

EDUCATIONAL CENTRES: MINIATURE SOCIETIES?



REGINA
CARMELI
RUBI



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1. Introduction

Miniature societies is the name of this statistics project carried out for four months by 3rd and 4th of ESO students. The main purpose is to verify if two Catalan academic centres placed in different environments adjust to the socioeconomic reality of its town. Also to know which is more coherent with Catalonia to determine if our schools can be considered *miniature societies*. The secondary schools we are going to compare are the Regina Carmeli School of Rubí in the urban area and the Serra de Noet Secondary School of Berga in a rural area.



Location of Berga and Rubí in Catalonia



2. Objectives

- Determine if our schools could be a representation of our cities.
- Determine which centre is more coherent with Catalan society and economy.
- Carry out a collaborative project using the platform *eTwinning* to work with another secondary school.
- Explain and compare two realities on the basis of the obtained data.
- Design a survey considering who is going to answer it.
- Find the data we need in an official website.
- Formulate, contrast and validate hypothesis.
- Experiment and learn statistics with data closer to the student's reality.



3. Methodology and work process

To do this project we followed some steps to have our ideas more clear. Although the project was thoroughly planned, we added different things that came out during its execution.

1. Both schools' students search data about their city on *Idescat.cat* individually and make graphics and tables with it.
2. Regina Carmeli students and Serra de Noet students situate their respective city in a region map of Catalonia.
3. Students in every centre make a video explaining the information about its city obtained in steps 1 and 2.
4. Both schools' students test the survey, write the changes they consider necessary for a better understanding of the survey to the forum in the Twinspace, and finally the survey is answered by all the students of both secondary schools.
5. Students in both schools make hypothesis about the results of the survey in their school.
6. Both schools' students make graphics and frequency tables with their survey's results.
7. Students in both schools conclude if their hypothesis were right.
8. All students search data about Catalonia on *idescat.cat*.
9. Students make hypothesis about the opposite school's results and we contrast them.
10. Students in both schools work together to conclude which one is more coherent with Catalonia.
11. Students in Berga and Rubí conclude jointly if our centres can be considered *miniature societies*.
12. Write all the parts of the projects, share the work done by Serra de Noet students and Regina Carmeli students and work together to make a PowerPoint to present our project.

The processes 1 and 4 are described in the section called *Collection of the data*. The results of the steps 2, 3, 5, 7, 8 and 9 can be found in the section *Data analysis, hypothesis and conclusions*. In this block we can also find the 6th step, which was substituted by infographics. The processes 10 and 11 can be read in the section *Conclusions*. After that, we added another part called *A step forward in our project*, which was not planned at first. Finally, step 12 has turned out into this written project and presentation.

To be connected with the other school we have used *etwinning.net*. It is a tool that the EU provides to educational centres to do collaborative projects.

Our *Twinspace* in *etwinning.net*





We want to provide you with an account in this platform so you can see our work. Here is the link to the Twinspace of our project: <https://twinspace.etwinning.net/73387/home> . Your username is **conkurs.elplanter** and the password is **elplanter2019** .

3.1. How are these secondary schools and cities?

Regina Carmeli school in Rubí: Rubí is a town located in Catalonia, in the province of Barcelona, exactly in the region of the Vallès Occidental. It has an area of 32,30 km² and more than 76000 residents. Regina Carmeli is located in the centre of Rubí, a metropolitan area. It is a catholic semi-private school. All the students from 3 to 16 years old must wear a uniform. This school offers Pre-school, primary, secondary education, as well as basic and higher vocational training. The total number of students is 1192. The secondary school has 232 students and 20 teachers. Students use books to study and work in class, but we also use computers and iPads when needed. Their lessons are from 8h to 13h in the morning and from 15h to 17h in the afternoon. On Fridays they are from 8h to 14h.

An air view of
Rubí and
Regina
Carmeli
School.



Serra de Noet Institute in Berga: Berga is a town located in Catalonia, in the province of Barcelona. It is the capital city of Berguedà, its region. It has an extension of 22,57 km² and a population of more than 16000 residents. Serra de Noet Secondary School is located near the centre of Berga, and it is more rural than Rubí. It is a public secondary school. The offer goes from 1st to 4th of ESO, for boys and girls from 12 to 16 years old. There are 220 students and 24 teachers. Serra de Noet Secondary School uses the new technologies in class. Lessons start at 8:15h and finish at 14:45h.

An air view of
Berga and
Serra de
Noet.





3.2. Collection of the data

On the one hand, to obtain our town’s data, the students of each centre searched on *idescat.cat* values about our population in different categories: sex, place of birth, nationality, instruction level, relation with economic activity and Catalan knowledge. We also looked for the main family homes by regime of possession, residences by type of nucleus and park of vehicles. We searched these data about Catalonia, too.

Rubí (081846)
 Vallès Occidental

Population (2018)	76.423
Surface area (km ²)	32.30
Altitude (m)	123
Longitude (°)	2.032506
Latitude (°)	41.492644

Data about Rubí and Berga on *Idescat*.

Berga (080229)
 Berguedà

Population (2018)	16.199
Surface area (km ²)	22.57
Altitude (m)	704
Longitude (°)	1.846964
Latitude (°)	42.102728

On the other hand, the data collection in our school was carried out by a survey answered by students of the ESO. It had been previously done by the teachers. We wanted to do simple questions that could be perfectly understood by everybody in order to get rigorous results. To reach this purpose we tested the survey ourselves and we proposed changes using the forum of the platform *Twinspace* in *etwinning.net*.

By clicking the links below you can see the survey mentioned before. All the survey was answered by students but only the first part was dedicated to them. Then the questions were related to their parents. By clicking the links below you can see the questions related to the students and the mothers (questions for the fathers were the same). It was responded by 224 students in Rubí, which represents the 96.6% of the ESO and the 18.8% of all the school.

