How can we make our school less noisy?

INS Milà i Fontanals
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Generació Plurilingüe (GEP)
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LED CLIL~SI

Adapted from CLIL-SI 2015.
More information at: http://grupsderecerca.uab.cat/clilsi/

PROJECT PLANNING TEMPLATE for CLIL and Content-Rich Environments

Identification of the GEP project:

Title	**How can we make our school less noisy?**
Authorship	**Jordi Beneito Sendra and Magda Moliné Gallart**
School	**INS Milà i Fontanals**
Students' CEFR Level (A1, A2...)	**B1**
Grade	**BAT 1**
Content area(s)	**Physics, Technology and English**
Number of sessions (4, 6 or 9)	**6**
Teacher(s) involved	**Jordi Beneito Sendra and Magda Moliné Gallart**
Key words	**wave, amplitude,wavelength, period, frequency,velocity (or speed), propagation, intensity, sphere, surface, receptor and Decibelius.**

1. OUR PROJECT
Introduction: Students have been encouraged to find solutions to the endemic problems in our school. One of these problems is noise, and this noise is basically due to the big number of students in each group, the concentration of classes in quite a small school and poor insulation in the rooms. In an attempt to improve the school environment, the students are going to develop a project that will consist on determining the level of noise in each classroom, doing some research on which materials can be used to insulate all the school rooms and then write a budget and write a formal report, which will show the conclusions of their research.
Driving question: How can we make our school less noisy?
Final product: Formal report and oral presentation to the headmaster and his team.

2. GOALS	2. HOW DO YOU KNOW STUDENTS ARE MAKING PROGRESS? (assessment criteria)
1. Explain the difference among several periodic movements.	1.1. Students can distinguish among periodic, oscillatory, vibratory and ondulatory movements 1.2. Students can define the magnitudes related to waves (amplitude,frequency…) 1.3 Students can explain phenomena related to waves (refraction, reflection, polarisation…)

2. Describe waves properties and their interactions among themselves or with the environment.	2.1 Students can explain how to calculate energy intensity of waves and its attenuation with distance. 2.2 Students can differentiate between energy intensity and sound intensity level.
3. Make a sound map for our high school	3.1 Students can explain how to measure sound correctly. 3.2 Students can make correct sound measurements of all the classes in the high school. 3.3 Students can justify they have measured sound correctly the different classes 3.4l.Students can share information and draw a sound map of our high school 3.5 Students agree on a graphic representation to make visible which are the noisiest rooms in the school 3.6 Students agree on which rooms need to be insulated.
4. Plan an improvement of noise level by insulating the noisiest parts of the school	4.1 Students can present some research of insulating materials for sound 4.2. Students can justify the reasons why they have chosen a specific insulation material. 4.3 Students can justify the amount of insulating materials they need to insulate each of the rooms 4.4 Students can write a formal budget of the total cost of this insulation. 4.5 Students can write a formal report of their project 4.6 Students can report all the steps they have gone through and their decisions when they present their project to the headmaster and his team. 4.6 Students can answer the questions posed by the headmaster and his team and they know how to justify their answers

3. CURRICULUM CONNECTIONS
SPECIFIC COMPETENCES AND KEY CONTENTS

Subject-matter curriculum		Foreign language curriculum	
Specific Competences	**Key Contents**	**Specific Competences**	**Key Contents**
1. **Research competence.** • identify problems • find issues to be researched. • register and analyse data • draw conclusions from evidence 2. **Competence in understanding and making a difference on the physical world.** • appropriate usage of mathematical tools. • make decisions affecting the school environment	1. **Communicative competence.** • describe facts and phenomena. • explain, present and argue sensitively on some facts or phenomena. • language related to wave movement. 2. **Research competence.** • find out about different insulation materials 3. **Competence in managing and processing information.** 4. **Digital competence.** • take decisions about the tools and resources to be used in research. • usage of the correct tools to write a report, a budget and a presentation 5. **Personal and interpersonal competence**	1. **Communicative competence.** 2. describe facts and phenomena. 3. explain, present and argue sensitively on some facts or phenomena. 4. language related to wave movement.	1. **Research competence.** 2. **Competence in managing and processing information.** 3. **Digital competence.** • take decisions about the tools and resources to be used in research. • usage of the correct tools to write a report, a budget and a presentation 4. **Personal and interpersonal competence.** • language to express opinions • expressions of agreement and disagreement

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4. 21st CENTURY COMPETENCIES			
Collaboration	X	Information, media and technology	**X**
Communication	X	Leadership & Responsibility	**X**
Critical Thinking and Problem Solving	X	Initiative & Self-direction	**X**
Creativity & Innovation		Social & Cross-cultural	
Others:			

5. KEY COMPETENCES			
Communicative, linguistic and audiovisual competence	X	Digital competence	X
Mathematical competence	X	Social and civic competence	
Interaction with the physical world competence		Learning to learn competence	X
Cultural & artistic competence		Personal initiative and entrepreneurship competence	

