and understand a text.
- C3: Matematical competence and basic competences in science and technology: Identify the appropiate strategies to solve problems.
- C5: Learning to learn - The ability to pursue and organise one's own learning, either individually or in groups, in accordance with one's own needs, and awareness of methods and opportunities.

Assessment:

Prerequisites:

- Operate with rational numbers (priority in the order of operations and the rule of signs)
- Translate into algebraic language and vice versa.
- Operate monomials (addition, subtraction and product by a scalar).

- Solve 1st and 2nd degree equations.
- Check the solution of an equation.
- Identify and represent basic geometric figures.
- Calculate the perimeter and the area of a geometric figure.

How to assess the prerequisites – 60-minute-test

- Exercise nº 1: Operations combined with integers and rational numbers.
- Exercises nº 2 and 10: Translate the following statements into algebraic language.
- Exercise nº 3: Translate the following algebraic expressions into colloquial language.
- Exercise nº 4: Operations of algebraic expressions (addition, subtraction and monomial product)
- Exercise nº 5: Represent geometric figures.
- Exercise nº 6: Express the perimeter and the area of flat geometric figures.
- Exercise nº 7: Solve equations of 1st and 2nd grade.
- Exercise nº 8: Check that a number is the solution of an equation.
- Exercise nº 9: Calculate the area and theperimeter of a given flat figure.

Final Assessment:
  - **The product**: Two worksheets (Wsht 1: Problem solving; wsht 2: raising problems) **(20 %)**, elaborated game and presentation of the game (game rules). **(20%)**
  - **The process**: Daily observation of the work done by students both individually and collectively. **(10%)**
  - **Final test (50%) (60 Minutes)**

Learning Scenario	Time/ no of lessons	Goal(s)	Learning Activities	Teacher's & Students' Roles	1) Learning Environment 2) Digital Technologies & Tools 3) Collaboration / Individual work 4) Reflection / Assessment
Dream	55 minutes	To motivate students in the importance of equations and, therefore, the need for problem solving throughout history.	• Initially the teacher asks the following questions: "Are the equations important? Why?" To do this, use one of the course platforms. (10 min) • Next, he proposes students a game in Kahoot (or any other app) based on problems throughout history, science, technology, and art that have required the use of equations. (20 min) • The class is then separated into groups of 4 people and asked to invent a name and a logo that will identify them throughout the unit in the different tests that are carried out. (10 min) • Next, the teacher enters the score obtained in the game by each student in a spread sheet and adds the components of each group, assigning each group points from 1 to the number of groups (from the lowest to the highest score). • Finally, the students sitting in groups reflect on existing strategies to solve any problem using the concepts acquired in previous courses. They list strategies and invent or look for an example in which they are applied. (15 min)	**Teacher** motivates, raises questions, controls time, and assigns scores. **Students** participate and get involved in the activity, contribute with ideas, look for information.	**1) Physical:** classroom **2)** Notebooks, computers (o students' mobilies with internet data) and a projector. **3) Individual work:** Each student individually values the importance of the equations and tests their knowledge in the game. **Collaborative work:** Each group thinks about a problem solving strategy and an example where it applies. (Team work: The work groups are elaborated by the professor previously by contemplating three levels of experts in each group). **4) Reflection:** **Assessment**: informal observation of the group work.

