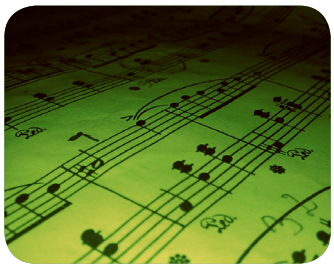

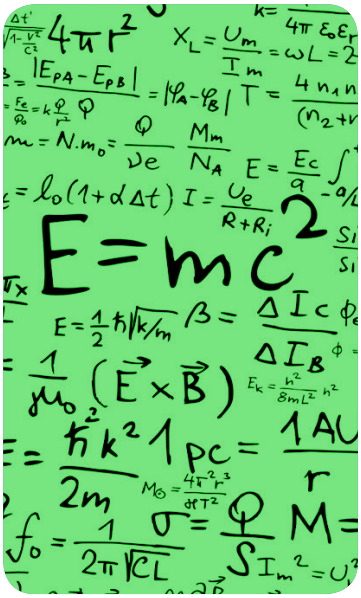

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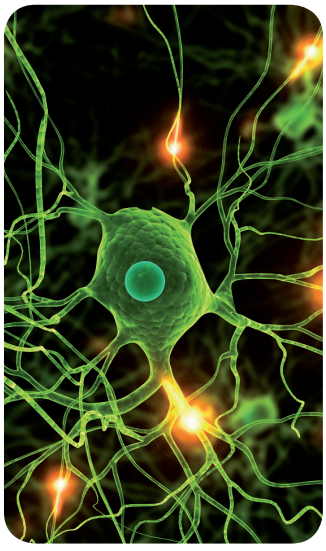

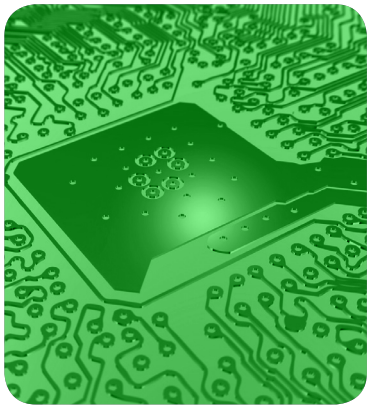

Integrating English grammar in the Biology subject through the use of board games

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UAM EDICIONES

MÁSTER EN FORMACIÓN DEL PROFESORADO DE EDUCACIÓN SECUNDARIA OBLIGATORIA Y BACHILLERATO

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ANEXO 4.
AUTORIZACIÓN DEL TUTOR/RA PARA LA PRESENTACIÓN DEL TRABAJO DE FIN DE MASTER

Tutor/a: D./Dª. ANA LLINARES GARCÍA

AUTORIZA la presentación del siguiente TFM para su defensa:

Alumno/a: D./Dª: MARTA HERNÁNDEZ ELVIRA

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Abstract

This work focuses on the way English language is integrated in the Biology subject in a 1st ESO group in a bilingual high school. While language is supposed to be given some attention in these content classrooms, the reality is that content teachers teaching in English often overlook the students' grammar and do not penalise poor writing skills. As the results of this study suggest, although correcting the students' grammar is not the task of the content teacher, the reality is that students make no effort to apply what has been learnt in the English classroom to the content class. This research also shows that real Content and Language Integrated Learning (CLIL) is possible with teachers' willingness to work jointly. Furthermore, using games as a teaching tool also proves to be efficient for increasing students' motivation towards a subject learnt in English. Finally, this work also shows which areas of the English grammar are more problematic for these students and provides pedagogical applications of the results obtained.

Key words: Content and Language Integrated Learning (CLIL), English as a Foreign Language (EFL), biology, integrating grammar, motivation, secondary education.

Resumen

Este trabajo se centra en la forma en que la lengua inglesa está integrada en la asignatura de biología en un grupo de 1º ESO en un colegio bilingüe. Mientras que al lenguaje debería otorgársele alguna importancia en las asignaturas de contenido, la realidad es que los profesores de contenido que explican en inglés con frecuencia ignoran la gramática de los estudiantes y no penalizan la pobreza en expresión escrita. Tal y como muestran los resultados de este estudio, aunque corregir la gramática de los alumnos no sea la tarea de estos profesores, la realidad es que, en las asignaturas de contenido, los estudiantes no hacen ningún esfuerzo por aplicar lo que han aprendido en la asignatura de inglés a estas otras. Esta investigación también muestra que un verdadero Aprendizaje Integrado de Contenidos y Lenguas Extranjeras es posible siempre que los profesores estén dispuestos a trabajar conjuntamente. Asimismo, también se ha demostrado que utilizar juegos como medio de enseñanza es eficiente para aumentar la motivación de los estudiantes hacia las asignaturas que estudian en inglés. Finalmente, este trabajo también muestra qué áreas de la gramática del inglés son más problemáticas para estos alumnos y proporciona aplicaciones pedagógicas de los resultados obtenidos.

Palabras clave: Aprendizaje Integrado de Contenidos y Lenguas Extranjeras, Inglés como Lengua Extranjera biología, integrar gramática, motivación, educación secundaria.

1. Introduction

Content and Language Integrated Learning (CLIL) is becoming more and more popular in Europe, Spain and, particularly, in Madrid due to the considerable increase of bilingual high schools. Whatever the benefits and disadvantages that CLIL education may have, it is unarguable that it at least entails a massive increase in the input of English that the students receive. While it had always been obvious to me that the students' listening skills and range of vocabulary are likely to improve due to this constant input, I was curious whether their writing skills and grammar proficiency would also improve thanks to this bilingual education (see Ruiz de Zarobe, 2011 for an overview of areas that seem to benefit or not from CLIL).

The high school I was assigned to for my Practicum is a bilingual one, so I decided to look into this matter more closely. I had the opportunity to talk to several CLIL teachers, and they all agreed that, during their classes, their only focus is on content and they give little importance to language. When I went through the Biology exams of one 1º ESO group, I noticed that the students' grammar was very seldom corrected by the teacher. While it is important that students are able to communicate and to get their message across, the form of this message should not be pushed into the background (see Lyster, 2007 on focus on form in immersion classrooms). In turn, in the EFL class, grammar is in focus but students often find this aspect of the language demotivating.

In this scenario, I then decided to carry out a study in which grammar proficiency was tested not in isolation but by means of the Biology subject in order to see whether it is possible to combine EFL and content subjects in a successful way. Moreover, I wanted to check whether what is taught in an EFL classroom has any impact on students' performance in a content subject and if the grammar in the students' exams can be improved.

Instead of carrying out this research using a traditional methodology (with textbooks, exercises, exams…), I decided to develop an innovative activity in which these aspects of the syllabus were addressed but in a context which would be interesting for the students and would –hopefully– help increase their motivation. This activity ended up being a board game based on questions in which biology and grammar were combined, an activity which the students welcomed warmly and enjoyed enormously. We can conclude, then, that this study is both a piece of research as well as the actual implementation of pedagogical innovation.

Research objectives

The main purpose of this study was to investigate if it is possible for teachers to carry out an activity which successfully involves the English subject as well as a content subject, in this case Biology, and therefore bridge the gap between language and CLIL subjects. In order to address this issue, three objectives can be identified in this study:

The main objective was to see if an explicit explanation of grammar structures in the EFL classroom prior to a game and a test in the Biology subject increases the students' grammar performance in the game and the test in this subject.

Another primary objective of this study was to explore with which grammar areas these students have more problems as well as which ways of elicitation of specific structures result in a higher frequency of grammatical productions.

A minor objective of this study was to see the efficiency of board games to increase students' motivation to study a content subject, as well as the motivation to perform better in terms of grammar accuracy. Although a less relevant objective, I thought it was important to include it, since the students' lack of motivation during their classes was what gave me the idea to introduce a board game in this study.

2. Literature review

Content and language integrated learning (CLIL) and task-based learning

The teaching of foreign languages has a long tradition, although it has very often been subject to criticism due to the apparent insufficiency of input and the lack of authenticity and usefulness it has (Lasagabaster, 2011). Researchers have found a correlation between this way of teaching and students' lack of motivation, which has partly facilitated the increase of CLIL subjects in which "learners are engaged in a joint learning practice of subject matter and foreign language" (Smit and Dafouz, 2012) and which help increase their motivation (Lasagabaster, 2011).

CLIL has received many praises for several reasons: first, it deals with authentic content; second, it gives the students a purpose for studying the language; third, it increases the amount of input that the students receive of the foreign language; and fourth, it "puts the emphasis on meaning rather than form." (Navés, 2009) Nevertheless, this latter advantage of CLIL can also be considered a disadvantage, since language learning must also include the learning of form, which is usually only provided by the language subject. Therefore, a way of making sure that the students are learning form and meaning at the same time would be to combine the essence of the content and the language subjects into the lessons, which would require the content and language teachers to work together (e.g. Lyster, 2007).

Ruiz de Zarobe (2011: 145) explains that, while it is true that many skills and language competencies do receive positive effects from content-based instruction (e.g. reading, receptive vocabulary or fluency in speaking and writing), it is not clear that other levels of language competence are favourably affected by CLIL, such as accuracy and discourse skills in writing, pronunciation, productive vocabulary or syntax (p.146). Regarding morphosyntactic skills, which are the focus of this study, there are no definite results as to

whether CLIL instruction has any clear positive effect at this level, and further research will be needed to provide more definite conclusions. Ruiz de Zarobe (2011: 141) concludes that "some morphological properties such as affixal morphemes or the incidence of placeholders seem to provide better results in CLIL". On the contrary, other properties, such as the use of null subjects and objects or negation, do not seem to be linked to content-based learning (p.141).

These results provided by Ruiz de Zarobe (2011) agree with Lyster's (2007) claim that only an incidental reference to language in content-based instruction is not enough for a real improvement in language skills. He states that it is necessary to "[eschew] this non-integrated approach and instead [to integrate] form-focused and content-based instruction through counterbalanced instruction" in such a way that it will "promote second language growth by inciting learners to shift their attentional focus in a way that balances their awareness of … learning both language and content together." (p.126) Lyster (2007) also explains that it is not necessary to implement form-focused activities in the content classroom to get the students engaged with language, since that would be very difficult. It would be enough to implement a content-based activity which integrates or complements a form-focused activity (p.133).

Research during the last two decades has focused mainly on the benefits of implementing CLIL in the classrooms, although very few or no studies have focused on how this is actually done or on how the language subject could be fully integrated in a successful way in a particular content subject (Navés, 2009). This could be done by means of Task-Based Learning, which follows the idea that "students learn language if they are thinking about a non-linguistic problem than if they are concentrating on particular language forms. Instead of a language structure, students are presented with a task they have to perform or a problem

they have to solve." (Бондаренко, 2010. See also Ellis, 2003 for more on task-based language learning).

Richards (2005: 29) claims that task-based and content-based teaching are both "extensions of the CLI [Content-Language Instruction] movement but which take different routes to achieve the goals of communicative language teaching." Therefore, it would be useful to study whether the task-based teaching approach used in foreign language settings could be incorporated into the content subjects in order to implement tasks which combine both the meaning-oriented philosophy of CLIL and the form-oriented philosophy of EFL.

Motivation

Motivation can be defined as the concept that explains "*why* people decide to do something, *how hard* they are going to pursue it and *how long* they are willing to sustain the activity." (Dörnyei, 2001: 7) During the last decades, many authors have written about students' motivation (Ames and Archer, 1988; Bernaus, Wilson and Gardner, 2009; McCombs and Whisler, 1997; Skinner and Belmont, 1993), especially in the context of the language classroom, since it is obvious that learning a language is nothing like learning other subjects, and therefore the motivation needed is also different. The EFL classroom, however, is not the only one in which students must have high motivation in order to succeed. Students need to find motivation in every single content subject, from science to history and, in CLIL contexts, they also need motivation in learning subjects in English.

There are many different theories of how motivation generally works, such as whether it is internal or external (Williams and Burden, 1997), the expectancy of success (Brophy, 1999), the desire to be perceived as worthy and valuable (Covington, 1998) or past instances of success and failure (Weiner, 1992). Whatever the exact reason, it is safe to say that all these

theories give a good explanation as to how motivation works and that it depends, as always, on the specific person.

The purpose of this study is to research whether it is possible to design a content-based task (a board game) which integrates a form-focused task in it and which can be implemented in either the content (Biology) or the English language subject with the purpose of increasing the students' motivation to study both the content subject and the English grammar itself.

3. Research design and methodology

3.1 Research context

The data for this study was collected from High School IES Profesor Máximo Trueba in Boadilla del Monte between the 11th of February and the 20th of April 2016. This is a bilingual school and, therefore, it offers two different programmes: on the one hand, there is the *bilingual section*, in which the students have five hours of English a week and all their content subjects (except Maths) are taught in English. On the other hand, in *bilingual programmes*, students also have 5 hours of English a week, but only some of the rest of their subjects are taught in English, but never Social Sciences, Natural Sciences, Geography or History. The participants of this study belong to a *bilingual section* group, so the Biology subject, which is also the focus of this research, is taught in English and consists of three hours a week.

In order to carry out this study, I worked jointly with the English and the Biology teachers. The Biology teacher provided me with the material that was needed for developing the board games as well as the exams that the students had taken on biology beforehand. The English teacher helped me with the explicit explanation of the target grammar points addressed in this study, during her English lessons. Regarding the implementation of the biology games, each

one was carried out in a different context due to timetable requirements: the first one was carried out during one Biology session, in which the class was divided into two groups who played two simultaneous games, one of them led by the Biology teacher and the other one by me. The second one, on the other hand, was carried out during an English subject session. This time, there were three teachers available –the official English teacher, a teaching assistant and myself–, and consequently three simultaneous games could be carried out. None of the students asked why they were performing a biology game in the English class, and only one student asked why I, an English teacher, had designed a biology game.

3.2 Participants

The participants of this study were twenty-five students between twelve and thirteen years old. Even though the group is heterogeneous, they all have more or less the same English level, since a requirement to be enrolled in the bilingual section is to have attended a bilingual primary school or to be able to provide proof of a B1 level. Moreover, the vast majority of these students comes from the same two primary schools, which suggests that they all have had a similar education in English.

3.3 Materials

In order to carry out this study, two types of materials were used: ordinary exams and tests, and a board game (Appendix I). This game was designed by me to mimic a common board game that children may use for playing. The biology questions were printed into small cards and the tiles were made of cardboard and had different drawings on them (a water molecule, an atom…).

3.4 Procedure

In order to carry out this research, the following procedure was followed:

Firstly, in order to know which grammar structures were more problematic for the students when examined on biology topics, I went through the exams that the students had just done in their Biology class, which corresponded to Unit 5 in their textbook (Appendix II), on the 11th of February. This exam was good proof of what the students' grammar was like in an environment in which no explicit attention to grammar is given. Unit 6 was later used as the context for the first board game, in which these problematic structures were analysed before any explicit explanation of the grammar, and unit 7 was used as the context for the second game after the explanation of the grammar as well as for the analysis of a second test.

By going through the twenty-five exams, six most common errors were detected:

- The lack of the suffix –s in the third person singular in the present tense.
- The passive structure, especially due to the use of the wrong form of the main verb after 'to be', since the form of the past simple was usually employed.
- The distinction between 'has' and 'have' in sentences with singular or plural subjects.
- The comparative structure with –er or 'more'.
- The structures 'there is´ and 'there are' depending on the number of the subject.
- The present simple and past simple tenses. In the study, this category includes three types of errors: agreement, past form and tense choice.

Even though the students had committed many other mistakes, they were either less frequent than these ones (such as the use of the determiner "the" before generic nouns) or they were made because the students were very unlikely to have ever received an explicit explanation of

those particular grammar points (for example, which verbs are followed by a verb in infinitive, like *afford*, and which by the present participle, like *avoid*), since they are typically only dealt with later in high school –indeed, these grammar points were not included in either the 1º ESO or 2º ESO textbooks and had never been explained by the students' current English teacher.

The category dealing with the tenses will be labelled "tense and agreement" throughout the paper. As mentioned before, this category includes both the present and the past tenses. The past tense, however, could not be included in the game for Unit 7. Since Unit 5 had been related to the origin of the atmosphere and Unit 6 to the discovery of the cell and to the beginning of life in the Earth, it had been possible to prompt answers with a past tense in both the exam and the game. However, Unit 7 was related to the kingdoms into which living things are divided, and everything that was studied was in the present tense –as part of general truths. Therefore, it was impossible to prompt any past tenses in the game. Regarding the present tense, this category focuses on agreement between the subject and the auxiliary verb, since the 3rd person –s is covered in a category of its own, as this feature alone already contains enough tokens to be considered an independent category. This subject-verb agreement, then, includes the distinction between "is" and "are" and "do" and "does" mainly. In the past tense, agreement also includes the distinction between "was" and "were".

Once these common errors had been analysed, questions were designed which would be used in the first game, incorporating as many instances of those structures as possible. Each question prompted one specific grammar structure in its answer. Three different types of questions were designed:

First, there are those in which the grammar structure prompted was already included in the question. For example: *Where can the cells that work as receptors be found in animals? They can be found in the sense organs*, in which the prompted structure was a passive construction.

Second, those in which the target grammar structure was elicited by a complete-the-sentence prompt: *Anabolism: complex molecules _____ (form) by joining _____ and using _____*. In this case, the target structure is also a passive construction ("are formed").

Finally, those in which the question elicited the target structure but some change must be made to the structure in the question in order to provide a grammatical answer: *What important function does the mitochondrion perform? The mitochondrion performs cellular respiration.* In this case, an –s must be added to the verb 'perform' when making the interrogative sentence affirmative.

In this first game (Appendix IV), carried out on the 13th of March (one month after the Unit 5 test), the class was divided into two groups so that two simultaneous games could be played. Each game consisted of three groups of four students each. The number of questions that were answered in each game was different, since some students took longer to give an answer than others. However, for the purpose if this study, in both the first and second games, the total number of questions has been added and the numbers and percentages provided in the analysis of the results are the sum of every team in every group.

A board was used in the games to move the tiles around. The dice were thrown by a team and they moved forward. I then read a question out loud. The members of the team had time to discuss the answer among them, and then one of them had to give a final answer using a full sentence. If this answer was correct in terms of content, the opponent teams had to move backwards their tiles the number of steps indicated in the board. If the answer was wrong,

then that team would be the one moving backwards. In addition to this, bad grammar was also penalised: if the answer given by the students included an ungrammatical form in any of the six target structures, the team would also have to move backwards. In this first game, the students did not know which grammar points were going to be tested.

The first game that was carried out was based on the content that the students had learnt in Unit 6 and on which they had just been examined (the origin of the Earth, atoms and molecules, the parts of the cell and the vital functions). The reason why the analysis of errors was done in Unit 5 and not in Unit 6, which was the unit the first game was based on, was merely due to time restrictions.

In order to analyse the students' answers in the games properly, the games were recorded using mobile phones.

The results of this first game showed what the students' grammar was like before any explicit explanation by the English teacher. Moreover, I used this game as a kind of pilot to make sure that the types of questions that I had written were adequate for the students' knowledge both of Biology and English grammar.

After carrying out this first game, the Biology teacher kept on teaching Unit 7 to the students. Right after finishing the unit, the English teacher devoted two sessions of her English class to providing an explicit explanation of the target grammar structures that I identified as problematic and would appear in the following game. She focused her explanation on the present tense (including the 3rd person –s, the difference between "has" and "have", "is" and "are" and "do" and "does"), the passive voice, the comparative and superlative structure (although this grammar point had already been dealt with in the English classroom before), the difference between "there is/was" and "there are/were" and the past tense, including

regular and irregular verbs. She gave several examples in class of each of the grammar points and they did some exercises to check that they had understood everything correctly. Only after making sure that these grammar structures had been internalised did I carry out the second game (Appendix V), on the 20th of April, one month and one week after the previous game and two months and a half after the first test.

This time, the game was implemented in the English classroom, and three simultaneous matches were played, each of them monitored by one teacher. Each of these included two teams of four members each. Again, the number of questions answered in each match was different, but we will be working with the total number. This time, the students were aware of which grammar points they were going to be assessed on in this game, since they had been told that the explanation of the grammar by the English teacher would include all the grammar needed in the game.

The biology teacher had no plans to examine the students formally in this unit. Therefore, after performing the game, I designed a short test (Appendix III) that the students took one week after in which they were prompted to use the same grammar structures that had been covered in the games. The structure of this test was similar to that of their previous Biology exams: short questions in which they had to provide recounts, short definitions or classifications. The test they were given is the following one:

Answer the following questions related to the topic you have been researching (monerans, fungi, algae or protozoa). Use full sentences to answer each of the questions and provide a long answer.