<https://docs.google.com/forms/d/e/1FAIpQLSfR3RTpg51-umDtq62rFwRWU6JnGMR-MowCpXYm0Gc0pBalZg/viewform?vc=0&c=0&w=1>

https://docs.google.com/forms/d/e/1FAIpQLScp5GqHVsgwh06lZ3HPt2L0_K9r67Q1kuQoAkLkPJHIXHNacA/viewform?vc=0&c=0&w=1

Finally, once each centre had compiled its data, they shared them with the other one to be able to compare them later.



3.3. Margin of error

People who answered the survey was not a great number so there is a margin of error in both cities. In Rubí it is of the 9%. In Berga it is 7,5%.

3.4. Data analysis, hypothesis and conclusions

3.4.1. Our city

The first data collected was the socio-economic values of our city. We studied these values making tables and graphics for each category, as it is traditionally done. Then, we elaborated a video showing the location of our city and explaining the diagrams. In the links below you can watch them.

Rubí: <https://www.youtube.com/watch?v=e-cUwOUof24>

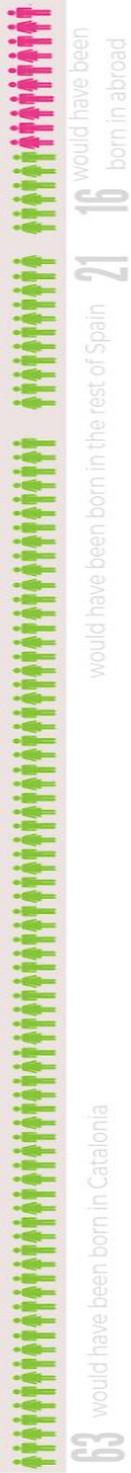
Berga: <https://youtu.be/0cq3k6Y9enY>

Below you will see all the study of Rubí and Berga with infographics. We were inspired on the project *100 people* and the infographic made by Esther Utrilla to the newspaper *Ara* on the 27th January of 2019.



Spanish nationality

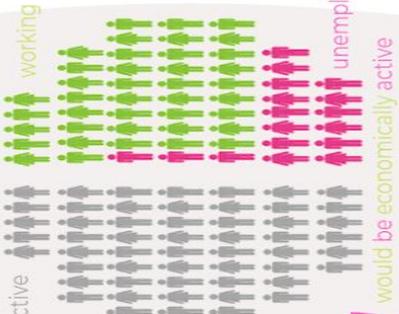
foreign nationality



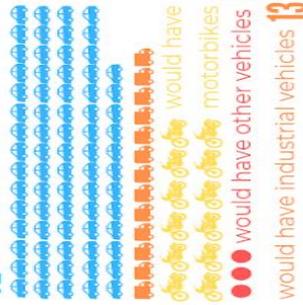
IF WE WERE A HUNDRED IN RUBÍ

43

would be economically inactive

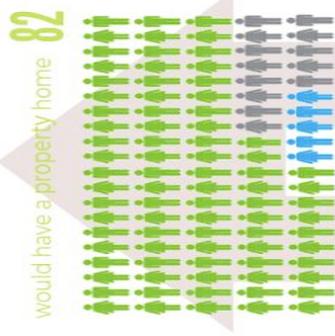


72 would have cars



13 would have a rental home

5 would have another way of home possession



21

homes would have only one person



39

would have a couple with children



24

would have a couple without children



10

would have a father or a mother with 3 or more children



3 would have two or more nuclei



63 would have a Certificate of Higher Education

95 would understand Catalan wouldn't understand it

76 would be able to read it

would be able to speak it

69

53 would be able to write it

14

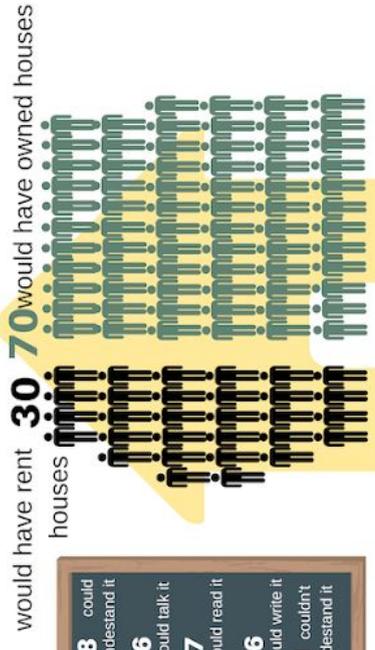
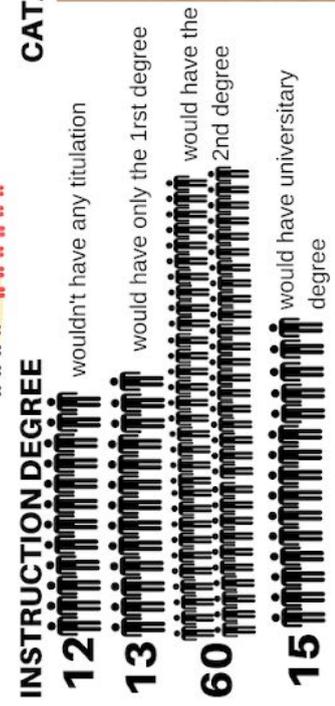
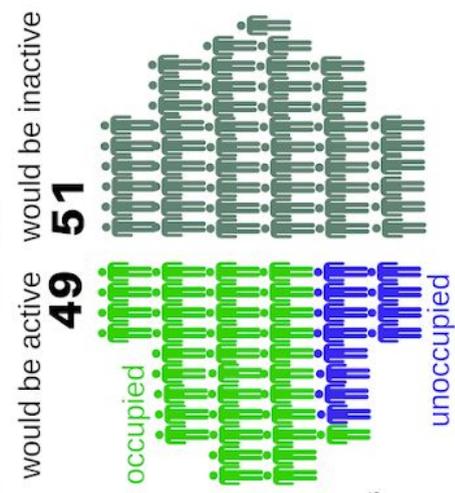
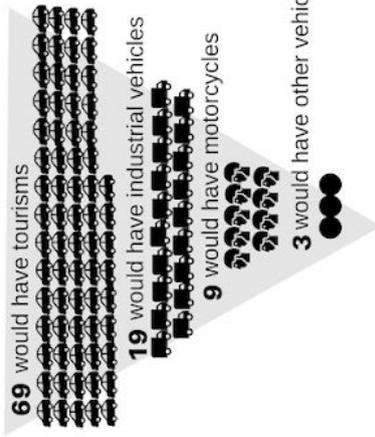
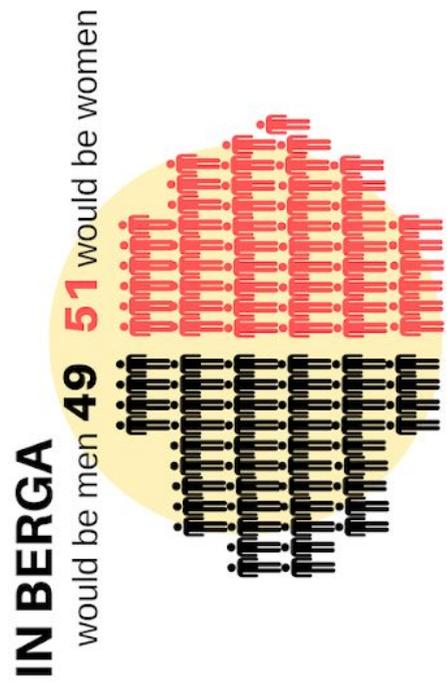
would have university studies