Learning Scenario	Time/ no of lessons	Goal(s)	Learning Activities	Teacher's & Students' Roles	1) Learning Environment 2) Digital Technologies & Tools 3) Collaboration / Individual work 4) Reflection / Assessment
Explore	50 minutes	• To understand basic problem solving strategies.	• At the beginning of the class, the teacher asks the the spokesperson of each group to present a problem-solving strategy and an example in which it is applied. • Next, the teacher makes a summary scheme and completes the information with those strategies that the students did not mention. (20 min)	**Teacher**: guide / advisor, stimulator, observer. They complete information, control time and provide material. **Students**: presents strategies.	**1) Physical:** Classroom**.** **2)** Notebook, class book. **3) Collaborative/Team work**: A spokesperson for each group presents the strategy and example selected to the rest of the class. In case their strategy has already been said, the group must provide another one. **4) Assessment:** informal observation of the group work.
Map	35 minutes	• Trabajar las diferentes estrategias de resolución.	•Initially, the teacher explains the activity, which consists of a contest to solve problems of equations, in which a problem, laminated, from the list given previously, will be given to each group randomly. They will then have 10 minutes to identify, read, lay out and solve it. After that time, the problems must be interchanged respecting the rotation assigned by the teacher. (5 minutes) • Next, the teacher gives each member of the group a sheet with 10 problems of equations, plus an extra sheet in which to indicate the collective approach of each problem, which must be delivered to the teacher at the end of the activity.	**Teacher:** advises, guides, reviews the work of students, controls time, provides material and gives instructions. **Students:** check and review the work of the other classmates. They suggest strategies.	**1) Physical:** Classroom **2) Notebook, worksheets with problems and a calculator.** **3Collaborative or cooperative work:** The students in each group review the work done by their peers and develop joint strategies to solve the problems raised. A spokesperson for the group is the one who stands up during the rotation of the problems and the secretary of the group writes the final proposal of the group in the extra sheet. For this, consensus must be reached. **4) Assesment**: At the end of the activity each group delivers the card with the final approach of the problems. **Homework:** Each student should perform the rest of the unsolved problems in class at home .

Learning Scenario	Time/ no of lessons	Goal(s)	Learning Activities	Teacher's & Students' Roles	1) Learning Environment 2) Digital Technologies & Tools 3) Collaboration / Individual work 4) Reflection / Assessment
Explore	20 minutes	• Strategies to develop a problem from its solution.	• At the beginning of the class, each group does a brainstorming session of problems solved at home, and a spokesperson from each group comes out to solve the problem on the board. • The teacher then proposes to all the students the challenge of inventing an equation that has a concrete value as its solution, taking into account for this, the elementary transformations in the equivalent equations. • Subsequently, each group must invent a statement that corresponds to the equation. Doing brainstorming later.	**Teacher:** checks the work of the groups, guides and gives instructions. **Students:** They help their peers, review the work done and make decisions.	**1) Physical:** Classroom **2) Notebook, worksheets with problems.** **3) Individual and collaborative work:** The secretary of each group will collect the names of those members of the group who have not completed the task in an agenda. Collaboratively they will make a brainstorming activity of the work done individually for the later correction by the teacher. Each group invents a statement associated with the solution proposed by the teacher. **4) Assessment**: Observation of the work done by each student.
Map	35 minutes	•Building problems form a given solution.	•The teacher gives each group a number with which they must invent an equation that has it as its solution. In addition, a statement corresponding to that equation must be invented. This statement will be written on a sheet provided by the teacher. • Next, the teacher assigns a number to each group that	**Teacher:** advises, guides, reviews the work of students, controls time, provides material and gives	**1) Physical:** Classroom **2) Notebook, worksheets with problems**

			will serve to identify the problem proposed by each group. Then, a quick round of problem solving is performed with the problems developed by the students themselves, following the same order established in the previous session.	instructions. **Students**: check and review the work of the other classmates. They raise equations, invent statements, and solve problems.	**3) Collaborative or cooperative work:** The students in each group review the work done by their colleagues and elaborate the equation and the statement associated with this equation. The secretary writes the statement of the problem on the sheet given by the teacher. A spokesperson for the group is the one who stands up in the rotation of the problems and the secretary of the group writes the final proposal of the group in the extra sheet. For this, consensus must be reached. **Assesment:** At the end of the activity each group delivers the card with the final approach of the problems. **Homework:** Each student is given a worksheet with problems to solve as well as with statements to associate with given equations and equations to invent a statement. (to hand in)
Explore	55 minutes	•Presentation of the final product. (Making a game)	• At the beginning of the class, the teacher collects homework. • Next, the teacher explains the final task of the unit. This consists of elaborating a game (a letter game, a board game or any other type) in which challenges are established based on the solving of problems of equations. To do this, the teacher shows them different types of games found on the network and provides them with guidelines on rules, thread, etc. (15 min) • Then, the students in groups select the type of game, choose the theme and set the rules. In case they finish, they must start to build or look for problems related to the selected theme (1/4 of the problems must be invented)	**Teacher:** Guides and advises, provides resources, observes. **Students:** Listen, make decisions and look for information.	**1) Physical:** Classroom **Virtual:** Internet **2) A notebook, a computer and a projector.** **3) Collaborative work:** Students in a group decide the theme of the game (thread), the format of the game; establish the rules and the number of players. All this is written by the group secretary in a sheet that will guide the rest of the students when they present the game at the end of the unit. **4) Assessment:** The teacher evaluates (individually) the collected worksheets, which will serve to add points to the box of each group. Direct observation of students.