1. *Explain what biodiversity refers to. Why is it important? Explain what happens if a species disappears. Give an example.*

2. *Introduce the different kingdoms.*
3. *Write about the one you have been researching about. Explain its cell structure and nutrition type.*
4. *What parts does a monera/prozotoa/alga/fungus cell have? What function does each component perform?*
5. *Where can this specific kingdom be found in nature?*

3.5 Data collection

The data for this study was collected from the Unit 5 Biology exam, the answers in the two board games (Units 6 and 7) and the final test for Unit 7. The way of collecting the data in each procedure was very similar.

In the Unit 5 exam, the most common errors were classified into six different categories: *3rd person -s, passive structure, there is vs. there are, comparatives, has vs. have* and *tense & agreement*. A table was made which contains the total number of correct and wrong structures of each kind in this exam:

	3rd person -s	Passive	There is/there are	Has/have	Comparatives	Ten & Agr
Correct						
Wrong						

This same table was used again for the two games as well as for the second test.

In each of the exams, the grammar structures were not prompted in any particular way, except sometimes the question suggested a possible structure that could be used in order to start a recount. However, this structure was not always used. In the games, on the other hand, the questions prompted a specific structure, and usually this structure was maintained. However,

a few times a different structure ended up being used. In the following example, none of the three groups used the target structure:

What different components does a monera cell have? (Target: a monera cell HAS…)

-Monerans have five types of different parts

+A monera cell is bacteria and it is composed of a prokaryote cell. Plasma membrane and a cell wall.

*******The different components of a monera cell are pili and…*

Sometimes, we interrupted the students and asked them to look carefully at the structure in the sentence, but this was not always the case, either because we forgot (particularly the Biology teacher) or because that would mean interrupting a whole recount, and the students got nervous every time they had to start again and their grammar got worse.

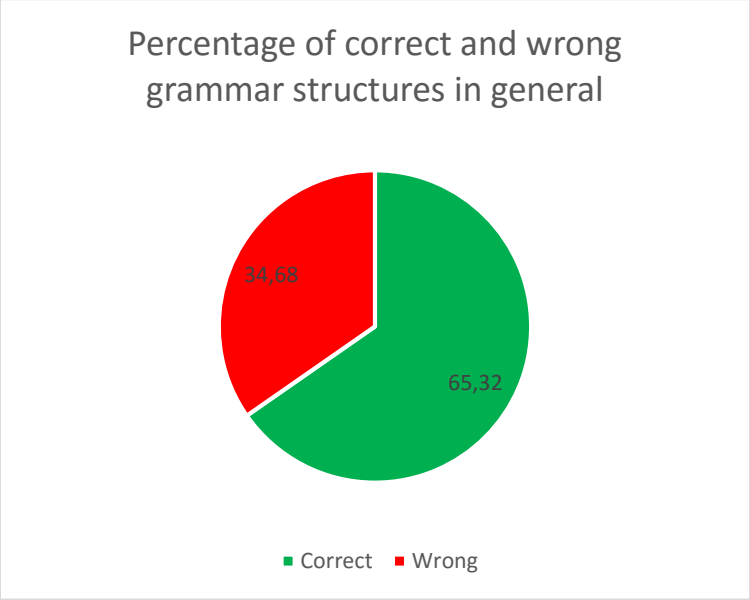
4. Analysis of results

4.1 Grammar in first test (Unit 5)

This first test (Appendix II) consisted mainly of recount questions, and many different grammar structures were necessary in order to answer them. For instance, question 1 ("Explain how the origin of the atmosphere and the hydrosphere were") required narration in the past tense, whereas questions 9 ("Paint a glacier cirque and explain how glacier tongues get form and why glacier valleys have an "U" shape") and 5 ("CO_2 and the Greenhouse effect that it produces are good for the life in the planet. Explain the reason.") required the narration to be in the present tense. There was also a true-or-false exercise in which the answer had to be justified; these answers did not include a single grammar point, but a mixture of many, including "has" and "have", passive voice structures and present tense.

4.1.1 Overall grammar results

The total percentage of correct and wrong grammar target structures in this exam is the following:



Graph 1. Percentage of correct and wrong grammar structures in the first test regardless of their grammar features.

We will compare these results with the data from the first game in a different section.

4.1.2 Results for each target structure

It is also important to analyse each of the grammar structures at focus individually. Table 1 below shows the total number of correct and wrong instances of each target structure in this test:

Table 1. Number of correct and wrong tokens of each grammar structure in the first test.

	3rd person -s	Passive	There is/there are	Has/have	Comparatives	Ten & Agr
Correct	50	35	23	42	36	138
Wrong	39	17	17	17	8	74
Total	89	52	40	59	44	212

As we can see in this table, the "tense and agreement" category has the highest number of tokens, a total of 212. Of those, 146 are related to the past tense and 66 to the present tense. Regarding wrong instances of past tense, the most common mistakes were two: firstly, the use of the present tense to explain past events ("because the Earth cool down, water vapour condensed and fall as precipitation"). Most frequently, these recounts used the past and present tense interchangeably, not following any kind of consistency. Secondly, wrong instances of past tense were also due to lack of subject-verb agreement ("all the water vapour were in the atmosphere"). Regarding the present tense, the most common mistakes were due to lack of agreement ("rivers doesn't have salt" or "the CO2 and the oxygen is good to breath"), as well as bad formation of negative sentences ("the same amount not changes").

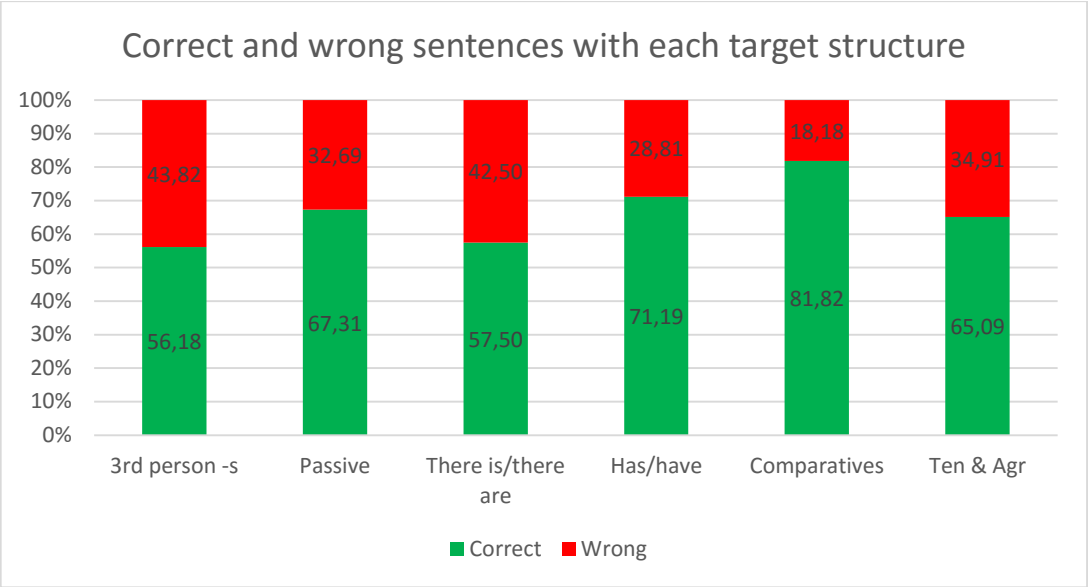
Passive structures were used throughout the whole exam in practically every question, although mainly in questions 1, 2, 5 and 9. The sentences classified as wrong in the passive structure category are of two kinds: first, those in which the main verb of the construction is not in the correct form (e.g. "Glaciers were form") or those sentences which are written in the

active voice but which have the meaning of a passive one (e.g. “The salinity of the water will reduce”). The fact that the verb ‘to be’ working as auxiliary in these structures does not agree in number with the subject does not qualify as a wrong instance of passive sentence but as wrong agreement (e.g. “The ice were accumulated in mountains”).

Regarding the category “there is/there are”, the classification of a sentence as wrong is also due to two reasons: either the agreement between the subject and the verb was not correct (e.g. “there is no gases that push her down) or the existential “there” was not used (e.g. “During the formation of the planet it was an intense volcanic activity”) and a content subject was used instead.

The “has vs. have” category only includes those instances in which either “has” was used with a plural subject (“the rivers hasn’t got so much salt”) or “have” with a singular one (“This is a water molecule because it have the two hydrogen atoms”), although the latter is the most frequent. One instance of “haves” was also found (“Because water is H2O so it haves three molecules”). Regarding comparatives, the wrong tokens were usually due to the use of “more” instead of the suffix –er with short adjectives (“Oceans are more big than seas”), although there are a few examples in which both markers of comparison were used (“The level of salinity is much more lower”). Finally, the 3rd person –s category contains instances in which no suffix was added to the verb (“the gravity of the Earth attract most of the gases”), and a few in which it was added even though the subject was not in the 3rd person singular.

Table 1 showed the total number of tokens in each category. Graph 2 below shows the percentage of correct and wrong structures in each of them:



Graph 2. Percentage of correct and wrong sentences with each target structure in the first test.

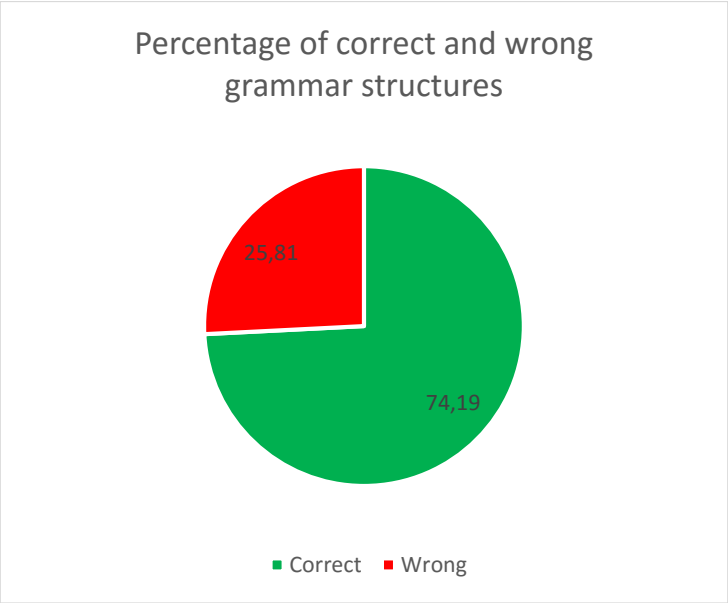
We can see that the percentage of well-formed comparatives is very high compared to the rest of the categories. Nevertheless, since the students had just studied this grammar point in their EFL classroom, I thought it important to include it in this study, since the proportion of wrong comparative formation is still too high taking into account that its explicit explanation had just taken place. The percentage of correct "has" and "have" reaches 71%, followed by passive voice structures, which were used correctly 67% of the time, and the "tense and agreement" category, which was produced correctly 65% of the time. The other features categories, "3rd person –s" and "there is/there are", have similar percentages of correct grammar, around 57%.

4.2 Grammar in first game (Unit 6)

The first game that I carried out (Appendix IV), which corresponded to Unit 6 in the Biology textbook, consisted of a total of 46 questions on the topic of the origin and structure of the cell as well as the vital functions that living things perform.

4.2.1 Overall grammar results

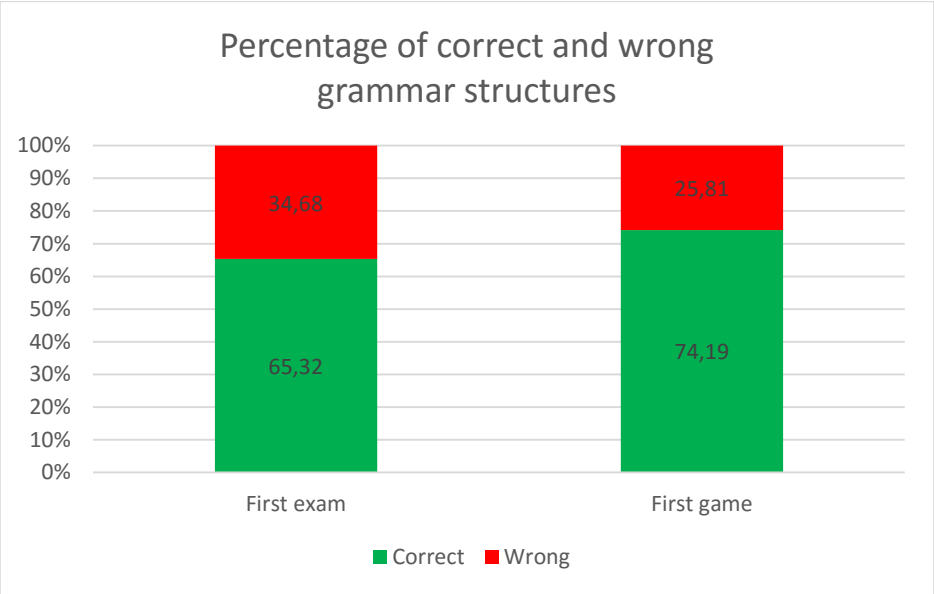
To start with, I will show the overall results of this game in Graph 3:



Graph 3. Percentage of correct and wrong sentences in the first game regardless of their grammar features.

Whereas each question in the game accounted for a correct or wrong answer in terms of content, this one-to-one equivalency is not followed in terms of grammar structures. Even though 61 questions were asked in total, there are 62 tokens of target structures, since one answer may contain more than one of these. Of these 62 tokens, 46 were grammatical productions, that is, 74% of the answers were correct in terms of grammar.

Graph 4 below compares the percentage of correct and wrong grammar structures in the first exam (Unit 5 exam) and the first game.



Graph 4. Comparison between the first test and the first game in terms of the percentage of correct and wrong sentences in each of them regardless of their grammar features.

We can see that the percentage of correct grammar in the first exam (65%) is considerably lower than this percentage in the first game (74%). It must be taken into account that both were done without any previous explicit explanation of the grammar.

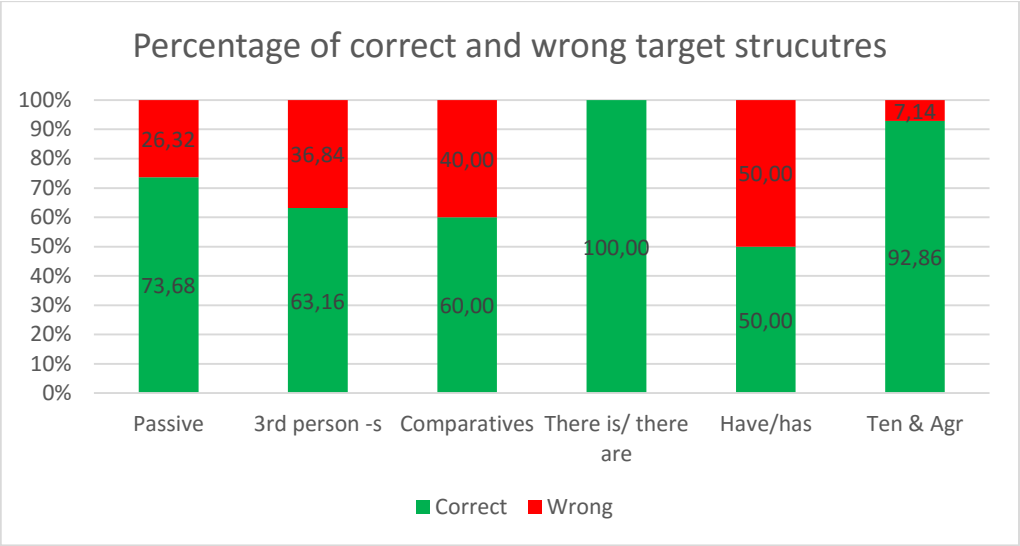
4.2.2 Results for each target structure

Each target structure was also analysed independently for the first game. The following table (Table 2) shows the total number of correct and wrong tokens of each feature:

Table 2. Number of correct and wrong tokens of each grammar structure in the first game.

	Passive	3rd person -s	Comparatives	There is/ there are	Have/has	Ten & Agr
Correct	14	12	3	3	1	13
Wrong	5	7	2	0	1	1
Total	19	19	5	3	2	14

Graph 5 below shows the same results in percentages:



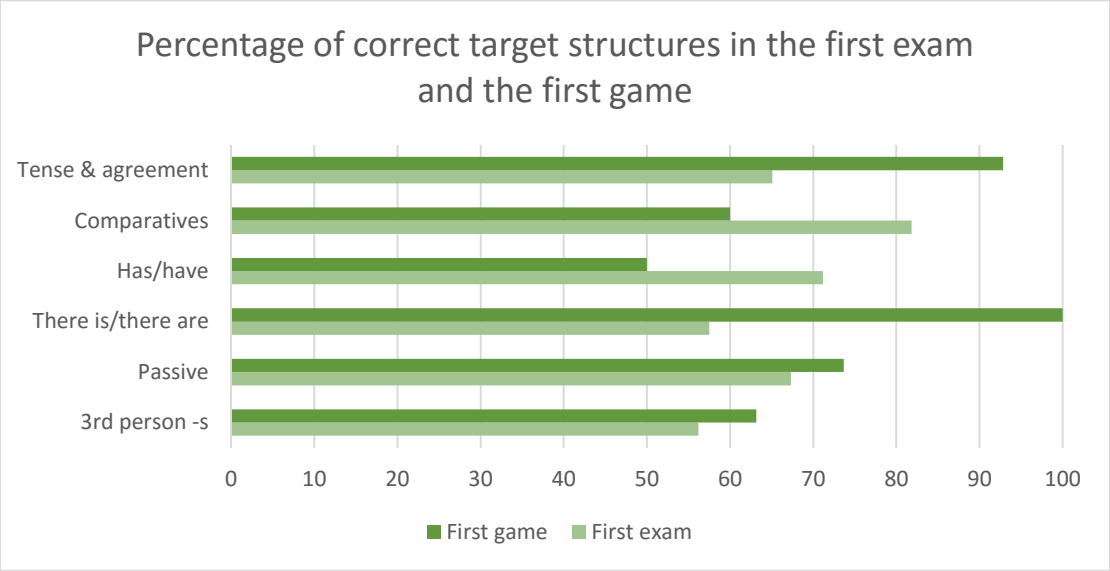
Graph 5. Percentage of correct and wrong sentences with each target structure in the first game.

The lowest percentage of correct grammar appears in the distinction between "have" and "has", in which only 50% of the time the students produced the correct structure. The second lowest appears in the comparative structures. In this game, the students failed to produce the correct structure for two reasons: first, the superlative forms of the adjectives were constructed with the comparative ending –er ("An atom is the smaller unit of matter"); second, because no form of comparison was expressed at all ("The Cellular Theory claims that the small living things have at least one cell").

The 3rd person –s was used correctly 63% of the time. Passive structures had a higher percentage of correctness, with 73%. This time, there were four types of structures the students used which entailed a wrong passive construction: the main verb was produced in its base form ("The cell was discover in 1888"); the main verb was either not produced in its correct form, the past participle, or the past participle was not used correctly ("there are 118 chemical elements knew by men"); the auxiliary "be" was missing ("complex molecules formed joining together with simpler molecules"); or an active structure was used instead of the passive one ("the two elaborate answers are for brain and spinal columns").

The percentage of correct structures regarding tense and agreement is very high, 93%, of which all instances of the past tense were correct. The percentage of correct tokens of "there is" and "there are" reaches 100%.

We can see many differences in the percentage of correct structures between the first exam and the first game, which are provided in Graph 6:



Graph 6. Comparison between the first test and the first game in terms of the percentage of correct and wrong sentences in each of them depending on their grammar features.

Graph 6 shows the percentage of correct structures of each of the target grammar points in both the first exam and the first game, carried out within a month of each other. We can see that four of the six categories were dealt with better in the game than in the exam. Of those, "there is/there are" and "tense & agreement" show a substantial difference between both, reaching, or almost reaching, 100% in the game and never exceeding 65% in the exam. In the other two categories, "passive" and "3rd person –s", this difference is not very big, of 6% and 7% respectively. The other two categories, "comparatives" and "has vs. have" were produced better in the exam than in the game, with around 20% more correct structures in the first one than in the second.

4.2.3 Results related to the way target structures are elicited by the questions in the prompt (in general, regardless of the grammar structure)

All the questions in the game prompt a particular structure, although this is not done in the same way in all of them. As was explained before, there are different ways in which the questions were asked. In this section we are going to see the four different places in which the prompted structure in the question can be found.

First of all, there are some questions in which the target structure was used in the question itself, and so the students just had to use that same structure when producing the answer (e.g. "In animals, what are the specialised cells receiving the stimuli called? They are called receptors."). This way of elicitation of the grammar will be called "Question" in the following graphs.

