

CLIL in IES Frederic Mompou

Sant Vicenç dels Horts

Joan Alberich i Carramiñana



The University of
Nottingham



Generalitat de Catalunya
Departament d'Educació
**Institut d'Educació Secundària
Frederic Mompou**

IES Frederic Mompou

St. Vicenç dels Horts (Barcelona)



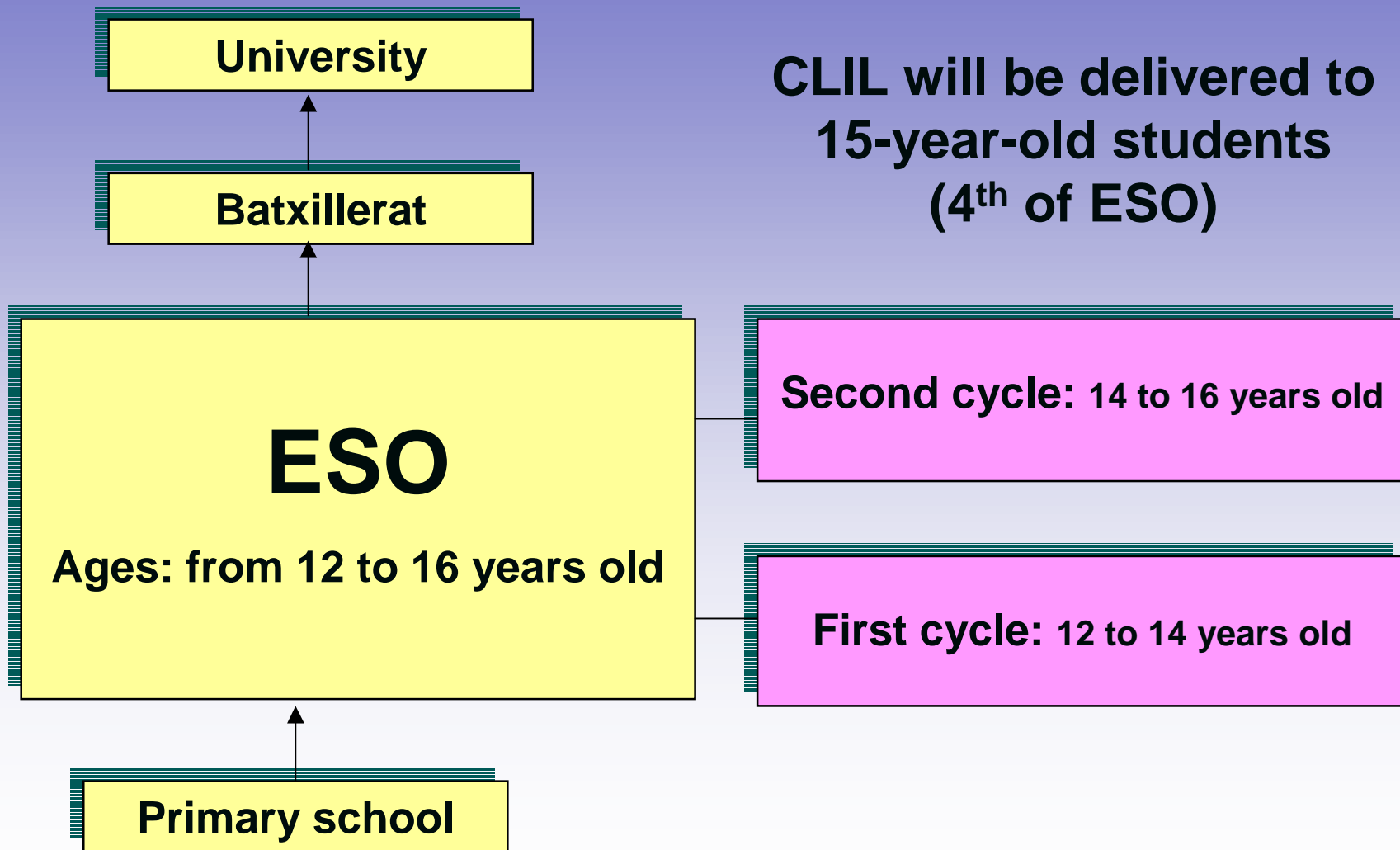
The school location



The school location



Educational system



What subjects involved in CLIL?

- **3rd year of ESO: English teachers will deliver a compulsory subject to reinforce English**
- **4th year of ESO: CV 'ENGLISH THROUGH SCIENCE'**

Teachers involved:

Pilar Belloc



Empar Beltran

Joan Alberich



CV 4th ESO

ENGLISH THROUGH SCIENCE

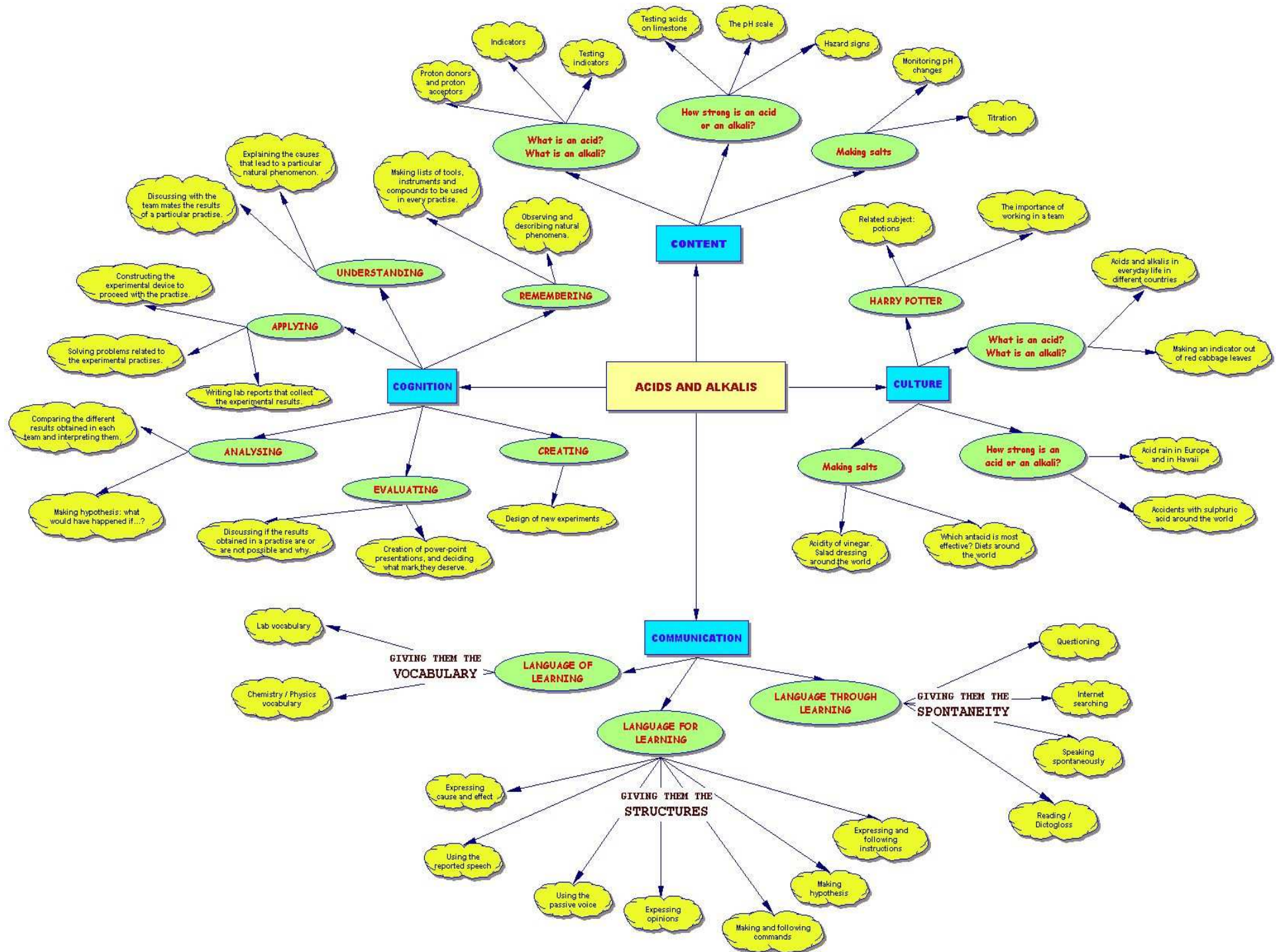
Materials created in Nottingham, January-March 2007

ETHOS: TO PUT INSIDE THE STUDENTS THE SEED OF INTEREST IN SCIENCE AND TO ENCOURAGE THEM TO SEARCH FURTHER INFORMATION OUTSIDE THE CLASSROOM

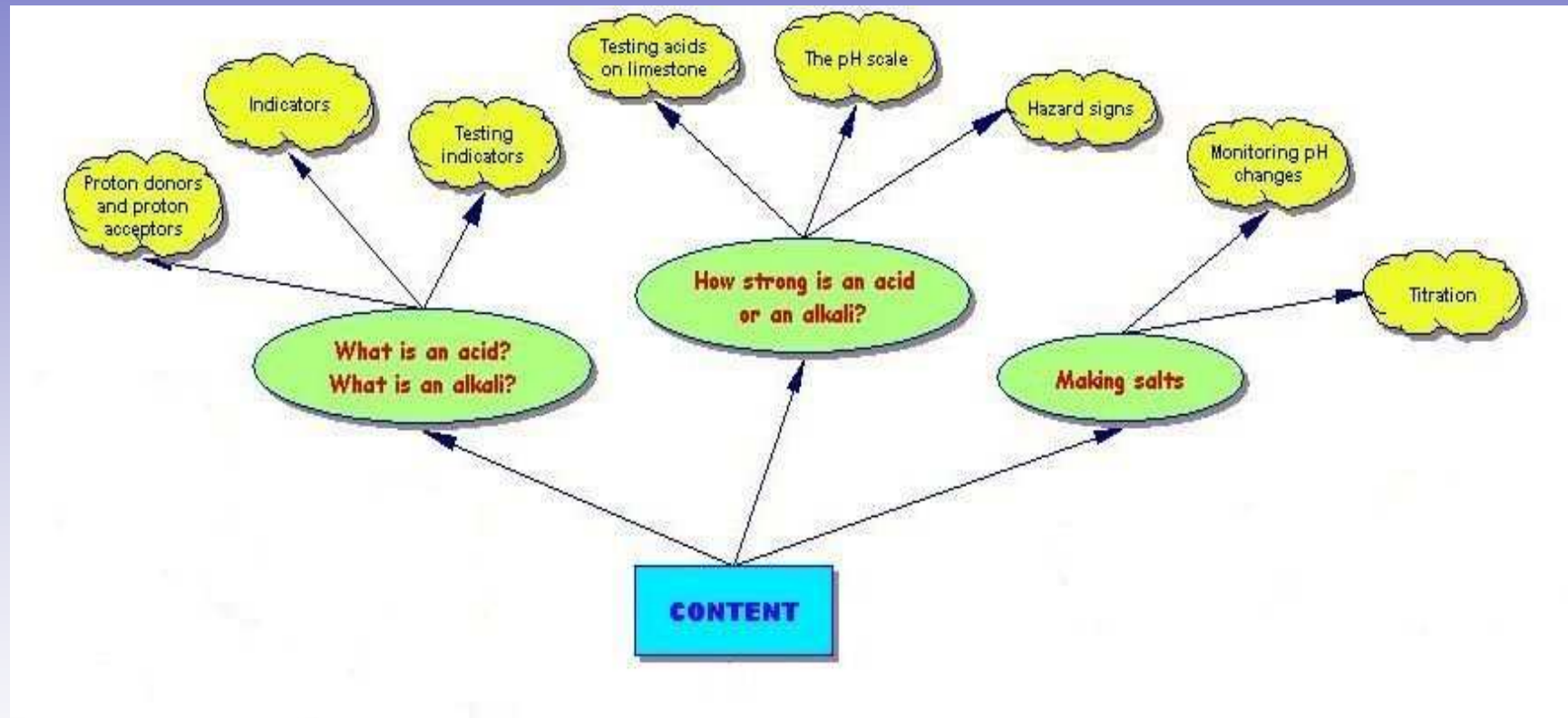
**PHYSICS AND CHEMISTRY
LAB EXPERIMENTS**