Learning Scenario	Time/ no of lessons	Goal(s)	Learning Activities	Teacher's & Students' Roles	1) Learning Environment 2) Digital Technologies & Tools 3) Collaboration / Individual work 4) Reflection / Assessment
Make	55 minutes	• Elaboration of the game	• In this session the students continue to work on the development of the game by selecting the problems they are going to use, drawing up and solving them, establishing a logical order that corresponds to the rules and goals of the game set.	**Teacher:** guides, advises and observe. **Students:** listen, propose, explain and help other colleagues, negotiate and decide.	**1) Physical:** Classroom **Virtual:**Internet **2) A notebook and computers.** **3) Collaborative work:** Students search for, elaborate and solve problems related to their game. For this, they will have one computer per group in which they can consult game models, problems, etc. Once the problems have been selected, they will elaborate the problems, so that all the components of the group will have to make decisions and contribute with ideas. **4) Assessment**: Direct observation of the students.
Make	55 minutes	• Elaboration of the game	•At the beginning of the session, the teacher reminds all the students that it is the last session they have to prepare the game. In fact, in this session the students must build the physical material of the game (board, cards, etc.) according to the chosen type.	**Teacher:** guides and advises, observes and motivates students. **Students:** listen, propose, explain and help other classmates, make material.	**1) Physical:** Classrooom **2) A notebook, cardboard, glue, scissors, plastic paper, etc. (Any material needed for the manufacture)** **3) Collaborative work:** Students build their set of equations with all the collected information and established rules. **4) Assessment:** Direct observation of students. **Homework**: If the game is not finished in the classroom, they should have it finished for the next session.

Learning Scenario	Time/ no of lessons	Goal(s)	Learning Activities	Teacher's & Students' Roles	1) Learning Environment 2) Digital Technologies & Tools 3) Collaboration / Individual work 4) Reflection / Assessment
Ask/remake	55 minutes	• Implementation of the game.	• At the beginning of the session, the teacher checks that all the groups have their game prepared with the rules included. • Each group then plays their game supervised by the teacher and another Arts, Technology or Mathematics teacher. This simulation will help to correct the possible errors in the execution or the approach, as well as possible problems of expression.	**Teacher:** guides, advises, observes and reviews the work done by the students. **Students:** Explain, listen, simulate, ask, propose, rectify.	**1) Physical:** Classroom **2) Description, rules and the game material.** **3) Collaborative work:** The students in groups make a simulation, noting, the group secretary, possible errors of the game raised. They consult the teachers and propose solutions. **4) Assessment:** Direct observation of the students.
Show	55 minutes	• Presentation of the game and its implementation.	• At the beginning of the session, the teacher selects a member from each group that will be responsible for explaining the rules of the game to the rest of their classmates and will ensure that these are met. • Then, the teacher distributes to the rest of the students for the different games (5 students maximum) which must compete among them, thus, the winner of each game will note down their score in the box of their group. For this, it will be taken into account that the allocated game is different from the one that each one has elaborated.	**Teacher:** watches, controls time and gives instructions. **Students:** carry out the task.	**1) Physical:** Classroom **2) Games elaborated by the students temselves.** **3) Individual work:** Each student must practice their knowledge in solving problems by competing through games made with the rest of their peers. **4) Assessment:** Direct observation of students. Evaluation of the presentation, effectiveness and consistency of the games by using a rubric.

