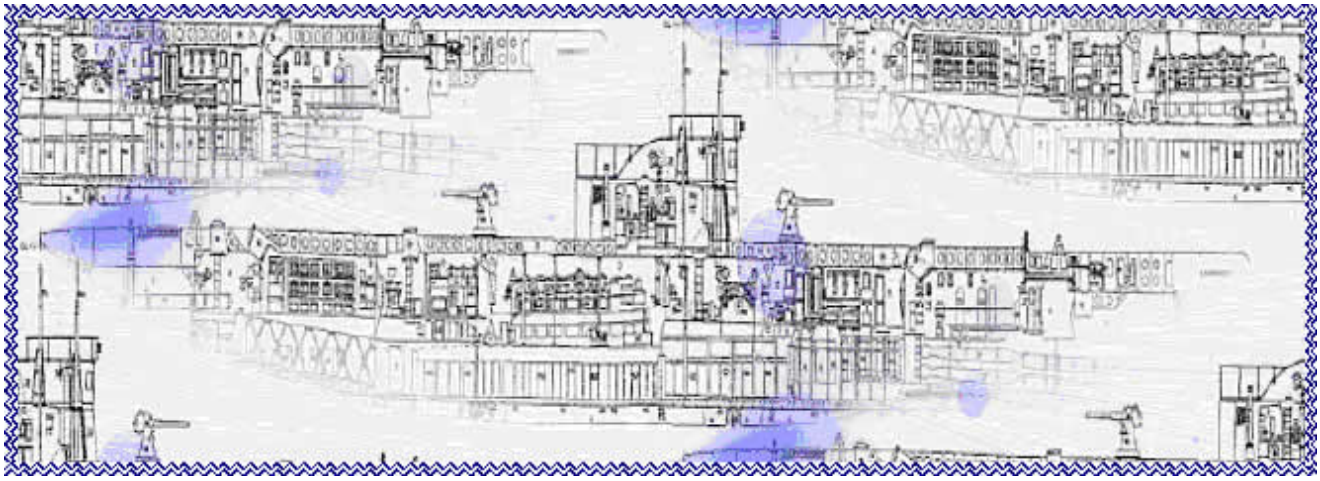
Module: “Let’s Discover The World Of The Periscope”

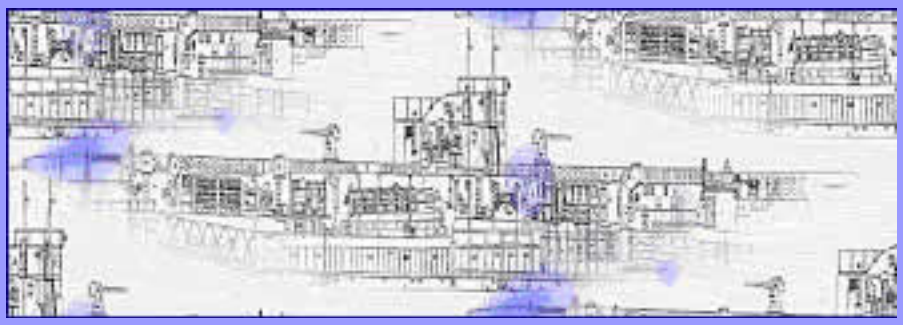
Traînées: VIRGINIA CORONA, MILENA TOCCO



► MODULE OVERVIEW

TARGET GROUP:	1st class of a Liceo Statale Nautico, beginning of the 2nd term, 20 students
LEVEL:	A1+
TIME:	5 hours of 60 min.
MATERIAL:	The Project Physics Course. Testo, guida di laboratorio e letture. Zanichelli editore, 1970, Bologna.
5 STEPS	..or Units, 1 hour each.