Planning the lessons

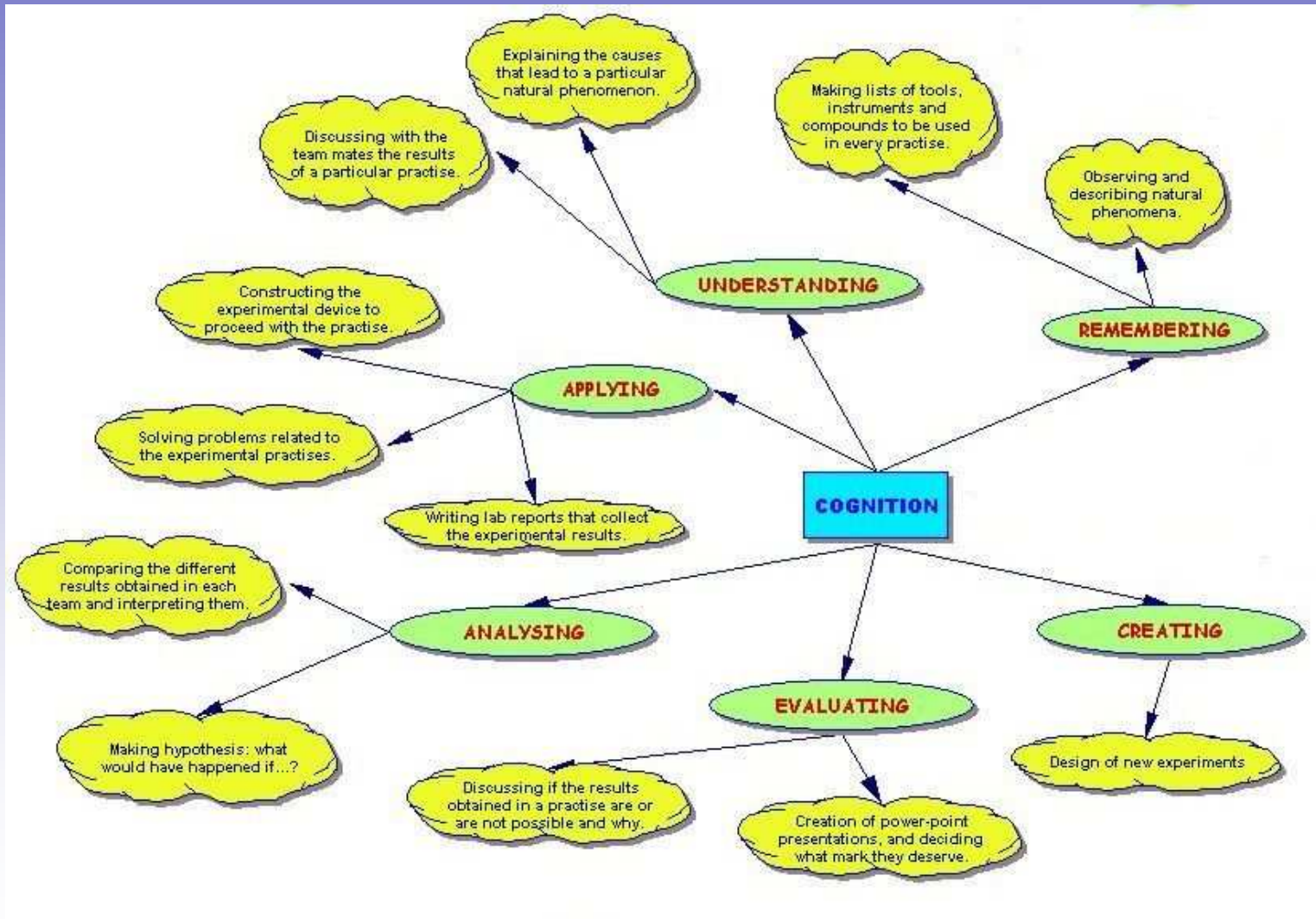
- The 4Cs Framework
- The 3As Planning Tool
- Matrix: high vs. low linguistic & cognitive demands