PREREQUISITE TEST:

INITIAL TEST

Name and surname:_____

1.- Operate and simplify:

a) $-3 - (-19 - 5) + 4 - 12 =$

b) $-(-9) \cdot (+5) + 16 : (-8) - (+4) \cdot (-6) =$

c) $3 - \dfrac{4}{5} + \dfrac{3}{6} - \dfrac{7}{4} - \dfrac{12}{15} =$

d) $4 - \dfrac{3}{8} \cdot \left(\dfrac{5}{6} - \dfrac{4}{15} : 2 \right) =$

2.- Express the following statements algebraically:

a) Double the price of apples:

b) The sum of two consecutive numbers:

c) Half the height of a building:

d) The square of the speed of a body:

3.- Express the following statements algebraically:

a) The average of the marks of the exams of Ana, Luis and Juana:

b) The difference of a number and its fifth part:

c) The age of Mary six years ago was three times that of John:

d) The quotient of two consecutive numbers is four:

4.- Operate:

a) -2x-4+14x+5x-8=

b) -3·(4x-5)+6·(8x+3) -7x=

c) 5x·(3- 6x) − 8·(2x-1)+5x·(1+8x)=

d) $\frac{3}{4} \cdot (4 - x) + \frac{2}{5}(3x - 2) - 1 =$

5.- Represents the following figures:

a) A square   b) A rectangular base prism   c) An equilateral triangle   d) An isosceles triangle

6.- Calculate the perimeter and area of the following figures:

a) A square: b) A rectangle: c) An equilateral triangle: d) A circumference:

7.- Solve the following equations:

a) $\dfrac{5}{2}x = -3$

b) $-2x + 4x + 3 = x - 8 + 2x$

c) $-3(x + 2) - (2x - 1) = 4 + x$

8.- Check whether x = - 2 or x = 1 are solutions of the following equations:
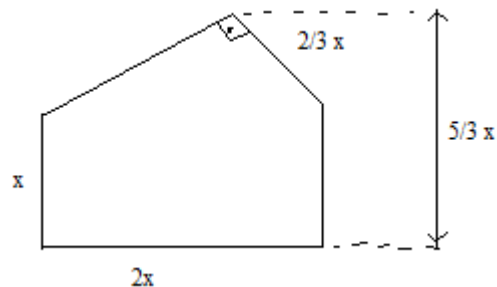
a) $2x - 3 = -x - 2$

b) $-3x + 1 = -5x - 4$

9.- Translates the following statemen into algebraic language t:

"Rosa's age is twice that of Maria, Fernando is five years older than Maria and Laura Rosa's age six years ago."

Name	Age

10.- Obtain the perimeter and area of the following figures:

SOLUTIONS INITIAL TEST

INITIAL TEST CORRECTION

NOTE: The test is evaluated on 10 points, and each question is the same.

1.- Operate and simplify:

a) $-3 - (-19 - 5) + 4 - 12 = -3 - (-24) - 8 = 24 - 11 = 13$

b) $-(-9) \cdot (+5) + 16 : (-8) - (+4) \cdot (-6) = 45 - 2 + 24 = 69 - 2 = 67$

c) $3 - \dfrac{4}{5} + \dfrac{3}{6} - \dfrac{7}{4} - \dfrac{2}{15} = \dfrac{180}{60} - \dfrac{48}{60} + \dfrac{30}{60} - \dfrac{105}{60} - \dfrac{8}{60} = \dfrac{210}{60} - \dfrac{161}{60} = \dfrac{149}{60}$

$mcm(5,4,6,15) = 2^2 \cdot 3 \cdot 5 = 60$

d) $4 - \dfrac{3}{8} \cdot \left(\dfrac{5}{6} - \dfrac{4}{15} : 2\right) = 4 - \dfrac{3}{8} \cdot \left(\dfrac{5}{6} - \dfrac{4}{30}\right) = 4 - \dfrac{3}{8} \cdot \left(\dfrac{25}{30} - \dfrac{4}{30}\right) =$