PRESENTATION OF THE MODULE

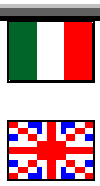


This module is the 3rd unit of a yearly curriculum of a 1st class of a Liceo Statale Nautico course and it takes 5 hours of 60 minutes. It is divided into 5 steps. It is an interdisciplinary module since it is supposed to be carried out by two teachers: the teacher of Physic and the teacher of English. Its main topic is "Building a periscope: "How and why. What it is and what it is for". It is a very important subject for a student who, at the end of his/her Liceo's studies, will work in a world of sea, ship, and sails. This module is supposed to enable students to cope with some situations in which they could be asked to talk about what they are doing, to describe their actions and paraphrase their intents. Students at this level should have their attention called to the use of tools and instruments in science and the use of practical knowledge to solve problems before the actual underlying concepts are understood. They should also develop the ability to use increasingly sophisticated tools and techniques and improve their skills in measurement, calculations, and communication. The activities included in the module should help students to make observations and measurements using instruments such as periscopes help reinforce the relationship between technology and science. These activities also give students skill and confidence in using tools in their everyday lives. In addition to experimenting with technology, students should begin to think and to write about how technology helps people. They should be encouraged to

consider alternative ways of doing something and to compare the advantages and disadvantages of the various options. In these four lessons, students will explore the concept of line of sight by recording the conditions under which they can and can't see an object. For the tests, they will build a periscope using simple objects and experiment with it to determine how this tool helps them extend their line of sight around corners, over walls, and beyond.

TIME-TABLE

	 TEACHER of PHYSIC	 TEACHER of ENGLISH	  LANGUAGE	**TOPICS**
UNIT 1				**INTRODUCTION** **WHAT** **IS A PERISCOPE?**
UNIT 2				**IMPORTANT WORDS**
UNIT 3			 	**PRACTICAL QUESTIONS AND EXPLANATIONS**
UNIT 4			 	**TESTING**

UNIT 5				ASSESSMENT AND EVALUATION

► PREREQUISITES

Grammar:

- Present continuous: interrogative, affirmative and negative forms.
- Question words: what, how, how much, what is it for? Comparative forms.

Vocabulary

- Name of clothes and of colours, countries and nationalities, jobs, numbers, weight and height of things, preferences or hobbies.

Skills:

Listening: students CAN:

- understand instructions, numbers, simple calculations (+, -, ÷ and x)
- the spelling of names, main information about tools: weight, colour, length, shape, and utility

Reading: students CAN:

- recognize the names of things, basic notions of physic, tools and instruments.
- understand brief written texts and e-mails
- understand main information about a person
- (names, countries, nationalities).

Speaking: students CAN:

Talk about simple things or tools, describing them and telling what they are for.

Writing: students CAN:

Write simple sentences about a text speaking of marine tools or instruments.

► OBJECTIVES

GENERAL:

- to enable students to use the function of describing their actions and how things work
- to develop the four skills according to the Common European Framework: listening, speaking, reading, writing in an integrated way.

SPECIFIC:

Grammar:

- to make students learn and practise the following grammar structures: "What + to be subject + for"?; to have got (affirmative, negative and interrogative form) and possessive case.
- to reinforce the structures of Present continuous: interrogative, affirmative and negative forms to revise comparative forms

Vocabulary:

- To increase students' vocabulary: physical structure of the tools and parts
- of their components, measure of length and measure of weight
- To revise how to expose and write the way things work.

Skills

the four skills (reading, writing, listening, speaking) and the interaction are introduced to the class in an integrated way, in order to have a link to real life. In fact, one of the primary aims of teaching in a Communicative approach is that the students must also learn how to relate language to social meanings to use it as a vehicle for interaction in context. To increase this goal it is necessary to increase their sense of performing in a meaningful social context.

Listening and speaking

Students will be able to listen to someone who is describing an object, and then to speak about what they've just heard or about the object they are building.

Reading and writing

Students will be able to read and write some instructions dealing with the construction of a tool. Students will be able to recognize the instructions of building a tool or a thing and paraphrase them.

► ACTIVITIES:

Students will be involved in transferring information, asking and answering questions, simulation activities, composition of letters, paraphrasing instructions.

► WORKING TECHNIQUES

- Group works, pair work, individual work
- Frontal lessons
- Inductive and deductive approach
- Brainstorming
- Communicative approach

► AIDS / MATERIALS

- Text book.
- Cassettes and tape recorder.
- Pictures and drawings.
- Photocopies of authentic documents.
- Computer and the net, web sites.

