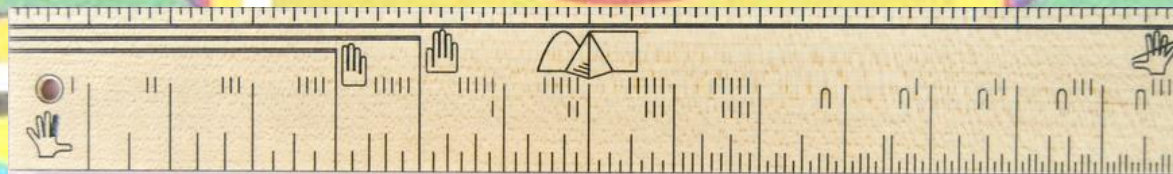


# Discovering Shapes & The Mysteries of Measure



**Institut La Riera**  
**Nèstor Abad · Mercè Pinyol**

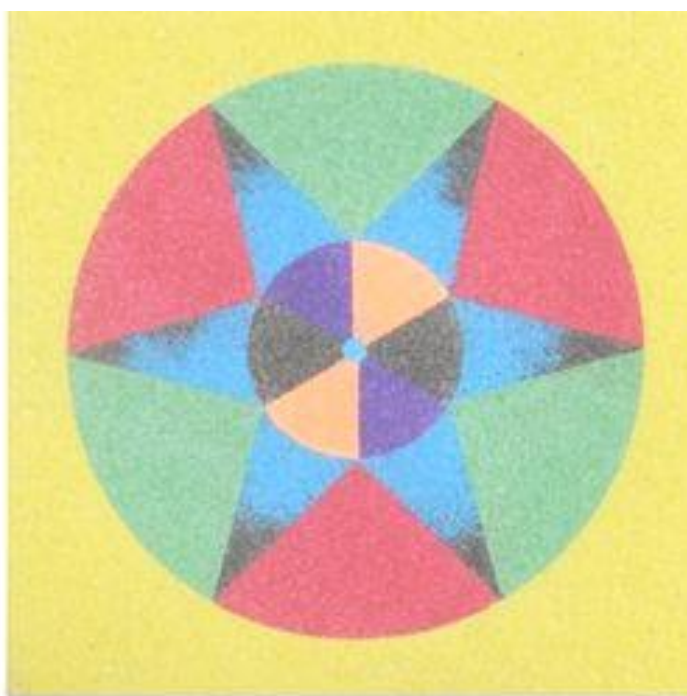
**Generació Plurilingüe (GEP)**

Year 1  
2018-2019

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Template adapted from CLIL-SI 2015.

More information at: <http://grupsderecerca.uab.cat/clilsi/>





<b>GEP 1</b>	<b>Task 1 : Input &amp; Cooperative /Collaborative learning in CLIL</b>	
<b>Title of the lesson or topic</b>	Flat shapes, perimeters and areas	
<b>Course / year / age</b>	1st ESO	
<b>Timing</b>	3 sessions	
<b>Collaboration with .....</b>	Tandem: content teacher (maths) & language teacher	
<b>Short description of the session/s</b>	<b>Session 1: Games on shapes (Big dominoes / Guess who)</b> <b>Session 2: Exploring Tangram (Building complex shapes and deducing relations between area and length)</b> <b>Session 3: Let's make art from shapes! (building padlets from our own pictures)</b>	
<p><i>The descriptions of the activities below should contain:</i>  <i>type of input,</i>  <i>questions (explicit, implicit and referential) posed by the teacher to ensure the students' involvement</i>  <i>dynamic instructions with collaborative and cooperative activities,</i>  <i>materials used.</i></p>		
<b>S E S S I O N</b>	<b>Presentation</b>	<b>Games on shapes</b> <b>5' INPUT &amp; QUESTION:</b> we show the first game with a visual presentation: <b>we'll show on the screen the pictures of a wall, maths shapes and dominoes, then we'll ask the students:</b> Can you tell me what do these elements have in common? A wall – Maths (shapes) – Dominoes. I would show them some standard domino pieces (VISUAL INPUT) and briefly explain how the game goes, just in case some student doesn't remember. Then I would show our dominoes and explain that they will have to connect all the pieces on the wall, forming a closed path.
	<b>Activity 1</b>	<b>20' Game of dominoes:</b> The aim of this activity is to get familiar with different shapes, their definition and their main



1

properties. Every student is given a domino piece and they have to connect their pieces in a collaborative way to form a huge mural on the wall (the wall must be previously prepared with some *velcro* to be able to hold all the pieces).  
*Organisation:* Students could collect the domino pieces from, for example, the table. Then, they need to make a line in groups, along the classroom and facing the wall they have to work on.

Conclusion questions:

- When the domino is done, we can make them think about the colors of the sentences with **IMPLICIT QUESTIONS**:  
*Do you think that the colors of the properties have some meaning? Can you see any relation among sentences that share the same color?*

- *20 seconds new words. In groups of five, standing up, students could tell each other some words related to maths they will learn this day (allow 20 seconds only), then, we could ask them to say the words aloud to check for coincidences.*

- Individual questionnaire of open questions (Google Classroom, to do at home):

- *Can you tell an advantage or a disadvantage of learning shapes with a domino?*
- *Do you think a domino activity can help in your learning?*
- *Could you give an exemple of something you have learnt with this activity?*
- *How did you feel? Why?*

Material needed: Big dominoes made in cardboard and velcro.

There is a sample of 6 domino pieces in an appendix at the end of this document. There you can also see how this set of pieces would be connected.

**Activity 2**

**20' Guess who:** Students sit in groups of 4. One pair will play against the other one. Each group is given a *Guess who* game about pieces. The students can look at the dominoes mural to find the suitable properties to ask their questions until they guess the shape that the other pair is hiding.

(Examples of questions: *Does your shape have 4 sides? Does your shape have any right angle? Does it have any parallel sides?...*)



		<p><u>Material needed:</u></p> <ul style="list-style-type: none"><li>- «Guess who» game in laminated cardboard (that can be easily erased)</li><li>- Set of cards with shapes</li><li>- felt-tip markers suitable for whiteboards, to cross out shapes</li></ul> <p>There is a sample of the board in the appendix.</p>
	<b>Ending</b>	<p><b>5' QUESTIONS &amp; HOMEWORK:</b> try to answer those questions at home: <i>Where do you find shapes in your real life? What are shapes useful for? If you were a shape, which one would you like to be? Take pictures</i> of the shapes that surround you: at home, in the street, at school, in buildings, even in art! Are you able to find all the shapes we have seen? Are you able to <b>create them using your body</b>? According to the pictures, which shapes do you think that are more useful? Why?</p>
<b>S E S S I O N 2</b>	<b>Activity 4</b>	<p><b>25' Building shapes with Tangram:</b></p> <p>First, we'll make groups of four by giving each student a shape, so they have to group those which share the same features. (For example, four trapeziums, four rhombus, four pentagons...)</p> <p>Then, each group of 4 students is given 2 Tangrams along with a list of several complex (compound) shapes that they have to build using the pieces of the Tangram. Once a figure is built, they have to take a photo and upload it to a shared folder. For each shape made and uploaded, the group earns a point (points can be like medals or stars or something similar). When time is over, we'll count which group has gathered more points.</p> <p>After playing, the winner group has to explain how they organised to succeed. The loser group has to explain what happened or what they think they should have done better.</p> <p><u>Roles in the group:</u> 2 students try to build the shapes; one student is the time keeper; the other one takes the photos and uploads them. After 10 minutes they must change roles.</p> <p><u>Material needed:</u></p> <ul style="list-style-type: none"><li>- Pictures of shapes in groups of 4 to deliver at the beginning to form the groups (four trapeziums, four rhombus, four pentagons...),</li></ul>



- 2 Tangrams for each group of 4 students,
- a list of shapes for each group,
- points to be given (stars, medals...),
- 1 laptop with the camera enabled (or mobile phone) for the student that uploads the pictures.

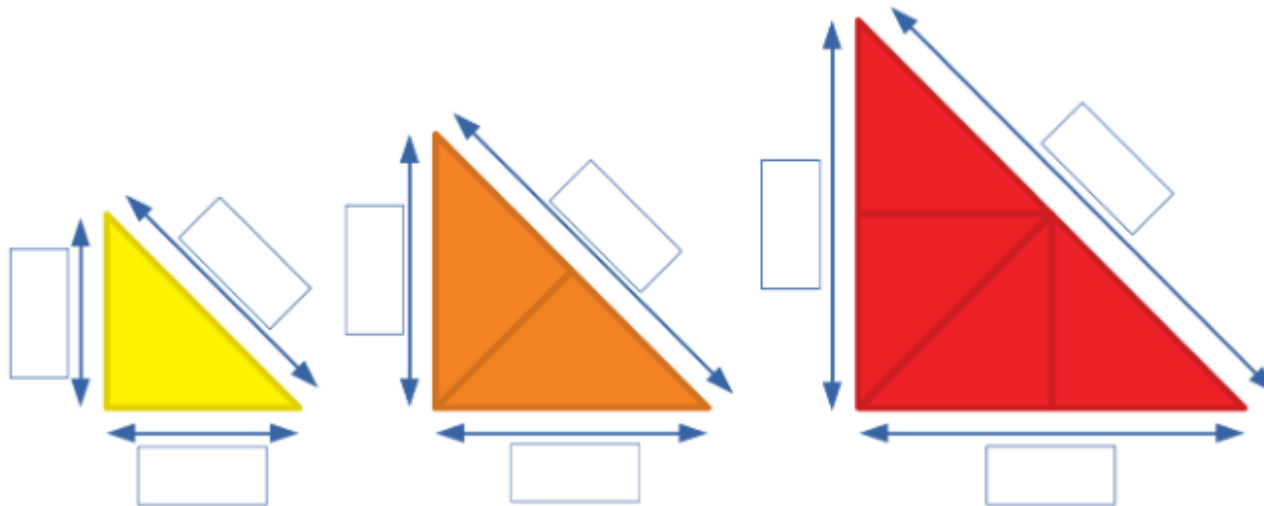
### Activity 5

**25' Deducing relations in Tangram: the groups keep their Tangrams and they are given** questionnaire (it can be in paper or in Google Classroom). By playing with the pieces they should answer the following **QUESTIONS** in the questionnaire:

1. Can you sort the pieces from **smaller** to **bigger**? (They will have to sort them by size.)
2. Are there any different shapes that have the same **size**? (Looking at their previous sorting, they can circle the ones that have the same area.) An **INPUT hint** that can be given if they struggle too much: «Try to fit some pieces inside other ones!»
3. Fill in this grid:

This piece...	... is <b>two times</b> as big as this one

4. Pick the three different triangles of the Tangram and with your ruler, measure all their sides and write them down:



5. In your group, discuss if this sentence is true:

*"When we double all the sides of a triangle, the area gets two times bigger."*

6. Write your conclusions and if you think it's not true, what can you change to make it true?

ROLES IN THE GROUP: the group works together to answer the questions, but one student reads the questions and writes the answers (once the group has agreed on them) and another one organises and controls the time.