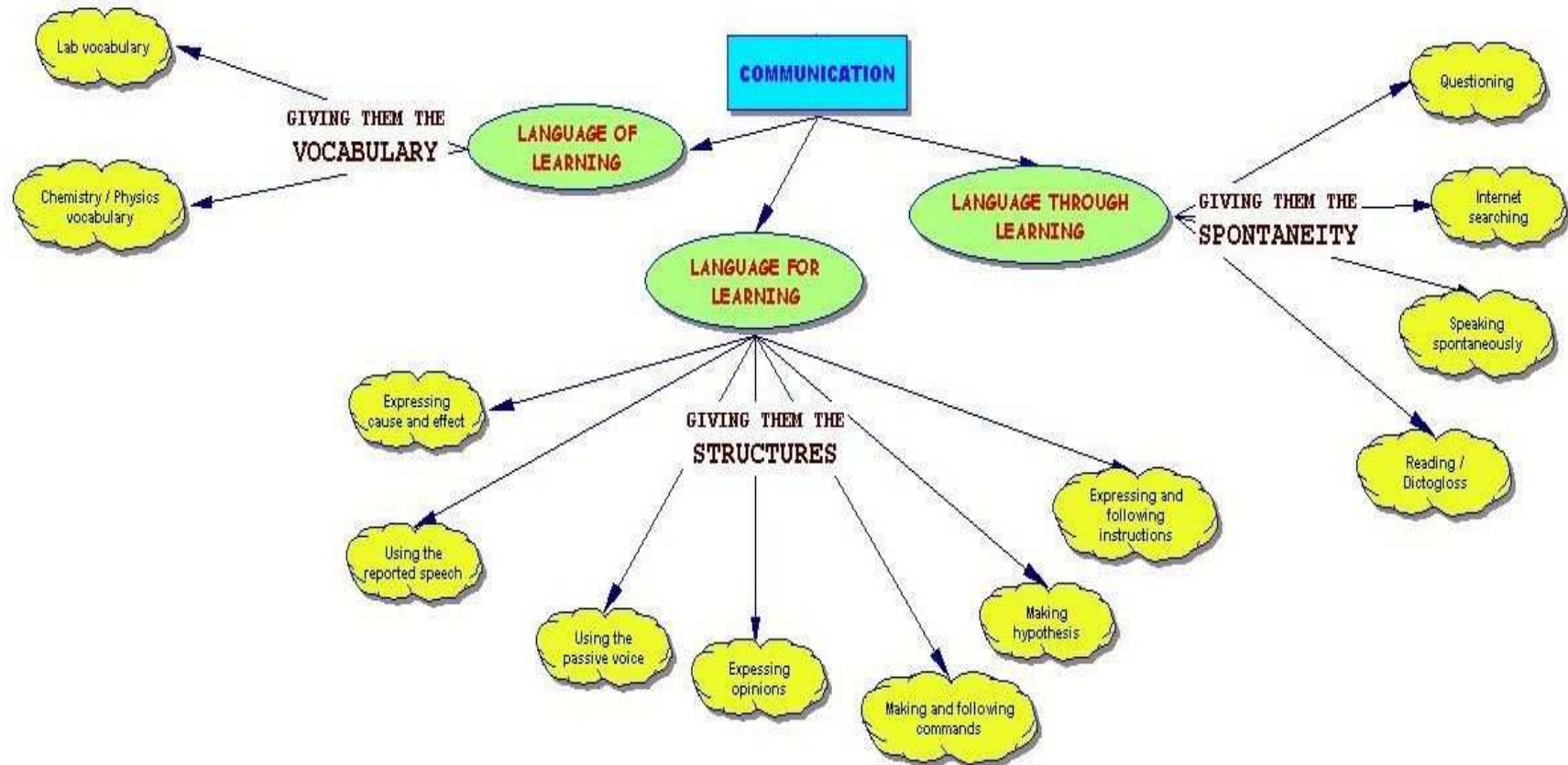
CONTENT



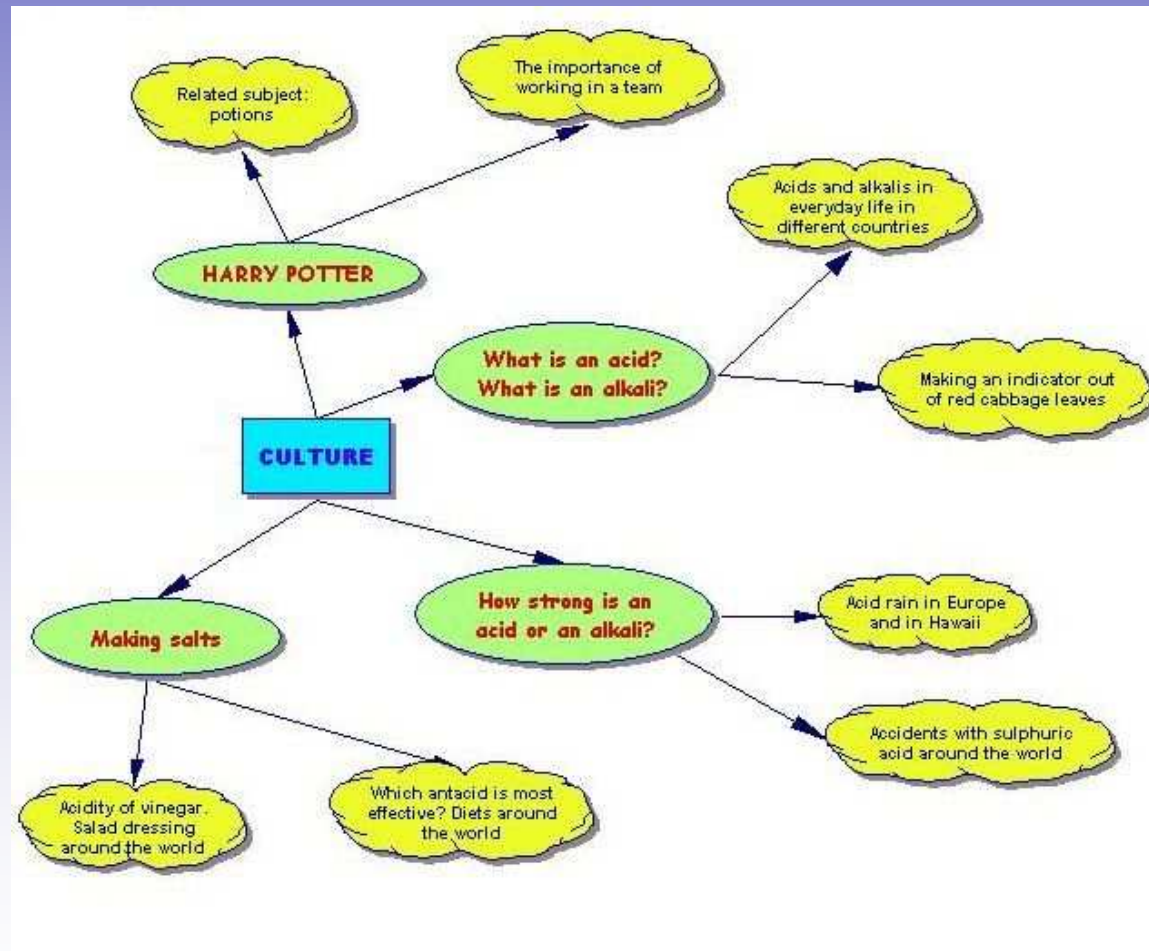
COGNITION



COMMUNICATION



CULTURE



LESSON PLAN 1

Aim: To make an introduction to acids, alkalis and indicators; to discuss hypotheses.