12 would have a General Certificate of Education





IF WE WERE A HUNDRED





3.4.2. Our school

Hypothesis

Then it was the time to formulate hypothesis about what the results of the survey of our schools would be, based on the data collected from our cities and our own intuition. These where the hypothesis from **Regina Carmeli**:

Students sex	There are more girls than boys.
Place of birth of students and parents	The vast majority will be born in Catalonia or in another place in Spain.
Nationality of fathers and mothers	The majority have Spanish nationality.
Instruction level of parents	The majority have a CHE.
Economic activity of parents	The majority are working.
Catalan knowledge	They majority understand, speak and read Catalan but they have problems to write it.
Homes by regime of possession	The vast majority live in rental housing.
Family nucleus	Same quantity of a couple with children and father or mother with children.
Type of vehicle	Mostly there will be two cars per family.

Serra de Noet students made hypothesis about their survey's results too.

Sex	There are more girls than boys.
Place of birth	The majority will be born in Catalonia and many of the rest in Spain.
Nationality	The majority have Spanish nationality.
Instruction level	Most of the them have the certificate of the High School and about half the CHE
Economic activity	More than half have a job.
Catalan Knowledge	The majority can understand and speak perfectly Catalan but not all of them can read and write it perfectly.
Homes by regime of possession	Half of them live in a rental house and the other half live in a property house.
Family nucleus	The vast majority are formed by a father, a mother and one or two children.
Type of vehicle	Most of them have one or two cars.