► TESTS AND EVALUATION

Students will be assessed through: a diagnostic assessment in order to verify prerequisites, and provide an evaluation for the learning in progress about the module on periscope before the final test a final summative assessment in order to give a mark to the final acquired result

Types of test

- Short answer questions.
- Information transfer.
- Calculation.

STRUCTURE OF THE MODULE

UNIT 1. INTRODUCTION

- Warm up:
- "What is a periscope?"

UNIT 2. IMPORTANT WORDS

- Basic vocabulary: pre-teaching
- Important words

UNIT 3. PRACTICAL QUESTIONS AND EXPLANATIONS

- How does it work ?
- How can I make one? …….

UNIT 4 TESTING

- Build up your periscope
- Problem solving/calculation

UNIT 5 ASSESSMENT AND EVALUATION

1st Unit

Presentation of the module. Introduction.

WARM UP

In L1 the teacher of Physic introduces the topic of the module: Periscopes! Before talking about the instrument itself yet, he/she asks students a few general questions about the way we see things. The teacher can ask for instance if everyone sees things exactly the same way. He/she lets them discuss differences they are aware of, such as not being able to see things that are far away (nearsightedness) or close up (farsightedness),or not seeing certain colours (colour/blindness). Then the teacher encourages students to consider the following questions:

1. What tools or instruments help people to see better ?
2. What do these tools do?

Common answers may include glasses, binoculars, telescopes, and magnifying glasses. Students may indicate that these tools make things seem bigger, closer or farther away.

Then the teacher includes in the discussion another important element , “the light” and explains that when there is no light and when something is not directly in line with their eyes we can’t see it. So the teacher explains to students that when we see an object, we are actually seeing the light it gives off. So when it is dark or when an object is not in line with our eyes, we can't see it. The Physics teacher points out

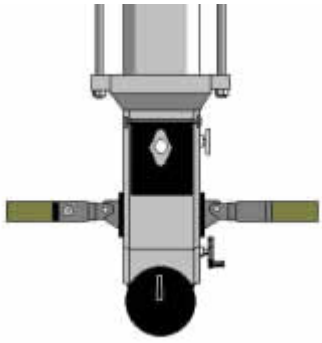
that light travels only in straight lines, it can't bend around corners. That's why we can only see what is in a straight line from our eyes, or in our line of sight.

Then the teacher of Physics gets to the point and asks students if they know of any tool that can help them see an object that is out of their line of sight. Some students will probably mention periscopes. If they don't, the teacher of Physics introduces him/herself the periscope by asking the following questions:

1. Do you know what is a periscope?
2. What is it for?
3. Where can you find a periscope?
4. What else do you know about a periscope?

The teacher collects the answer then he/ shows some pictures of a real periscope illustrating to the class the main components of the instruments

- Picture of a periscope



- Picture of a submarine

- Picture of a submarine seen through a periscope

Then the teacher concludes the Unit by giving to students some more information about periscopes and focusing their attention on what periscopes are used for in the real world….

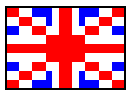
- Periscope comes from two Greek words, *peri*, meaning "around," and *scopus*, "to look." A periscope lets you look around walls, corners, or other obstacles.

- Sub-marines have periscopes so the sailors inside can see what's on the surface of the water, even if the ship itself is below the waves.

- In the past and especially during the 2nd world war, periscopes were fundamental on board to locate enemy ships

- Nowadays submarines are supplied with many other instruments .. they still have periscope on board but they are becoming more and more sophisticate.

2nd Unit

Basic vocabulary 

This is the time of the teacher of English. It is necessary, so as to the students can understand all the instructions of the final test, to pre-teach some vocabulary in English concerning the periscope such as:

GLOSSARY

- LENS: piece of glass or other transparent material with one or more curved surfaces used to make things appear clearer, larger or smaller when viewed through it.

- MIRROR: polished surface usually of coated glass or metal that reflects images.

- INCH: measure of length equal to 2,54 cm.

- HOLE, SLOT: hollow place in a solid mass or surface; cavity

- MAGNIFYING: it means that makes something appear larger
- TO DRAW: to make pictures with a pencil
- RULER: straight strip of wood, plastic, metal etc used for measuring or for drawing straight lines
- TO BOUNCE: to move in a specified direction with an up and down motion.
- TO CUT: to divide something into pieces using a sharp tool, like a knife, scissors…
- TOP :upper part of an object
- BOTTOM :ending or final part of an object
- TO REFLECT :to give back an image on a mirror or on a lucid surface

The teacher should also supply to students the basic vocabulary concerning shapes in order to enable them to understand and talk about specific objects during the following activities.