Teaching objectives:

Content

- Indicators

Communication

- Use of 'perhaps' to make hypotheses
- Interpreting data and writing conclusions

Cognition

- Remembering the steps of an experiment
- Analysing and evaluating hypotheses

Outcomes:

At the end of the lesson, students will be able to

- know that acids and alkalis have different effects on indicators
- recognise the importance of hypotheses in science
- draw and recognise sketches of laboratory tools and experiment steps
- know scientific vocabulary
- make hypotheses and discuss them with team members
- write conclusions concerning an experiment
- present and defend an argument
- understand the result of an experiment
- develop criteria for judging the value of a hypothesis

Tasks planned and timing:

1. Power-point to introduce the subject: what it is about; that it will be taught in English; and the topics that will be explained (5 min)
2. The teacher will perform an experiment: he will water a white flower with two sprays; with the first one, the flower will turn pink, with the second one, the flower will turn back to white (5 min)
3. Students will be provided with two sets of cards: one set depicting 5 hypotheses to explain why the flower changed its colour, the other set with the same written hypotheses, all of them starting with 'I think that perhaps the flower changed its colour because...'. Working in pairs, students will match each picture with a sentence, and then will have to discuss which two hypotheses they think are more likely to be true (10 min)
4. Once they have chosen two hypotheses, students will be asked to decide which one is the true one performing a small investigation on the flowers and the sprays. They will be provided with a handout to write down evidence supporting and refuting their hypotheses, and they will have to write down their conclusions (20 min)
5. Plenary: the conclusions of each team will be presented to the rest of the class (10 min)
6. Power-point: which of the hypotheses is the true one and why, introduction to indicators and their effect with acids and alkalis (10 min)
7. Homework: a handout to draw the steps of the experiment, a handout to remember the effects of acids and alkalis on indicators

Resources

- For the power-point: a computer, a screen and a projector
- For the experiment: three white flowers, the best ones are white carnations; a spray with an alkali solution inside (bleach); a spray with an acidic solution inside (vinegar); phenolphthalein. The carnations should be previously watered with phenolphthalein, before the beginning of the class
- For the hypotheses activity: two sets of 5 cards for each team, one with drawings, the other one with sentences; a handout for each student to write down evidence supporting and refuting the hypotheses, and to write down conclusions
- For the homework: two photocopies for each student

Assessment

- Homework will be suitably marked
- In the plenary, students will be asked to assess each other

Evaluation

EXAMPLE 1

Making and testing hypotheses

Why did the flower change its colour?



First spray

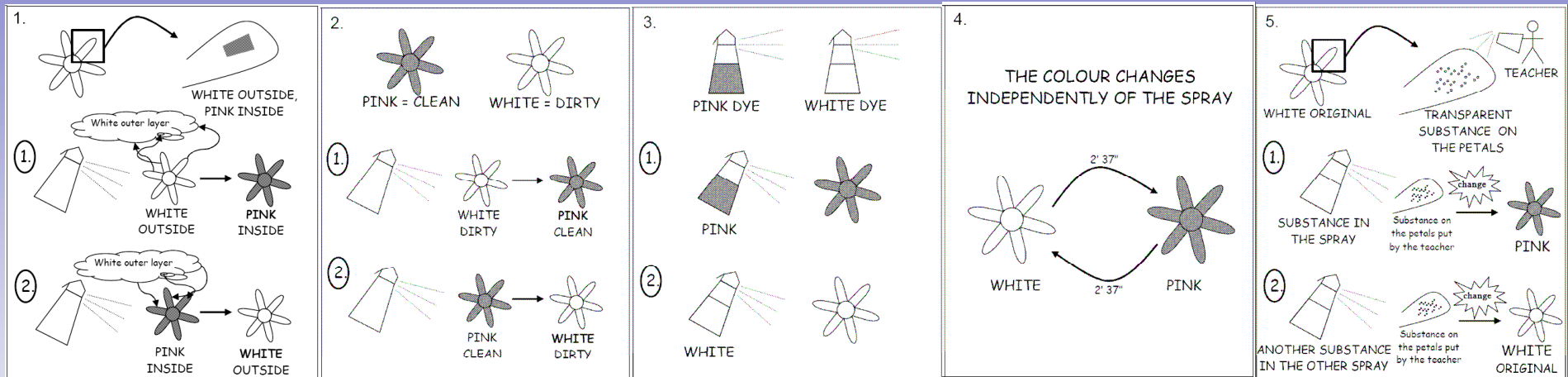


Second spray

EXAMPLE 1

Making and testing hypotheses

Why did the flower change its colour?



A.

I think that perhaps the flower changed its colour because ...

the flower was in fact pink, and with the first spray it got clean, and with the second one it got dirty.

B.

I think that perhaps the flower changed its colour because ...

there was a pink dye in one of the sprays, and a white dye in the other one.

C.

I think that perhaps the flower changed its colour because ...

the substance in the spray destroyed the outer layers of the flower, and let us see the pink deeper layers.

D.

I think that perhaps the flower changed its colour because ...

on the flower petals the teacher had put a substance that changed with the substances inside the sprays.

E.

I think that perhaps the flower changed its colour because ...

it was not a natural flower, but an artificial one made of transmutational plastic the colour of which changed every 2 minutes and 37 seconds.

EXAMPLE 1

Making and testing hypotheses

Why did the flower change its colour?

SUBSTANCE hypothesis

Things you can do to test this hypothesis:

To the flowers:

smell

touch

compare two flowers

observe the drops

To the sprays

try them on water

try them on another liquid

TEST YOUR HYPOTHESES

Touch the flowers, touch the sprays, AND DECIDE!