Data analysis

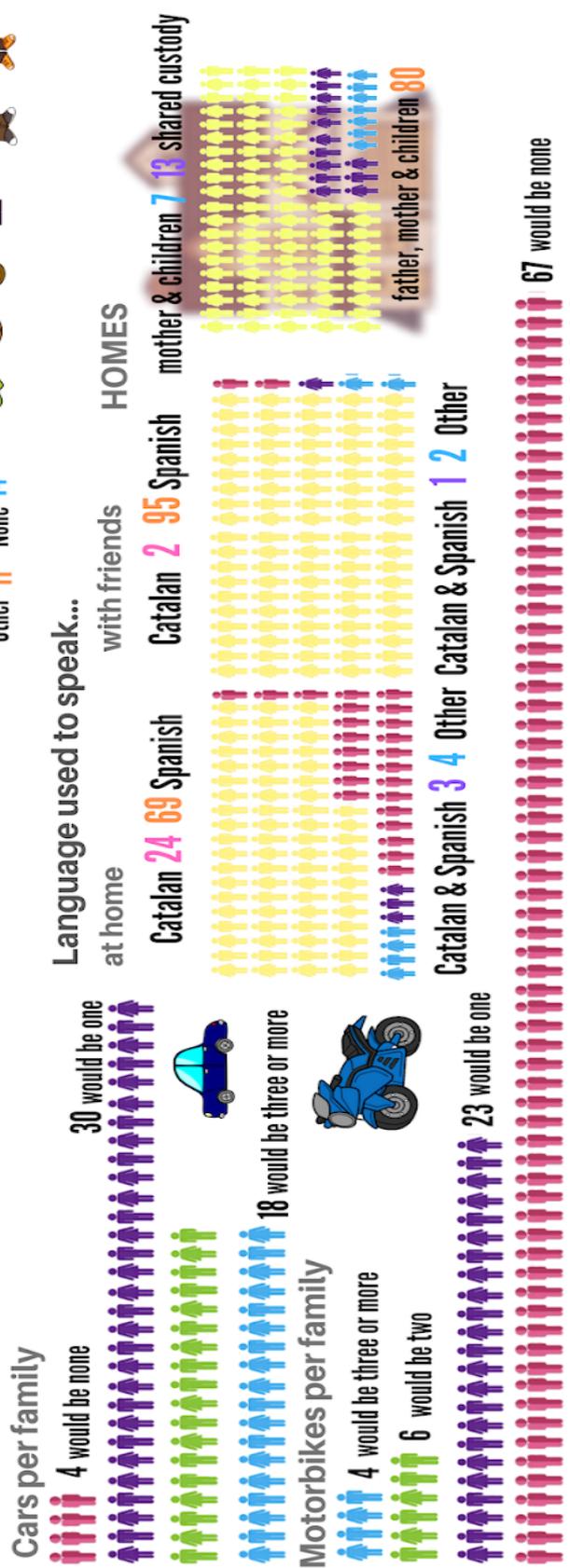
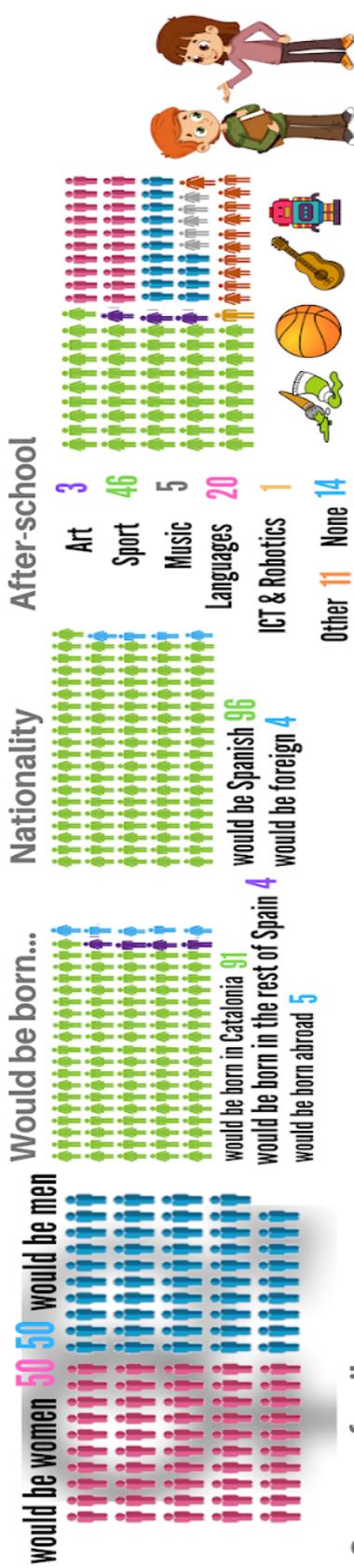
Afterwards, the survey was answered by all the students in both schools. And then we processed all the data gathering it in tables and showing it in tables using Excel. After that, we made the infographics you can see below.



IF WE WERE A HUNDRED

IN REGINA CARMELI (ESO)