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### Activity 6

### Let's make art from shapes!

Each group will present their pictures using Padlet. The Padlet will be built from the homework pictures the students had after the first session. Each group will select the best pictures and build a Padlet. Then, they will share it with the other groups.



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<p><b>O N 3</b></p>		<p>The questions from the homework must be answered, in some way, in the Padlet! <i>(Where do you find shapes in your real life? What are shapes useful for? Which shapes do you think that are more useful? If you were a shape, which one would you like to be?)</i></p> <p>Our roles in this activity would be supervising and giving the groups some guidelines.</p>
	<p><b>In terms of academic content, what are the students learning and what are they learning to do?</b></p>	<ul style="list-style-type: none"> <li>- Learn the names and the properties of the basic flat geometric shapes.</li> <li>- Find the shapes in the real world and discover what are they used for.</li> <li>- Build complex shapes from simple ones.</li> <li>- Distinguish between the concepts of length and surface.</li> <li>- Discover how the area of a shape changes when the shape is scaled up.</li> </ul>
	<p><b>In terms of language, what are the students practicing or learning to do?</b></p>	<p>In general terms, the students will learn to use the English Language in an academic context related to Maths; to use the input given in the target Language in the output tasks. They will also learn to acquire, produce and negotiate academic messages in English.</p> <p>In some activities (2-4), students need to use question-answer structures to get the information they need. This type of activity enables interaction using academic language; grammar use occurs in context: question making and giving answers, and other grammar contents which may appear in a question are used in a specific and actual context.</p> <p>Working on collaborative tasks enables students to use both the input given related to content language and interaction language.</p> <p>Activity 4 will allow practice on Language related to organisation.</p> <p>Activity 5 includes practice of writing skills as well as using language related to expressions of agreement and disagreement.</p>
	<p><b>In what way is this lesson plan a good example of what we learnt in the GEP course session?</b></p>	<p>Students are given an interactional space. They'll be able to contribute to class conversation and to receive feedback. The activities proposed enable collaborative work and interaction. They also take into account multiple intelligences in learning.</p> <p>They have been organised considering aspects such as the students' academic needs in terms of input, the grade they are and the language level.</p>
	<p><b>Other important information</b></p>	<p>Our roles as teachers are as facilitators in order to promote self-learning and help students develop critical thinking skills and retain knowledge that leads to self-actualization.</p> <p>We will also use teaching strategies that result in high-quality interaction, such as the use of learner-convergent</p>







	<p>language, as well as teaching strategies to contribute to afford students interactional spece areas; for instance, effective eliciting strategies (good qüestions), and refining, adjusting and clarifying them for students.</p> <p>In the same line, we will also “shape” the students’ contributions by seeking clarification, modelling, paraphrasing, reiterating or repairing the students’ productions (we will help students to say what they mean by using the most appropriate language to do so).</p>
<p><b>ANNEXES (materials, handout, pictures... if not possible to include in the activity section.)</b></p>	<p>Some samples of the materials have been included at the end of this document.</p>

### Self assessment Checklist

Task 1 : Input & Cooperative /Collaborative learning in CLIL	YES/NO
1. Students are presented with <b>multimodal</b> and <b>varied</b> input (spoken, written, visual, hands-on...)	Yes
2. The input presented is used to <b>help</b> learners <b>understand</b> ideas and <b>construct</b> meaning	Yes
3. The input is presented at the right <b>cognitive level</b> and the right <b>language level</b> , i.e. it is neither too challenging in terms of content nor too difficult in terms of language.	Yes
4. Students are <b>helped</b> in some way to <b>understand</b> , i.e. input is made comprehensible	Yes
5. Students are <b>helped</b> in some way to <b>process</b> the input presented, i.e. activities or questions make students think and construct meaning.	Yes



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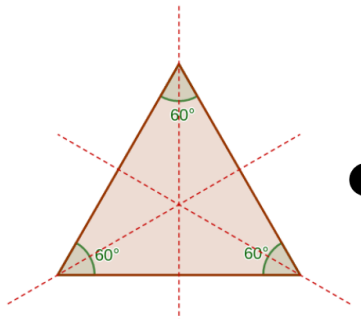
6. The input and activities presented cater to <b>multiple intelligences</b>	Yes
7. Students are presented with <b>good questions</b> (explicit, implicit and referential) that help them process input and that challenge them not only to understand, but to think, create...	Yes
8. A variety of <b>collaborative learning strategies</b> are used throughout the session.	Yes
9. At least one of the activities presented requires <b>cooperation</b> among students.	Yes
10. Students are <b>explicitly taught</b> how to work in groups (or pairs).	Yes
11. Students are <b>explicitly guided</b> to succeed in group/pair work <b>discussions</b> and <b>interactions</b> . Clear <b>support</b> to guide their interactions is provided.	Yes
12. At least one <b>ICT tool</b> is used to promote <b>digital collaborative learning</b> .	Yes

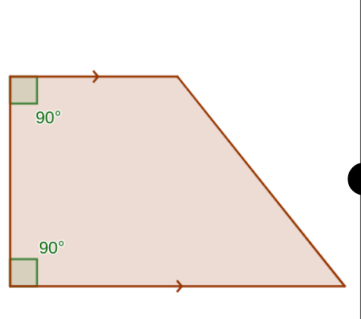


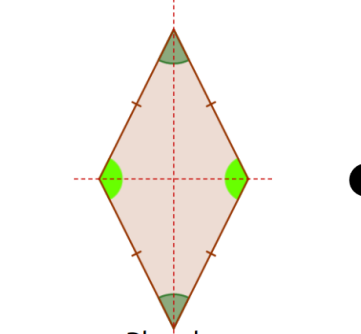
## Appendix – Materials

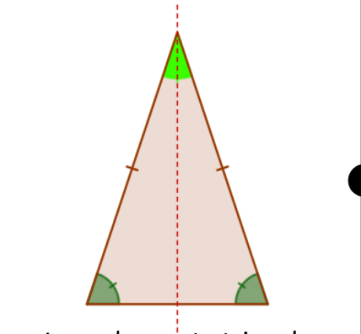
### Session 1 – Activity 1

This is a sample of 6 pieces of the «Domino of shapes game». Each one must be printed in A4 size and on both sides of the paper: on one side the image of the shape on the left and the text on the right. On the other side, the opposite way. This is to prevent the piece from being turned upside down and to be easily read. Here is a link to the Google document that will contain the whole set of pieces.

 <p>Equilateral triangle</p>	<ul style="list-style-type: none"><li>I have four sides</li><li>Two of my sides are parallel</li><li>Two of my angles are right</li><li>I have no symmetry axes</li></ul>
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 <p>Right trapezium</p>	<ul style="list-style-type: none"><li>I have four sides</li><li>All my sides are of equal length</li><li>My opposite sides are parallel</li><li>My opposite angles are of equal measure</li><li>I have two symmetry axes</li><li>My diagonals are perpendicular</li><li>I look like a diamond!</li></ul>
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 <p>Rhombus</p>	<ul style="list-style-type: none"><li>I have three sides</li><li>Two of my sides are equal</li><li>Two of my angles are equal</li><li>My angles are acute</li><li>I have just one symmetry axis</li></ul>
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 <p>Isosceles acute triangle</p>	<ul style="list-style-type: none"><li>I have six sides</li><li>All my sides are of equal length</li><li>All my angles are of equal measure</li><li>I have six symmetry axes</li><li>I can be formed with six equilateral triangles</li><li>Bees know how to build me!</li></ul>
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Regular hexagon

- I have four sides
- My opposite sides are parallel
- My opposite sides are of equal length
- My opposite angles are of equal measure
- I have no symmetry axes

Parallelogram

- I have three sides
- My sides are equal
- My angles are equal
- I have three symmetry axes

These 6 pieces would be connected on the wall, for example, this way:

<ul style="list-style-type: none"> <li>I have four sides</li> <li>My opposite sides are parallel</li> <li>My opposite sides are of equal length</li> <li>My opposite angles are of equal measure</li> <li>I have no symmetry axes</li> </ul>	<p>Regular hexagon</p>	<ul style="list-style-type: none"> <li>I have six sides</li> <li>All my sides are of equal length</li> <li>All my angles are of equal measure</li> <li>I have six symmetry axes</li> <li>I can be formed with six equilateral triangles</li> <li>Bees know how to build me!</li> </ul>	<p>Isosceles acute triangle</p>	<ul style="list-style-type: none"> <li>I have three sides</li> <li>Two of my sides are equal</li> <li>Two of my angles are equal</li> <li>My angles are acute</li> <li>I have just one symmetry axis</li> </ul>
<p>Parallelogram</p>				<p>Rhombus</p>
<ul style="list-style-type: none"> <li>I have three symmetry axes</li> <li>My angles are equal</li> <li>My sides are equal</li> <li>I have three sides</li> </ul>	<p>Equilateral triangle</p>	<ul style="list-style-type: none"> <li>I have four sides</li> <li>Two of my sides are parallel</li> <li>Two of my angles are right</li> <li>I have no symmetry axes</li> </ul>	<p>Right trapezium</p>	<ul style="list-style-type: none"> <li>I have four sides</li> <li>All my sides are of equal length</li> <li>My opposite sides are parallel</li> <li>My opposite angles are of equal measure</li> <li>I have two symmetry axes</li> <li>My diagonals are perpendicular</li> <li>I look like a diamond!</li> </ul>

Plantilla creada pel grup de formadores del Programa GEP (Generació Plurilingüe) del Departament d'Ensenyament. Curs 2018-2019





The full set of pieces will contain the following shapes (in bold the six shown here):

**01.equilateral triangle**

**02.isoscelles acute triangle**

03.isoscelles right triangle

04.isoscelles obtuse triangle

05.scalene acute triangle

06.scalene right triangle

07.scalene obtuse triangle

08.quadrilateral

09.isoscelles trapezium

**10.right trapezium**

11.obtuse trapezium

**12.parallelogram**

13.rectangle

**14.rhombus**

15.square

16.regular pentagon

**17.regular hexagon**

18.regular heptagon

19.regular octagon

20.regular nonagon

21.regular decagon

22.kite or deltoid

23.dart

24.circle

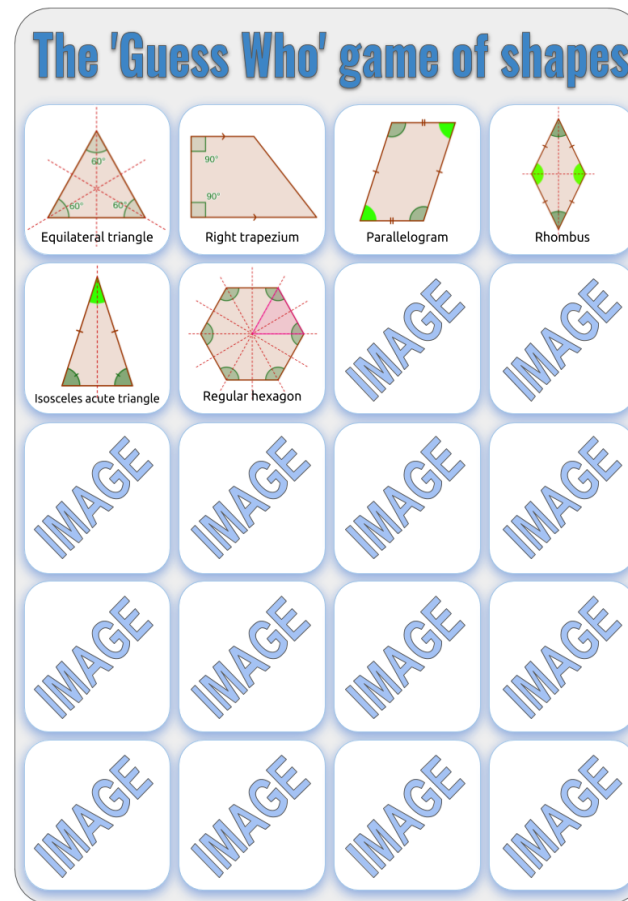
25.ellipse



## Session 1 – Activity 2

The board for the 'Guess Who' game will look like this, with 20 images taken from the 25 of the dominoes. There will also be a set of cards with the same images of the 20 shapes.

Each player takes one card and keeps it hidden so the other player tries to guess it through questions regarding the properties of the shapes (sides, angles, symmetries...). With a felt-tip marker each player crosses out on their board the discarded shapes.





GEP 1	Task 2: Reading, writing and Assessment in CLIL
Title of the lesson or topic	How do we measure things?
Author	Nèstor Abad & Mercè Piñol
Course / year / age	1st ESO
Number of sessions	4
Collaboration with...	Tandem: content teacher (maths) & language teacher
Main objectives of the sessions	<ul style="list-style-type: none"><li>- Being aware of the different units of measure of civilizations throughout history.</li><li>- Learning to measure lengths and areas with unusual units and performing conversions to the usual ones.</li><li>- Improve the students' use of the English language in their writing, reading and speaking, throughout a communicative approach, in an academic context.</li><li>- Help students gain awareness of their learning processes, and manage them, through providing a range of tasks, and self-assessment and co-assessment.</li></ul>



Short description of the sessions	<p><b>Session 1+2: What is a meter? Guided reading about units of measure through history.</b></p> <p><b>Session 3: Let's get to work! Measuring the playground with unusual units.</b></p> <p><b>Session 4: Guided writing and assessment: how good were my measurements?</b></p>
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<p><i>The descriptions of the activities below should contain:</i></p> <ol style="list-style-type: none"> <li>1. <i>collaborative and cooperative activities instructions (including the timing and the language support)</i></li> <li>2. <i>type of support,</i></li> <li>3. <i>readings and writings planned,</i></li> <li>4. <i>assessment tools</i></li> <li>5. <i>materials used</i></li> </ol>		Timing
S E S S I	<p><b>Activity 1</b></p> <p><b>Motivation for the reading: how long is this segment?</b></p> <p>Students will be arranged in groups of 4 using FlipQuiz (<a href="https://flipquiz.com/toolbox/grouper/">https://flipquiz.com/toolbox/grouper/</a>). Each group will be given a sheet of paper with a segment drawn on it, a questionnaire for each student and also a fake ruler, that is, a ruler which is not subdivided in cm or mm, but in other unit instead, slightly bigger or smaller (one different ruler for each student).</p> <p>They will be asked to measure their segment and to write down the measurement on the questionnaire, according to their ruler.</p> <p>Then, they will be asked to compare the results within their groups. Make them write on the questionnaire,</p>	<b>10'</b>





O N I A N D		<p>under their measurement (following are <u>explicit</u>, <u>implicit</u> and <u>referential</u> Q's):</p> <ul style="list-style-type: none"> <li>- What happened?</li> <li>- Can you guess which was the cause of the differences?</li> <li>- What do you think about not sharing the same units to measure things?</li> <li>- And finally, could anyone tell any other example where this situation can happen?</li> </ul> <p><b>Material needed:</b></p> <ul style="list-style-type: none"> <li>- Paper with a segment drawn (15 cm long approx.). <u>1 copy for each group</u>.</li> <li>- Questionnaire to write the measure and to answer the four questions. <u>1 copy for each student</u>.</li> <li>- Four different <i>fake rulers</i> with divisions and subdivisions as if they were cm and mm. Two of them with units smaller than 1 cm and the other two with units bigger than 1 cm. <u>4 rulers for each group</u>.</li> </ul>	
2	Activity 2	<p><b><u>Exploring ancient measurements</u></b></p> <p><b>Session 1: 40'.</b></p> <p><b>This session will be completed through the following activities in the Google Classroom: History of measurements. The students will find a guideline once they access the classroom.</b></p> <p><b>Introduction. The aim of tasks 1 and 2 are to serve as background information both to vocabulary and to history to task 3, which consists of a reading on different measurement units in ancient cultures and the development of the metric system.</b></p> <p><b>Task 1. Can you measure your table like an ancient Egyptian?</b></p> <p>PART 1</p> <p>1. Use some of the units you'll see on the document attached to measure your table. These are based on how ancient civilisations used the first "thing" they found to measure length: THEIR BODY.</p>	80'



Each group member should use one of the measures.

2. Note down your measurements. (example in centimeters: 30×40)

#### PART 2

Watch the video on the history of the units of measurement, twice. It will help you understand the readings in the reading comprehension task.

Video: YouTube, Metric and Standard Measurement Systems, [https://youtu.be/DQPQ\\_g59xyw](https://youtu.be/DQPQ_g59xyw)

While watching the video for the second time, you can note down some important key words. Then, we'll check together any doubts.

#### **Task 2. Video Math Antics: Introduction to the Metric System.**

1. Watch the video Math Antics, just to the minute 7:16, <https://www.youtube.com/watch?v=ZNX-a-5jGeM>

2. Answer the questions about the video (as homework) (see the material attached)

3. As homework, do the following pronunciation exercise: repeat the information:

-from minute 3:34-4:28. Then add your voice file to the assigned task in the classroom.

End of the first session.



**Session 2: 40'.**

**Task 3. Let's learn from the ancient civilisations.**

All-group starter sentence: During History, the Ancient Egyptians.... and the students need to finish the sentence.

Recap intro: let's check together some of the concepts we learnt the last session. We'll read aloud some of the students' answers to the homework questions.

Now, In groups, you will join the classroom: History of measurements (see the annexes) read some information about ancient cultures and their units of measure. The groups just need to follow the indications in the classroom. In every task, you will find instructions on how to proceed.