Hypothesis 1:	
Evidence supporting We... (verb in past) and we found that...	Evidence refuting We.... (verb in past) but we didn't find that...
Hypothesis 2:	
Evidence supporting We.... (verb in past) and we found that...	Evidence refuting We.... (verb in past) but we didn't find that...

EXAMPLE 1

Making and testing hypotheses

Why did the flower change its colour?



Write down your conclusions. Use the following substitution table:




We think that perhaps the flower changed its colour because		(hypothesis 1)	or because	(hypothesis 2).	
The evidence supporting the	first	hypothesis is (that)	(first argument)	and (that)	(second argument).
	second				
There is no evidence supporting the		first	hypothesis.		
		second			
The evidence refuting the	first	hypothesis is (that)	(first argument)	and (that)	(second argument).
	second				
There is no evidence refuting the		first	hypothesis.		
		second			
Our conclusion is then that		there is a stronger evidence for the		first	hypothesis.
		second			
the		first	hypothesis is more likely to be true.		
		second			

EXAMPLE 2

Making groups: Harry Potter

ADJECTIVES OF PERSONALITY

leading shy brave intelligent bright extrovert stubborn
 outgoing charismatic experienced dominant dynamic vulnerable
 clever generous skilfull absent-minded enigmatic hard-working

Subject: Potions		Teacher: prof. Snape	
TEAM MEMBERS	Harry Potter	Hermione Granger	Ronald Weasley
PHOTOGRAPH			
PERSONALITY	leading, brave, clever, skilfull	intelligent, stubborn, dynamic, hard-working	experienced, vulnerable, generous, absent-minded
CONTRIBUTION TO THE TEAM	I will be the one who does the experiment	I will be the one who writes the report	I will be the one who sets up and cleans the device

EXAMPLE 3


Experiment: making and testing an indicator

MAKING AN INDICATOR OUT OF RED CABBAGE

1. Circle the lab material you will need in this experiment.



2. Draw next to each name a sketch of the proper instrument from the ones above.

pestle		mortar	
funnel		support stand	
beaker		clamp holder	
filter paper		support ring	

3. Complete these sentences using the word bank below, and order them 1-8.

Keep crushing until all the _____ has come out.

Filtrate the _____ obtained.

Collect your _____ in a flask and label it.

Take some _____ of the red cabbage.

Crush your plant pieces with the _____.

Set up the _____ device.

Add some _____ to the mixture.

Fold the filter paper and put it into the _____.

leaves water indicator acid filtration
 colour pestle and mortar funnel mixture bleach

4. Who is going to do what? Organise your tasks. Write the sentences above in two columns, the left one with your tasks, and the right one with your partner's tasks. Remember to add the **cleaning** tasks!

My tasks	My partner's tasks
I will be the one who...	My partner will be the one who...

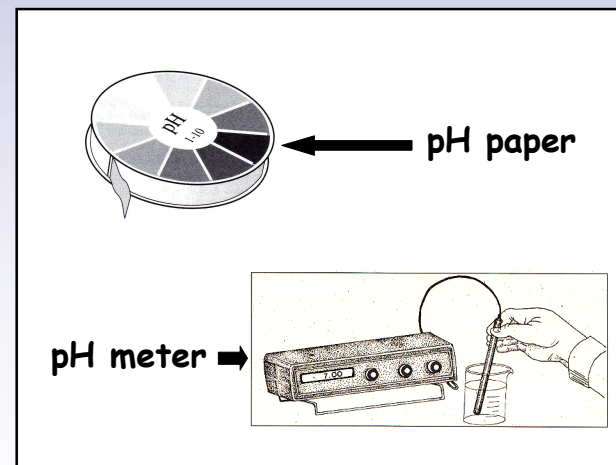
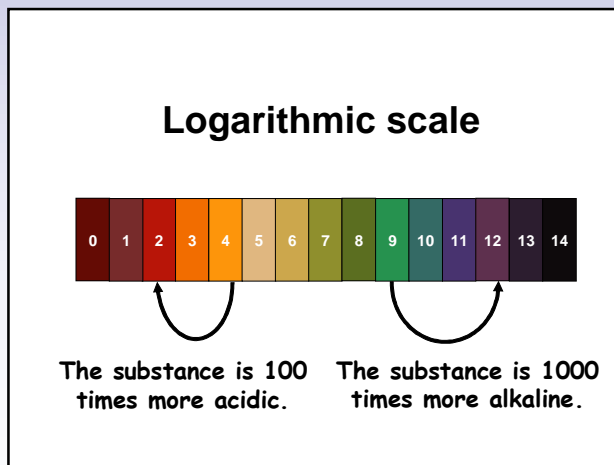
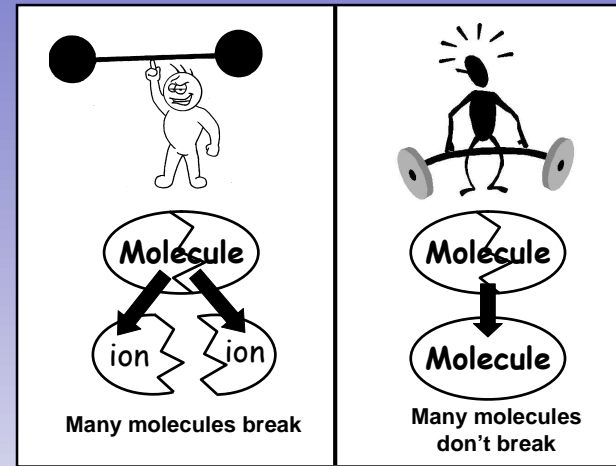
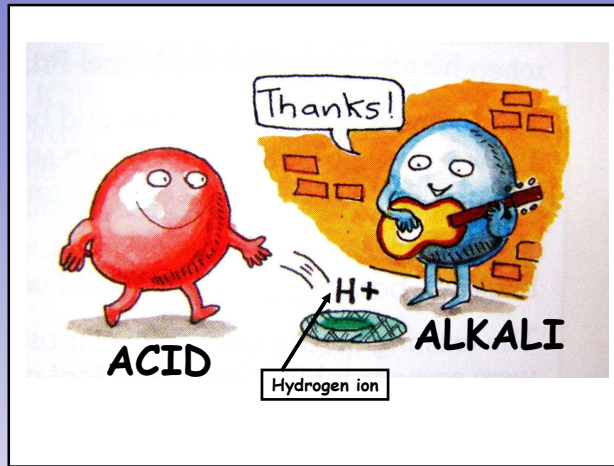
EXAMPLE 3

Experiment: making and testing an indicator

LAB REPORT	
Aim (This report aims to show ...)	
Material Draw the devices you used on the other side of this paper	
Instruments	Substances
Procedure (1. First we... 2. Then... 3. Next... Finally...)	
Results (We found out that...)	
Conclusions (This experiment has shown that... Although I already knew that... I have learnt that... Another fact I learnt... However the most interesting thing I learnt was...)	