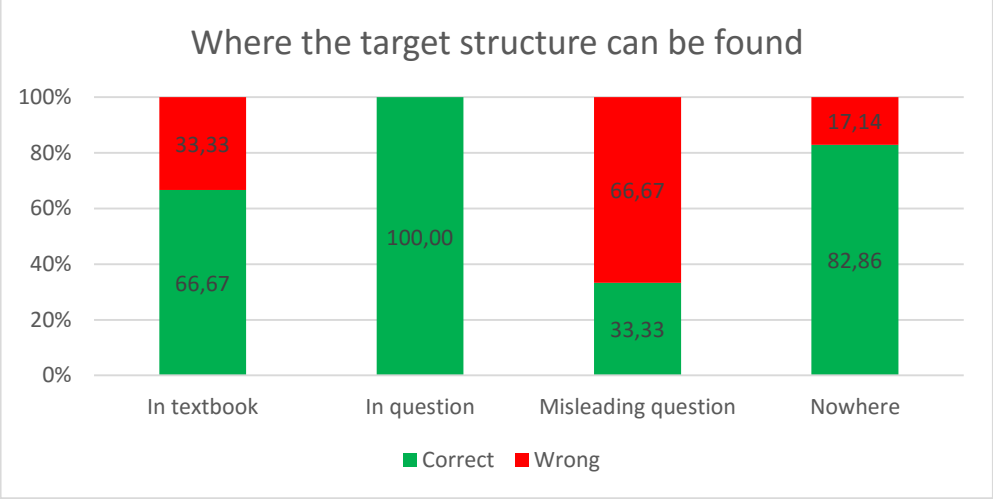
It is also the case that the target structure appeared in the question but that some change had to be made in the answer in order to change an interrogative sentence into affirmative (e.g. "In what organisms does sexual reproduction occur? Sexual reproduction occurs in the mitochondrion."). This category will be called "Misleading question".

Many other times, the target structure had to be given by the students without having any reference of what structure to use. These questions were either elicited by a fill-in-the-blanks question (e.g. "complex molecules _____ (form) joining _____ and using _____") or produced spontaneously as part of a recount ("e.g. What is the difference between organic and inorganic biomolecules? That inorganic matter can be also found in other things). This way of elicitation will be called "Nowhere", since the target structure does not appear anywhere.

Finally, in this game, the students had already studied the unit for their exams, and there were certain definitions and explanations in the textbook which they had learnt by heart. A few of the questions in the game had one of those definitions as the answer, and so the structure that was used in the textbook was expected to be used in the game too ("What is an atom? It is the smallest unit of matter", with a superlative). This category will be called "Textbook".

There are some target structures which could not be elicited by every single elicitation form for the very nature of the structures themselves. For instance, a "3rd person –s" structure can never fully appear in the question ("*What function does a ribosome performs?"), and only misleading questions can be used. Passive sentences, on the contrary, can never have the form of a misleading question. There are also some target structures which do not appear directly in the textbook as part of any definition that the students would have to learn by heart, and so this "textbook" category is empty.

The following graph (Graph 7) shows the percentage of correct and wrong sentences produced by the students depending on the way the structures were elicited by the prompt, that is, depending on the place where the target structure could be found.



Graph 7. Percentage of correct and wrong sentences in the first game according to the way the structures are elicited in the prompt, regardless of their grammar feature.

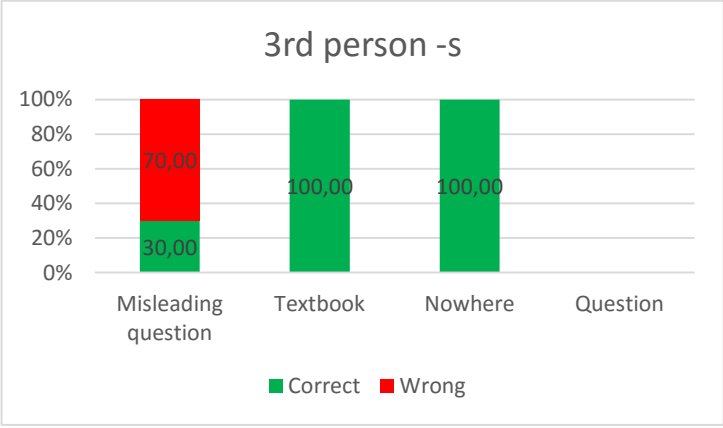
In this graph we can see that every single target structure which appeared as such in the given question was produced correctly. However, only one third of the sentences produced after a misleading question had the appropriate grammar, that is, students remembered to add the –s in only 4 answers out of 12.

The sentences which appeared in the textbook as such with no major change were reproduced correctly in the game in only 66% of the cases.

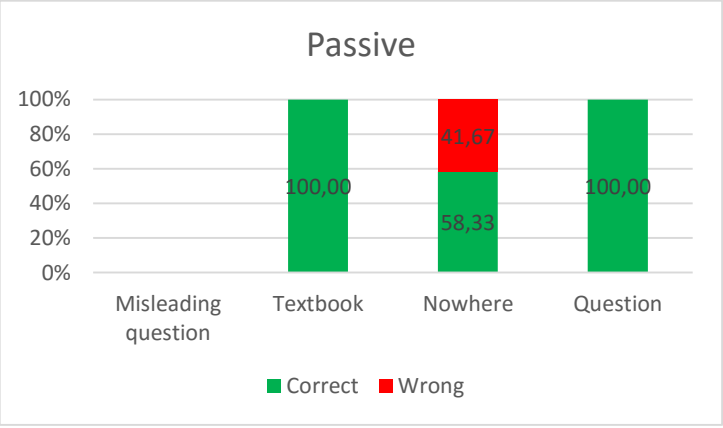
Finally, those sentences in which the target structure did not appear explicitly anywhere were produced correctly in 83% of the cases.

4.2.4 Results related to the way target structures are elicited by the questions in the prompt (each grammar structure individually)

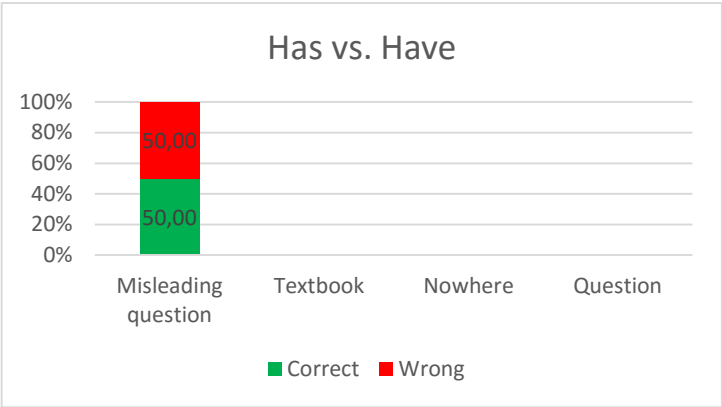
After seeing these overall results, it is important to explore how each of the target structures is affected by the way it is elicited in the prompt. The graphs below show the percentage of correct and wrong instances of each structure according to their elicitation patterns:



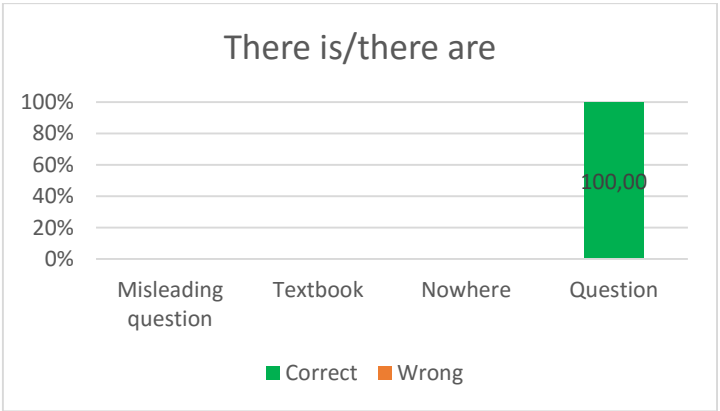
Graph 8. Percentage of correct and wrong sentences for the "3rd person –s" feature in the first game according to the way the structure is elicited in the prompt.



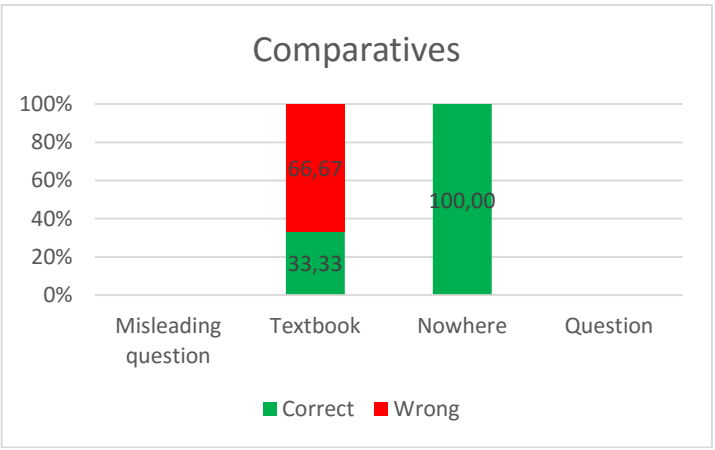
Graph 9. Percentage of correct and wrong sentences for the "passive" feature in the first game according to the way the structure is elicited in the prompt.



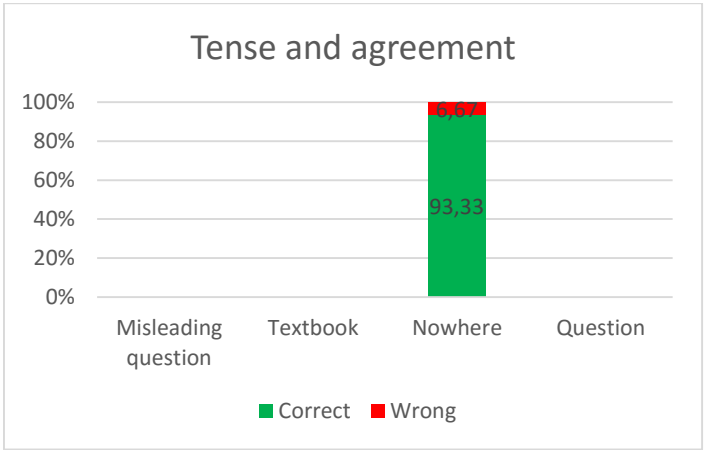
Graph 10. Percentage of correct and wrong sentences for the "has vs. have" feature in the first game according to way the structure is elicited in the prompt.



Graph 11. Percentage of correct and wrong sentences for the "there is vs. there are" feature in the first game the according to way the structure is elicited in the prompt.



Graph 12. Percentage of correct and wrong sentences for the "comparatives" feature in the first game according to the way the structure is elicited in the prompt.



Graph 13. Percentage of correct and wrong sentences for the "tense and agreement" feature in the first game according to way the structure is elicited in the prompt.

In the "3rd person –s" category we can see that all the sentences which appeared as definitions in the textbook were produced correctly by the students in the game. In the same way, every spontaneous sentence which required this suffix was also produced correctly. Nevertheless, a profound difference can be found in the answers given after a misleading question. In these cases, the students added the –s suffix to only 30% of these verbs

Regarding sentences in the passive voice, again 100% of the sentences that appeared unchanged in the textbook were produced correctly in the game. When the passive voice was

used in the question, the answers were also correct 100% of the time. However, in spontaneous production, the students failed to use the passive voice correctly (or to use it at all) in 41% of the cases.

The “has vs. have” distinction could only be measured by means of misleading questions. The students produced correctly only half of the sentences with this auxiliary, although the tokens are so few that this result is not meaningful.

The “there is vs. there are” category was very difficult to elicit due to the topic at hand, since there were very few questions that could be answered with an existential “there”. Therefore, this structure could only be elicited by providing the structure in the question, and all the answers were correct.

Comparative and superlative structures did appear in definitions in the textbook, and the same structure was pursued in the game. However, only one third of the structures used by the students in this category were correct. Those answers which were totally spontaneous, on the other hand, and which used a comparative in them were produced correctly.

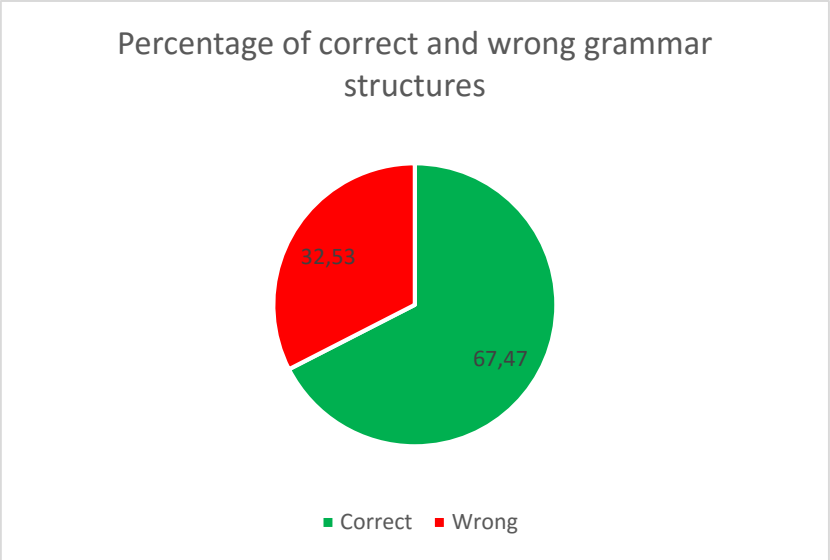
Finally, regarding “tense and agreement”, the only category was spontaneous production, in which only 6.67% of the sentences used wrong grammar, which corresponded only to 1 wrong structure out of 15.

4.3 Grammar in second game (Unit 7)

The second game that was carried out (Appendix V) consisted of a total of 38 questions on the topic of the five kingdoms into which living things are divided. The game was implemented in the English classroom two days after the lessons taught by the English teacher.

4.3.1 Overall grammar results

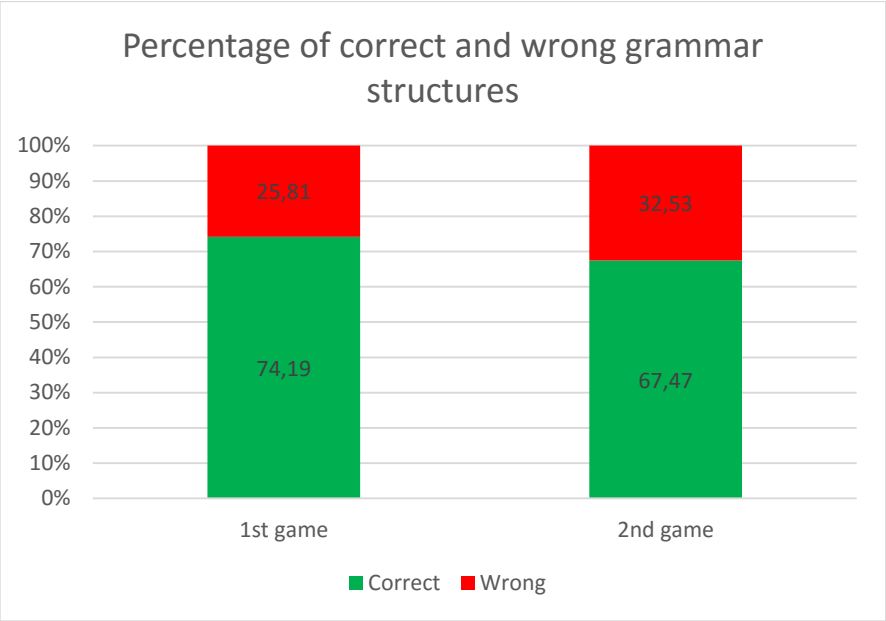
The overall results for this game were the following:



Graph 14. Percentage of correct and wrong sentences in the second game regardless of their grammar features.

In this game, only 67% of the tokens with target structures were produced grammatically, that is, only 56 of the 83 target structures were correct in terms of grammar.

If we compare these results to those of the previous game (Graph 15), we can see that the percentage of correct grammar has gone down 7 points from the first game to the second one. Even though this is not a big difference, it is important to mention it, since this game was implemented right after the explicit explanation of the grammar.



Graph 15. Comparison between the first and second games in terms of the percentage of correct and wrong sentences in each of them regardless of their grammar features.

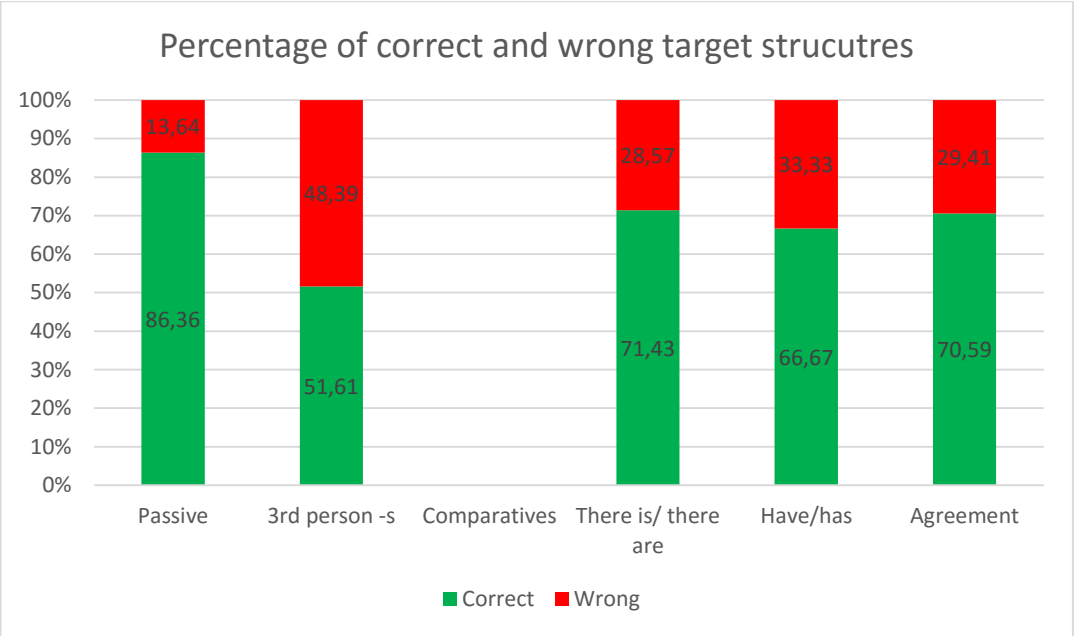
4.3.2 Results for each target structure

Regarding the individual results for each target structure, it is important to mention that there are no tokens for the comparatives category. It was impossible for me to come up with questions whose answer required a comparative structure, and no free answer by the students used one either. The total number of correct and wrong instances of each target structure in this game is the following:

Table 3. Number of correct and wrong tokens of each grammar structure in the second game.

	Passive	3rd person -s	Comparatives	There is/ there are	Have/has	Ten & Agr
Correct	19	16		5	4	12
Wrong	3	15		2	2	5
Total	22	31		7	6	17

Graph 16 below shows the same data using percentages:



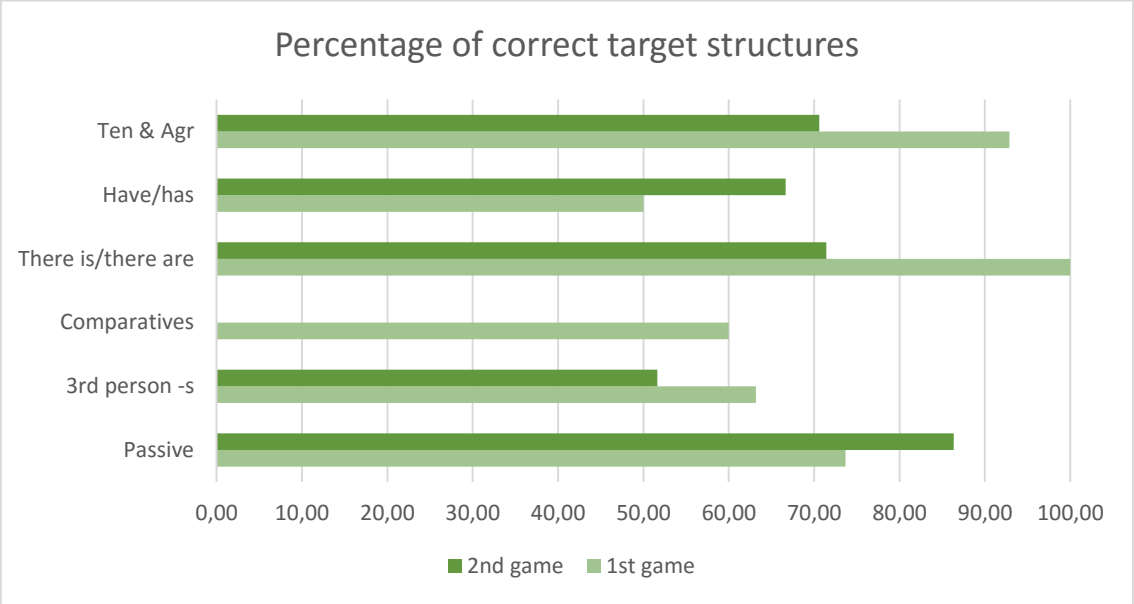
Graph 16. Percentage of correct and wrong sentences with each target structure in the second game.