As a general introduction to the task:

You need to work the readings in groups and in different steps:

- Step 1: All the group members are readers: You need to read aloud the information. (one paragraph or sentence each)
- Step 2: all the group members are translators. You need to find the meaning of the text. Divide your work and work on the translation of different paragraphs. You can use the translator but you have to prepare a glossary.
- Step 3: you need to organize the information and explain your reading to the other groups. (you can prepare a presentation or a poster, find one or two pictures, mimics, objects... whatever support you may need)
- Step 4: prepare 3 questions for the rest of the groups about your explanations.
- Step 5: explain the info to your partners.



Group 1: The ancient Greeks.

Group 2: The Romans.

Group 3: The ancient Egyptians.

Group 4: The ancient China.

Group 5: The Incas.

Group 6: The Metric System.

**Final conclusion:** as homework, you need upload a summary of the information you've learnt from another group.

For example, if you have worked on "the Incas", you should write your summary on another group's work.

The length should be 5 lines, more or less.

You will find the information in the classroom History of measurements, task: Summary.



**Material needed:**

Google Classroom: History of measurement.

Videos from the YouTube.

Laptops.

Paper, Posters, software (presentation)

Markers, pencils, rubbers.

Word documents with the readings.

**Self-assessment Questions:**

1. Have I read:
  - paying attention on the pronunciation?
    - a) Yes, mostly.
    - b) I have mispronounced some words.
    - c) It was difficult for me to pronounce.
  
  - making the appropriate pauses?
    - a) Yes, mostly.
    - b) I haven't paused properly at commas and full stops.
    - c) I don't recognise any pause.



		<ul style="list-style-type: none"><li>- with a good intonation?<ul style="list-style-type: none"><li>a) Yes, mostly.</li><li>b) I don't know very well intonation.</li><li>c) I don't know anything about intonation.</li></ul></li></ul> <p>2. I have understood....</p> <ul style="list-style-type: none"><li>-Most of the content T/F</li><li>-I had to check some words. T/F</li><li>-I had to check many words. T/F</li><li>-I had to search on the Google translator most of the content. T/F</li></ul> <p>3. In your explanations... 1&gt;5</p> <ul style="list-style-type: none"><li>- Did you follow an outline? 1 2 3 4 5</li><li>- Did you use the vocabulary accurately? 1 2 3 4 5</li><li>- Did you address to all the audience? 1 2 3 4 5</li><li>- Did you use an appropriate pace of speech and pitch of voice? 1 2 3 4 5</li></ul>	
S E S S	Activity 3	<p><b>Let's get to work! Measuring what surrounds us.</b></p> <p>In the previous session, students learned that ancient cultures had units of measure that were different from ours. Today, they will be arranged in the same groups as the previous session and each group will pretend that they belong to an ancient (or future!) civilization. They will be given a "presentation card" to hang on their shirt, with four blanks that they will have to fill in:</p> <ul style="list-style-type: none"><li>- Group number: ____</li></ul>	50'



I O N 3		<ul style="list-style-type: none"><li>- Which civilization are you? Try to imagine an original name! _____</li><li>- Which is the name of your unit of measure? _____</li><li>- How did you define it? _____</li></ul> <p>In order to answer the 4th question, each group will have to decide which is their measuring unit: it can be a part of their body, their step or any other thing that they can take as a reference. Then, <u>only if they think it's helpful</u>, they will cut it from a piece of rope (2 copies) and use it to measure the <b>perimeter</b> and the <b>area</b> of a playpen next to the school. Every piece of rope should be marked with a little piece stuck of adhesive tape and the group number written on it.</p> <p>Maybe they decide that they don't need any rope. For example, they can decide to use just their foot to measure and do it by putting one after the other.</p> <p><b>Roles in the group:</b></p> <p>Two members of the group will take one rope each and will be the ones who measure. The other two will take notes of the measurements in a sheet and perform the calculations:</p> <ul style="list-style-type: none"><li>- How many <i>ropes</i> (units) is the playpen long? _____ <u>units</u> (replace "units" with the chosen name)</li><li>- How many units is it wide? _____ <u>units</u></li><li>- What is its perimeter? _____ <u>units</u></li><li>- What is its area? _____ <u>units<sup>2</sup></u></li></ul> <p>The double measure is to double check the results in order to prevent errors.</p> <p>Math teacher will give support, if needed, on how to make those last calculations.</p> <p><b>Material needed:</b></p> <ul style="list-style-type: none"><li>- Felt tip permanent markers. <u>2 for each group</u>.</li><li>- Laminated presentation cards with a clip or peg to fix it on the clothes. <u>1 copy for each student</u>.</li></ul>	
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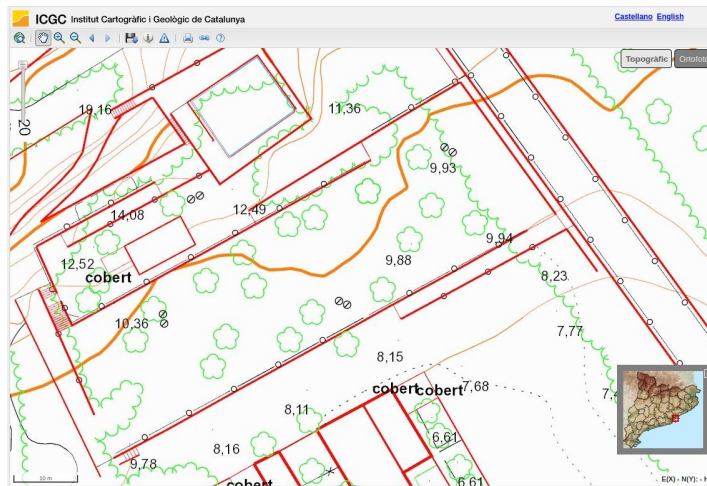
- Measurements sheet. 2 for each group.
- Ball of rope.
- Scissors. 1 for each group.
- Adhesive tape to stick on each rope and write the group number on it.

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Activity 4

**Checking the measurements: how accurate they were?**

Students will arrange in the same groups as the previous sessions. Using their Chromebooks, they will go to the web page of the maps of the ICC (Institut Cartogràfic de Catalunya, <http://www.icc.cat/vissir3/>). With the visual help of a projection done by the teacher, they will be able to locate the playpen that they measured the last session.



With the tools of this page, they will be able to accurately measure the perimeter and area of the playpen:

40'







Math teacher will guide through the process of using the tools and learning how to calculate the area and perimeter.

Once they are done, they will put their measures on a Google Form. While projecting the answer spreadsheet, the teacher will calculate the average of all the measurements and show it to the students.





		<p>Now each group will have to check if the measurements of some other group were accurate enough. Each group will pass on their ropes (if they used any) and measurement sheets to the following group. If some group didn't use a rope, they will have to explain what unit they used to do the measurements. All groups will be given standard rulers or measuring tapes; they will have to <b>convert</b> the unit of the other group to meters (as much precisely as they can), and also convert the measurements of perimeter &amp; area to meters and square meters. These results will be written on the measurement sheet, next to the ones in units and square units.</p> <p>Then they will be able to check if those measurements match the ones obtained with the ICC map, and <b>register the deviation</b>. This deviation will be also written on the measurement sheet.</p>	
	Activity 5	<p><b>Group self-assessment</b></p> <p>About the measuring activity of the last session:</p> <ul style="list-style-type: none"><li>- Did your group have any difficulty measuring with the unit you chose?<ol style="list-style-type: none"><li>1. Yes, it was very difficult!</li><li>2. Yes, but at last we succeeded!</li><li>3. No, we did the measurement without any problems.</li></ol></li><li>- About the calculation of the <b>perimeter</b>:<ol style="list-style-type: none"><li>1. We needed help and now we would need it again if we had to repeat it.</li><li>2. We didn't need help but now we don't remember how we did it.</li><li>3. We needed help but now we know how to do it.</li><li>4. We didn't need help. We still know how to do it, now.</li></ol></li><li>- About the calculation of the <b>area</b>:<ol style="list-style-type: none"><li>1. We needed help and now we would need it again if we had to repeat it.</li><li>2. We didn't need help but now we don't remember how we did it.</li><li>3. We needed help but now we know how to do it.</li><li>4. We didn't need help. We still know how to do it, now.</li></ol></li></ul>	10'



### Co-assessment of another group

*About the unit of measure that the other group has given to you:*

- Think on some advantage and some concern about the unit that you received. What do you like about it? What do you dislike? (you can think about originality, ease of use, accuracy...)

Like: \_\_\_\_\_

Dislike: \_\_\_\_\_

*About the measurements of the other group, after checking the right values with the ICC maps:*

- Was their measure of the **perimeter** accurate enough?

1. The deviation is more than 30% 😞
2. The deviation is between 30% and 20% 😊
3. The deviation is between 20% and 10% 😎
4. The deviation is less than 10% 🎓

*About the measurements of the other group, after checking the right values with the ICC maps:*

- Was their measure of the **area** accurate enough?



1. The deviation is more than 30%! 🤔
2. The deviation is between 30% and 20% 😊
3. The deviation is between 20% and 10% 😎
4. The deviation is less than 10% 🎓

### **Portfolio**

The students will be asked to write down notes during the sessions, to keep record of their experiences, new vocabulary, expressions.

As homework and once they have finished all the sessions, they need to organise this information on an online portfolio, with the following structure:

- Cover: a title which makes reference to their experience, for example: "My cubit tirolina" (they have to invent it)

- The sessions:

For example, Session 1.