6. CONTENT (Knowledge and Skills)

CONTENT-RELATED KNOWLEDGE	CONTENT-RELATED SKILLS
1. In relation to Physics • Mechanical waves, focusing on sound • Simple harmonic movement (SHM) of vibrating objects and sound waves • Wave properties • Wave phenomena • Human hearing scale and acoustic pollution	**1. In relation to English** **1.1 Communicative dimension** • Understanding and taking part in class interactions • Understanding of oral, written and audiovisual messages • Production of oral, written and audiovisual messages • Oral, written and audiovisual interaction **1.2 Research and information processing dimension**

7. REFERENCES

8. COMMENTS (optional)

9. ACKNOWLEDGEMENTS (optional)

We would like to thank the Technology Department and the student Gerard Borrell, in 1r C, because they have offered to record our sessions using the student's personal video recorder and a professional microphone that he will borrow from the above-mentioned department.

Skills: R: reading , S:speaking, L: listening, W: writing, I: Interaction
Interaction: T-S: teacher-student, S-S: student-student, SG: small groups, WG: whole group, S-Expert, S-World
Assessment: PA: Peer assessment, SA: Self-assessment, TA: Teacher assessment, AT: Assessment tools

10. UNIT OVERVIEW

Session	Activities	Timing	Skills	Interaction	ICT	Assessment
1	Warm up activity:A mysterious sound	20'	L,S	WG	YES	NO
	Make up the story behind the sound	30'	I,W	S-S WG	NO	NO
	Dictogloss activity : The real story	25'	R,S	SG	NO	T-A
2	Video activity: An introduction to sound	5'	S,R	SG	S-S	NO
	Kahoot: Sound features	25'	R,W	SG	S-S	S-A

	Putting together cut-out sound properties definitions	5'	S,R	SG	S-S	NO
	Whiteboard drawing activity	15'	S,I	I	S-S	NO
	Our own mysterious sounds	5'	L	SG	YES	NO
3	Active listening activity: what noise pollution is and how we can prevent it	5'	L	I	S-S	NO
	Think, pair, share activity	20'	I,S	SG,WG	NO	T-A
	Running dictation: instructions to measure sound.	10'	S, W	SG	YES	S-A
	School Map Lottery Draw	15'	S	T-S, WG	YES	NO
4	Sound measuring activity	45'	W,S	SG	*YES*	T-A
	Reporting on sound measures	15'	I,R,S	SG,WG	*NO*	*NO*
5	Ball of yarn	5'	S	WG	*NO*	NO
	The final decision	10'	S	WG	NO	NO
	Let's Recap	30'	W,S	SG,WG	*YES*	T-A

	The magnitude of the tragedy	15'	S	SG	*YES*	T-A
6	3,2,1...What have we learned?	15'	I	S-S, T-S	NO	T-A
	How much have I learnt?	30'	W	SG	YES	T-A
	How can I make the school less noisy?	15'	I	WG	NO	T-A

11. SESSION PLANNING

SESSION 1: What is sound?

Content-obligatory language for the session: description of sounds (wave, amplitude,wavelength, period, frequency, speed, propagation, intensity);past tenses and connectors of sequence to narrate a story; language for express reasons behind their the choices.

	Activities					
1.1	Warm up activity:A mysterious sound Teachers play a piece of sound and they ask students what they think it is. They tell them there is story behind this sound. Here is a link to the sound: A mysterious sound	5'	I	T-S	NO	YES
1.2	Make up the story behind the sound In groups of 5, students make up a story behind the sound and they share it with the class. Students can use the guidelines and read a model text in the following document: Narrative: a model text	30'	I,W	S-S WG	NO	*NO*

1.3	Dictogloss activity : The real story Students hear the real story, adapted from two articles in *Livescience Magazine* and put the pictures in order. The student story that was closest to the truth wins! Then will explain the story again using the pictures and finally, they will write their stories in a Drive so that they can all read each other's stories. Here is a link to the dictogloss text and another one to the dictogloss images *NOTE FOR THE TEACHERS: This sound was heard in the USA Cuban Embassy in 2016 and reported by some USA embassy workers as a sonic attack. Ultimately, this January a piece of news has come out in the press proving that this is the sound of crickets that live around the embassy.*	25'	R,S	SG	YES	*YES*

	SESSION 2: What are sound waves like?					
	Content-obligatory language for the session: Adjectives to describe different types of sound, verbs to describe sound processes and properties, questions.					
	Activities					
2.1	Video activity: An introduction to sound Students watch a video. Each group has a task. The five different tasks are: write down the names of sound, explain how sound is made, explain how it gets to our ears, explain how we can hear sound and write down adjectives describing types of sounds. *NOTE FOR THE TEACHERS: This is the link to the video: An introduction to sound*	10'	L,S	SG T-S	NO	NO
2.2	Kahoot: Sound features Teacher forms new groups of 5 using *Instant classroom*	25'	R,W	SG	YES	*YES*