Passive voice constructions have a high percentage of correctness, 86%. Only 3 of the 22 tokens were ungrammatical, two of which were wrong due to the lack of conjugation of the main verb (e.g. “Protozoa can be find in an aquatic environment or in humid places”) and one of which avoided the passive structure, deriving in an ungrammatical sentence (“Protozoa classification depending on where they live”).

The –s suffix in the third person singular was only used 52% of the time. Regarding the remaining three categories, their percentages of correct structures are quite similar, all of them around 70%. In the “there is/there are” category, none of the ungrammaticalities were caused by the lack of agreement between the subject and the verb “to be”, unlike in the Unit 5 exam, in which most of the ungrammaticalities of this feature were caused by this lack of agreement. Instead, in this game, one problem came with the omission of the existential “there” and the other one with the replacement of “there” by “they” (e.g. “The difference between asexual and sexual reproduction is that in asexual reproduction is only one individual and in sexual reproduction they are two). The wrong instances of “has vs. have” structures were due, again,

to the use of "have" with a singular subject (e.g. "A fungus cell wall have cellulose"). Finally, problems with agreement were caused by the use of "does" with a plural subject (e.g. "Bacteria doesn't have a nucleus") and by the lack of agreement in passive constructions (e.g. "Algae is classified in multicellular and eukaryote").

We can see many differences in the percentages of correct and wrong structures between the fist and the second games, provided in graph 17 below:



Graph 17. Comparison between the first and second games in terms of the percentage of correct and wrong sentences in each of them depending on their grammar features.

We can see a very big difference between the way students produced "there is" and "there are" in the first and the second games, with the percentage of grammaticality decreasing from 100% to 71%. The "tense and agreement" category also experienced an important decrease of 22 points. Finally, the 3rd person –s suffix was left out more often in the second game than in the first one.

The only two categories in which the students performed better in the second game than in the first one are "has vs. have" and the passive voice construction, increasing 17 and 12 points

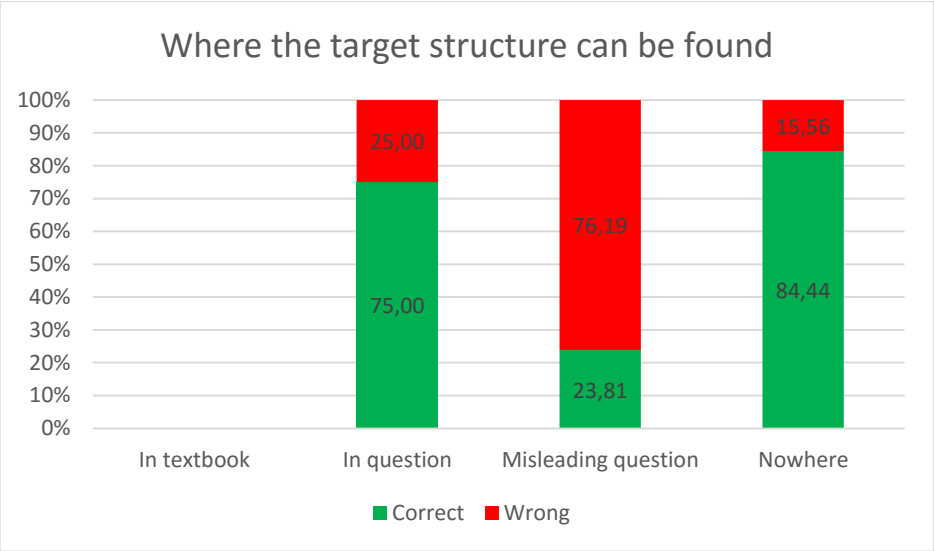
respectively. Since no comparatives were elicited in any of the questions in the second game, no contrast can be seen with respect to the first game.

These results, however, need to be analysed in more detail after looking into the way of elicitation of each target structure, since the increase in the proportion of a category which is the students' weak point (for example, "misleading question") from the first game to the second one could have increased significantly the difference between the proportion of correct instances of a feature in one game and the other. In the following section, a more thorough analysis of the results for the evolution of each grammar structure will be provided.

4.3.3 Results related to the way target structures are elicited by the questions in the prompt (in general, regardless of the grammar structure)

Regarding the place in which the target structures appear, it is important to mention that the "textbook" category is not included in this second game, since this unit was dealt with through cooperative work and no specific textbook was followed. Moreover, a large part of what the students had to study for this game came from the notes that they had taken while listening to their classmates' oral presentations on their topics. The other three categories ("Question", "Misleading question" and "Nowhere") were kept for this second game.

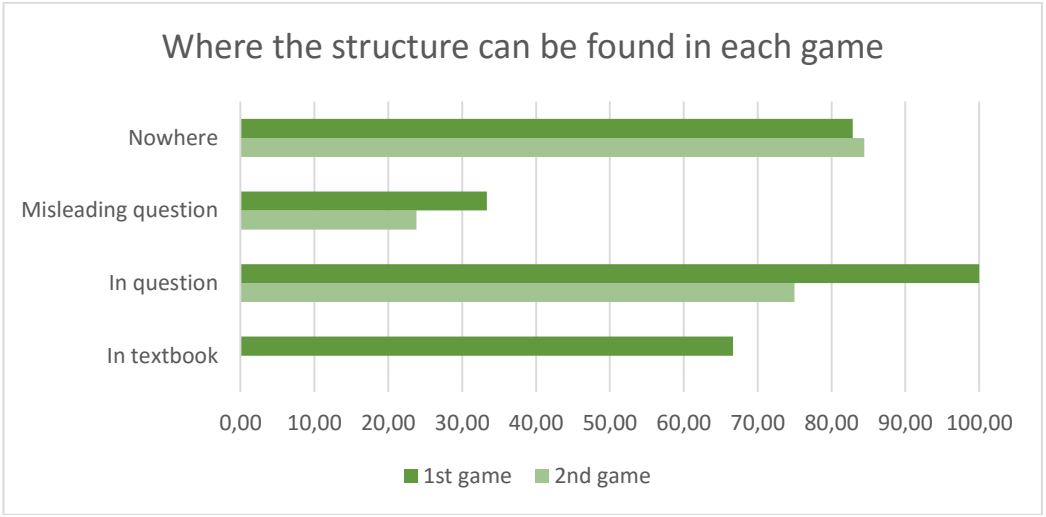
The following graph (Graph 18) shows the total percentage of grammatical structures depending on how they had been elicited:



Graph 18. Percentage of correct and wrong sentences in the second game according to the way the structures are elicited in the prompt, regardless of their grammar feature.

Whereas the percentage of correct sentences in which the target structure did not appear anywhere is very high, 84%, when the target structure already appeared in the question, only 75% of the time were the students able to reproduce it correctly, and when this question was misleading, this percentage is much lower, not even reaching one fourth of the total number of answers.

If we compare this to the previous game (graph 19), some of these results are similar:

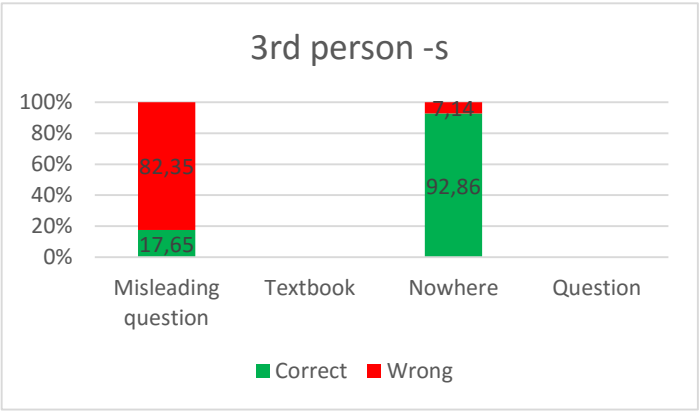


Graph 19. Comparison between the first and second games in terms of the percentage of correct and wrong sentences in each of them according to the way the structures are elicited in the prompt, regardless of their grammar feature.

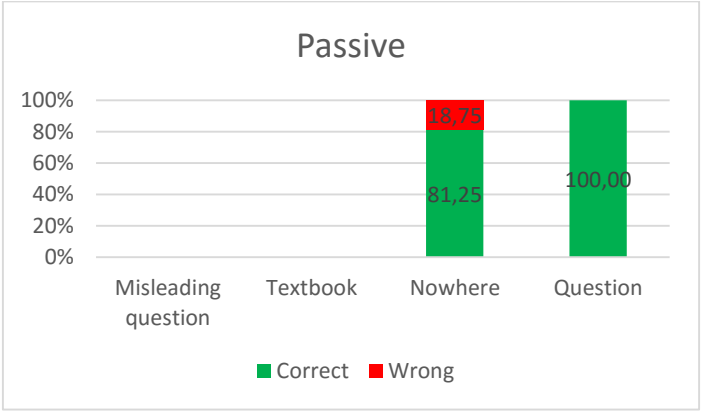
The percentage of correct target structures in the "Nowhere" category has barely changed, staying very high. In the "misleading question" one, it has decreased 10 points, but they are both similar and quite low. However, a major change can be seen in the percentage of correct sentences in the "question" category. Whereas in the first game there had not been any wrong sentences, there was an unexpected increase of ungrammaticality in the second one, reaching a 25%.

4.3.4 Results related to the way target structures are elicited by the questions in the prompt (each grammar structure individually)

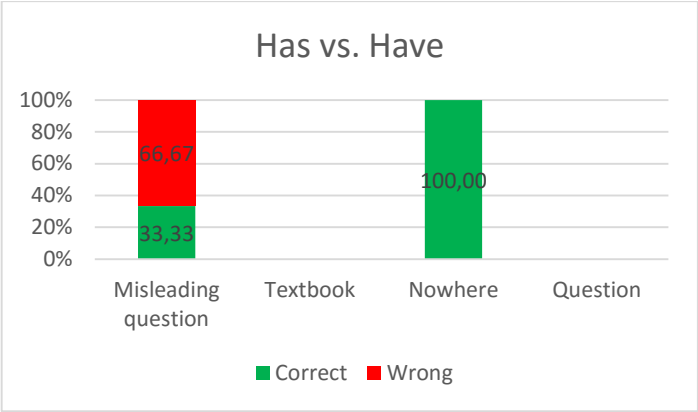
We will now explore how each of the target structures is affected by the way it is elicited in the prompt. The graphs below show the percentage of correct and wrong of each structure according to their elicitation patterns.



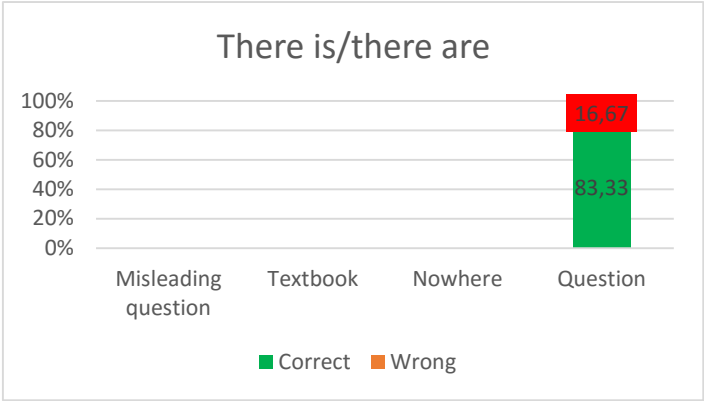
Graph 20. Percentage of correct and wrong sentences for the "3rd person –s" feature in the second game according to the way the structure is elicited in the prompt.



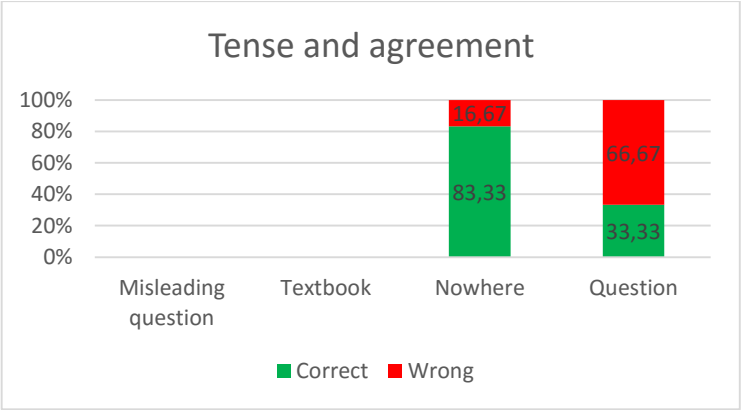
Graph 21. Percentage of correct and wrong sentences for the "passive" feature in the second game according to the way the structure is elicited in the prompt.



Graph 22. Percentage of correct and wrong sentences for the "has vs. have" feature in the second game according to the way the structure is elicited in the prompt.



Graph 23. Percentage of correct and wrong sentences for the "there is vs. there are" feature in the second game according to the way the structure is elicited in the prompt.



Graph 24. Percentage of correct and wrong sentences for the "tense and agreement" feature in the second game according to the way the structure is elicited in the prompt.

In the "3rd person –s" category, the only two elicitation forms were "misleading questions" and "nowhere". When the students had to make a change to the verb –i.e. add the –s suffix– when producing the answer after a misleading question, 82% of the time they did not use it, thus leaving the verb as it was in the question. On the contrary, when the sentence that required the suffix added to the verb was spontaneous, only 7% of the time this suffix was missing.

The production of passive voice was extremely high both when the structure appeared in the question, which was expected, and when the students spontaneously used this construction, ending up producing ungrammatical sentences only 19% of the time.

Regarding “has vs. have”, whereas no error was made when the students had to come up with the correct form themselves, only one third of the instances in which these verbs were used after a misleading question resulted in grammatical sentences.

The existential “there is” and “there are” were only elicited through their explicit use in the questions, and the students just had to repeat the structure in their answer. However, the percentage of correct grammar in their productions was, unexpectedly, only of 83%.

Finally, “tense and agreement” category shows unexpected results. Whereas the percentage of correct agreement in spontaneous speech was very high (83%), the percentage when the agreement was stated in the question is extremely low, of just 33%, when a much higher percentage would have been expected.

As mentioned before, it is necessary to account for the difference in the proportion of each elicitation form in each of the features, since this difference could provide interesting information regarding the students’ improvement or lack of improvement after the explicit explanation.

In the “passive” category, the previous results show the reality of the students’ improvement. Since the “nowhere” category had been their weak point in the first game, the proportion of questions with this prompt in the second game is what will mark the difference between an apparent improvement and a real one. The proportion of “nowhere” questions in the second game is remarkably higher than that in the first game (it went from 63% to 72%) and the

percentage of correct grammar was still higher in the former than in the later. Therefore, we can conclude that there has indeed been an actual improvement in the production of the passive voice.

In the "3rd person –s" category, a substantial decrease in grammaticality was predicted by the original results. Since the proportion of misleading questions, their weakest point, in the second game was practically the same as in the first game (55 and 53% respectively), the difference in proportions of each elicitation form cannot be the reason of this sudden drop in the percentage of correct structures by the students. Therefore, some other reason must account for this drop. The same happens with the other grammar categories: there is no difference in the proportion of elicitation ways between the first and second games, which means that the original results were accurate.

Regarding the "has vs. have" category, the data collected in the first game (only two tokens in total) is not enough to account for a real improvement in the second game.

To sum up, the comparison between the first and the second game shows:

- Passive voice constructions have experienced considerable improvement, from 74% to 86% of correctness, from the first to the second game.
- The "3rd person –s", "there is vs. there are" and "tense and agreement" categories have a lower percentage of correctness in the second game.
- There is not enough information to account for variation in the "has vs. have" category.

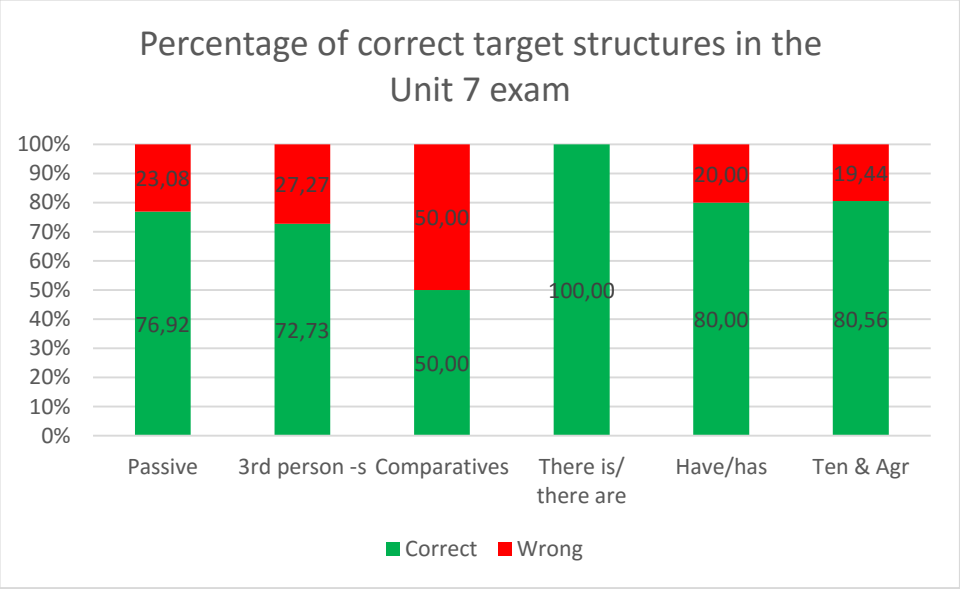
4.4 Grammar in second test (Unit 7)

This test (Appendix III) was designed by me because the Biology teacher was not planning to make the students take any exam. Therefore, I was only granted twenty minutes of a Biology class to carry it out. Consequently, the answers provided by the students are not very long, and not many tokens of each grammar point can be found in them. Moreover, even though full sentences were required in each of the questions, as stated at the beginning of the test, only a minority of the students followed that rule. Therefore, the tokens are even fewer than anticipated. Table 4 below shows the total number of tokens for each feature:

Table 4. Number of correct and wrong tokens of each grammar structure in the second test.

	Passive	3rd person -s	Comparatives	There is/ there are	Have/has	Ten & Agr
Correct	10	40	1	3	4	29
Wrong	3	15	1	0	1	7
Total	13	55	2	3	5	36

Graph 25 shows the percentage of correct and wrong instances of those features:



Graph 25. Percentage of correct and wrong sentences with each target structure in the second test.

The target structures that were most frequently used are the 3rd person –s and the passive voice. In the former category, of a total of 55 instances in which the suffix was needed, it was indeed used in 40, that is, 72% of the time. Most of the errors in this category appeared in long recounts, whereas short answers were usually correct. An interesting observation in this grammar structure is the fact that one student wrote "eat's" and "allow's" in his exam, adding the suffix as if it were a possessive.

Regarding passive constructions, only 3 out of 13 sentences, 23%, were wrong. However, only one of these wrong structures was wrong in its form ("will be affect"), the other two were instances in which the active voice had been used to express a passive one.

The "tense and agreement" category reaches 80% of correct sentences. Concerning just the past tense, only 1 out of 7 sentences with non-present tenses were wrong, but this one was not even a major error, since the sentence expressed a hypothesis and these students have not yet studied how to express them. Therefore, we could say that the students expressed the past tense correctly in every single case.

The other three categories do not have enough tokens, since most of them should have been used when answering the questions using full sentences, which the students did not do. The three instances of "there is" or "there are" structures were correctly written, only one of the two comparative structures used was correct and three of the four "has" and "have" instances were correct.