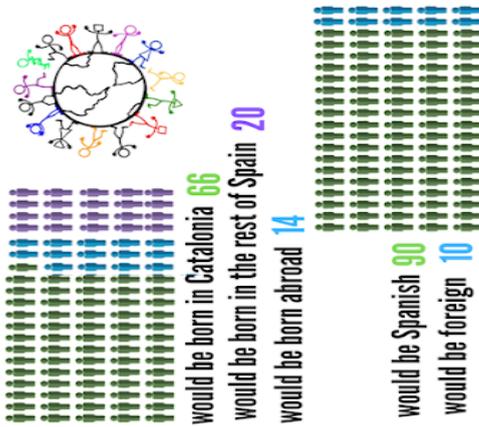
Students



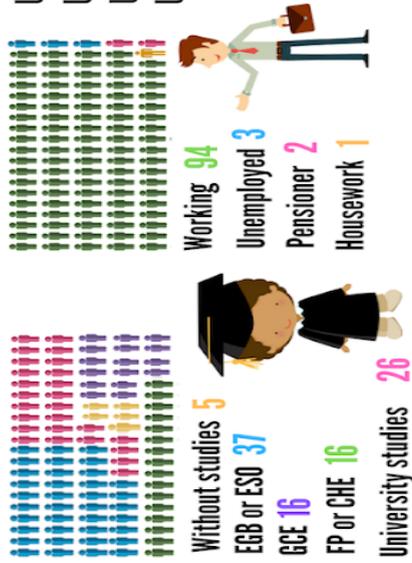


Parents

Father



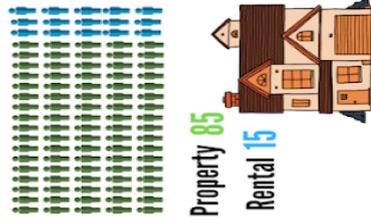
Level of instruction



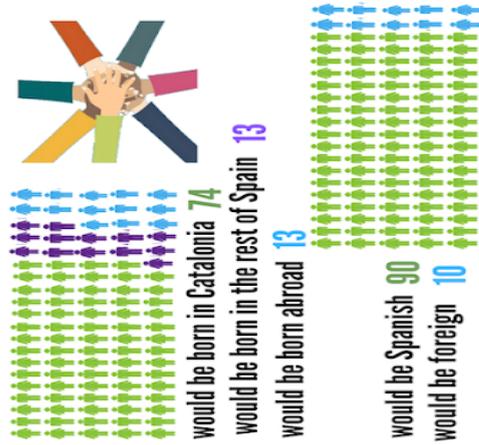
Catalan knowledge



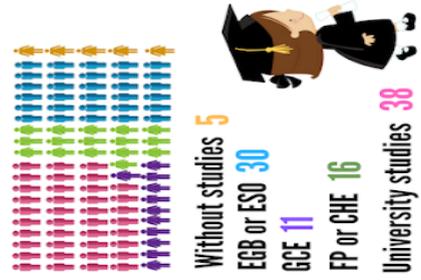
Homes



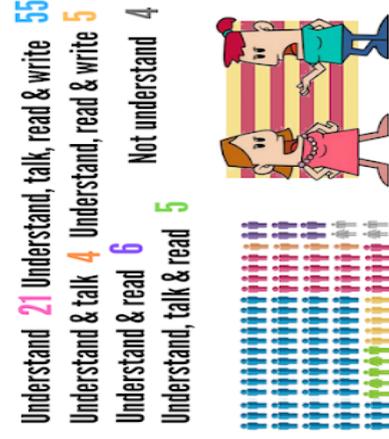
Mother



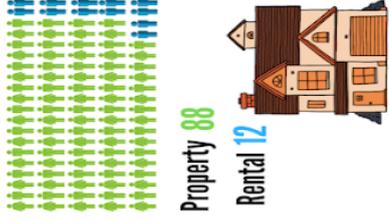
Level of instruction



Catalan knowledge



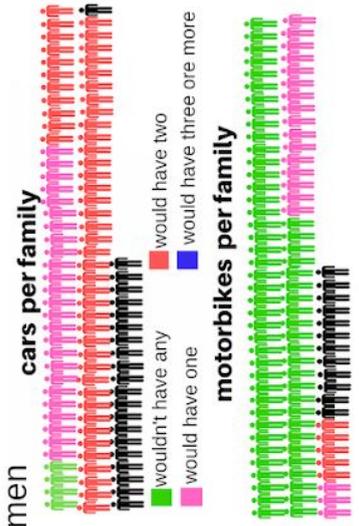
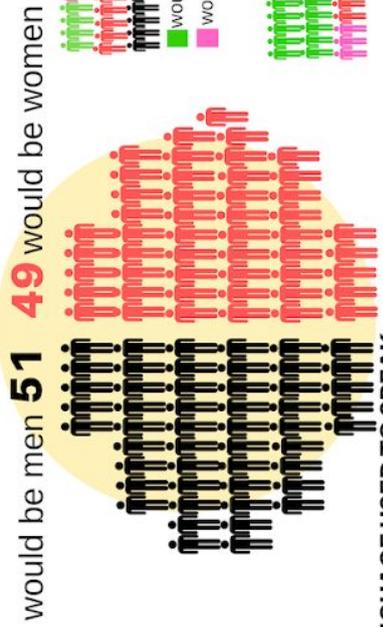
Homes



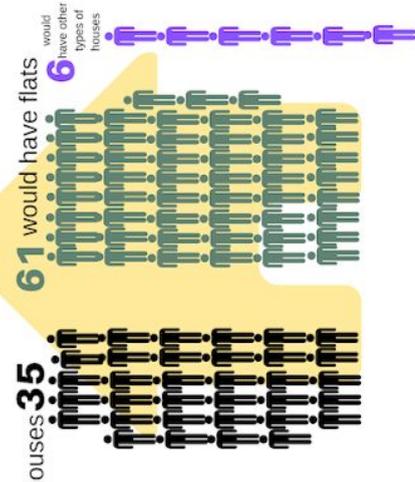
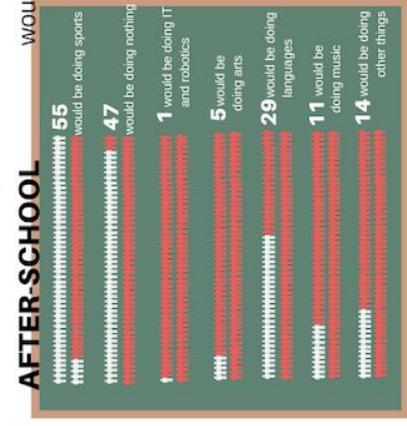
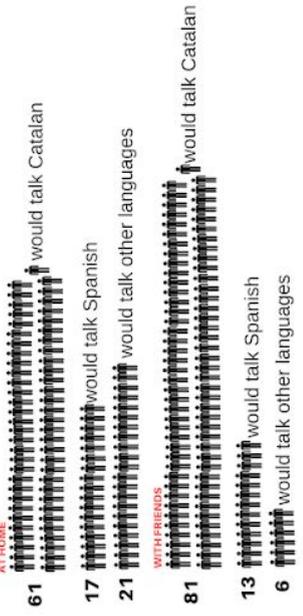