- Date:
- Vocabulary:
- My experience:
  - What we did. Descriptive text (We will have provided them with a sample)



	<ul style="list-style-type: none"><li>- How was my experience. With the help of some support language: This activity has helped me in ... With this activity I learned ... What I liked most was ... One thing that made me laugh during the activity was ... What I didn't like was ... Something that I can improve is ...</li><li>• Finally, either a picture and picture caption, or a drawing and a caption:</li></ul> <p>The same structure will apply to the remaining sessions.</p> <p>- Final reflection: In these tasks you worked pretty much as a scientist! Remembering what you did, can you complete these sentences?</p> <ul style="list-style-type: none"><li>❖ I realised that the work of a scientist consists of .....</li><li>❖ Scientists are needed to .....</li></ul>	
<p><i>In terms of academic content, what are the students</i></p>	<p>Students will learn that measures rely on the units of measure, that have changed time to time through the different civilisations and they will know the most important ones. Through a practical activity, they will be shown the importance to share a standard unit of measure.</p> <p>They will learn to invent their own unit of measure and to do a practical measurement with it, so they will be</p>	

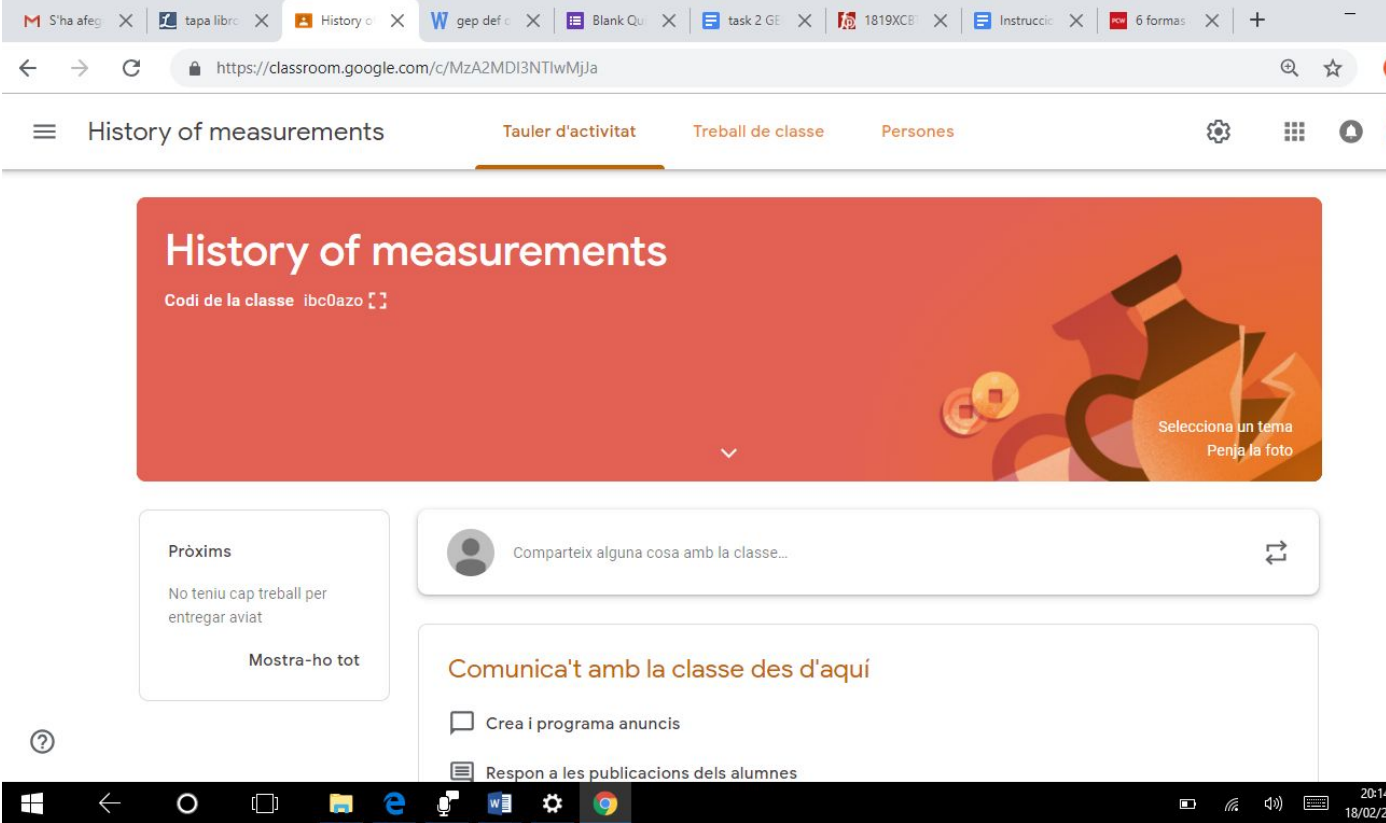


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**Departament d'Ensenyament**

<p>learning and what are they learning to do?</p>	<p>aware of the benefits or weaknesses of their unit.</p> <p>They will review the concepts of perimeter and area of a region, and specifically to calculate the perimeter and area of a rectangular shape. Eventually, they will have to subdivide their unit to get the most accuracy in their measurements. They will also practice conversions from their particular units to meters.</p> <p>Finally they will learn to use online tools to accurately calculate perimeters and areas of real regions on a map and calculate a % error of deviation from an approximate measure to the exact one.</p>	
<p>In terms of language, what are the students practicing or learning to do?</p>	<p>With this type of tasks, students learn to deal with new vocabulary, new grammar structures, fixed expressions, etc, in a foreign language, in a context which is not familiar to them; in an academic context. They have, therefore, to face difficulty in understanding the content through using translation tools and other strategies online to solve the "lack of vocabulary and structures problem". For example, they will be allowed to find pictures online to get the meaning through, for instance, of an expression they don't understand.</p> <p>Students will also improve their communication and speaking skills, since one of the tasks consists of explaining the culture and the measures in their reading. In order to perform properly, students will have both to use their knowledge of the language and communication skills, including, if necessary, non verbal communication.</p> <p>They will also improve their written skills by learning to use recently learnt expressions in their writings, in context and in a meaningful way.</p> <p>To sum up, new vocabulary and grammar acquisition occurs in context and needs to be used immediately in a meaningful way.</p>	
<p>In what way is this lesson plan a good</p>	<p>The students will appreciate team work as a valuable means of collaboration in future.</p> <p>Through problem solving tasks, they will learn to face situations in which a solution to a problem needs to be</p>	



<p>example of what we learnt in the GEP course session?</p>	<p>found.</p> <p>Learning is understood as a process in which multiple intelligences intervene. The students will be able to do a range of tasks, which is consistent with this learning theory, and places students and diversity at the centre of teaching.</p> <p>If students are at the centre, then, our roles as teachers would be of facilitators, mainly; in the sense that we offer students guidance throughout knowledge, for example, in the use of scaffolding in the reading and writing activities, and we train students to ask questions and help them develop skills to find answers through exploration.</p> <p>Self-assessment and co-assessment have been considered as essential tools to help students to become aware of their own learning processes.</p>	
<p>Other important information</p>		
<p>ANNEXES (materials, handout, pictures... if not possible to include in the activity section.)</p>	<p>Annex Activity 2</p> <ol style="list-style-type: none"><li>1. Screenshot classroom tasks, cover:</li></ol>	