It is important to mention a very unexpected result in the "3rd person –s" category, however. We saw in the two games that most of the times that this suffix had been forgotten had been due to a misleading question, since there had been practically no mistakes in the students'

spontaneous speech. Nevertheless, the results in this exam (Graph 26) show exactly the opposite:

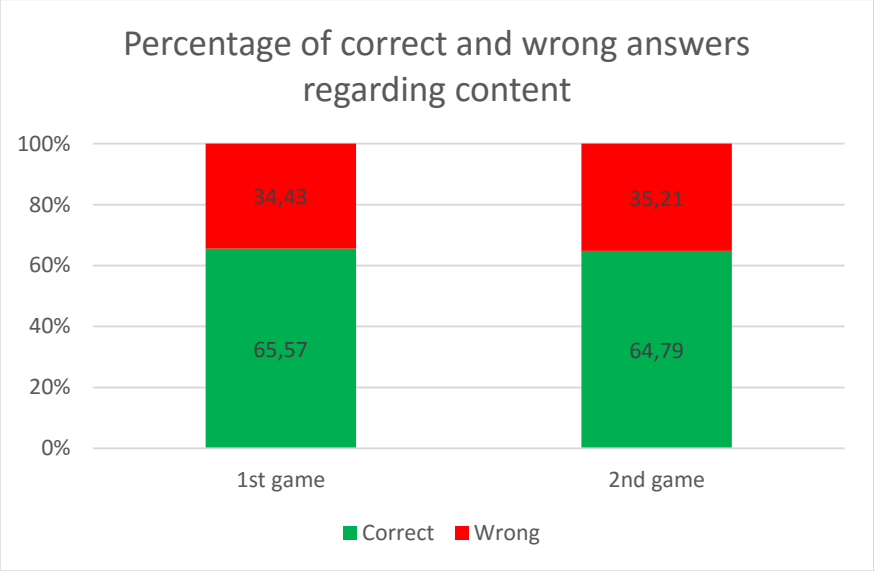
Graph 26. Percentage of correct and wrong sentences for the "3rd person –s" feature in the second test according to the way the structure is elicited in the prompt

17 of the 25 students answered the misleading question in Question 1 with a full sentence, and all of them remembered to add the –s to the verb. On the contrary, in the rest of their writing, only 23 out of 38 times did they remember to add the –s.

4.5 Analysis of motivation towards content in the two games

Up until this point, I have only focused on the evolution of the students' grammar in order to see if an explicit explanation before the second game would increase their performance in grammar in the following game and test. However, it is also interesting to observe whether the games might have increased in any way the students' motivation to study the content subject as well as the grammar. In order to find the answer to this question, the students' answers in the games were also analysed in terms of content.

In the first game, right after they did the unit's exam, 40 questions out of 61 were answered correctly by the students, which constitutes a 65.57% of the total. In the second game, on the other hand, they were not going to have an exam and they were told to study for the game if they wanted some extra points. In this case, 46 questions out of 71 were answered correctly, which constitutes the 64.79% of the total. We can see, then, that there is practically no difference in performance between the first and second games, that is, between their content performance playing the game after an exam and playing it when there was not going to be one.



Graph 27. Comparison between the first and second games in terms of the percentage of correct and wrong answers

5. Discussion of results and pedagogical applications

As mentioned in the introduction, the purpose of this study was to find a way of bridging the gap between language and CLIL subjects by means of a task which combined the focus on content and the focus on form. The study pursued three objectives which are presented below in the form of questions and which will now be discussed individually. The possible pedagogical applications of the results will also be provided.

- Does an explicit explanation of the grammar in the EFL classroom improve the students' grammar in Biology games and tests?

Regarding the first objective, the analysis of the students' grammar in the two games shows very unexpected results. While the first game was carried out before any explicit explanation of the grammar structures that were going to be on focus on the game, the second game took place after the English teacher had devoted two hours in the EFL classroom to explaining these grammar structures and the students had had time to practice them with exercises in class. The difference between these two contexts predicts better grammar results in the second game than in the first one. Nevertheless, the analysis of the students' grammar shows completely unexpected results: not only did the students' grammar not improve from the first to the second game, but it even got slightly worse, from 74% of correct structures to only 67%. If we itemise these results, we get that passive voice constructions are the only ones that experienced improvement, while "has vs. have" usage remained the same and the 3rd person suffix, "there is" and "there are" and tense and agreement increased their percentage of wrong tokens.

The reason for this sudden decrease of correct structures is very hard to explain. A possible reason would be that, after the explicit explanation of the grammar, the students were more

aware of the mistakes they used to make and were making a bigger effort to correct them in this second game, thus resulting in confusion and, very often, hypercorrection of sentences that were already correct. Nevertheless, in order to accept this factor as a valid explanation, the students should have shown some kind of awareness that they were thinking about the grammar during the game. However, this was not the case. As I will explain later, the students gave little or no importance to the grammar they were using, focusing exclusively on the content. Therefore, it is very unlikely that this confusion and hypercorrection was the cause of their bad grammar unless this cognitive process took place internally and was never externalised. Moreover, while each answer was given by a single student at a time, and it is possible that the particular student giving the answer was experiencing some confusion, the answers were previously discussed in groups, and the members of the groups were allowed to help and correct the person saying the answer out loud. Nevertheless, this happened very few times. Almost always, the members of the group accepted the answer that their mate was giving. This means that no member of the group realised that the grammar being used was wrong, and, since it is highly unlikely that every member was experiencing confusion at exactly the same moment, this hypothesis of hyper-awareness of the grammar should be discarded.

The most reasonable hypothesis, then, is that the Biology topic itself was less familiar. The first game had dealt with an easier topic and, mainly, with a topic that the students were more familiar with (the atmosphere, the global warming…). On the contrary, the second game was related to living things kingdoms such as monerans, algae or fungi, a topic that is not frequently spoken about. Moreover, this topic had complex vocabulary that the students had never heard before, and it is very likely that this caused some confusion. The students had many problems with subject-verb agreement in this second game, which may have been

caused by the actual words that were behaving as subjects, since it might have been difficult for the students to tell if they were singular or plural.

While this is a reasonable hypothesis, it only explains why the second game was worse in terms of grammar and not why grammar had not been better in general in both games. On the one hand, the students did not make an effort to produce grammar correctly while playing the games: they knew that wrong grammar would penalise them and they still did not try to improve it. On the other hand, many of the mistakes that the students made both in the games and in both tests would have probably not been made in the EFL classroom. I have been attending their classes and correcting their English exams for three months, and the number of mistakes of this type that they commit in this subject is much lower than the number of mistakes made in the Biology subject. In the English classroom, the 3rd person –s is very seldom forgotten, and agreement is usually not a problem at all. In these games and tests, however, which dealt with the Biology subject, the number of mistakes was extremely high compared to the other subject. We can then hypothesise that the reason why the proportion of good grammar in the Biology tests and games was so low is that the students see the Biology subject as totally unrelated to the English subject. It is as if, when studying Biology, even if it is CLIL, they left behind some of the English they know and focused exclusively on the content. In this subject, they seem to consider that the only thing that matters in their biology exams is their content mastery, and not their language skills and, consequently, grammar is pushed into the background. Therefore, it is very unlikely that explicit explanations of the grammar in the EFL classroom will ever mean an improvement in the students' grammar in the Biology subject as long as the students do not feel that their language skills are going to be valued.

- Which areas of grammar do these students have more problems with? Which ways of elicitation of the grammar result in a higher frequency of ungrammatical productions?

Once the reason for this low performance on grammar has been explored, the second objective of this study will be explored. The aim of this study was to see what these students' main problems are when dealing with structures like the ones that have been on focus in these games.

The first game and the second test shed light on the real problem these students find when dealing with the past tense. Whereas in the first exam there had been many errors related to this feature, this was not the case in the first game or the second exam, in which all the sentences that should have been expressed in the past were in the past indeed, as well as grammatical. This difference can be explained in terms of the length of the answers, that is, the number of sentences that were used by the students to explain a concept. For example, in both the first game and the second exam, the past had to be used only in one-sentence answers. In contrast, in the first exam, the past tense had to be used in long recounts, usually consisting of six or seven sentences, in order to explain past events, like the origin of the atmosphere. This means that the students do not have problems with the construction of past tenses as such, or with knowing when to use this tense: their problem appears when they have to write long recounts, which end up lacking consistency, since very often the students start writing in the past and end up writing in the present, or merely combining both tenses randomly.

Regarding passive voice, these results indicate that these students do not usually have problems with the formation of a sentence in the passive voice, especially after the explicit

explanation of the grammar. As with the "tenses" category, problems with this structure usually only arise with being able to identify in which context the passive voice should be used. Practically all the instances in which this structure was wrong both in the games and in the exams were not due to a problem with form (e.g. using the main verb in the past simple instead of the participle) but with meaning, that is, not being able to identify that the passive voice should have been used in that context instead of the active voice. Therefore, this may indicate that EFL teachers should not give so much importance in their explanations to the formation of a sentence in the passive voice, but they should help the students identify when a subject requires the verb to be in the passive voice.

The results in the "3rd person –s" category are extremely unexpected when comparing the games and the second exam. On the one hand, the games show a need for the EFL teachers to focus on "misleading questions" in their explanation of the present simple. For example, in the second game, after the explicit explanation of the grammar, the students produced the suffix in 93% of the cases when they were being spontaneous. However, when the suffix had to be used in the answer after a misleading question, it was forgotten in 82% of the cases. Therefore, it is clear that, at least in the games, it was difficult for the students to know when to add an –s in these cases, probably because they were no paying attention to the grammar they had to use.

The results in the second exam, however, are confusing. Every single student who used a full sentence to answer the misleading question in the first question, a total of seventeen, remembered to add the suffix. On the contrary, in the rest of the composition, in spontaneous writing, they only remembered to add it 60% of the time. The data in each of the games and the exams shows a very clear fact: in written English, the 3rd person suffix is used only 58% of the time (56% in the first exam and 60% in the second exam) when no misleading question

is provided. On the contrary, in spoken English, the –s is used 97% of the time (100% in the first game and 93% in the second one) in spontaneous speech. The very few texts that the students have to produce in English at school compared to the high frequency with which they participate verbally in class accounts for this difference. We should not forget, nevertheless, that the games were played in groups and the exams were done individually, and even though every student had to speak equally during the games, these results account for the whole class as a group and not for each student individually. Regarding the "misleading question" results in the exam, they show an individual approach, which still clashes with the results obtained in the game. Apparently, these students pay more attention to misleading questions in written than in spoken form.

Another conclusion that can be drawn from these results is that the students do not pay attention to the way questions are asked in order to know the correct agreement between subject and verb. Whenever they were asked a question whose subject, in the plural, did not have a regular plural marker (e.g. algae, fungi, pili, bacteria…), the students tended to produce the verb in their answer in the singular form (e.g. "Do bacteria have a nucleus? No, bacteria doesn't have a nucleus"). Therefore, they should be warned, especially in the EFL classroom, of the importance of paying attention to the way questions are produced so as to mimic the target structures in their answers, not only when dealing with biology topics but in any context in their lives in which they have to use English.

A last remark on the students' answers in the games and exams is the simplicity of their productions. Especially when they had to provide an explanation stating the difference between two things, they always resorted to the addition of two simple sentences (e.g. "What is the difference between algae and plants at a cellular level? Algae are multicellular and plants not.") After noticing this fact in the first game, I added another target structure to the

ones at focus: constructions with “whereas”. The English teacher included this connector in her explanation of the grammar previous to the second game. She explained what it is used for, what it means in Spanish and how it should be used when comparing two things. In the following game, the students were reminded that they would be rewarded every time they used this connector in their answers, and they kept being reminded every time a question like the one in the example was asked. Nevertheless, none of the seven questions that allowed for “whereas” in the answer was actually answered with anything different from the addition of two sentences. An effort should be made by teachers, then, to make sure that their students are able to produce more complex sentences in which contrast is shown by means of connectors, and this, as I will explain later, can only be achieved by increasing the frequency with which students have to practice writing long texts.

These last results contradict Ruiz de Zarobe’s (2011) findings. She had claimed that one of the areas which are clearly improved by a CLIL environment is the lexical and syntactic complexity of students’ written English. Nevertheless, this study shows that these students’ written productions are extremely simplistic. Regarding syntax as such, this study also shows that these students have many problems with the structures that have been on focus here, which corroborates Ruiz de Zarobe’s (2011) findings that syntax is not one of the areas which is favourably affected by CLIL.

- Do board games increase students’ motivation to study a content subject? What about grammar?

Finally, the third –and less relevant– objective of the study will be discussed. In order to answer this question, however, the two games are not the only factors that should be taken into account. Students’ reactions to the game and comments heard through direct observation are also an important factor.

On the one hand, regarding the analysis of the data related to content, it can be concluded that these games were, at least to a certain extent, motivating for the students. These results show that there was no variation in the percentage of correct and wrong answers between the first and the second game, which means that the students' performance was not diminished by the fact that there was not going to be an exam afterwards: the students studied for the game as if it were an exam itself. Obviously, their motivation could have been bigger, since the proportion of correct answers only reaches 65%. Nevertheless, that is the same proportion of correct answers in the first game, which means that the students were at least as motivated to study as for their previous exam.

On the other hand, leaving behind quantitative data and focusing only on qualitative analysis, it can be stated that these games were highly motivating for the students. The first time they played, the game was new for them and they did not know how it worked, so at the beginning they were a bit sceptical that a biology game could be fun. When I started explaining the rules before the game, they looked thrilled (they started whispering to one another, arranging the teams, shouting things like "we're going to crush you!") and eventually ended up having a lot of fun, so much that, at the end of the game, they begged me to let them play again. The second time they played was just as successful. The Biology teacher had told them that on Wednesday they would be playing the same game again, this time in the English class. When I went in, they were so anxious to play that they were already getting into their groups.

Even though I had expected the students to perform better in the second game in terms of content –they were really looking forward to play again and they told the Biology teacher that they would study hard for it–, it is obvious by the students' behaviour that they appreciate it when lessons are a little more out of the ordinary. Moreover, while playing games, they behave very well, the session runs smoothly and they are having fun while learning. Even

though this study has not carried out real research on motivation but it has merely been an interpretative analysis of what could be observed while carrying out the task, it seems that what motivated the students to study for the game, what drove them, was what Covington (1998) had defined as the desire to be perceived as worthy or valuable, and their desire to succeed in front of their classmates. Competitiveness was also an important factor: comments like "we're going to beat you; unlike you, I did study" suggest that one of the reasons why the students had studied the content was to win the game. Even though sometimes it is believed that intrinsic motivation is the best one, I believe that whatever extrinsic reasons these students might have had to study for the game, the results were just as satisfactory.

Sadly, the same cannot be said about the students' motivation towards grammar. While sometimes it was possible to hear comments like "Hey, but let's think about the grammar" or "Don't forget to add the –s" from some students during the game, this was very seldom the case. Most of the time, the students did not even think about the grammar, even if a wrong structure would mean moving backwards in the game. Whenever they were penalised for this reason, they were angry with themselves, but rarely did they do something to fix it the following time it was their turn to answer. Following the conclusions reached before, it is very likely that the only reason why the students were not motivated to improve their grammar was because they felt that the game's primary focus was not English but Biology, so grammar was pushed into the background. If a game had been played which focused exclusively on grammar, it is very likely that it would have attracted their attention and increased their motivation.

6. Pedagogical applications of the results of this study

In order to conclude whether this study shows that integrating a language subject in a content one is possible or if it is not, we have to take into account two different perspectives, that of the teachers and that of the students, since, frequently (as was the case with this study), an activity that has been carefully planned by a teacher does not necessarily meet the expectations when it is carried out.

On the one hand, from the point of view of the teachers, combining CLIL and language subjects is possible, although it requires a good deal of effort. Combining these subjects is, in terms of content, easy: the CLIL teacher provides the context and content for the activity and the EFL teacher shapes it in order to adjust it to the syllabus requirements for this subject at each point of the academic year. The result is an activity in which the students are learning or revising content seen in other subjects while, in the meantime, using the grammar that they have learnt in a meaningful context.

Apart from using these activities for the revision of content, CLIL teachers may use them as a way of receiving support from language teachers in order to improve their students' performance in their own subjects. For instance, if a History teacher has noticed that their students' writings are difficult to understand because they do not know how to express the past tense correctly, they can raise this problem to the EFL teacher, who will explain this grammar point explicitly and then create an activity in which this tense is practiced in context (the same history topic as in this other subject).

Even though this can be done, it requires a lot of effort from both parties, since coming to an agreement on what to teach and how to do it can sometimes not be easy. The overall results of this study are not satisfactory as far as improvement in grammar is concerned. Nevertheless,

once the correct method for integrating content and language is found and improvement can be seen in the students' proficiency in both subjects, this effort will have been worthwhile.

This study is good proof that the integration of content and language by the teachers is possible and that, in fact, they welcome it. Both the Biology and the English teachers were very involved in this research, they provided me with all the material I needed, they continuously offered hep and they were curious not only about the results concerning their own subject but also about the other one. Moreover, the English teacher offered to carry out the second game during an English class because she wanted to see how her students performed in terms of grammar in a content-based task. Regarding the Biology teacher, he took advantage of this study to get help from the English teacher. He had observed that the students' English could improve greatly in many areas, and he wanted to see if collaboration between both departments would help improve the students' grammar proficiency in his own subject.

From the point of view of the students, on the other hand, these types of activities can be very motivating: seeing that grammar is being learnt with a purpose and feeling that they are revising another subject at the same time may make students work harder and involve themselves more in the activity. Nevertheless, it is also possible that the students only give importance to one of the subjects at focus, as happened with the games I carried out. In these games, the students gave much more importance to the Biology content than to the grammar they were using, and failed to understand that the game was meant to address both subjects equally. There can be two reasons why this happened: on the one hand, the first time the game was played was in a Biology class, and therefore it is likely that the students automatically associated it to this subject, pushing the English subject to the background. On the other hand, even though they associate me with the English subject, I am not a real teacher, unlike the

Biology teacher, who played with them the first time. Therefore, they might have felt more obliged to comply with this other teacher than with me.

When these tasks are carried out, teachers should be careful how they address them. Which subject the activity is carried out in and what repercussion it may have in each subject are things that should be taken into account, since they might make a difference in the actual effectiveness for both subjects. From my experience when carrying out this study, it might be more effective to carry out these activities in the English classroom so that students do not forget that this subject is important in the activity too –it will not be a problem for the students to keep the content subject in mind, since the actual content of the task will already remind them of it. Once the students have got used to using proper grammar in the English classroom when dealing with these topics, it will be easier for them to maintain this correctness in the rest of the subjects.

The fact that these students have always studied in bilingual schools may have had an effect on their lack of interest in the grammar part of this task. They are used to practising spoken English continuously in content subjects, but they are not used to being corrected on their grammar, since form is not usually given so much importance in these subjects. Therefore, for them, language accuracy is not as relevant as getting the message across. Going back to what Lyster (2007) said, this study shows that indeed content teachers should also focus on form, since belittling grammar clearly has negative effects on the students' motivation towards it, as can be seen in language-based tasks integrated in content-based ones.

Some other problems have been raised in this study which should be given solution either by the EFL or the content teachers, since this would improve the students' proficiency in their subjects as well as increase their motivation towards them.

Firstly, concerning grammar and writing, students should be asked to write long recounts more often. In the EFL classroom, these students seldom have to write long texts –they usually have to produce short sentences using target grammar structures. In the Biology classroom, no texts are ever written either, yet students are expected to be able to produce them in the exam without any previous practice. Students should then be asked to write texts more often in order to get more practice, which would improve their proficiency not only in the EFL classroom but also in CLIL subjects.

As we have seen before, most of the students' grammar problems come when having to deal with consistency of tenses and 3rd person –s, and this can only be practiced through long writing compositions. Moreover, these students should also be taught how to add cohesion to their writings. They should learn how to structure a text using sequential markers as well as how to state the difference between two items or actions by means of contras markers. These simple but useful tools would help them enrich their writings and gradually start building real texts.

Secondly, regarding content subjects taught in English, teachers should try to pursue a real CLIL context in which language is also given importance. The situation in this 1st ESO group, which is similar to the situation in most CLIL high schools in Spain, is that English is merely the medium of instruction of these subjects, but its grammar is not given much importance in the actual development of the sessions, let anole in the exam. Content teachers should try to pay more attention to form and take grammar into account in the assessment of the subject. Consequently, students would improve their communication skills in English and would not consider grammar to be unrelated to the content they are learning. This could be achieved by encouraging student participation in class and giving corrective feedback not only of the content but the grammar as well. Asking the students to explain parts of the syllabus

themselves would also increase both their exposure to a real use of English and their motivation, making them feel useful in the classroom and engaged in the content.

A third issue that teachers should take into account in order to improve their students' performance is how to increase their motivation towards the subject. While the topic as such can be motivating for some students and not attractive at all for others, the way in which this topic is presented can make a difference in every student's actual performance. Students are usually tired of always being taught in the same way, following the textbook and taking an exam at the end of the unit. Even though studying students' motivation was only a secondary objective of this piece of research, and its results are interpretative and future research should use questionnaires or interviews to confirm it, this game proved to be successful in terms of increasing the students' motivation. This study has shown how games can be used as a medium of instruction or revision in both a content and a language subject. While students are having fun doing something different from the ordinary, they are also learning without realising it. Moreover, games can also be beneficial for teachers, who are often tired of teaching the same content year after year always in the same way.

Nevertheless, teachers should keep in mind that games are only useful if the objectives that were planned in advanced are fulfilled. For instance, the game used in this study was useful in terms of Biology but not of grammar. Therefore, these activities should be carefully planned by the teachers to make sure that they are useful for their subject.

7. Conclusion

This study has dealt with an issue that has seldom been subject of research, which is the possibility of integrating the English subject in a content one in such a way that not only meaning but also form are paid attention to by the content teacher at the same time that it allows for English to be used in a real context. Some suggestions have also been provided that could improve the students' English grammar proficiency as well as increase their motivation towards both types of subjects.