$mcm(6,30) = 2 \cdot 3 \cdot 5 = 30;$
$\qquad = 4 - \dfrac{3}{8} \cdot \dfrac{21}{30} = 4 - \dfrac{21}{80} = \dfrac{320}{80} - \dfrac{21}{80} = \dfrac{299}{80}$

2.- Express the following statements algebraically:

a) Double the price of apples: $2x$

b) The sum of two consecutive numbers: $x + (x + 1)$

c) Half the height of a building: $\frac{x}{2}$

d) The square of the speed of a body: x^2

3.- Express the following statements algebraically:

a) The average of the marks of the exams of Ana, Luis and Juana: $\frac{x+y+z}{3}$

b) The difference of a number and its fifth part: $x - \frac{x}{5}$

c) The age of Mary six years ago was three times that of John: $x - 6 = 3(y - 6)$

d) The quotient of two consecutive numbers is four: $\frac{x}{x+1} = 4$

4.- Operate:

a) $-2x - 4 + 14x + 5x - 8 = 17x - 12$

b) $-3 \cdot (4x - 5) + 6 \cdot (8x + 3) - 7x = -12x + 15 + 48x + 18 - 7x = 48x - 19x + 33 = \ = 29x + 33$

c) $5x \cdot (3 - 6x) - 8 \cdot (2x - 1) + 5x \cdot (1 + 8x) = 15x - 30x^2 - 16x + 8 + 5x + 40x^2 =$

$= 10x^2 + 4x + 8$

d) $\frac{3}{4} \cdot (4 - x) + \frac{2}{5}(3x - 2) - 1 = \frac{12}{4} - \frac{3x}{4} + \frac{6x}{5} - \frac{4}{5} = \frac{24x}{20} - \frac{15x}{20} + 3 - \frac{4}{5} = \frac{9x}{20} + \frac{15}{5} - \frac{4}{5} =$

$$= \frac{9x}{20} + \frac{11}{5}$$

5.- Represents the following figures:

a) A square

b) A rectangular base prism

c) An equilateral triangle

d) An isosceles triangle

6.- Calculate the perimeter and area of the following figures:

a) A square: Perimeter=4x; Área=x^2

b) A rectangle: Perimeter=x+y; Área=x·y

c) An equilateral triangle: Perimeter=3x; Área=$\frac{b \cdot a}{2}$

d) A circumference: Perimeter=2·π·r; Área= π·r^2

7.- Solve the following equations:

a) $\frac{5}{2}x = -3 \rightarrow 5x = -6 \rightarrow x = \frac{-6}{5}$

b) $-2x + 4x + 3 = x - 8 + 2x \rightarrow 2x + 3 = 3x - 8 \rightarrow 2x - 3x = -8 - 3 \rightarrow -x = -11 \rightarrow x = 11$

Erasmus+

$c) -3(x + 2) - (2x - 1) = 4 + x \rightarrow -3x - 6 - 2x + 1 = 4 + x \rightarrow -5x - 5 = 4 + x \rightarrow$

$$-5x - x = 4 + 5 \rightarrow -6x = 9 \rightarrow x = -\frac{9}{6} = -\frac{3}{2}$$

8.- Check whether x = - 2 or x = 1 are solutions of the following equations:

a) $2x - 3 = -x - 2$

$\rightarrow 2 \cdot (-2) - 3 = -(-2) - 2 \rightarrow -4 - 3 = 2 - 2 \rightarrow -7 \neq 0 \rightarrow x = -2$ *is not a solution.*

$\rightarrow 2 \cdot 1 - 3 = -1 - 2 \rightarrow 2 - 3 = -3 \rightarrow -1 \neq -3 \rightarrow x = 1$ *is not a solution.*

b) $-1 - 3(x - 1) = -(5x - 4)$

$\rightarrow -1 - 3(-2 - 1) = -(5 \cdot (-2) - 4) \rightarrow -1 - 3(-3) = -(-10 - 4) \rightarrow -1 + 9 = -(-14) \rightarrow$