EXAMPLE 4

Dictogloss: the pH scale



EXAMPLE 4

Dictogloss: the pH scale

DICTOGLOSS - HOW STRONG IS AN ACID OR AN ALKALI?



1. Your teacher has just read a text about the pH, while you were taking notes about it. Glue the cards you have been provided in the same order as the information read by the teacher. Write next to each picture an explanation according to your notes. The boxes below the lines will help you. Work as a team.

a)

abbreviation	relative	solution
acidity	alkalinity	


b)

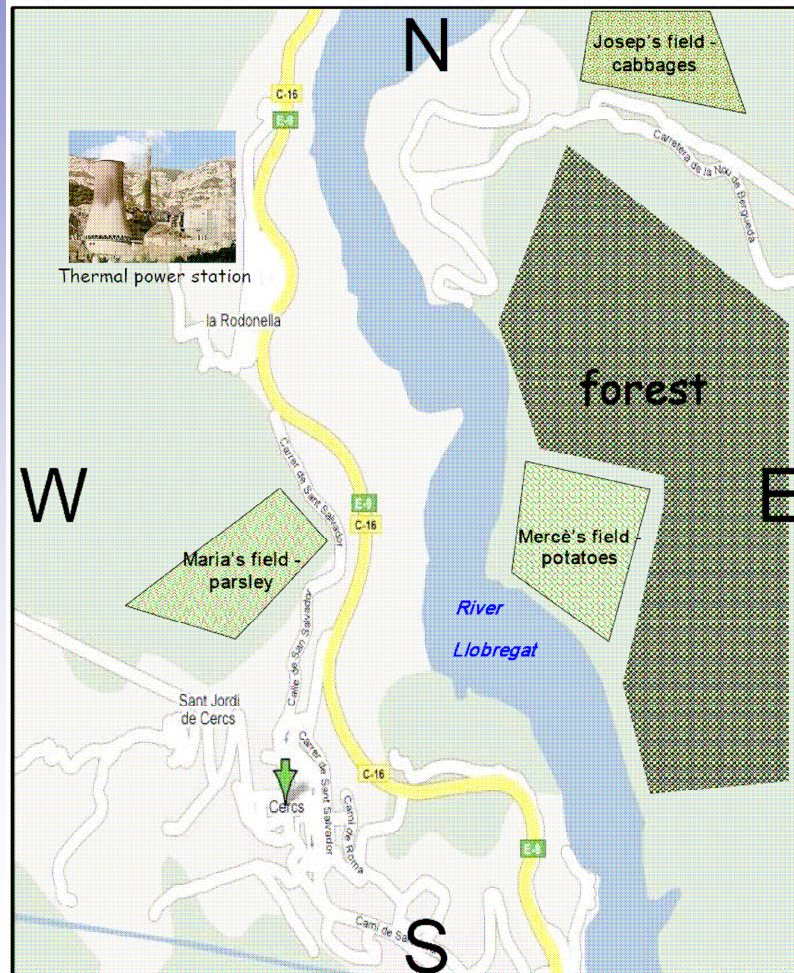
scale	change	times
acidic	alkaline	

EXAMPLE 5

Mysteries: introduction to acid rain

MYSTERIES – MAP OF CERCS

 This is a map of the area surrounding Cercs, Catalonia. Observe it carefully to solve the mystery. Why does Maria grow potatoes in her field if cabbages are much better paid?



1. Near Cercs, there are many coal mines.
2. Josep Galimany usually goes to fish to the river Llobregat. In the past he used to fish chars, now he fishes trouts.
3. Mercè Montoliu has had conjunctivitis since 1971.
4. Maria Romeva decided to replace cabbages for parsley in 1980.
5. Cercs is 105 km far from Barcelona and has 1342 inhabitants.
6. The new thermal power-station of Cercs was opened in 1971.
7. Mercè Montoliu's children love eating potatoes.
8. The chimney of the thermal station of Cercs has 122 m.
9. Chars are fish that can only live in waters of pH 7.
10. Cercs is in el Berguedà, Catalonia.
11. The winds in Cercs usually blow in direction south-east.
12. The coal used in the thermal power station contains 0.45% of sulphur.
13. Mercè Montoliu's brother is an engineer. He works in the thermal power station of Cercs.
14. In 1973, the price of cabbage was higher than the price of potatoes. Nevertheless, Mercè Montoliu decided to grow potatoes in her field instead of cabbages.
15. Mercè Montoliu's brother likes hunting in the forest of Cercs. Now, he can only hunt in the north of the forest.

EXAMPLE 5

Mysteries: introduction to acid rain

EXPLANATION OF THE MYSTERY

We want to explain why...

These are the statements that support our theory:

- 1.
- 2.
- 3.
- 4.

- 5.
- 6.
- 7.
- 8.

Apart from these statements, we already know that:

- 1.
- 2.
- 3.
- 4.

- 5.
- 6.
- 7.
- 8.

Our theory is then the following:

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.