While it is indeed true that English is the medium of instruction in the Biology subject that this study has focused on, this research has shown that, apart from this fact, there is no real integration of the linguistic component of English in the content classroom. The students' grammar proficiency while they were answering the questions in the game was considerably below what was expected of them, as was confirmed by the EFL teacher. The little importance that content teachers give to grammar in their subjects clearly reduces the importance that students also give to it. Moreover, this study shows that, even though an explicit explanation of the grammar was carried out in the EFL classroom, grammar proficiency did not improve in the Biology subject. The most likely explanation for this fact is that students consider the CLIL Biology and the English subjects to be totally unrelated to one another, and therefore what is learnt in the English subject does not necessarily have to be applied to Biology.

Regarding the students' grammar as such, this study shows two important facts: first, that their spoken language is more correct than their written language, which is due to the low frequency with which students are asked to produce texts. And second, that too much importance is given in the EFL classroom to the way grammar structures are formed and too little to the actual use of these structures. Consequently, students end up knowing how to

write a verb in the passive voice when they are told to do so but they do not know when they should be doing it.

Another conclusion that can be drawn from this study is that it is possible to carry out activities which integrate both a content and a language subject, although it does require a great deal of effort and the will to work jointly with teachers from other departments. Nevertheless, as this study shows, the real challenge is to get students involved in both subjects at the same time and to prevent them from giving more importance to one than to the other. The way in which the activity is presented to the students should be carefully pondered over in advance.

Finally, this study has proved that students generally appreciate any activity which is out of the ordinary. Playing games increases students' motivation and keeps them more focused on the activity. These students in particular were looking forward to the Biology class every time they knew they were going to play a game. Nevertheless, it is important that games are useful and that the objectives are fulfilled –for instance, the games carried out for this research were useful in terms of biology content but not of grammar. Teachers should make sure that, as well as having fun, the students are learning, or else the games will not have been successful.

There are three things that teachers could do in their classrooms which would be extremely beneficial for their students, as can be concluded from this study: first of all, teachers, both of content and language subjects, should ask the students to write texts more often, making emphasis not only on grammar but on cohesion as well; second, content and English teachers should work jointly more often to increase the usefulness of both subjects and should pursue a real CLIL context in which language is given more importance; finally, teachers should make sure that they carry out activities in the classroom which are motivating for the students and make them look forward to studying and learning.

8. Statement of limitations, problems identified and future research on the area

The main problem that I found when dealing with this study was adjusting the content of each Biology unit in such a way that it could address all of the aspects that I wanted to take into account in the grammar component. Not all the topics in Biology allow for every grammar structure. For example, although the "tenses" category was one of the targets in the Unit 6 game, it was impossible to include it in the Unit 7 one, since the topic (the five kingdoms into which living things are divided) did not allow for other tenses but the generic present. The same problem was encountered with the "comparatives" category, since there were practically no possible questions that could be answered by means of a structure with a comparative.

Apart from the problems derived from the inadequacy of the topic, sometimes it was also difficult to find a question in which the grammar structure that was elicited did not appear in the question itself, especially in the target structures "there is vs. there are".

Another problem that I encountered was analysing the students' speech after carrying out the games. The students were recorded using mobile phones and, even though the sound quality was quite good, there were some times in which the recording had too much noise and the students' voices could barely be heard. Moreover, since the questions were answered orally, it was sometimes difficult to understand exactly what the students had answered, especially regarding the suffix –ed in past participles, which sometimes was barely audible.

The fact that the first game was carried out in the Biology class and that the Biology teacher was in charge of one of the groups was also a disadvantage. Even though he is a CLIL teacher and his English level is very good, he sometimes was not able to spot grammar mistakes in the students. Especially in the answers in which the verb needed to be formed with the 3rd

person –s, he rarely spotted that mistake, resulting in no penalisation during the game. Consequently, this prevented the students from realising that their grammar was being incorrect, possibly preventing them as well from making a bigger effort to get the grammar correct in the following answers because they thought they were already doing so.

The main limitation of this study is that it does not show accurately the improvement that the students have achieved in their second exam, since, due to time limitations, only a very short exam could be carried out for Unit 7, and it did not allow for the students to write long recounts as in their previous exams. Moreover, even though the instructions of the test stated clearly that long sentences should be used when answering the questions, many students did not do so, and so there are fewer grammar tokens than anticipated.

In addition to this, the answers provided in the games do not mimic those provided in the exams, since the exams allow for long recounts whereas the questions in the games required one- or two-sentence answers.

A last limitation of this research is that there is no control group. It was impossible to follow the same procedure in two different groups, since their Biology teachers are not the same and their exams are also very different, and so it would not have been possible to reproduce the same context in another group.

Future research

In the future, it would be interesting to research new ways in which a content and a language subject could be integrated but in such a way that the students do not associate the activity they are carrying out with just one of those subjects but with both at the same time, so that they give the same importance to the content aspect of the activity as they do to the grammar itself.

Future research should also deepen into the motivational component of this game, using questionnaires and interviews to find out how the students really felt about it so as not to base our conclusions on mere observation or on a quantitative analysis of the data. It would also be interesting to compare the students' grammar proficiency in the EFL classroom and in the Biology subject to see if there is significate difference between them both before and after an explicit explanation of the grammar.

Finally, it would also be interesting to study whether students would perform better in the games if both of them had been carried out in the English classroom instead of Biology since the beginning. This would show if the subject in which the tasks are carried out really has an impact on which subject the students give more importance to during such task.

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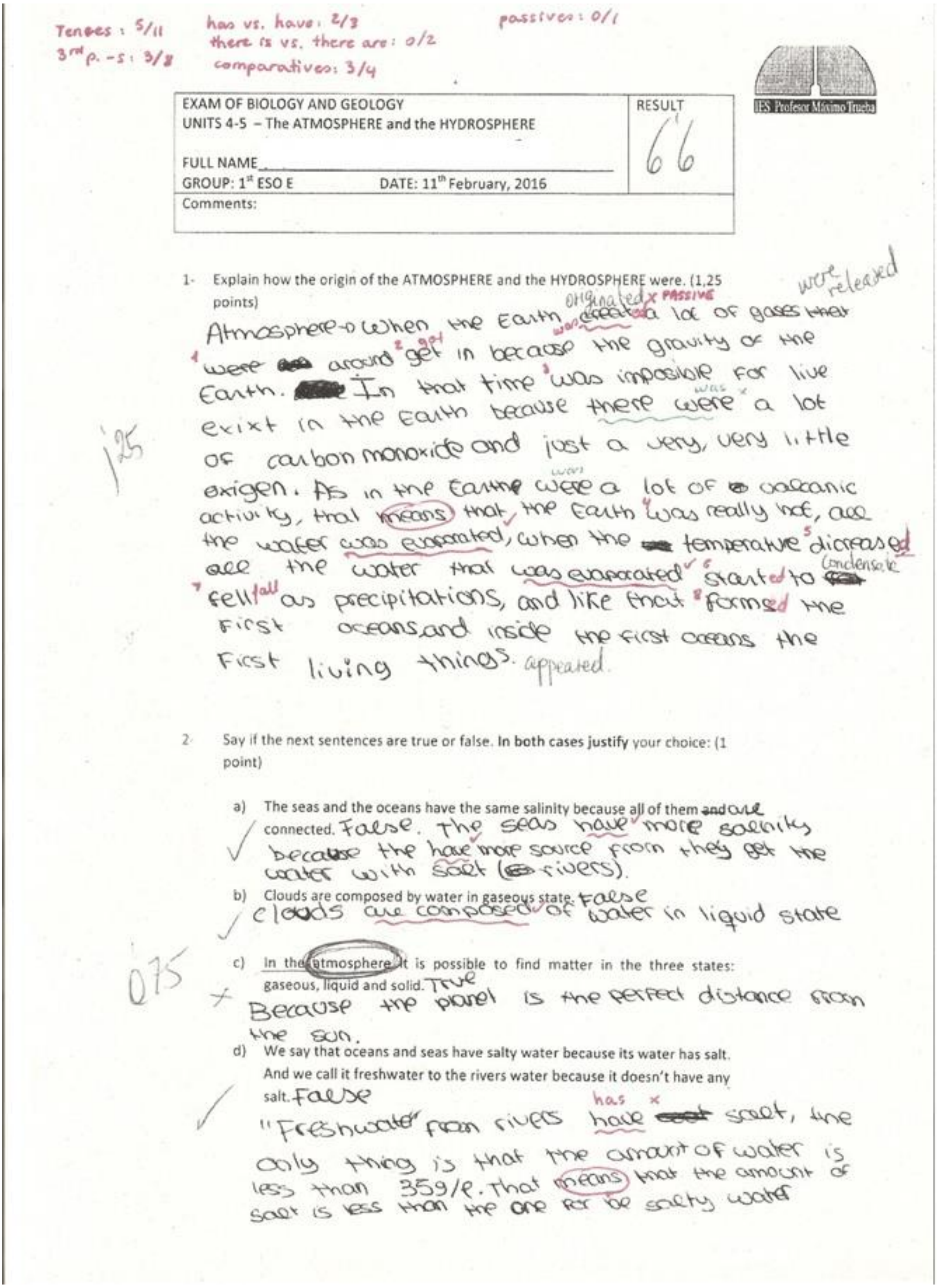
APPENDIX I – Board game

APPENDIX II – 1st test (Unit 5) sample



Tenses : 5/11
3rd p. -s : 3/8
has vs. have : 2/3
there is vs. there are : 0/2
comparatives: 3/4
passives: 0/1

EXAM OF BIOLOGY AND GEOLOGY UNITS 4-5 – The ATMOSPHERE and the HYDROSPHERE FULL NAME______________ GROUP: 1st ESO E DATE: 11th February, 2016	RESULT 6.6
Comments:	

IES Profesor Máximo Trueba

1- Explain how the origin of the ATMOSPHERE and the HYDROSPHERE were. (1,25 points)

Atmosphere → When the Earth was created (originated x PASSIVE) a lot of gases that were around get (got) in because the gravity of the Earth. In that time was impossible for live exixt in the Earth because there were (was) a lot of carbon monoxide and just a very, very little of exigen. As in the Earth were (was) a lot of volcanic activity, that means that the Earth was really hot, all the water was evaporated, when the temperature dicreased all the water that was evaporated (condensate) started to fell (fall) as precipitations, and like that formed the first oceans and inside the first oceans the first living things. appeared

(were released)

1'25

2- Say if the next sentences are true or false. In both cases justify your choice: (1 point)

a) The seas and the oceans have the same salinity because all of them ~~and~~ are connected. False. The seas have more salinity because the have more source from they get the water with salt (rivers).

b) Clouds are composed by water in gaseous state. False clouds are composed of water in liquid state

c) In the atmosphere it is possible to find matter in the three states: gaseous, liquid and solid. True Because the planet is the perfect distance from the sun.

d) We say that oceans and seas have salty water because its water has salt. And we call it freshwater to the rivers water because it doesn't have any salt. False "Freshwater" from rivers have (has) salt, the only thing is that the amount of water is less than 35g/l. That means that the amount of salt is less than the one for be salty water

0'75

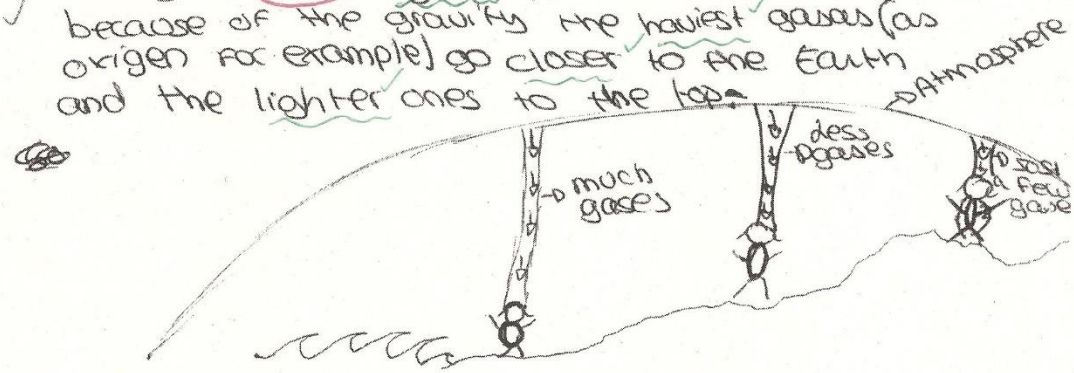
IES Profesor Máximo Trueba

3- Lorenza has visited the doctor because she has a terrible pain on her knees. The doctor has explained to her that she needs to lose weight because her bones are very weak. The doctor has also explained to Lorenza something about moving to a village in the mountain or to a village next to the coast, because in one of these two places, she will feel much lighter than in Boadilla, but she didn't understand exactly which one of the places was the good one.

a) Could you guess which place did the doctor recommend to Lorenza in order to make her feel lighter and improve her knees pain? (0,25 points)

The doctor has told her to go to a village in the mountain.

b) Now that you have studied how gases are distributed along the atmosphere, explain **in detail** why would Lorenza feel lighter in one of the two places. (0,75 points) She feels lighter in the mountain because of the gravity the haviest gases (as oxigen for example) go closer to the Earth and the lighter ones to the top.



4- Most of the living things breathe, but the percentage of the **THREE** main gases (N, CO_2 y O_2) hardly changes. Why does it happen? (0,75 points)

It changes because as the humans are pollution a lot the Earth composition (the gases) change

IES Profesor Máximo Trueba

5- CO_2 and the Greenhouse effect that it produces are good for the life in the planet.

a) Explain the reason. (0,25 points)

b) So, why all the countries had a meeting in Paris in November to try to reduce the emissions of CO_2 in order to stop the Greenhouse effect? (0,75 points) ??

0,75

Because if the poles desapear a lot of animals, plants... (living things) will desapear and also because if the poles melt the water will grow and same island, costa... will desapear. Also because the salinity of the sea will reduce and same animals of salty water will die.

be reduced

6- Solve the next problem:

There are three samples of water. One of them was taken in the Tajo River; another one was taken in the Atlantic Ocean; and the last one was taken in the Mediterranean sea. Each bottle had a different volume of water and we measure the mass of salt for each one of them:

Sample 1 – 5 liters of water – 195 gr. of salt
Sample 2 – 3 liters of water – 108 gr. de salt
Sample 3 – 9 liters of water – 108 gr. de salt

a) Calculate the salinity for each sample. (0,5 points)
b) Where was each sample taken? (0,5 points)

1

Tajo River → 12 g/l (sample 3)
Atlantic ocean → 36 g/l (sample 2)
Mediterranean sea → 39 g/l (sample 1)

195 ÷ 5 = 39
108 ÷ 3 = 36
108 ÷ 9 = 12

39 g/l, 36 g/l and 12 g/l

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7- Relate each one of the next processes with a water property: (1 point)

- Life in aquatic ecosystems is possible during the winter although the temperatures decrease under 0°C.

× keep heat

- When we leave the water after having a bath in the sea or the swimming pool we get very ~~could~~ cold if we don't dry ourselves with a towel.

×

- Plants can transport mineral salts from the soil up to several meters to the top of the tree.

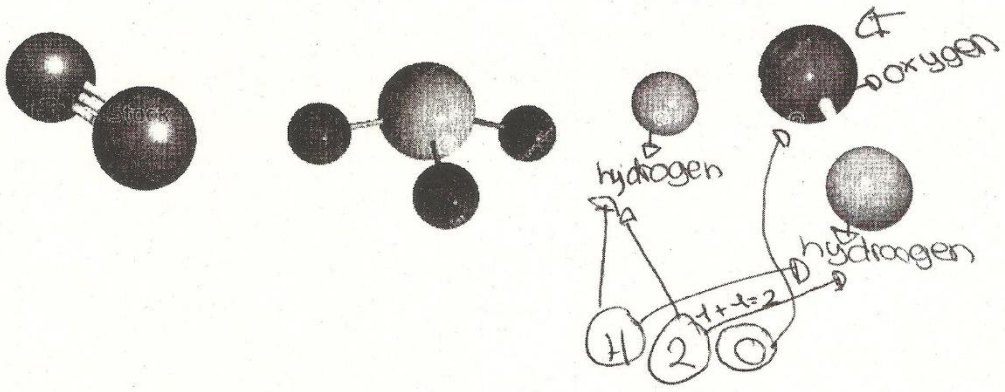
✓ universal ~~de~~solvent

- In Barcelona is warmer in the winter and cooler during the summer than in Madrid.

×

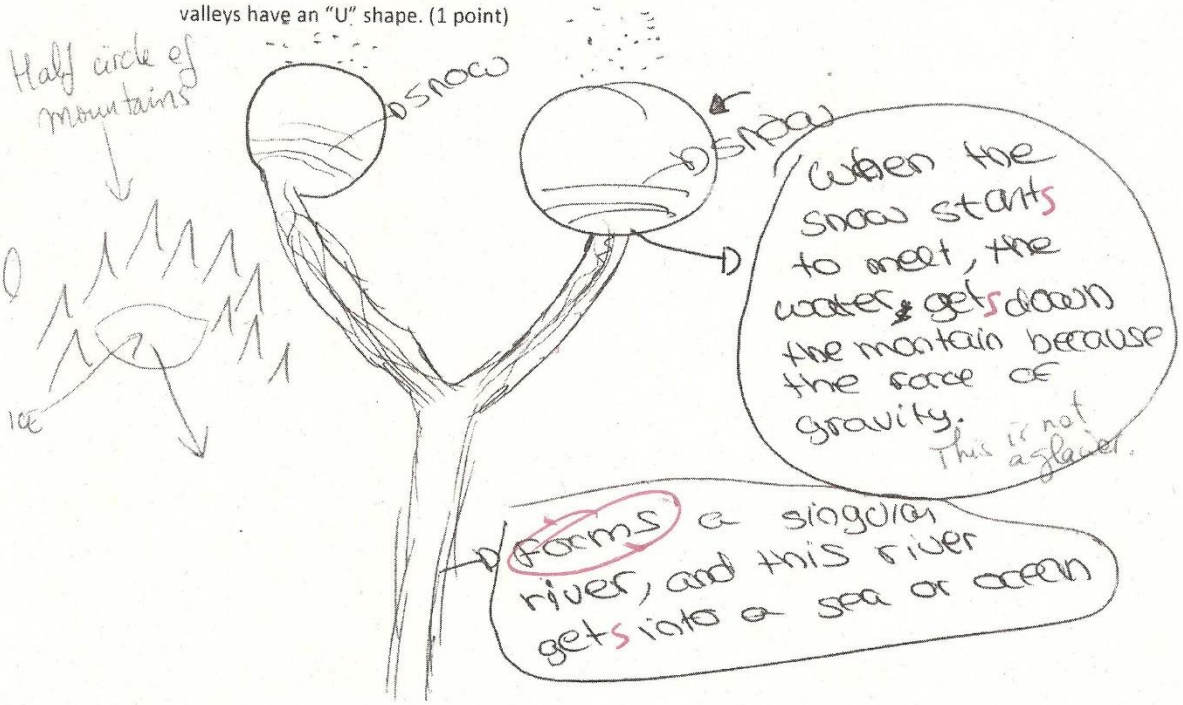
0,25

8- Which of the next pictures would you say is a water molecule? Why? (1 point)

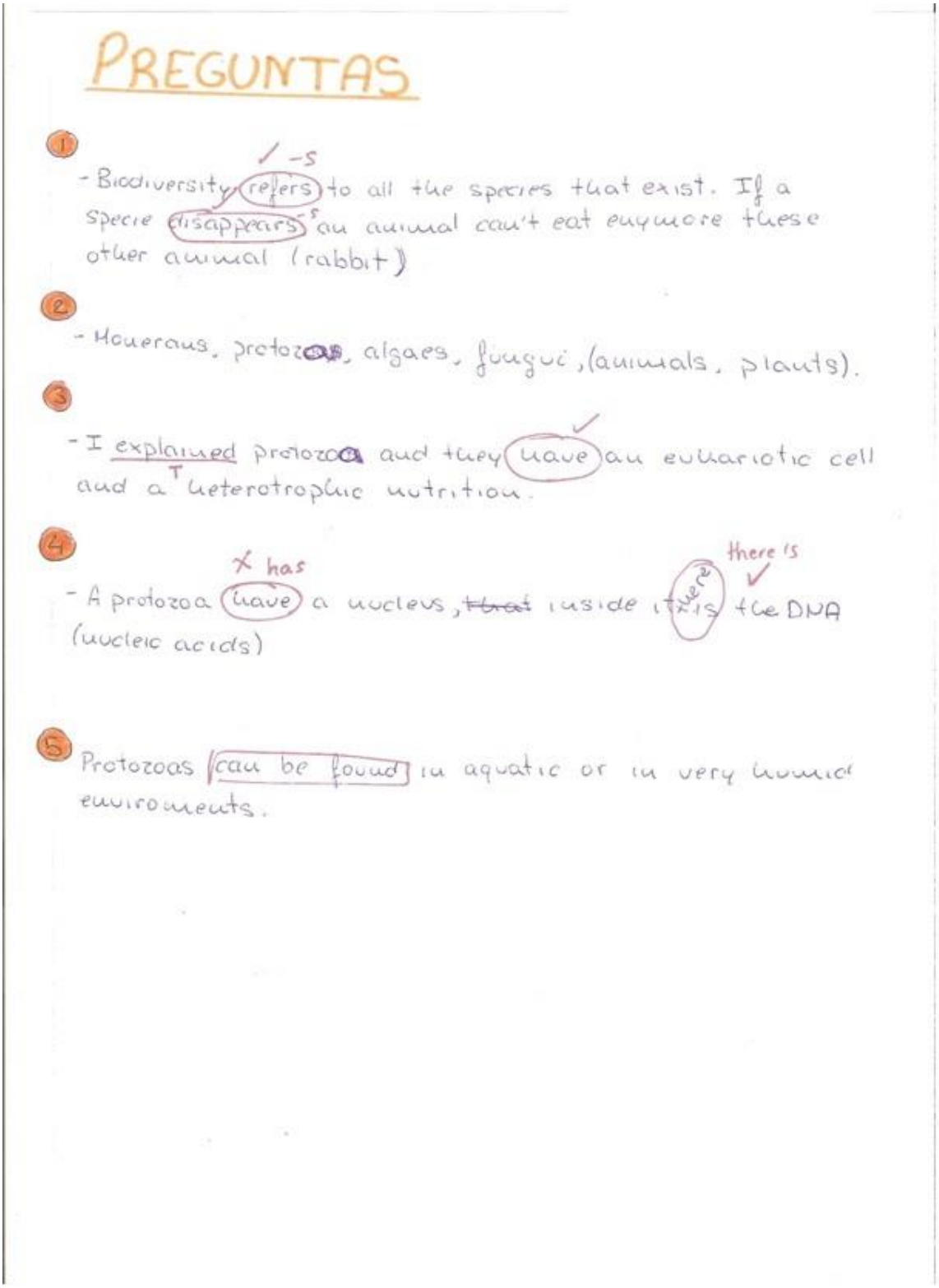


1

9- Paint a glacier cirque and explain how glacier tongues get form and why glacier valleys have an "U" shape. (1 point)



APPENDIX III – 2nd test (Unit 7) samples



PREGUNTAS

1. - Biodiversity refers to all the species that exist. If a specie disappears an animal can't eat anymore these other animal (rabbit)

2. - Moneraus, protozoa, algaes, fungui, (animals, plants).