- Rectangular 
- Square 
- Round 
- Diagonal 

At the end of the Unit there will be a matching exercises to see if students have learnt enough names and are able to recognize them. The teacher shows some

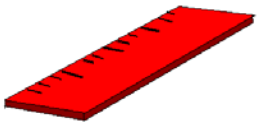
pictures and the Ss have to match them to the definitions. The teacher allows enough time to students to find the definition then goes on with the checking calling students to give their answers. Only when he/she realizes that students can't give the right names to pictures the teacher will offer the correct answer to students.

LENS ⟶

MAGNIFYING ⟶

TO BOUNCE: ⟶

TO DRAW ⟶

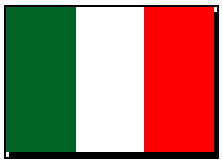


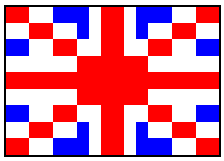
RULER

MIRROR

3rd Unit V. Corona

PRACTICAL QUESTIONS AND EXPLANATIONS





In the third Unit will be given to students further information about the main topic and practical advices in order to extent their competence and to enable them to carry out correctly the final tests. The two teachers shall work together, sharing their competences and collaborating to enhance students linguistic and physics knowledge. To make the integration of the two disciplines possible and to avoid confusion in students the lesson will be divided into two parts :the teachers of physics should start first while the teacher of English will have his/her turn in the second part of the lesson. The activity includes all linguistic skills applied to physics elements and notions .Moreover, during the two parts of the lesson, both teachers will be able to realize the level of competence of students in their respective

disciplines, since the teacher of Physic will focus his/her attention on correctness and precision of answers, while the teacher of English will focus his/her attention on fluency ,form and pronunciation. The activity is supposed to be done in class and students will have to work in small groups.

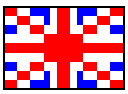
Part one (30 min) 

The teacher of Physics divides the class into small groups and gives to each group a photocopy with a table printed in it. In the table there will be two columns . In one column students will have to write a question about periscope , and on the other they will have write the teacher's answer . Each group has to formulate at least one question, even more if they like… The teacher invites the students to write down their questions , allows enough time to do the task then he/she asks each group to read aloud their questions and answers to all the students questions. The teacher's answers should be complete but also quite short and simple to permit students to take notes and to get a clear idea about the topic. If students hesitate or look puzzled the teacher may help them by offering to the class some hints or ideas…

Here are some examples of expected questions:

STUDENTS' QUESTIONS	**TEACHER'S ANSWERS**
Come funziona un periscopio?	
Il periscopio può funzionare anche di notte e senza luce?	

Chi ha inventato il periscopio e quando?	
Quanto può essere lungo un periscopio?	
Quanto lontano è possibile vedere con un periscopio?	

Part two (30 MIN) 

The teacher of English tells the students that now they will have to answers themselves to the questions they have just asked to the teacher of Physics . They will do it in English both in writing and orally. (The students in fact will be given another photocopy with a table in it to fill in as they listen to their schoolmates's answer.) They can keep their notes before them as a guide but the whole activity will be carried out in L2.

The teacher of English allows to the groups enough time to revise their notes and to organize their discourse, then he/she starts asking the questions to each group and to collects all the answers, correcting when necessary the form and the pronunciation ,and supplying ,if requested some vocabulary…

Teacher's questions	**Students' answers**
How does a periscope work?	
Do periscopes work at night and with no light?	
Who invented the periscope ?and when?	

How long can a periscope be?	
How far can I see with a periscope ?	

4th Unit

TESTING

Students will be assessed on the base of two different tests. The first one is a practical test and it includes the building up of a periscope following given instructions in L2…
The second text is a problem solving including some calculations which students will have to do following a given model or example offered by the teacher of Physics.
In this way both teachers will be able to assess the abilities of the students concerning their respective disciplines.