$8 \neq 14 \rightarrow x = -2$ *is not a solution.*

$\rightarrow -1 - 3(1 - 1) = -(5 \cdot 1 - 4) \rightarrow -1 - 3 \cdot 0 = -(5 - 4) \rightarrow -1 = -1 \rightarrow x = 1$ *sí es solución*
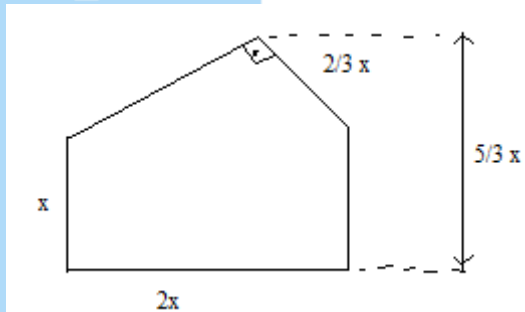
9.- Translates the following statemen into algebraic language t:

"Rosa's age is twice that of Maria, Fernando is five years older than Maria and Laura Rosa's age six years ago."

Nombre	Edad
María	x
Rosa	2x
Fernando	x+5
Laura	2x - 6

10.- Obtain the perimeter and area of the following figures:

1º We calculate the missing side, applying the Pythagorean Theorem:

$$y = \sqrt{(2x)^2 - \left(\frac{2}{3}x\right)^2} = \sqrt{4x^2 - \frac{4}{9}x^2} = \sqrt{\frac{36x^2 - 4x^2}{9}}$$

$$= \sqrt{\frac{32}{9}x^2} = \frac{\sqrt{32}}{3}x$$

2º We calculate the perimeter of the figure:

Perimeter=$2x + x + \frac{\sqrt{32}}{3}x + \frac{2}{3}x + x = 4x + \frac{2+\sqrt{32}}{3}x = \frac{12}{3}x + \frac{2+\sqrt{32}}{3}x = \frac{14+\sqrt{32}}{3}x$

3º

We calculate the height of the triangle, for this we subtract the height of the figure and the side of this one:

$$Height = \frac{5}{3}x - x = \frac{2}{3}x$$

4º We calculate the area of the rectangle: $2x \cdot x = 2x^2$

5º We calculate the area of the triangle: $\frac{2x \cdot \frac{2}{3}x}{2} = \frac{4}{6}x^2 = \frac{2}{3}x^2$

WSHT 1: PROBLEM SOLVING

Wsht 1: Problem solving

1. Two political activists, Roger and Nick, have a friendly bet to see who can get the most signatures on a petition. So far, Roger has collected 5 signatures and Nick has collected 15signatures. Roger is averaging 3 new signatures per minute, while Nick is managing to collect an average of 2 signatures per minute. Assuming this trend continues, they will have a tie before long. How long will that take?

2. Band students are tested on, and required to pass, a certain number of scales during the year. As of today, Anthony has passed 9 scales, whereas his friend Wayne has passed 6 of them. Going forward, Anthony has committed to passing 4 scales per week, and Wayne has committed to passing 5 per week. At some point soon, the two friends will have passed the same number of scales. How long will that take? How many scales will that be?

3. There are 3 consecutive integers with a sum of 9. What are the integers?

4. Rosa's and Marta's houses are separated by a stretch of road that is 92 kilometres long. One day, they decide to meet up somewhere in the middle and spend the afternoon together. Rosa leaves her house and travels at 100 kilometres per hour at the same time that Marta leaves her house and drives 93 kilometres per hour. How long will it be until they meet? (If necessary, round your answer to the nearest minute)

5. Students have organized a party to raise money for the end-of-the- year trip. They have sold 735 tickets of two types: one with the right to participate in an auction at € 15 and another at € 6. If the collection was 6246 €, how many tickets were sold of each type?

6. Find the sides of a right triangle that has one leg 7m longer than the other and whose hypotenuse is only one meter longer than the largest of the legs.

7. A virus has a rate of contagion in people given by the following relation: "the number of people infected is the difference of 16 times the number of days of contagion and the square of the number of days of contagion." When will there be 64 infected? And when 15?