3. - I explained protozoa and they have an eukariotic cell and a heterotrophic nutrition.

4. - A protozoa has a nucleus, ~~that~~ inside it there is the DNA (nucleic acids)

5. Protozoas can be found in aquatic or in very humid environments.

-S
T (tenses)
A (agreement)

1: Biodiversity ✓ refers -S to the different types of living things.
And why they have to live.
T
It is important, because help to you to now that all the animals
are important.
A ✓

The fox ✗ eat -S the rabbit, and the rabbit ✗ eat -S the carrots
of Emilio.

If Emilio ✗ stop -S to give water to the carrots, they die.
If the carrots die, the rabbit ✗ don't have food and die -S ✗
And if the rabbit die -S, the fox ✗ don't have food and die -S ✗
A
A ✗

2: Protozoa, Monera, and Fungi.

3: Protist; Protozoa. Cell structure: Multicellular.
Nutrition type: Eukaryotic.

4:

Monera: Nucleus, nucleic acids, plasma membrane

Protozoa:

1 It refers to the diffgerent parts that every living thing is composed by.
When a species disappears the one that eat's that species will die too.

2 Plant Kingdom Protist Kingdom Animal Kingdom Fungi Kingdom Bacteria Kingdom

3 Monerans it's cell type is Eukaryote and it's nutrition type is heterotrofic

4 Moneran it has a cell wall a nucleus and the ~~Pil~~ Pili Chloroplast
Pili alows movement the cell wall protects the chloroplast. ~~so it~~
Chloroplast is the liquid inside the cell and the nucleus can protect the
5 Every where In animals especialy (~~but also in other places~~)

APPENDIX IV – Questions for 1st board game (Unit 6)

CONTENT: GAME 1 (ALL GROUPS)

Key:
Group 1 (-), Group 2 (+)
✔ Correct content
X Wrong content

1. **When did life in the Earth start?**
   - The life on Earth started 3.600 millions years ago. ✔
   +When the first chemical elements were found in the atmosphere... Life started 10 million years ago **X**

2. **Who discovered the cell? Start your answer with "The cell..."**
   -The cell was discovered by Robert Hooke. ✔
   +The cell was discovered by Robert Hooke ✔

3. **How many organic biomolecules are there? Say the names too.**
   -There are six: oxygen, hydrogen... **X**
   +No answer **X**

4. **Complete this sentence: The Cellular theory claims that every cell _____**
   -That every cell comes from another cell ✔
   +Comes from another cell ✔

5. **How many chemical elements do we know of? Complete this sentence: __(a number) chemical elements _____ (know) by men.**
   -There are 118 chemical elements knew by men ✔
   +117 elements known by men **X**

6. **What is the difference between asexual and sexual reproduction?**
   -Asexual reproduction is only a single individual that makes many descendants that are equal and sexual requires two individuals of opposite sex. ✔
   +The difference between asexual and sexual reproduction is that asexual reproduction needs just one individual and sexual needs two. ✔

7. **How many parts does a cell have? Say the names.**
   -The cell has three parts: the nucleic acid, the cytoplasm and the plasma membrane. ✔
   +It have mainly three parts: the nucleus, the cytoplasm and the plasma membrane ✔

8. **Complete this sentence: The Cellular theory claims that all organisms ____**
   -All organisms have to have at least one cell. ✔
   +Are made of cells ✔

9. **What important function does the mitochondrion perform?**

-No answer **X**

+The function that it performs is that it takes the nutrients and makes a reaction to take energy. **X**

10. What is the difference between organic and inorganic biomolecules?

-The organic molecules are only found in living things and the inorganic not only in living things. ✔

+[not clear in recording]... inorganic matter can be also found in other things. ✔

11. Why does a living thing need energy?

-Need energy because __ needs to do the vital functions ✔

+Living things need energy for the vital functions. ✔

12. What is an atom?

-It's the smaller unit of matter. ✔

+An atom is the smallest unit of matter in the Earth. ✔

13. How many types of reactions are there by which organisms obtain matter and energy? Say the names.

-There are two types of reactions: cellular respiration and photosynthesis **X**

+There are two reactions: photosynthesis and cellular respiration **X**

14. In what part of the cell of a plant does photosynthesis happen?

-It happens in the mitochondrion **X**

+Photosynthesis happen in the chloroplasts ✔

15. Where can the cells that work as receptors be found in animals?

-Can be found in the nervous system ✔

+The cells that work as receptors can be found in the sensory organs ✔

16. Where does cellular respiration happen?

-Cellular respiration occurs in the mitochondrions ✔

+Cellular respiration happen in the mitochondrion ✔

17. How does the chemical evolution theory say that the first simple cells were created?

+The chemical theory claims that the first cells were originated from chemical elements in the atmosphere. The molecules joined and they formed complex molecules. They joined because of external energy from electric storms and the sand. ✔

18. Complete the sentence: the percentage of atoms of calcium and sodium is ____ _____ the percentage of oxygen and carbon.

-No answer **X**

+Lower than ✔

19. In animals, what are the specialised cells receiving the stimuli called?

-They are called receptors ✔

+The cells receiving the stimuli are called receptors ✔

20. Complete the sentence: Anabolism: complex molecules _____ (form) joining _____ and using _____

-They are formed joining cells and using energy ✔

+Complex molecules formed joining together with simpler molecules and using energy. ✔

21. In what organisms does sexual reproduction occur?

-It occur in animals **X**

+Sexual reproduction occur in animals **X**

22. What two types of answers do living things elaborate after receiving stimuli through receptors?

-The two elaborate answers are for brain and spinal columns. **X**

+Animals have different reactions. They take a hormonal reaction or a movement reaction. ✔

23. Explain how plants obtain the energy to carry out the vital functions.

+Plants obtain the energy to carry out the vital functions by taking inorganic matter and making organic matter. **X**

24. How do heterotroph organisms obtain matter?

-Heterotroph organisms obtain matter by other living things ✔

+They obtain organic matter by taking it from other living things ✔

25. When was the cell discovered?

-The cell was discovered in 1888 **X**

26. In what organisms does asexual reproduction occur?

-It occurs in plants **X**

27. What kind of biomolecule is glucose? Is it organic or inorganic?

-It is organic and it's carbohydrate ✔

28. In what functions do mineral salts participate?

-Mineral salts participate in photosynthesis **X**

29. In what functions does water participate?

-It participates only in interaction and nutrition **X**

30. What kind of biomolecule is cholesterol? Is it organic or inorganic?

-It's organic and it's proteins **X**

31. Complete this sentence: The Cellular theory claims that the _____ living things we know have at least _____.

-That the small living things have at least one cell. ✔

32. Explain how plants obtain the matter to carry out the vital functions

-The plants obtain the inorganic matter from the environment to form organic matter and… ✔

33. What kind of biomolecule is DNA? Is it organic or inorganic?

-Is organic and is a nucleid acid. ✔

34. **How do protozoa and fungi obtain organic matter? Complete the sentence: They obtain organic matter using other _____ obtained by eating _____**
-Organic matter obtained by eating living things. ✔

35. **The stimuli that plants react to are humidity, gravity attraction and what else?**
-They are sunlight and ... I don't know. **X**

36. **What are the three vital functions an organism must achieve to be considered a living thing?**
-The three vital functions are nutrition, interaction and reproduction ✔

37. **Living things get information from the exterior and that causes an answer. What is this information called?**
-This information is called stimuli ✔

38. **What are the six atoms that compose the 99% of the organic matter of living things called?**
-They are called primary bioelements and are ... ✔

39. **Order these levels of organisation of the matter from the smallest to the biggest. Species, system, biocenosis, biosphere and organism.**
+The smallest one is an organ, organism, system **X**

GRAMMAR: GAME 1 - GROUP 1

Key:	**(nw): Nowhere (spontaneous choice of grammar)**
✔ Correct grammar structure	**(txb): Grammar structure in textbook**
X Wrong grammar structure	**(q): Grammar structure in question**
Brackets Type of structure used	**(mq): Grammar structure in misleading question**

CORRECT GRAMMAR

1. **When did life in the Earth start?**
   - The life on Earth started 3.600 millions years ago. ✔ **(TENSES & AGREEMENT) (nw)**

2. **Who discovered the cell? Start your answer with "The cell..."**
   -The cell was discovered by Robert Hooke. ✔ **(PASSIVE) (nw)** ✔ **(TENSES & AGREEMENT) (nw)**

3. **How many organic biomolecules are there? Say the names too.**
   -There are six: oxygen, hydrogen... ✔ **(THERE ARE) (q)**

4. **Complete this sentence: The Cellular theory claims that every cell _____**
   -That every cell comes from another cell ✔**(3rd PERSON –S) (txb)**

5. **What is the difference between asexual and sexual reproduction?**
   -Asexual reproduction is only a single individual that makes many descendants that are equal and sexual requires two individuals of opposite sex. ✔✔ **2x(3rd PERSON -S) (nw)**

6. **How many parts does a cell have? Say the names.**
   -The cell has three parts: the nucleic acid, the cytoplasm and the plasma membrane. ✔ **(HAS VS HAVE) (mq)**

7. **Complete this sentence: The Cellular theory claims that all organisms ____**
   -All organisms have to have at least one cell. ✔**(TENSES & AGREEMENT) (nw)**

8. **What is the difference between organic and inorganic biomolecules?**
   -The organic molecules are only found in living things and the inorganic not only in living things. ✔**(PASSIVE) (nw)**

9. **How many types of reactions are there by which organisms obtain matter and energy? Say the names.**
   -There are two types of reactions: cellular respiration and photosynthesis ✔ **(THERE IS/THERE ARE) (q)**

10. In what part of the cell of a plant does photosynthesis happen?

-It happens in the mitochondrion ✔ **(3rd PERSON –S) (mq)**

11. In animals, what are the specialised cells receiving the stimuli called?

-They are called receptors ✔ **(PASSIVE) (q)**

12. Complete the sentence: Anabolism: complex molecules _____ (form) joining _____ and using _____

-They are formed joining cells and using energy ✔ **(PASSIVE) (nw)**

13. How do heterotroph organisms obtain matter?

-Heterotroph organisms obtain matter by other living things ✔**(TENSES & AGREEMENT) (nw)**

14. In what organisms does asexual reproduction occur?

-It occurs in plants ✔ **(3rd PERSON –S) (mq)**

15. What kind of biomolecule is glucose? Is it organic or inorganic?

-It is organic and it's carbohydrate ✔**(TENSES & AGREEMENT) (nw)**

16. In what functions do mineral salts participate?

-Mineral salts participate in photosynthesis ✔ **(TENSES & AGREEMENT) (nw)**

17. What kind of biomolecule is cholesterol? Is it organic or inorganic?

-It's organic and it's proteins ✔ **(TENSES & AGREEMENT) (nw)**

18. Explain how plants obtain the matter to carry out the vital functions

-The plants obtain the inorganic matter from the environment to form organic matter and… ✔ **(TENSES & AGREEMENT) (nw)**

19. How do protozoa and fungi obtain organic matter? Complete the sentence: They obtain organic matter using other _____ obtained by eating _____

-Organic matter obtained by eating living things. ✔**(PASSIVE) (nw)**

20. The stimuli that plants react to are humidity, gravity attraction and what else?

-They are sunlight and ... I don't know. ✔ **(TENSES & AGREEMENT) (nw)**

21. What are the three vital functions an organism must achieve to be considered a living thing?

-The three vital functions are nutrition, interaction and reproduction ✔ **(TENSES & AGREEMENT) (q)**

22. Living things get information from the exterior and that causes an answer. What is this information called?

-This information is called stimuli ✔**(PASSIVE) (q)**

23. **What are the six atoms that compose the 99% of the organic matter of living things called?**
-They are called primary bioelements and are ... ✔**(PASSIVE) (q)**

24. **Why does a living thing need energy?**
-Need energy because needs to do the vital functions **3RD PERSON –S X (mq) ✔ (nw)**

25. **Where can the cells that work as receptors be found in animals?**
-Can be found in the nervous system ✔ **(PASSIVE) (q)**

WRONG GRAMMAR

1. **How many chemical elements do we know of? Complete this sentence: __(a number) chemical elements _____ (know) by men.**
-There are 118 chemical elements knew by men **X (PASSIVE) (nw)**

2. **Why does a living thing need energy?**
-Need energy because needs to do the vital functions **3RD PERSON –S X (mq) ✔ (nw)**

3. **What is an atom?**
-It's the smaller unit of matter. **X (COMPARATIVES) (txb)**

4. **In what organisms does sexual reproduction occur?**
-It occur in animals **X (3rd PERSON –S) (mq)**

5. **In what functions does water participate?**
-It participate only in interaction and nutrition **X (3rd PERSON –S) (mq)**

6. **What two types of answers do living things elaborate after receiving stimuli through receptors?**
-The two elaborate answers are for brain and spinal columns. **X (PASSIVE) (nw)**

7. **When was the cell discovered?**
-The cell was discover in 1888 **X (PASSIVE) (nw)**

8. **Where does cellular respiration happen?**
-Cellular respiration occur in the mitochondrions **X (3rd PERSON -S) (mq)**

9. **Complete this sentence: The Cellular theory claims that the _____ living things we know of have at least _____.**
-That the small living things have at least one cell. **X (COMPARATIVES) (txb)**

10. **What kind of biomolecule is DNA? Is it organic or inorganic?**
-Is organic and is a nucleid acid. **X (TENSES & AGREEMENT) (nw)**

GRAMMAR: GAME 1 – GROUP 2

Key:	**(nw): Nowhere (spontaneous choice of grammar)**
✔ Correct grammar structure	**(txb): Grammar structure in textbook**
X Wrong grammar structure	**(q): Grammar structure in question**
Brackets Type of structure used	**(mq): Grammar structure in misleading question**

CORRECT GRAMMAR

1. **When did life in the Earth start?**
   +When the first chemical elements were found in the atmosphere... Life started 10 million years ago ✔ **(PASSIVE) (nw)** ✔✔ **(TENSES & AGREEMENT) (nw)**

2. **Who discovered the cell? Start your answer with "The cell..."**
   +The cell was discovered by Robert Hooke ✔ **(PASSIVE) (nw)** ✔ **(TENSES & AGREEMENT) (nw)**

3. **Complete this sentence: The Cellular theory claims that every cell _____**
   +Comes from another cell ✔ **(3rd PERSON -S) (txb)**

4. **What is the difference between asexual and sexual reproduction?**
   +The difference between asexual and sexual reproduction is that asexual reproduction needs just one individual and sexual needs two. ✔ **(3rd PERSON -S) (nw)** ✔ **(3rd PERSON -S) (nw)**

5. **Complete this sentence: The Cellular theory claims that all organisms _____**
   +Are made of cells ✔ **(PASSIVE) (tb)**

6. **What important function does the mitochondrion perform?**
   +The function that it performs is that it takes the nutrients and makes a reaction to take energy. ✔ **(3rd PERSON -S) (mq)** ✔✔ **(3rd PERSON -S) (nw)**

7. **What is the difference between organic and inorganic biomolecules?**
   +[not clear] Inorganic matter can be also found in other things. ✔**(PASSIVE) (nw)**

8. **Why does a living thing need energy?**
   +Living things need energy for the vital functions. ✔ **(TENSES & AGREEMENT) (nw)**

9. **What is an atom?**
   +An atom is the smallest unit of matter in the Earth. ✔**(COMPARATIVES) (txb)**

10. **How many types of reactions are there by which organisms obtain matter and energy? Say the names.**
    +There are two reactions: photosynthesis and cellular respiration ✔ **(THERE IS/THERE ARE) (q)**
11. **Where can the cells that work as receptors be found in animals?**
    +The cells that work as receptors can be found in the sensory organs ✔**(PASSIVE) (q)**

12. **Complete the sentence: the percentage of atoms of calcium and sodium is ____ _____ the percentage of oxygen and carbon. Smaller than**
+Lower than ✔ **(COMPARATIVES) (nw)**

13. **In animals, what are the specialised cells receiving the stimuli called?**
+The cells receiving the stimuli are called receptors ✔ **(PASSIVE) (q)**

14. **What two types of answers do living things elaborate after receiving stimuli through receptors?**
+Animals have different reactions. They take a hormonal reaction or a movement reaction. ✔ **(TENSES & AGREEMENT) (nw)**

15. **Explain how plants obtain the energy to carry out the vital functions.**
+Plants obtain the energy to carry out the vital functions by taking inorganic matter and making organic matter. ✔ **(TENSES & AGREEMENT) (nw)**

16. **How do heterotroph organisms obtain matter?**
+They obtain organic matter by taking it from other living things ✔ **(TENSES & AGREEMENT) (nw)**

17. **Order these levels of organisation of the matter from the smallest to the biggest. Species, system, biocenosis, biosphere and organism.**
+The smallest one is an organ, organism, system ✔ **(COMPARATIVES) (nw)**

WRONG GRAMMAR

1. **How many chemical elements do we know of? Complete this sentence: __(a number) chemical elements _____ (know) by men.**
+117 elements known by men **X (PASSIVE) (nw)**

2. **How many parts does a cell have? Say the names.**
+It have mainly three parts: the nucleus, the cytoplasm and the plasma membrane **X (HAS VS HAVE) (mq)**

3. **In what part of the cell of a plant does photosynthesis happen?**
+Photosynthesis happen in the chloroplasts **X (3rd PERSON –S) (mq)**

4. **Where does cellular respiration happen?**
+Cellular respiration happen in the mitochondrion **X (3rd PERSON –S (mq)**

5. **Complete the sentence: Anabolism: complex molecules _____ (form) joining _____ and using _____**
+Complex molecules formed joining together with simpler molecules and using energy. **X (PASSIVE) (nw)**

6. **In what organisms does sexual reproduction occur?**
+Sexual reproduction occur in animals **X (3rd PERSON –S) (mq)**

APPENDIX V – Questions for 2nd board game (Unit 7)

CONTENT: GAME 2 (ALL GROUPS)