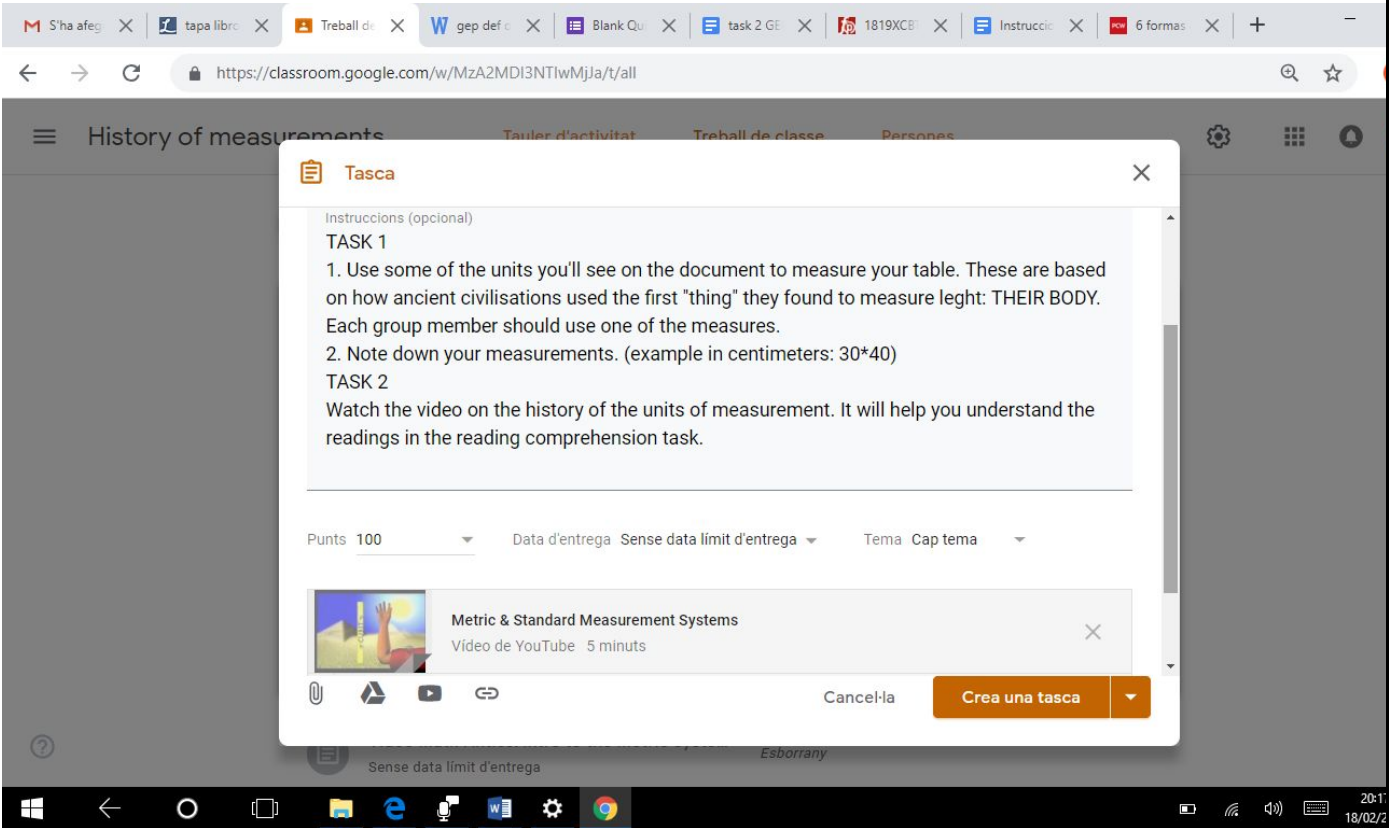


The screenshot shows a Google Classroom interface. At the top, the browser address bar displays the URL <https://classroom.google.com/c/MzA2MDI3NTIwMjJa>. The page title is "History of measurements". Below the title, there is a red banner with the text "History of measurements" and "Codi de la classe ibc0azo". To the right of the banner, there is an illustration of a pitcher and coins, with the text "Selecciona un tema" and "Penja la foto". Below the banner, there are two main sections: "Pròxims" (Next) and "Comunica't amb la classe des d'aquí" (Communicate with the class from here). The "Pròxims" section shows "No tens cap treball per entregar aviat" (You have no work to submit soon) and a "Mostra-ho tot" (Show all) button. The "Comunica't amb la classe des d'aquí" section has a "Comparteix alguna cosa amb la classe..." (Share something with the class...) button and a list of actions: "Crea i programa anuncis" (Create and schedule announcements) and "Respon a les publicacions dels alumnes" (Respond to student posts). The Windows taskbar is visible at the bottom of the screenshot, showing the date and time as 20:18 on 18/02/2019.

2. Screenshot classroom tasks list.



3. Screenshot classroom task 1.



The screenshot shows a Google Classroom interface with a 'Tasca' (task) creation modal open. The task is titled 'History of measurements' and includes the following instructions:

**TASK 1**  
1. Use some of the units you'll see on the document to measure your table. These are based on how ancient civilisations used the first "thing" they found to measure length: THEIR BODY. Each group member should use one of the measures.  
2. Note down your measurements. (example in centimeters: 30\*40)

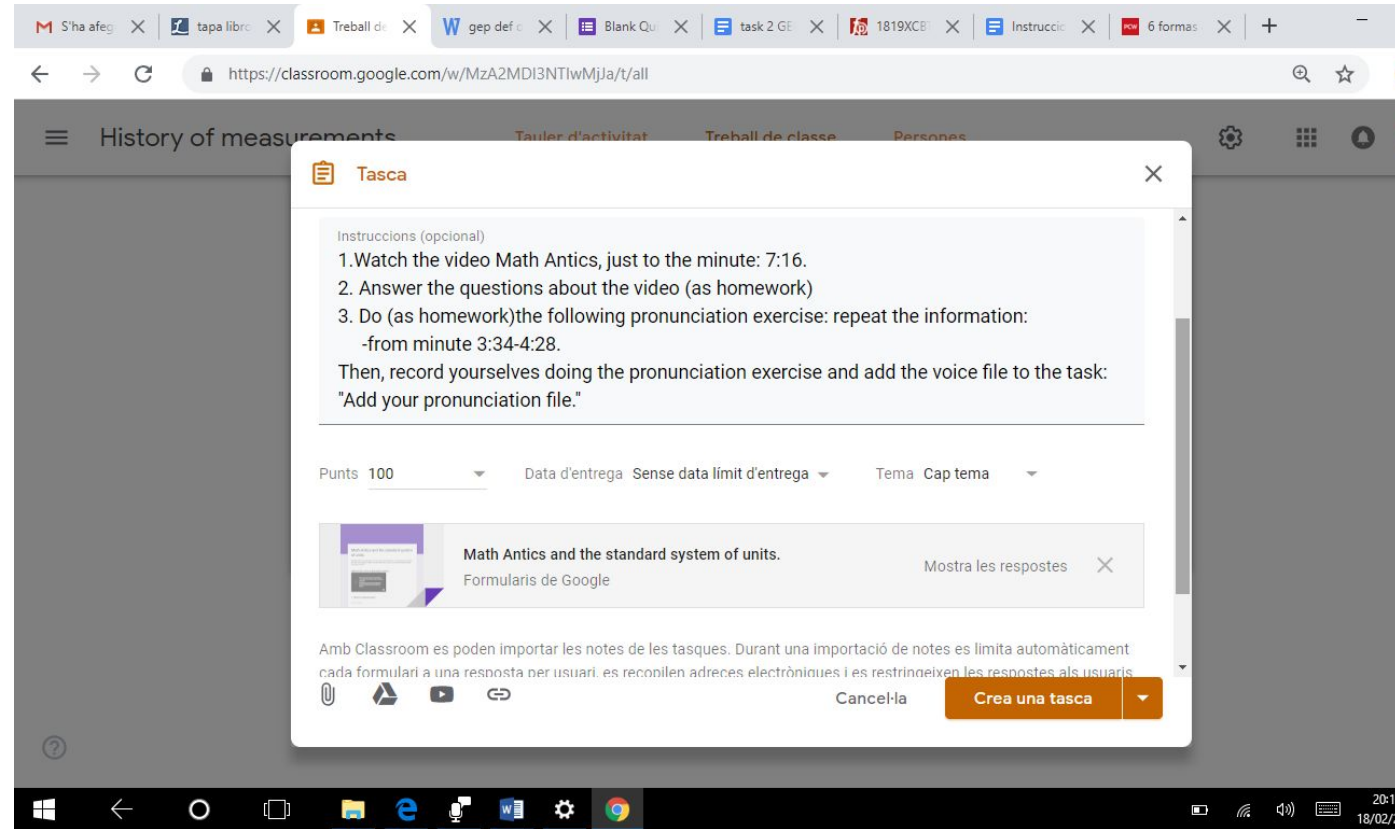
**TASK 2**  
Watch the video on the history of the units of measurement. It will help you understand the readings in the reading comprehension task.

The modal also shows a 'Punts' (Points) field set to 100, a 'Data d'entrega' (Due date) field set to 'Sense data limit d'entrega' (No due date), and a 'Tema' (Topic) field set to 'Cap tema' (No topic). A video titled 'Metric & Standard Measurement Systems' is attached to the task. The 'Crea una tasca' (Create task) button is highlighted in orange.

Plantilla creada pel grup de formadores del Programa GEP (Generació Plurilingüe) del Departament d'Ensenyament. Curs 2018-2019



#### 4. Screenshot classroom task 2.



History of measurements

Tasca

Instruccions (opcional)

1. Watch the video Math Antics, just to the minute: 7:16.
2. Answer the questions about the video (as homework)
3. Do (as homework) the following pronunciation exercise: repeat the information:  
-from minute 3:34-4:28.  
Then, record yourselves doing the pronunciation exercise and add the voice file to the task:  
"Add your pronunciation file."

Punts 100

Data d'entrega Sense data límit d'entrega

Tema Cap tema

Math Antics and the standard system of units.  
Formularis de Google

Mostra les respostes

Amb Classroom es poden importar les notes de les tasques. Durant una importació de notes es limita automàticament cada formulari a una resposta per usuari, es recullen adreces electròniques i es restringeixen les respostes als usuaris.

Cancel·la Crea una tasca

Questionnaire task 2:



S'ha afegit u x tapa libro - x Treball de cl x Math Antics x W gep def on l x task 2 GEP 1 x 1819XCBT: L x Instruccions x +

← → ↻ [https://docs.google.com/forms/d/e/1FAIpQLSfC14cq1vTQKRkez8wFXAO-GwfiD\\_at85SKg3FZJdF3-jnOaw/viewform](https://docs.google.com/forms/d/e/1FAIpQLSfC14cq1vTQKRkez8wFXAO-GwfiD_at85SKg3FZJdF3-jnOaw/viewform) 📄 ☆

## Math Antics and the standard system of units.

Watch the video up to the minute 7:16' and answer to the questions. You can pause and rewatch the video. There questions follow the order of the video, and you can share information with the other group members.

### Math Antics: Intro to the Metric System.

130 centimeters 5.2 kilograms

Windows taskbar: Start, Back, Forward, Home, File Explorer, Edge, Microphone, Word, Settings, Chrome, System tray: 20:15, 18/02/2019

Task 3. Screenshots of the readings.





The screenshot shows a Google Classroom interface. The browser tabs at the top include 'S'ha afegit un e...', 'tapa libro - Trad...', 'Treball de classe', 'W gep def on bod...', 'task 2 GEP 1\_ter...', '1819XCBT: Des...', and 'Instruccions per...'. The address bar shows the URL 'https://classroom.google.com/w/MzA2MDI3NTIwMjJa/t/all'. The main content area displays a document with the following text:

The Greeks

*They collected from the members of the human body the proportionate dimensions which appear necessary in all building operations; the finger or inch, the palm, the foot, the cubit. and these they grouped into the perfect number which the Greeks call teleon. N determined as perfect the number which is called ten.*

Body measures and their equivalences.

The digit was the width of a thumb, and a palm was the width of a hand. In most lands, four digits made a palm and five palms made a cubit.

Schoinion.