8. Pedro has grapes at 2 € / kg and chestnuts at 1 € 2 / kg and wants to make a basket of 1kg of both products to sell for 1'6 €. How much will you have to put of each product to be able to put that price? If you want to sell 50 baskets, how many grapes and chestnuts do you need?

9. The length of the Airbus 380 is 7m smaller than the wingspan. The company has decided to make a box for the scale model 1: 100. If the base of this box has a perimeter of 306cm, how many meters long and how many of wingspan has the airplane? If 13184cm^2 of cardboard is used to make the box, with a cover included, so that the model fits perfectly in it, what is the height of the Airbus?

FINAL TESTS

TEST

SOLVING WORD PROBLEMS WITH EQUATIONS

(NOTE: Each problem has a score of 1.5 points, except for the first one that is worth 1 Point. The resolution must state the whole approach and the procedure followed, that is, a number will not be evaluated.)

NAME:_____

1.- The product of a number and its following is 6, what are the numbers said?

2.- In a chocolate factory, cocoa at 21€ per kilo is mixed with cocoa at 45 € per kilo. How many kilos of cocoa of each type should be mixed to get half a ton of cocoa at 39 €/ kg?

3.- Marta travelled from Seville to Barcelona in her car to visit a friend. She left at 8 am at an average speed of 90km / h. However, his friend Manuel left Barcelona, at the same time, but in a bus, at an average speed of 70km / h towards Seville. Knowing that the distance that separates them is 998km, where did Manuel have to stop to meet Marta? What time did the meeting take place? How far had each one gone?

4.- The city council wants to change the lawn of the football field for next season. The manager issues a report saying that the field is 30

meters longer than wide and its area is 7000m2. Find the dimensions of the field. When ordering the lawn, the company says that the lawn comes in pieces of 40x60 cm. How many pieces should you order?

5.- Andrea has three children. The youngest child is half the age of the middle child and the middle child is six years younger than the oldest child. How old is each of her children, knowing that the sum of their current ages coincides with the age of their cousin Fernando, who is 12 years older than the youngest brother?

6.- The price of a ring and its case is € 10,200. Knowing that the ring costs the square of five times the price of the case, what is the price of the case and the ring?

7.- In a town, the mayor has decided to control water consumption by putting the following prices: 4.25 cent / L will be charged for the first 80L of water consumed per person per month (consumption recommended by the WHO); over that amount of water, the price charged will be 6.25 cents /L.

a) How many liters over the recommended amount has a person consumed if their invoice is 35€? b) How much is the water bill if a person consumes three times the amount of water recommended by WHO?

ATTACHMENTS

●**Attachment 1**

Cooperative Learning Rubric

	4	3	2	1
Team Work: How well did your group work together?	Worked extremely well together; you provided a model to other groups as you were seen; you stayed "on task" involving each member and took your teamwork seriously; highly productive	Worked very well together; you were productive and cooperative and worked to get everyone involved.	Attempted to work well most of the time; at times you were "off task" and not all members were actively involved; this diminished the overall effectiveness of the group. Responsibility is unevenly shared by	There was little or no teamwork involved. You did not respect each others' opinions and were disagreeing over your group's work. Exclusive reliance on one or two persons.

			group members.	
Active Learning: How well did your group seek solutions?	Was extremely clever in seeking different solutions through "risk taking" and exploring different approaches and strategies in an original and/or creative way.	Was clever at times in seeking solutions through "risk taking" and exploring different approaches and strategies.	Sought a single solution through different approaches and strategies but did not pursue better/original alternatives when a solution was found.	Relied on the first solution generated and used a single strategy to find it.
Communication: How well did your group communicate and share information?	Went above and beyond in communicating thought processes and strategies by asking questions, discussing ideas, listening, offering constructive criticism and summarizing discoveries.	Communicated and elaborated on the thought processes and strategies by asking questions, discussing ideas, and listening.	Communicated thought processes and strategies but did not listen to constructive criticism.	Members of the group worked individually and did not communicate with one another. Members of the group lacked a respect of each other by not listening to each other's thoughts and ideas.