Key:
Group 1 (-), Group 2 (+), Group 3 (*)
✓ Correct content
X Wrong content

1. **Living things are divided into kingdoms. How many are there? Say the names.**
   -There are five kingdoms and they are: monerans, animals, protists, plants and fungi. ✓
   +There are six groups that are: fungi, protozoa, monerans, algae, plants and animals. **X**
   ***There are five kingdoms such as monerans, protists, fungi, animals and plants. ✓

2. **What does biodiversity refer to?**
   -Biodiversity refers to reproduction of monerans X
   +Biodiversity refer to all the living things in ecosystem. ✓
   *Biodiversity refer to the living things, animals and plants in a place. ✓

3. **What does the binomial nomenclature consist on?**
   -It consists on the names to refer to an animal. **X**
   +It consist consists on the amount of living things **X**
   *It consists on two Latin words: the first is the name of the species and the second one is a characteristic. ✓

4. **What is the difference between algae and plants at the cellular level?**
   -Algae are multicellular and plants not. **X**
   +The difference between them is that algae do not have tissues and plants have tissues **X**
   *The differences between algae and plants are that plants are multicellular and algae are multicellular or unicellular and the other is that plants have tissues and algae, thallus. ✓

5. **How do we classify algae? Complete this sentence: Algae _____ (classify) according to _____.**
   -Algae are classified according to their pigments ✓
   +Algae is classified in multicellular and eukaryote. **X**
   *Algae are classified according to their predominant pigments, multicellular or unicellular or autotroph or heterotroph. ✓

6. **How many types of algae are there? Which are they?**
   -They are three types of algae and are: brown, red and green ✓
   +There are three types of algae: brown, red and green. ✓
   *There are three types: brown, red and green. ✓

7. **What different components does a monera cell have?**

-Monerans have five types of different parts: **X**

+A monera cell is bacteria and it is composed of a prokaryote cell. Plasma membrane and a cell wall. ✓

*****The different components of a monera cell are pili.**X**

8. **What are the pili in bacteria used for?**

-They are used to exchange genetic material with other monerans ✓

+The pili is used for reproduction ✓

*The pili is used in the reproduction ✓

9. **What is the difference between parasite nutrition and symbiotic nutrition?**

-In the symbiotic, the both bodies get good things but in the parasitic only one gets a good thing. ✓

+The difference is that the symbiotic consists on two or more living things that give food one to the others and parasite nutrition that feeds on other living things. ✓

*The difference between parasite nutrition and symbiotic nutrition is that parasitary nutrition may kill a living thing and make damage on the living things and symbiotic they give something good for the plants ✓

10. **Where does a saprophytic organism take its nutrients from?**

-It take the nutrients from other cells **X**

+The saprophytic organism take the nutrients from the organic matter in other living things ✓

*A saprophytic organism take the nutrients from the dead organisms and decomposes. ✓

11. **Complete this sentence: There are around 70,000 _____ (know) species of fungi, such as _____ and _____.**

-There are around 70,000 known species of fungi, such as mushrooms and mould. ✓

+There are around 70,000 knew species of fungi such as unicellular and multicellular **X**

*There are around 70.000 known species of fungi such as yeasts and mould. ✓

12. **What substance does a fungus cell wall have: cellulose, chitin or peptidoglycan?**

-Fungus substance of the cell wall is chitin. ✓

+A fungus cell wall have is cellulose **X**

*The cell wall have cellulose. **X**

13. **What does the bacteria wall of a monera do?**

-It protects the moneran and gives safety ✓

+A bacteria cell wall protects the interior of the cell. ✓

*It protects the nuclei **X**

14. **How does a monera organism reproduce?**

-A monera reproduce by a process called bipartition that in the genetic material it divides into two and it separates and forms two monerans. ✓

+Monerans organisms reproduce changing the genetic material through the pili **X**

*A monera organism reproduce divinding the genetic information and the nuclei in two. ✓

15. According to what criterion do we classify protozoa? Complete this sentence: Protozoa _____ (classify) depending on _____.

-Protozoa are classified according to — **X**

+Protozoa is classified depending on its nutrition ✓

*Protozoa classification depending on where they live. **X**

16. In what kind of environment can we find protozoa? Complete this sentence: Protozoa can _____ (find) in _____ or in _____.

-Protozoa can be found in humid weathers or in dry environments **X**

+Protozoa can be find in an aquatic environment or in humid places ✓

*Protozoa can be found in water or land. **X**

17. Why does a living thing need energy?

-A living thing need energy to perform the vital functions ✓

+A living thing need energy to do the vital functions ✓

*A living thing need energy to do the three vital functions. ✓

18. How do fungi obtain energy? What is this process called?

-They obtain energy by… **X**

*They obtain energy in photosynthesis. **X**

19. How does a heterotroph organism obtain matter?

-It obtain matter by photosynthesis **X**

20. How do algae carry out their nutrition?

-Algae carry out their nutrition by performing a process called photosynthesis ✓

21. What can bacteria be used for?

-Bacteria is used for make medicines, is found in food… ✓

22. What is the cell structure and the nutrition type of fungi?

-It can be multicellular and unicellular, and their nutrition type is heterotroph ✓

23. Explain the type of cell, the cell structure and nutrition type of protozoa with a full sentence.

-The cell structure is unicellular, is eukaryote and the nutrition type is heterotroph ✓

24. What does the nutrition of protozoa consist of?

-The nutrition consist of an autotrophic nutrition **X**

25. In what part of the cell of a plant does photosynthesis happen?

-It happen at the chloroplasts ✓

26. What is the nutrition type of fungi?

-The nutrition type of fungi is heterotrophic. ✓

27. Do bacteria have a nucleus?

-Bacteria doesn’t have a nucleus ✓

28. What is the difference between asexual and sexual reproduction?

-The difference between asexual and sexual reproduction is that in asexual reproduction is only one individual and in sexual reproduction they are two. ✓

29. How does an ecosystem with a high biodiversity of species react to the extinction of one of the species? Why?

-An ecosystem the biodiversity can change if for example a lynx eat rabbits and if the rabbits disappear the lynx will die ✓

30. What kingdom do algae belong to?

-Algae belong to the bacteria kingdom X

31. Why are monerans important in biology?

-They are important in biology because eat decomposed living things ✓

32. Complete this sentence about the importance of diversity: Individuals and species interact with other _____ and _____. For this reason, the _____ of a species _____ other species.

- For this reason, the extinction of a species can change the ecosystem of other species **X**

DIFFICULT QUESTIONS

How are living things classified? Name at least <u>three</u> of the levels of the taxonomic classification of species. Complete this sentence: Living things _____ (classify) according to their _____, _____ and _____.

-Living things are classified to their family, species and order. ✓

What does a ribosome do?

-It creates proteins ✓

*The ribosome makes proteins. ✓

What do algae have instead of tissues?

-They have just one cell that is not specialised in any function. ✓

GRAMMAR: GAME 2 - GROUP 1

Key:	**(nw): Nowhere (spontaneous choice of grammar)**
✔ Correct grammar structure	**(txb): Grammar structure in textbook**
X Wrong grammar structure	**(q): Grammar structure in question**
Brackets Type of structure used	**(mq): Grammar structure in misleading question**

CORRECT GRAMMAR

1. **Living things are divided into kingdoms. How many are there? Say the names.**
   -There are five kingdoms and they are: monerans, animals, protists, plants and fungi. ✓ **(THERE IS/THERE ARE) (q)**

2. **What does biodiversity refer to?**
   -Biodiversity refers to reproduction of monerans ✓ **(3rd PERSON -S) (mq)**

3. **What does the binomial nomenclature consist on?**
   -It consists on the names to refer to an animal. ✓ **(3rd PERSON -S) (mq)**

4. **What is the difference between algae and plants at the cellular level?**
   -Algae are multicellular and plants not. ✓ **(AGREEMENT) (nw)**

5. **How do we classify algae? Complete this sentence: Algae _____ (classify) according to _____.**
   -Algae are classified according to their pigments ✓ **(PASSIVE) (nw)**

6. **What different components does a monera cell have?**
   -Monerans have five types of different parts: ✓ **(HAS VS HAVE) (mq)**

7. **What are the pili in bacteria used for?**
   -They are used to exchange genetic material with other monerans ✓ **(PASSIVE) (q)**

8. **What is the difference between parasite nutrition and symbiotic nutrition?**
   -In the symbiotic, the both bodies get good things but in the parasitic only one gets a good thing. ✓ **(3rd person -s) (nw)**

9. **Complete this sentence: There are around 70,000 _____ (know) species of fungi, such as _____ and _____.**
   -There are around 70,000 known species of fungi, such as mushrooms and mould. ✓ **(PASSIVE) (nw)**

10. **What substance does a fungus cell wall have: cellulose, chitin or peptidoglycan?**
    -Fungus substance of the cell wall is chitin. ✓ **(AGREEMENT) (nw)**

11. **What does the bacteria wall of a monera do?**
    -It protects the moneran and gives safety ✓✓ **(2x 3rd person -S)** (**nw)**

12. How does a monera organism reproduce?

-A monera reproduce by a process called bipartition that in the genetic material it divides into two and it separates and forms two monerans. ✓ **Grammar: one wrong (3rd person -s) (mq), three correct (nw)**

13. According to what criterion do we classify protozoa? Complete this sentence: Protozoa _____ (classify) depending on _____.

-Protozoa are classified according to —✓ **(PASSIVE) (nw)**

14. In what kind of environment can we find protozoa? Complete this sentence: Protozoa can _____ (find) in _____ or in _____

-Protozoa can be found in humid weathers or in dry environments ✓ **(PASSIVE) (nw)**

15. How do fungi obtain energy? What is this process called?

-They obtain energy by… ✓ **(AGREEMENT) (nw)**

16. How do algae carry out their nutrition?

-Algae carry out their nutrition by performing a process called photosynthesis ✓ **(PASSIVE) (nw)**

17. What can bacteria be used for?

-Bacteria is used for make medicines, is found in food… ✓✓ **(PASSIVE) (q)**

18. What is the cell structure and the nutrition type of fungi?

-It can be multicellular and unicellular, and their nutrition type is heterotroph ✓ **(AGREEMENT) (nw)**

19. Explain the type of cell, the cell structure and nutrition type of protozoa with a full sentence.

-The cell structure is unicellular, is eukaryote and the nutrition type is heterotroph ✓ **(AGREEMENT) (nw)**

20. What is the nutrition type of fungi?

-The nutrition type of fungi is heterotrophic. ✓ **(AGREEMENT) (nw)**

21. What kingdom do algae belong to?

-Algae belong to the bacteria kingdom ✓ **(AGREEMENT) (q)**

22. Why are monerans important in biology?

-They are important in biology because eat decomposed living things ✓ **(PASSIVE) (nw)**

23. Complete this sentence about the importance of diversity: Individuals and species interact with other _____ and _____. For this reason, the _____ of a species _____ other species.

-For this reason, the extinction of a species can change the ecosystem of other species ✓ **(AGREEMENT) (nw)**

24. **How are living things classified? Name at least <u>three</u> of the levels of the taxonomic classification of species. Complete this sentence: Living things _____ (classify) according to their _____, _____ and _____.**

-Living things are classified according to their family, species and order. ✓ **(PASSIVE) (q)**

25. **What does a ribosome do?**

-It creates proteins ✓ **(3rd PERSON -S) (nw)**

26. **What do algae have instead of tissues?**

-They have just one cell that is not specialised in any function. (**Have + passive) (nw)**

WRONG GRAMMAR

1. **How many types of algae are there? Which are they?**

-They are three types of algae and are: brown, red and green X **(THERE ARE/THERE IS) (q)**

2. **Where does a saprophytic organism take its nutrients from?**

-It take the nutrients from other cells **X (3rd PERSON -S) (mq)**

3. **How does a monera organism reproduce?**

-A monera reproduce by a process called bipartition that in the genetic material it divides into two and it separates and forms two monerans. **X Grammar: 3rd person -s: one wrong (mq), three correct (nw)**

4. **Why does a living thing need energy?**

-A living thing need energy to perform the vital functions **X (3RD PERSON –S) (mq)**

5. **How does a heterotroph organism obtain matter?**

-It obtain matter by photosynthesis **X (3rd PERSON -S) (mq)**

6. **What does the nutrition of protozoa consist of?**

-The nutrition consist of an autotrophic nutrition **X (3rd PERSON -S) (mq)**

7. **In what part of the cell of a plant does photosynthesis happen?**

-It happen at the chloroplasts **X (3rd PERSON -S) (mq)**

8. **Do bacteria have a nucleus?**

-Bacteria doesn't have a nucleus **X (AGREEMENT) (q)**

9. **What is the difference between asexual and sexual reproduction?**

-The difference between asexual and sexual reproduction is that in asexual reproduction is only one individual and in sexual reproduction they are two. **X (THERE IS VS. THERE ARE) (nw)**

10. **How does an ecosystem with a high biodiversity of species react to the extinction of one of the species? Why?**

-An ecosystem the biodiversity can change if for example a lynx eat rabbits and if the rabbits disappear the lynx will die **X (3rd person) (nw)**

GRAMMAR: GAME 2 - GROUP 2

Key:	**(nw): Nowhere (spontaneous choice of grammar)**
✔ Correct grammar structure	**(txb): Grammar structure in textbook**
X Wrong grammar structure	**(q): Grammar structure in question**
Brackets Type of structure used	**(mq): Grammar structure in misleading question**

CORRECT GRAMMAR

1. **Living things are divided into kingdoms. How many are there? Say the names.**
   +There are six groups that are: fungi, protozoa, monerans, algae, plants and animals. ✓ **(THERE IS/THERE ARE) (q)**

2. **What is the difference between algae and plants at the cellular level?**
   +The difference between them is that algae do not have tissues and plants have tissues ✓ **(HAVE VS. HAS) (nw)**

3. **How do we classify algae? Complete this sentence: Algae _____ (classify) according to _____.**
   +Algae is classified in multicellular and eukaryote ✓ **(PASSIVE) X (AGREEMENT) (nw)**

4. **How many types of algae are there? Which are they?**
   +There are three types of algae: brown, red and green. ✓ **(THERE ARE/THERE IS) (q)**

5. **What different components does a monera cell have?**
   +A monera cell is bacteria and it is composed of a prokaryote cell. Plasma membrane and a cell wall. ✓ **(PASSIVE) (nw)**

6. **What are the pili in bacteria used for?**
   +The pili is used for reproduction ✓ **(PASSIVE) X (AGREEMENT) (q)**

7. **What is the difference between parasite nutrition and symbiotic nutrition?**
   +The difference is that the symbiotic consists on two or more living things that give food one to the others and parasite nutrition that feeds on other living things. ✓✓ **(3rd PERSON -S) (nw)**

8. **What does the bacteria wall of a monera do?**
   +A bacteria cell wall protects the interior of the cell. ✓ **(3rd PERSON -S) (nw)**

9. **How does a monera organism reproduce?**
   +Moneran organisms reproduce changing the genetic material through the pili ✓ **(AGREEMENT) (nw)**

10. **According to what criterion do we classify protozoa? Complete this sentence: Protozoa _____ (classify) depending on _____.**
    +Protozoa is classified depending on its nutrition ✓ **(PASSIVE) X (AGREEMENT) (nw)**

WRONG GRAMMAR

1. **What does biodiversity refer to?**
    +Biodiversity refer to all the living things in ecosystem. **X (3rd PERSON -S) (mq)**

2. **What does the binomial nomenclature consist on?**
    +It consist on the amount of living things **X (3rd PERSON -S) (mq)**

3. **How do we classify algae? Complete this sentence: Algae _____ (classify) according to _____.**
    +Algae is classified in multicellular and eukaryote ✓ **(PASSIVE) X (AGREEMENT) (nw)**

4. **Where does a saprophytic organism take its nutrients from?**
    +The saprophytic organism take the nutrients from the organic matter in other living things **X (3rd PERSON -S) (mq)**

5. **Complete this sentence: There are around 70,000 _____ (know) species of fungi, such as _____ and _____.**
    +There are around 70,000 knew species of fungi such as unicellular and multicellular **X (PASSIVE) (nw)**

6. **What substance does a fungus cell wall have: cellulose, chitin or peptidoglycan?**
    +A fungus cell wall have cellulose **X (HAS VS HAVE) (mq)**

7. **According to what criterion do we classify protozoa? Complete this sentence: Protozoa _____ (classify) depending on _____.**
    +Protozoa is classified depending on its nutrition ✓ **(PASSIVE) X (AGREEMENT) (nw)**

8. **In what kind of environment can we find protozoa? Complete this sentence: Protozoa can _____ (find) in _____ or in _____**
    +Protozoa can be find in an aquatic environment or in humid places **X (PASSIVE) (nw)**

9. **Why does a living thing need energy?**
    +A living thing need energy to do the vital functions **X (3RD PERSON –S) (mq)**

10. **What are the pili in bacteria used for?**
    +The pili is used for reproduction ✓ **(PASSIVE) X (AGREEMENT) (q)**

GRAMMAR: GAME 2 - GROUP 3

Key:	**(nw): Nowhere (spontaneous choice of grammar)**
✔ Correct grammar structure	**(txb): Grammar structure in textbook**
X Wrong grammar structure	**(q): Grammar structure in question**
Brackets Type of structure used	**(mq): Grammar structure in misleading question**

CORRECT GRAMMAR

1. **Living things are divided into kingdoms. How many are there? Say the names.**
   *****There are five kingdoms such as monerans, protists, fungi, animals and plants. ✓ **(THERE IS/THERE ARE) (q)**

2. **What does the binomial nomenclature consist on?**
   *It consists on two Latin words: the first in the name of the species and the second one is a characteristic. ✓ **(3rd PERSON -S) (mq)**

3. **What is the difference between algae and plants at the cellular level?**
   *The differences between algae and plants are that plants are multicellular and algae are multicellular or unicellular and the other is that plants have tissues and algae, thallus. ✓ **(AGREEMENT) (nw)** ✓ **(HAS VS. HAVE) (nw)**

4. **How do we classify algae? Complete this sentence: Algae _____ (classify) according to _____.**
   *Algae are classified according to their predominant pigments, multicellular or unicellular or autotroph or heterotroph ✓ **(PASSIVE) (nw)**

5. **How many types of algae are there? Which are they?**
   *There are three types: brown, red and green. ✓ **(THERE ARE/THERE IS) (q)**

6. **What different components does a monera cell have?**
   *****The different components of a monera cell are pili and… ✓ (**AGREEMENT) (nw)**

7. **What are the pili in bacteria used for?**
   *The pili is used in the reproduction ✓ **(PASSIVE) X (AGREEMENT) (q)**

8. **What is the difference between parasite nutrition and symbiotic nutrition?**
   *The difference between parasite nutrition and symbiotic nutrition is that parasitary nutrition may kill a living thing and make damage on the living things and symbiotic they give something good for the plants ✓ **(AGREEMENT) (nw)**

9. **Where does a saprophytic organism take its nutrients from?**
   *A saprophytic organism take the nutrients from the dead organisms and decomposes. **(3rd PERSON -S) ✓ (nw) X (mq)**

10. **Complete this sentence: There are around 70,000 _____ (know) species of fungi, such as _____ and _____.**
    *There are around 70,000 known species of fungi such as yeasts and mould. ✓ **(PASSIVE) (nw)**

11. **What does the bacteria wall of a monera do?**
    *It protects the nuclei ✓ **(3rd PERSON -S) (nw)**

12. **What does a ribosome do?**
    *The ribosome makes proteins. ✓ **(3rd PERSON -S) (nw)**

13. **In what kind of environment can we find protozoa? Complete this sentence: Protozoa can _____ (find) in _____ or in _____**
    *Protozoa can be found in water or land ✓ **(PASSIVE) (nw)**

14. **How do fungi obtain energy? What is this process called?**
    *They obtain energy in photosynthesis. ✓

WRONG GRAMMAR

1. **What does biodiversity refer to?**
    *Biodiversity refer to the living things, animals and plants in a place. **X (3rd PERSON -S) (mq)**

2. **What are the pili in bacteria used for?**
    *The pili is used in the reproduction ✓ **(PASSIVE) X (AGREEMENT) (q)**

3. **Where does a saprophytic organism take its nutrients from?**
    *A saprophytic organism take the nutrients from the dead organisms and decomposes. **(3rd PERSON -S) ✓ (nw) X (mq)**

4. **What substance does a fungus cell wall have: cellulose, chitin or peptidoglycan?**
    *The cell wall have cellulose **X (HAS VS HAVE) (mq)**

5. **How does a monera organism reproduce?**
    *A monera organism reproduce dividing the genetic information and the nuclei in two **X (3rd PERSON -S) (mq)**

6. **According to what criterion do we classify protozoa? Complete this sentence: Protozoa _____ (classify) depending on _____.**
    *Protozoa classification depending on where they live. **X (PASSIVE) (nw)**

7. **Why does a living thing need energy?**
    *A living thing need energy to do the three vital functions. **X (3RD PERSON –S) (mq)**