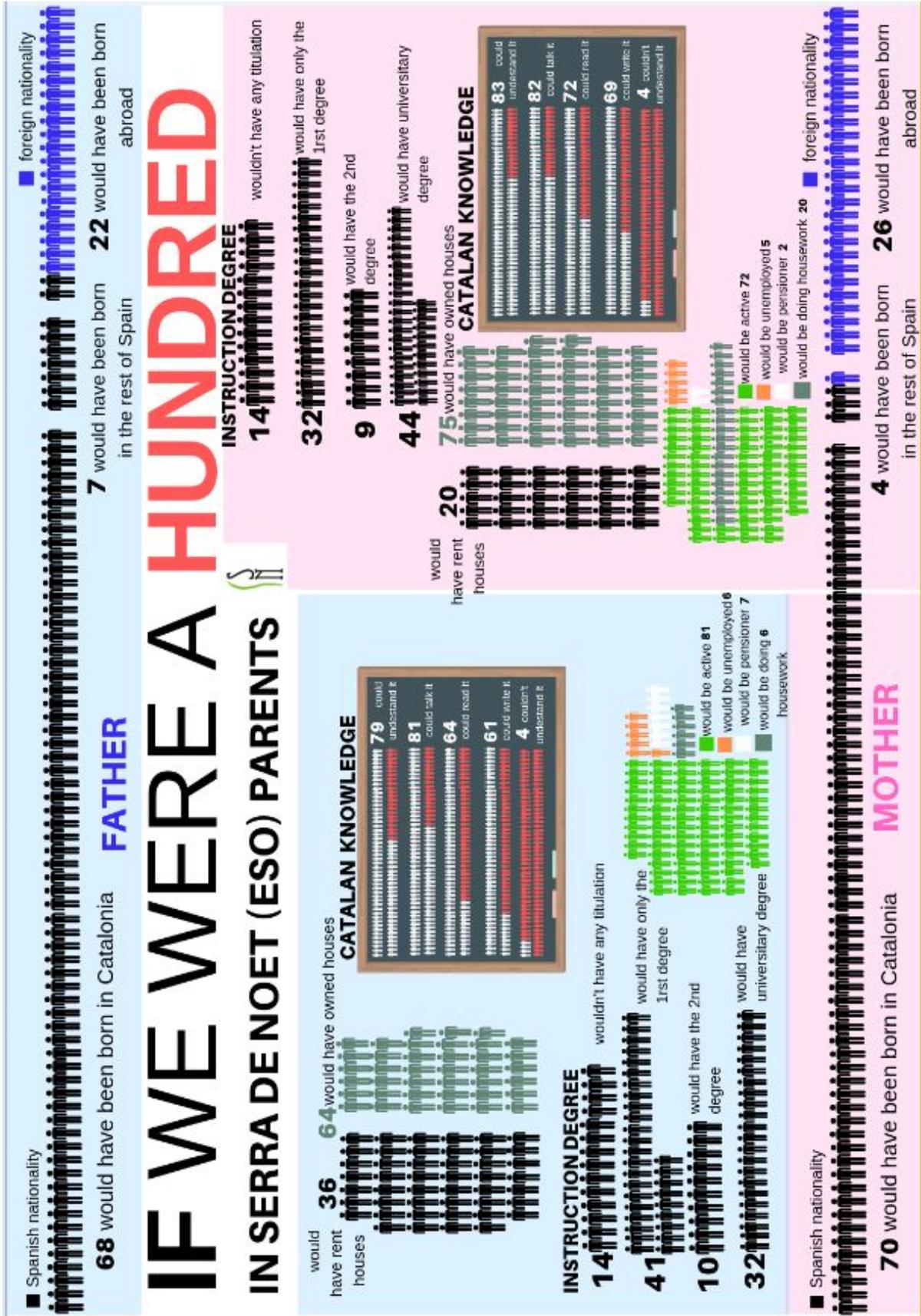
IF WE WERE A HUNDRED

IN SERRA DENOET (ESO) Students



LANGUAGE USED TO SPEAK...







Hypothesis contrast

Using the information compiled in the infographics, we compared the results of the survey to the data of each city to see if there were similarities.

In **Regina Carmeli**, the results of the comparison were the following ones:

- Population by sex and population by nationality adjust perfectly. Homes by regime of possession category also presents similar percentages although the survey only studied property and rental options.
- Population by level of instruction is dissimilar because in Rubí people with a CHE stand out, but the parents of this centre usually have the EGB/ESO or university studies.
- There are some categories whose results in the school do not represent in an exact way the data of Rubí, but they still maintain the same trend (people born in Catalonia are the majority, working people predominate and the values for the Catalan knowledge are similar except in the part of reading it).
- There were two categories that we weren't able to compare: family nucleus, because the data of Rubí consider the ones that do not include children while the centre counts one child minimum, and park of vehicles, although we can observe that in both cases cars are the majority.

These have been the results of the comparison between **Serra de Noet** and Berga:

- Population by nationality, family nucleus and homes by regime of possession adjust perfectly.
- Population by level of instruction does not coincide because of the same reason as Regina Carmeli.
- Some results do not show the same values as Berga's data but follow the same patterns: the number of men and women is almost the same, people born in Catalonia are the majority and most people have a job.
- We were not able to compare the park of vehicles but we can still observe that cars are the majority.

Finally, we contrasted our hypothesis with the real data of the survey. We arrived at these conclusions: we determined that Regina Carmeli students' hypothesis were, in general, correct except in the categories of level of instruction, regime of possession of homes and composition of the family nucleus, because the most common instruction levels are 1st degree and university degree, people tend to live in a property house and the quantity of families composed by father, mother and children is very different to the quantity of families with shared custody and mother/father with children. This results surprised them. The hypothesis Serra de Noet students made were good but they failed in the level of instruction category, whose situation is the same as Regina Carmeli's.



3.4.3. Regina Carmeli vs Serra de Noet

Hypothesis

Before each school knew the data of the other we made hypothesis of their results. These were the suppositions of **Regina Carmeli** about Serra de Noet:

Students sex	There are more girls than boys.
Place of birth of students and parents	The majority will be born in Catalonia.
Nationality of fathers and mothers	The majority have Spanish nationality.
Instruction level of parents	The majority have a CHE.
Economic activity of parents	The majority are working.
Catalan knowledge	The majority understand, speak and read Catalan but has problems to write it.
Homes by regime of possession	The majority live in a property house.
Family nucleus	The majority are a couple and children.
Type of vehicle	Mostly there will be two cars per family.
Language spoken at home	The majority speak Catalan at home.
Language spoken with friends	The majority speak Catalan with friends.
After-school	The majority do sport.

These were the hypothesis made by **Serra de Noet** about Regina Carmeli:

Students sex	There are more boys than girls.
Place of birth of students and parents	The majority have been born in Catalonia.
Nationality of fathers and mothers	The majority have the Spanish nationality.
Instruction level of parents	The majority have the first degree.
Economic activity of parents	The majority are working.
Catalan knowledge	The majority understand, talk, read and write it. But some people can not do that.
Homes by regime of possession	The majority live in rent houses and flats.
Family nucleus	The majority are a couple with children.
Type of vehicle	The majority of the families have one car.
Language spoken at home	People speak Catalan and Spanish at home.
Language spoken with friends	They speak more Spanish than Catalan.
After-school	The majority do languages.