• **Attachment 2 – Rubric for creative projects**

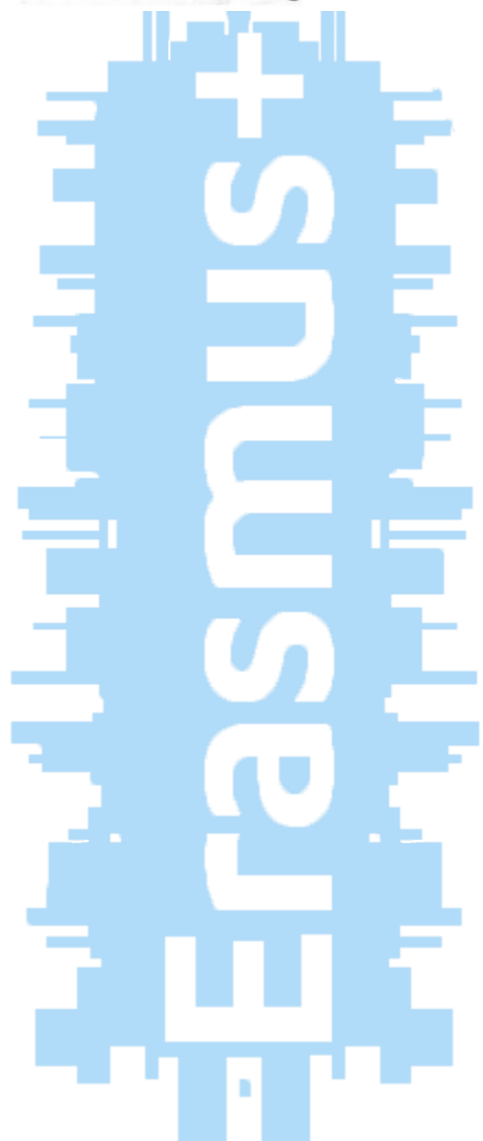|	Exemplary – 4	Proficient – 3	Partially Proficient – 2	Incomplete – 1	POINTS
Use of Available Class Time	Students used class time well and achieved what they needed to do without being reminded to stay on task.	Students used class time well overall, however, students had to be refocused at least once.	Students used class time appropriately but did not take full advantage of the time and or resources available to them. Students had to be refocused more than once.	Students were rarely on task and utilized class time poorly.	
Ad Content	Appropriately utilized the primary assigned propaganda technique while incorporating other secondary techniques to supplement it.	The primary propaganda technique is appropriately utilized but is not supplemented with any other secondary technique.	The primary propaganda technique is somewhat appropriately utilized and no other technique is utilized.	Fails to utilize or demonstrate the assigned propaganda technique.	
Creativity	Highly creative, well thought out, and original. Demonstrates effort, innovative interpretation, and creative production. Highly visually appealing.	Mostly creative production and clearly thought out. Most ideas presented demonstrate original and creative interpretation. Visually appealing.	Somewhat creative, planning is clear, some ideas demonstrate original thought, however most appears to be borrowed. Somewhat visually appealing.	Severely lacks creativity and shows little if any originality or effort. Lacks visual appeal.	
Written Portion	Well written and clear/accurate explanation of the primary and any secondary techniques used. No grammatical or spelling errors.	Well written, somewhat clear and accurate explanation of primary and any secondary techniques. Some grammatical or spelling errors.	Written explanation does not accurately explain the primary or secondary techniques utilized in the ad. Several grammatical or spelling errors.	Poorly explains the primary techniques utilized and does not address any secondary techniques utilized. Several grammatical or spelling errors.	
Group Effort/ Collaboration	Each member appeared to contribute equally in the production of the video or presentation of the poster.	It is apparent that at least one member was not involved in the production of the video or presentation of the poster.	Multiple members were apparently not involved in the production of the video or presentation of the poster.	One student monopolizes time in the video or in the presentation of the poster.	

Total Possible Points: 20

Total Earned:_____

Group Grade: _____