This was a cord and was used as a standard length, measuring 100 cubits long. To measure something a bit smaller, the Greeks made 8 knots on each schoinion, therefore being able to measure all sorts of different lengths using the same instrument. A Greek person even knew that the cord would shrink during humid times, making the measurements inaccurate. To fix this problem, they decided to smear wax all over the schoinions, which made them not shrink during changes in the humidity. They used this instrument for measuring almost anything, from the distance between two objects

The bottom of the screenshot shows a Windows taskbar with various application icons and a system tray displaying the time '20:21' and date '18/02/2019'.





S'ha afegit un e... | tapa libro - Trad... | Treball de classe... | gep def on bod... | task 2 GEP 1\_ter... | 1819XCBT: Des... | Instruccions per... | +

← → ↻ <https://classroom.google.com/w/MzA2MDI3NTIwMjJa/t/all> 🔍 ☆

← W The Romans and measurement reading.docx

The Romans.

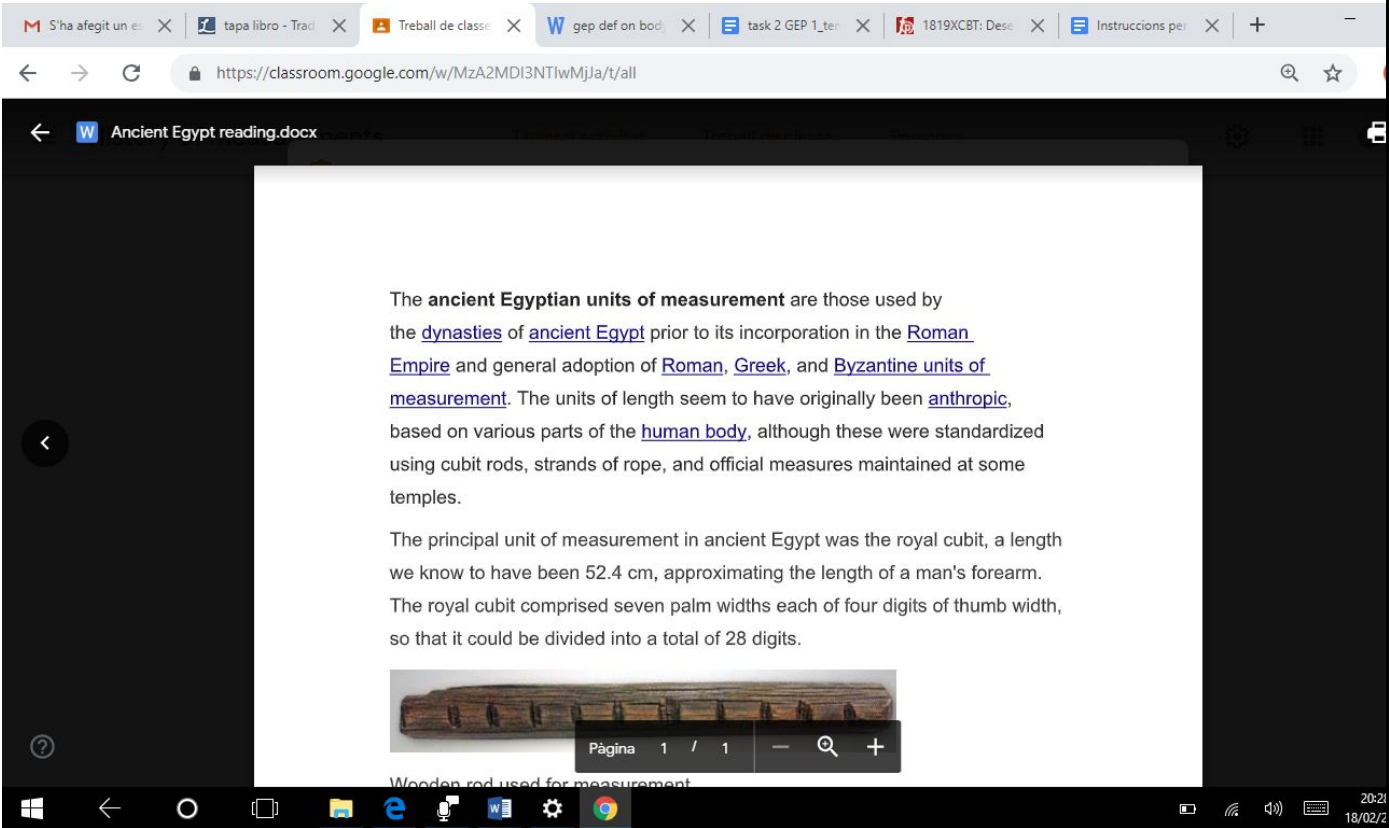
*From the Iberian Peninsula of modern Spain, to the isles of Britain, across the shores of North Africa and to the eastern borders of the Empire, the Romans were united not only by the Pax Romana, but also a very precise system of measurements which spread uniformity in construction, trade, cartography and science.*

The Romans devised fourteen commonly referenced units for linear measurement (length). The most basic unit was the *pes* (plural *pedes*) or Roman foot. In terms of modern reference, the Roman foot measured 0.97 feet (296 mm). Other commonly used measurements were the *gradus* (step) which measured 2.5 *pedes* and the *passus* which measured 5 *pedes*. For measurements of less than one *pedes* the Romans commonly used the *digitus* (1/16 of a *pedes*), *uncia* (1/12 of a *pedes*) and *palmus* (1/4 of a *pedes*). When it came to longer distances, the Roman mile (*mille passus*) was simply 1000 *passus* or 5000 *pedes*.

Página 1 / 1

Windows taskbar: 20:21 18/02/21





The screenshot shows a Google Classroom interface. The browser tabs include 'S'ha afegit un e...', 'tapa libro - Trad...', 'Treball de classe', 'gep def on bod...', 'task 2 GEP 1\_ter...', '1819XCBT: Des...', and 'Instruccions per...'. The address bar shows the URL 'https://classroom.google.com/w/MzA2MDI3NTIwMjJa/t/all'. The document title is 'Ancient Egypt reading.docx'. The text in the document reads: 'The **ancient Egyptian units of measurement** are those used by the dynasties of ancient Egypt prior to its incorporation in the Roman Empire and general adoption of Roman, Greek, and Byzantine units of measurement. The units of length seem to have originally been anthropic, based on various parts of the human body, although these were standardized using cubit rods, strands of rope, and official measures maintained at some temples. The principal unit of measurement in ancient Egypt was the royal cubit, a length we know to have been 52.4 cm, approximating the length of a man's forearm. The royal cubit comprised seven palm widths each of four digits of thumb width, so that it could be divided into a total of 28 digits.' Below the text is an image of a wooden rod with markings, captioned 'Wooden rod used for measurement'. The bottom of the screenshot shows the Windows taskbar with the date '20-21 18/02/2'.



S'ha afegit un e... X tapa libro - Trad X Treball de classe X W gep def on bod X task 2 GEP 1\_ter X 1819XCBT: Des X Instruccions per X +

← → ↻ https://classroom.google.com/w/MzA2MDI3NTIwMjJa/t/all

← W Ancient China measurements reading.docx

In Asia, they also developed their own units of measurement, as for instance in China:

According to the *Liji*, the legendary *Yellow Emperor* created the first measurement units. The *Xiao Erya* and the *Kongzi Jiayu* state that length units were derived from the human body.

**Chinese units of measurement**, known in Chinese as the *shizhi* ("market system"), are the traditional units of measurement Although Chinese numerals have been decimal (base-10) several Chinese measures use hexadecimal(base-16). Local applications have varied, but the Chinese dynasties usually proclaimed standard measurements.

In the present day, the People's Republic of China maintains some customary units based upon the market units but standardized in the metric system.

Pàgina 1 / 1

Windows taskbar: 20:24 18/02/2







The Incas

The Inca Empire [also known](#) as the Incan Empire and the Inka Empire, was the largest empire in [pre-Columbian America](#). The administrative, political and military center of the empire was located in [Cusco, Peru](#). The [Inca civilization](#) arose from the Peruvian highlands sometime in the early 13th century.

Inca skill in engineering works almost required a system of measurement at least as exact as that in use in 16th-century Europe.

Below are the known Inca units of distance:

<i>Inca Word</i>	<i>Description</i>	<i>Distance</i>
<i>rikra</i> (3)	= Distance of a man's outstretched arms (4)	= 162 cm (5)
<i>sikya</i> (6)	= One half <i>rikra</i> . (7)	= 81 cm (8)
<i>khococ</i> (9)	= Distance from elbow to tip of the hand (10)	= ~ 45 cm (11)
<i>k'apa</i> (12)	= Size of a palm (13)	= 20 cm (14)
<i>yuku</i> (15)	= Tip of outstretched thumb and forefinger (16)	= 10 cm (17)

Quipu or Khipus

Página 1 / 2





The screenshot shows a Google Classroom interface. The browser's address bar displays the URL: <https://classroom.google.com/w/MzA2MDI3NTIwMjJa/t/all>. The main content is a document titled "History of the Metric System".