After comparing the two schools we were able to decide if the hypothesis that each school made about the other one were right. From the hypothesis made by **Regina Carmeli** students, the ones about population by sex and population by level of instruction were wrong, because in Serra de Noet there are more men than women and more people with 1st degree or university degree than with a 2nd degree. The rest were right.

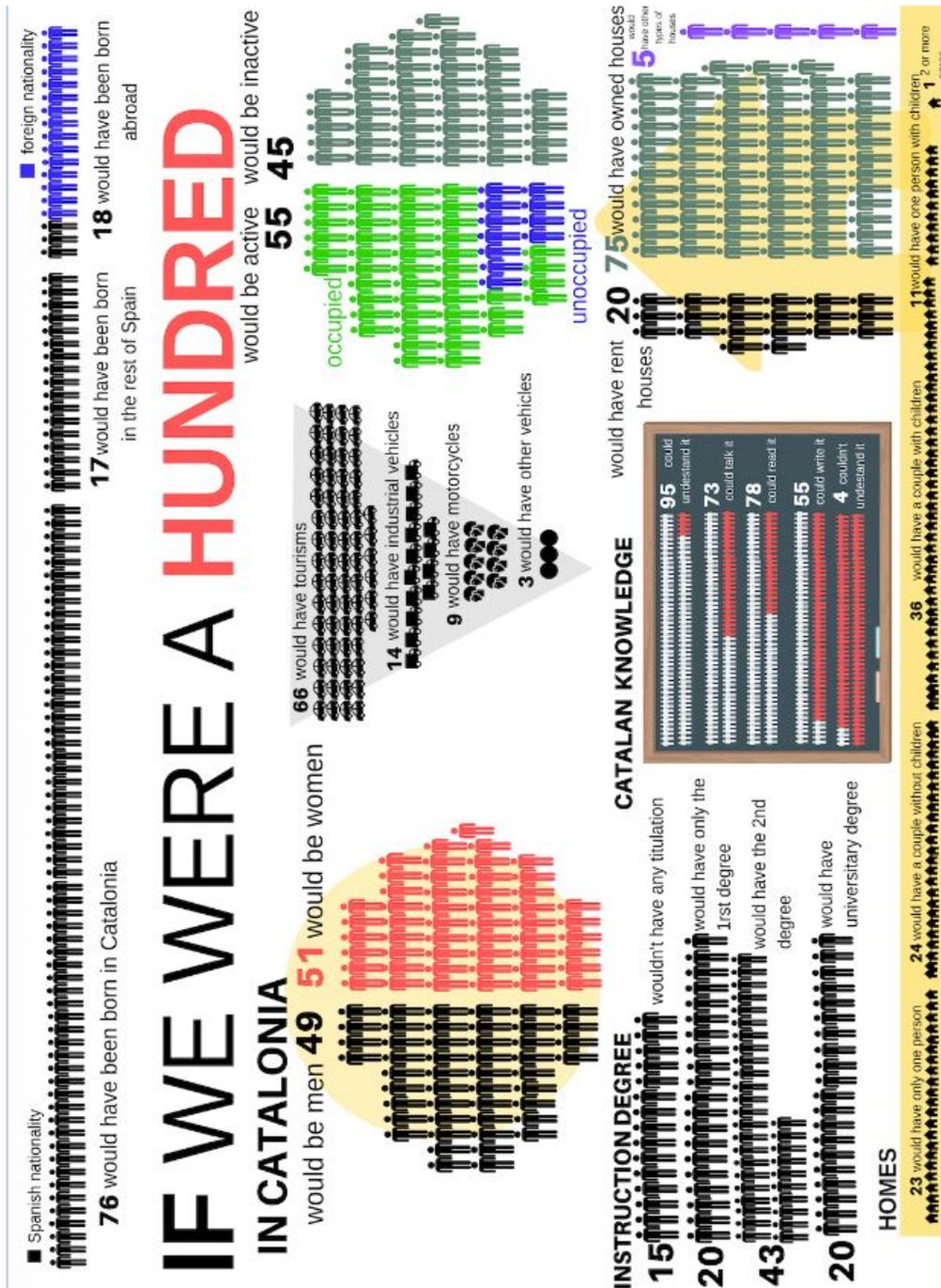
Hypothesis made by **Serra de Noet** students on population by sex, homes by regime of possession and after-school were wrong, because in Regina Carmeli there are more girls than boys, people live mostly in property homes and the predominant after-school activity is sport.



Also, the hypothesis about level of instruction were partially wrong because it fits the result of the fathers but not the result of the mothers. The rest were right.

3.4.4. Catalonia

Then we searched for the information about Catalonia also in the Idescat website and below you can see the infographics with all the information.





Hypothesis

Previously to the comparison of our centre with Catalonia we made hypothesis about what we thought our school and Catalonia have in common. The suppositions made by **Regina Carmeli** were these:

Sex	More girls than boys in both cases.
Place of birth	The majority will be born in Catalonia in both cases.
Nationality	The majority have Spanish nationality in both cases.
Instruction level	The majority have a CHE in both cases.
Economic activity	The majority are working in both cases but the unemployed people in Catalonia is numerous.
Catalan knowledge	The majority understand, speak and read Catalan but they have problems to write it in both cases.
Homes by regime of possession	Mostly people in Catalonia live in property houses.
Family nucleus	Mostly are a couple with children in both cases.
Type of vehicle	Mostly there will be two cars per family.

We compared the situation in our school **Serra de Noet** in Berga with Catalonia and we tried to see similarities. We made more hypothesis.