	Students read a text about sound movements, magnitudes and phenomena (although the text is easy to understand, the students are provided with extra scaffolding , so that they can work autonomously). Then create a Kahoot questionnaire on it. Then each group must answer another group's questionnaire.					
2.3	Putting together cut-out sound properties definitions Teacher gives students some cut-out properties definitions and the students must put them in order and read them. They are provided with a language frame	5'	S,R	SG	NO	NO
2.4	Whiteboard drawing activity: Students draw sound properties on a whiteboard. The other students must ask questions to try and work out what property has been drawn and the student who has drawn it has to answer back. Then the teacher provides them with a document that contains texts and pictures about sound properties.	10'	S,I	S-S, WG	NO	NO
2.5	Our own mysterious sounds: Students are asked to find a mysterious sound and share it in the project's Drive folder	5'	L	SG	YES	NO

	SESSION 3: Can our health be affected by sound?					
	Content-obligatory language for the session: Vocabulary about health pollution and health hazards, language to express their opinions and to reach to an agreement and imperative for instructions					
	Activities					
3.1	Active listening activity: what noise pollution is and how we can prevent it. The students stand up and in groups, they move around a circle of chairs. As they hear about noise pollution and the ways to prevent it, they must pick up the pictures and words on the chairs that are mentioned in the text. Here's a link to the audio.	5'	L	NO	NO	NO
3.2	Think, pair, share activity: Having heard about noise pollution, health hazards and the possible ways to prevent it, students must decide which sound level thresholds are safe in different environments. First, they do it individually. Then they revise their appreciations with a partner, and finally they share it with the group and they must reach to an agreement. Finally, they discuss with the teachers. Here's a link to the thresholds activity and the key to it	20'	I,S	SG, WG	NO	YES
3.3	Running dictation: instructions to measure sound. In groups, one or two students stay at a table and write down the information that the others tell them. To get the information, the remaining students have to look for the instructions around the classroom walls, memorise it and dictate it to the group secretaries. Then, as a group, they have to write the instructions in the correct order in a poster on the wall.	20'	S, W	SG	YES	*YES*

3.4	School Map Lottery Draw. The students are divided into four groups using *Instant Classrooms*. According to the group number they get, they are assigned a part of the school for the next measuring session. The school map has been divided into four areas: the ESO 1 and ESO 2 corridor, the ESO 3 and ESO 4 corridor and the gym, the A-levels corridor and the specific rooms corridor (containing rooms such as the hall, the laboratories, the language room, the computer rooms and the teacher's room). Students get everything ready for the next session.	15'	S	T-S, WG	YES	NO

	SESSION 4: The colours of our school					
	Content-obligatory language for the session: Language expressions to analyse and share (such as "What has surprised the most is…." "When we entered the places and told them what we were doing they have ….." "As we thought, the …..")					
	Activities					
4.1	Sound measuring activity: Students measure the sound level of the classrooms and the corridors in the school area that they have been assigned. To make the measurements they will use a mobile app. Each student has a specific goal that they have to decide before starting: the speaker that will introduce them to each room, two technicians-recorders and two secretaries that will record the information in a grid.	45'	W,S	SG	*YES*	YES

4.2	Reporting on sound measures: Students come back to the classroom with the sound measures in their part of the school. They inform the other groups about the numbers of red, yellow and green lights they have stuck and what the noisiest room in their area was.	15'	I,R,S	SG, WG	*NO*	*NO*

	SESSION 5: A solution to the problem					
	Content-obligatory language for the session: Language to express decisions and to justify their choices and questions.					
	Activities					
5.1	Ball of yarn. This is a revision activity: each student must mention something he/she has learnt all through the PBL, tie the yarn around its wrist and pass the ball of yarn to another student in the group. At the end, the students are all tied up, which is a metaphor of the fact that they have learnt something together.	5'	S	WG	*NO*	YES
5.2	The final decision: Students discuss which room to insulate and give some reasons for it.	10'	S	WG	NO	NO

5.3	To do this, they can get some information in the document insulating materials pictures and on internet sites, especially the following one. After that, the whole group must decide which material it's best to insulate this room. Then they start a Fishbowl technique discussion.	30'	W,S	SG, WG	*YES*	*YES*
5.4	The magnitude of the tragedy Students measure the room and the cost of its insulation. They calculate its cost.	15'	S	SG	*YES*	*YES*

	SESSION 6: Making the school a better place					
	Content-obligatory language for the session: Present Perfect to express what they have learned,					
	Activities					
6.1	3,2,1...What have we learned? In groups, students think about three things they have learnt, two things that they found interesting and one question about the project content and processes. At the end, teachers also do the activity by mentioning things they have learned from the project, from the students or from each other.	15'	I	S-S, T-S	NO	
6.2	How much have I learnt? Students complete a test about the content and processes involved in the project. First they do it individually, then they compare their answers with another person and finally they compare them with the whole group.	15'	W	I,	YES	

				SG, WG	
6.3	How can I make the school less noisy? Students give in their project project reports (including the budget) to our headmaster. They choose four spokespeople and they agree on a date and time to present their findings and proposal to the headmaster and his team.	30'	I	WG	NO