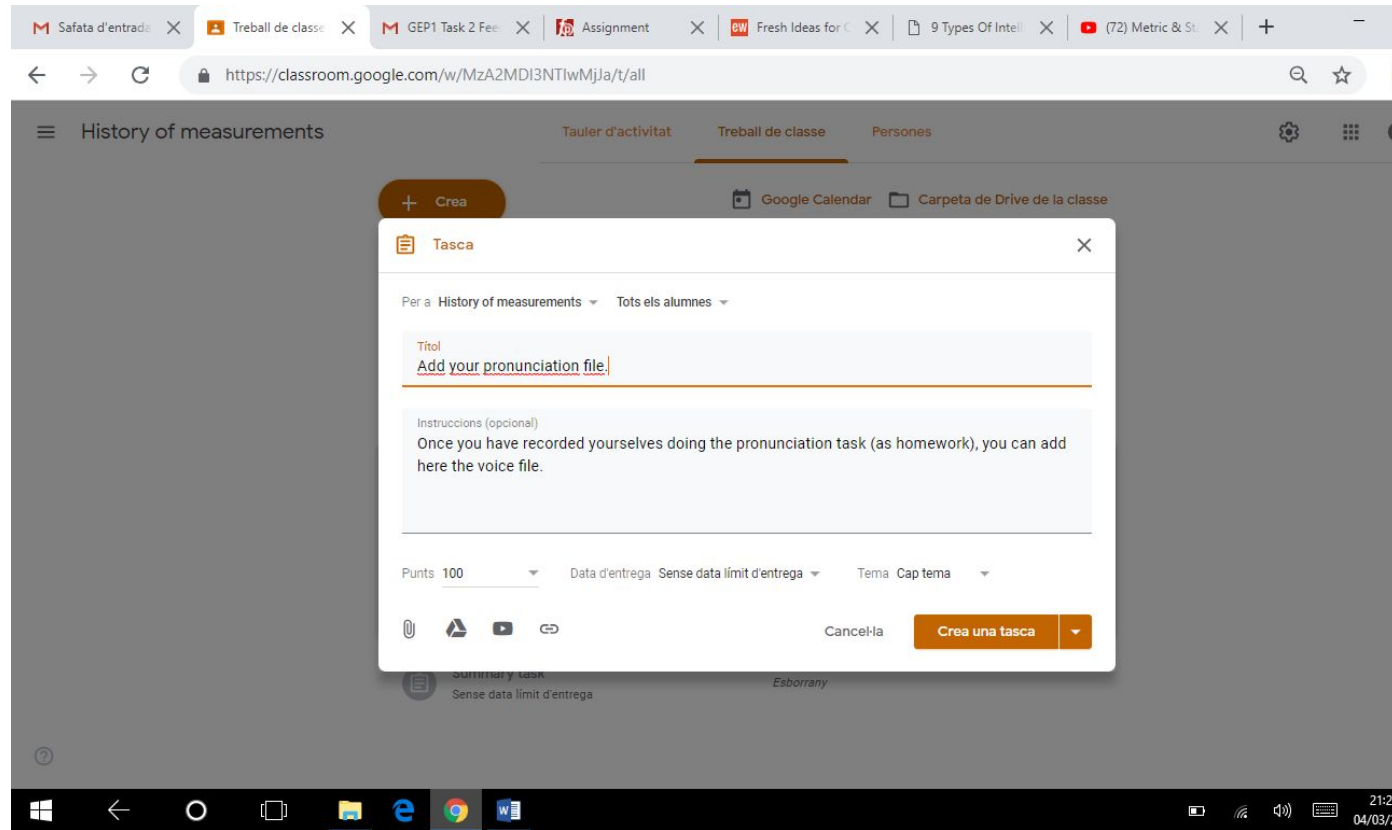
**History of the Metric System**

The metric system was created in order to make a standardized unit of measurement. Long ago, people used all types of body parts, like arms and palms, to measure. Imagine how hard would it be to follow a bread recipe that called for two handfuls of flour and a nose width of butter? No two loaves would taste the same!

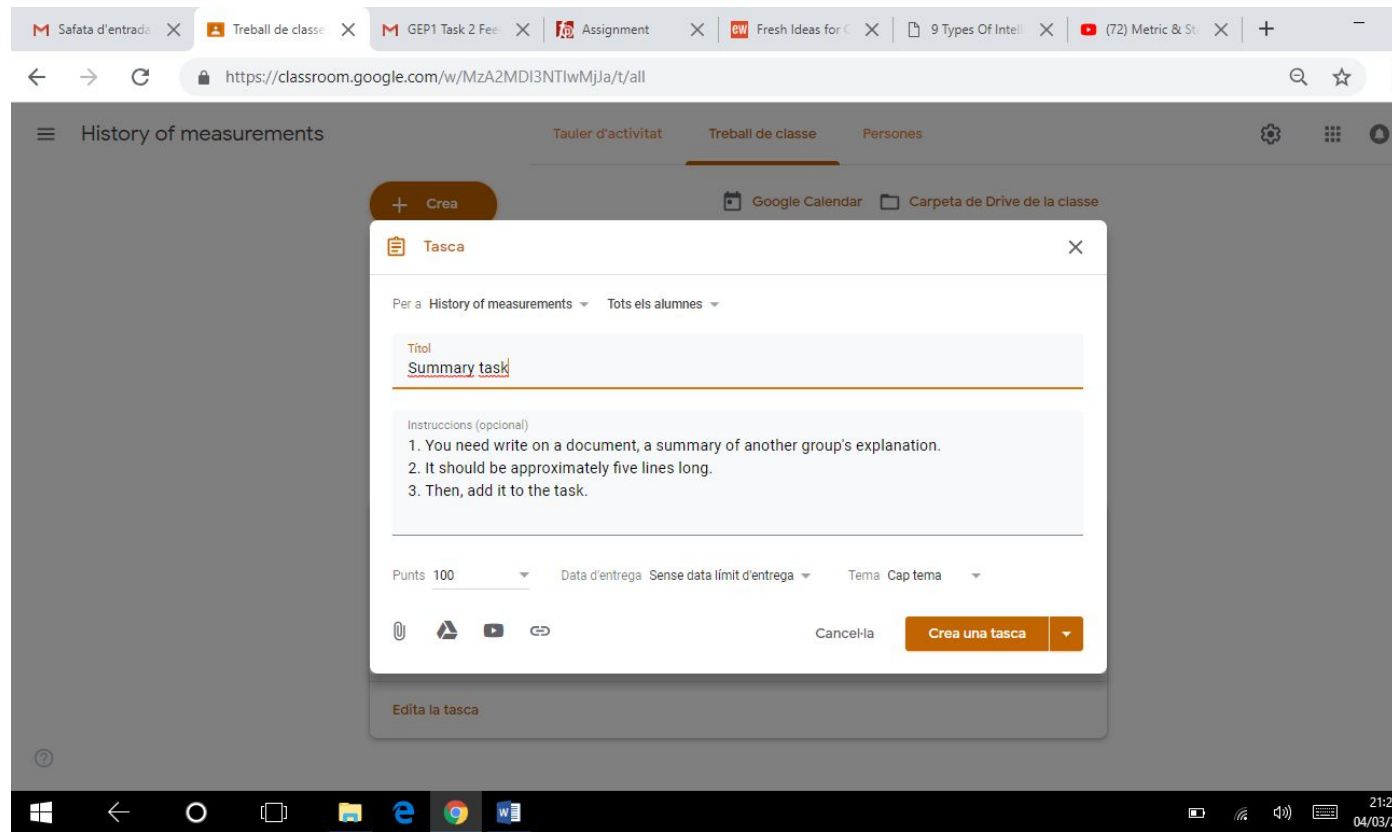
By the late 18th century, there were so many individual systems of measurement that it became very difficult to convert across different regions and countries. During the French Revolution (1789-1799), the French government asked a team of scientists to develop a standardized system that everyone could use to measure. The team developed the metric system based on the discoveries of past mathematicians.

Task 4. Screenshot: pronunciation task (homework)





Task 5. Screenshot Summary task (homework)



Screenshot of the homework questions related to the video: Math Antics: Intro to the Metric System.



The screenshot shows a web browser window displaying a Google Forms quiz. The browser's address bar shows the URL: [https://docs.google.com/forms/d/1hjcFr\\_2Ctjm3zllli-fuj4RvjbhH-tp07B81Fj9yFM/edit](https://docs.google.com/forms/d/1hjcFr_2Ctjm3zllli-fuj4RvjbhH-tp07B81Fj9yFM/edit). The quiz contains five questions:

1. What is measurement?  
Text d'una resposta breu
2. What does "standarized" mean?  
Text d'una resposta breu
3. What is the most popular system of units? What is its official name?  
Text d'una resposta breu
4. Why is it a good Idea?  
Text d'una resposta breu
5. What is a meter?  
Text d'una resposta breu

The interface includes a top navigation bar with several tabs (Safata d'entrada, Treball de classe, Blank Quiz - For, MEP1 Task 2 Fee, Assignment, Fresh Ideas for, 9 Types Of Intell) and a right-hand sidebar with icons for adding elements, text, images, video, and a menu. The bottom of the screen shows a Windows taskbar with various application icons and system tray icons, including the date and time (21:38, 04/03/2019).

## Self assessment checklist

Plantilla creada pel grup de formadores del Programa GEP (Generació Plurilingüe) del Departament d'Ensenyament. Curs 2018-2019





Task 2 : Reading, writing in CLIL and Assessment	YES/NO
1. <b>Support</b> is provided to help students read and understand texts.	Yes
2. <b>Before-, during- and after-</b> reading activities are prepared.	Yes
3. The materials use <b>visuals</b> to support comprehension.	Yes
4. The writing process takes place in <b>joint collaboration</b> with the teacher (modelling)	Yes
5. <b>Support</b> is provided to help students write (the students are provided with language patterns, language frames, vocabulary banks...)	Yes
6. The teacher uses different strategies to help students <b>throughout the process</b> of reading and writing	Yes
7. The teacher has <b>previously predicted the language</b> the students will need when carrying out the different tasks successfully and, therefore, is aware of the <b>content-obligatory language</b> .	Yes
8. At least the teacher uses 1 type of <b>assessment</b> (self-assessment, teacher assessment or co- assessment)	Yes
9. At least teacher used 1 type of <b>designed assessment tool</b> during the sessions (rubric, digital app, checklist, personal dossier...)	Yes