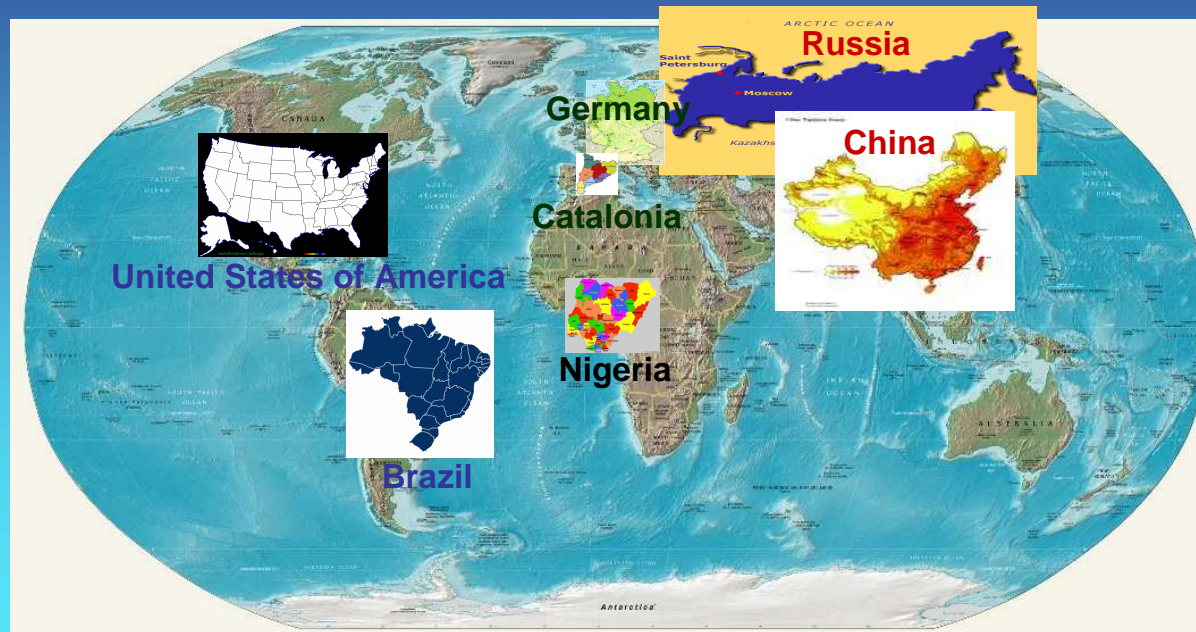
As a result, we think that...

Our final conclusion is that...

EXAMPLE 6

Assessing an oral presentation

INTERNATIONAL MEETING OF ACIDS AND ALKALIS



Sant Vicenç dels Horts, 17th of April 2007

EXAMPLE 6

Assessing an oral presentation

a) Organise your slides. Draw a sketch of each slide, which should include the information given in this table:

<p>Slide number 1 should contain:</p> <ul style="list-style-type: none">Names (and PICTURES) of some acids and alkalis and where we can find them.What makes acids acidic and alkalis alkaline.	<p>Slide number 2 should contain:</p> <ul style="list-style-type: none">Differences between acids and alkalis. Organise it showing their main properties. Include TABLES and/or PICTURES.
<p>Slide number 3 should contain:</p> <ul style="list-style-type: none">Similarities between acids and alkalis. Explain what corrosive means, and that acids and alkalis neutralise forming salts. Include TABLES and/or PICTURES.	<p>Slide number 4 should contain:</p> <ul style="list-style-type: none">Production, uses and problems of acids and alkalis in the country you have chosen. Include a MAP of the country and PICTURES.

b) Organise your script. You can use these sentence starters:

Slide 1:

- We want to show you...*
- Acids / alkalis can be grouped in ...*
- Some examples of acids / alkalis are ...*
- We can find these acids / alkalis in ...*

Slide 2:

- Acids and alkalis are different because ...*
- While acids are ..., alkalis are...***
- Some other properties of acids / alkalis are ...*

Slide 3:

- Acids and alkalis have some similar properties because ...*
- This property means that...*
- Acids and alkalis are also similar because ...*

Slide 4:

- In (name of country), the acids / alkalis with a higher production are ...*
- Acids / alkalis are used in (name of country) mainly in (name of industry) for ...*
- There have also been some problems with acids / alkalis because ...*

EXAMPLE 6

Assessing an oral presentation

ASSESSING AN ORAL PRESENTATION



The following chart will help you to assess your peers' work. Write marks 1-4 in the right columns according to the instructions of the columns on the left.

Power-point	Beginning 1	Developing 2	Accomplished 3	Excellent 4	Score						
					United States	Brazil	Nigeria	China	Russia	Germany	Catalonia
General aspect of slides	Disorganized and difficult to follow.	Organized but difficult to follow.	Disorganized but easy to follow.	Organized and easy to follow.							
Pictures and graphics	Small and impossible to understand.	Big but difficult to understand.	Small but easy to understand.	Big and easy to understand.							
Texts	Small and impossible to understand.	Big but difficult to understand.	Small but easy to understand.	Big and easy to understand.							
Content	Does not cover all appropriate topics.	Covers some of the appropriate topics.	Covers most of the appropriate topics.	All topics covered. Also interesting facts.							
Speech	Beginning 1	Developing 2	Accomplished 3	Excellent 4	United States	Brazil	Nigeria	China	Russia	Germany	Catalonia
Matching between speech and images	Speech has nothing to do with slides.	Speech is substantially different from slides.	Only a few items of the speech are not reflected on the slides.	Speech and slides match perfectly.							
Language	Many pronunciation and grammatical errors.	A few errors.	Only one or two errors.	Pronunciation and grammar perfect.							
Communication	The speech is read all the time.	The speech is read most of the time.	The speech is read sometimes.	The speech is not read.							
Timing between team members	Only one member speaks.	One member speaks most of the time.	One member speaks more than the other.	The two members speak the same time.							
Final score											

THANKS TO

- The teachers in Nottingham: Stephen Bailey, Philip Hood, Do Coyle
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- The Catalan Ministry of Education
- IES Frederic Mompou, specially to the head teacher Laia Casanovas and to the English teachers