Sex	There are more girls than boys in Berga but there are more boys than girls in Catalonia.
Place of birth	The majority will be born in Catalonia in both cases.
Nationality	The majority have Spanish nationality in both cases.
Instruction level	Most of them have the certificate of high school in both cases, but there is a higher level in Catalonia.
Economic activity	People without a job is higher in Catalonia..
Catalan knowledge	There is a higher Catalan knowledge in Berga, in Catalonia there are more people that don't know how to write or read it.
Homes by regime of possession	The number of rental houses is higher in Catalonia than in Berga.
Family nucleus	The majority is formed by a couple and one or two children in both cases.
Type of vehicle	There are one or two vehicles per family in both cases.

Hypothesis contrast

After studying the data of Catalonia, we compared its situation with the situations in our schools to see the similarities and find out if we can know things about Catalonia with only the data we have from a high school.

In Regina Carmeli, the results of the comparison were the following ones:



- The proportion of men and women and working and unemployed people is practically the same. Regina Carmeli's Catalan knowledge values adjust to Catalonia's data except in the number of people able to read it and write it, which is higher in Catalonia.
- Population by level of instruction does not coincide because in Catalonia predominate people with a Certificate of Higher Education, whereas in Regina Carmeli stand out parents with EGB or ESO and the graduated with university studies. Despite this, people without studies are the minority in both cases.
- Population by place of birth, population by nationality and homes by regime of possession categories show different percentages in Catalonia and our school, but the patterns are the same: people born in Catalonia predominate, most people have Spanish nationality and it is commoner to live in a property home than in a rental home, although in Catalonia it is a bit more typical to have a rental home than in our school.
- We could not compare the park of vehicles, but we can observe that in both cases cars are the most popular type of vehicle.

These are the similarities between Serra de Noet and Catalonia:

- Population by sex adjust to Catalan situation. In the Catalan knowledge category the results are very similar, but in Catalonia people have more problems to write it.
- Some categories do not show exactly the same results, but they follow the same trends in both places: people born in Catalonia predominate, most people have Spanish nationality, the majority have a high instruction level, the most common nucleus is father and mother with children, the majority have a job and property homes stand out.
- We were not able to compare the park of vehicles, but we can see that in both cases cars are the most popular type of vehicle.

Finally, we concluded that Regina Carmeli students' hypothesis were right, except the one about population by the level of instruction, whose results in their school were not expected, and that Serra de Noet students failed in the instruction level because they thought that it will be a higher level of instruction in Catalonia, which surprised them. The other hypothesis were right.



4. Conclusions

We have spent numerous hours doing this project but we are really proud of it because we have been able to summarise a lot of information in a small number of pages. People who read this work will be able to have an idea of how the Catalan society is and particularly of the cities where we live. In the end, all this process of recollection, analysis and description of the data that we have explained has been useful to us to be able to answer the questions we suggested in the introduction:

a) Do our centres adjust to the socioeconomic reality of the city where they are located?

We have concluded that:

- Regina Carmeli does not represent the situation of Rubí in an exact way, but it follows patterns that are very similar to the ones of its town.
- The situation in Serra de Noet is quite similar to the situation in Berga.

This means that both schools adjust fairly to the reality of their town.

The fact that Regina Carmeli and Rubí have had similar coincidences and dissimilarities as Serra de Noet and Berga is curious, because in Serra de Noet study people from different social levels (due to the low quantity of institutes placed in Berga) while Regina Carmeli is located in a pretty different environment and is semi-private. This seems to demonstrate that this project could work quite properly in any school.

b) Which of the two centres is more coherent with the data of Catalonia?

We have concluded that:

- The socioeconomic situation of students, mothers and fathers from Regina Carmeli does not have many differences with the situation in Catalonia. Values are not the same in both cases but they follow the same trends.
- Serra de Noet is a good reflection of the Catalan situation.

We can conclude being exact that Serra de Noet is more coherent with Catalan society, but we could consider both schools almost equals with the data of Catalonia because Regina Carmeli does not have many differences with it. In the school of Rubí predominate people with EGB or ESO and with university studies. Here more people have problems to read and speak Catalan too. These values are different from the ones in Catalonia. In the school of Berga the number which is less equal to Catalonia is that more parents can write Catalan.

Knowing all of this, we can say that our schools are not just a quite good reflection of their cities but of their region. So we can conclude that, with just a little differences, they can be considered miniature societies.

We also thought that this information can be useful, for example, for someone who wanted to do a study of all Catalonia, either for marketing or for studies, instead of doing a questionnaire to everybody, this person could do a questionnaire to one of those "similar to Catalonia" schools and the results should be the same or very similar. So, it's interesting to give to this another point of vision, with another finality.



5. A step forward in our project

As this project has worked out pretty good for us, we have asked ourselves if it would give the same result on a bigger scale. We think it would be very interesting to expand this work and involve other schools from Spain and Europe, since the eTwinning tool allows us to be connected and work collaboratively.

On the one hand, we would like to compare some of the socio-economic values of each country involved in the project, which can be found in the Eurostat website. This way we will be able to see the similarities and differences among countries.

On the other hand, we would like to carry out a survey to get to know the students of each country in terms of after-school activities, interests, hobbies and duties, ...

The aim of this new project would be, apart from achieving the objectives of this current project, to achieve a new and very important objective nowadays: get to know people from other countries with other cultures, understand more different people, learn from the differences, realize we are more similar than we had first thought and, above all, be more tolerant and open-minded and learn to live in harmony in a diverse world.





6. Webgraphy

<https://www.idescat.cat/>

https://www.ara.cat/suplements/diumenge/fossim-cent_0_2168783359.html

<https://www.canva.com/>

<https://www.surveymonkey.com/mp/margin-of-error-calculator/>

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<https://www.100people.org>