In test 1, each student will receive the necessary material to build up a very simple periscope following the instructions which will be given in English. As the students start making their periscope the teacher of English passes along the desks to check if they are following the instructions correctly and asking to students to describe what they are doing.…
At the same time the teacher of physics passes along the desks too , to check the precision and the correctness of the students' works..

In test 2 students will be given a problem solving exercise including some calculations which they should be able to do thanks to a model or example

previously offered by the teacher of Physics in L1 to make sure that students understand the procedure.
Even in this case both teachers will pass along the desks to see if the students are doing the exercise correctly.

TEST 1

►Read the instructions and build up a periscope
Try to describe you moves and what you are doing in L2.

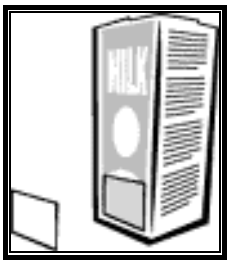
You have:

- Two 1-quart milk cartons
- Two small pocket mirrors (flat, square ones work best)
- A knife
- Ruler
- Pencil or pen
- Adhesive tape

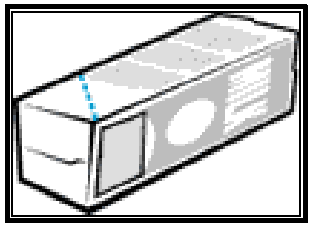
Instructions:

1. 

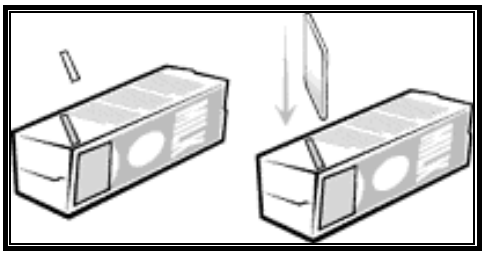
Use the knife to cut around the top of each milk carton, removing the top.

2. 

Cut a hole at the bottom of the front of one milk carton. Leave about 1/4 inch of carton on each side of the hole.

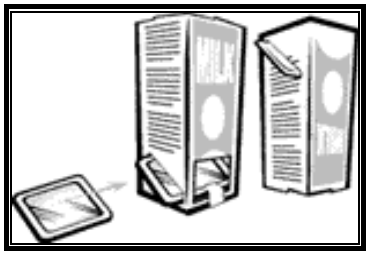
3 

Put the carton on its side and turn it so the hole you just cut is facing to your right. On the side that's facing up, measure 2 3/4 inches up the left edge of the carton, and use the pencil to make a mark there.
Now, use your ruler to draw a diagonal line from the bottom right corner to the mark you made.

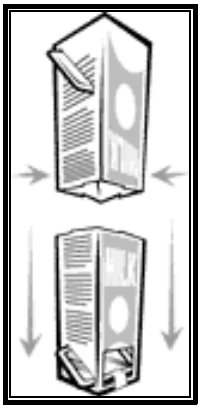
3. 

Slide the mirror through the slot so the reflecting side faces the hole in the front of the carton. Tape the mirror loosely in place. Starting at the bottom right corner, cut on that line. Don't cut all the way to the left edge of the carton-just make the cut as long as one side of your mirror. If your mirror is

thick, widen the cut to fit. Hold the carton up to your eye and look through the hole that you cut. You should see your ceiling through the top of the carton. If what you see looks tilted, adjust the mirror and tape it again. Repeat steps 2 through 6 with the second milk carton.



4. Stand one carton up on a table, with the hole facing you. Place the other carton upside-down, with the mirror on the top and the hole facing away from you.



5. Use your hand to pinch the open end of the upside-down carton just enough for it to slide into the other carton. Tape the two cartons together.

6. Now you have a periscope! Check out if it works.

TEST 2

Example:

Due barche si trovano su un fiume a distanza di 5oo m l'una dall'altra. Partono contemporaneamente, andando nel medesimo verso, la prima con velocità V1=0,5m/s, quella arretrata con velocità V2 0,75 m/s.
Tu sei nella prima barca e vedi tutto tramite il tuo periscopio. Dopo quanto tempo la seconda raggiungerà la prima?

Barca n. 1

V = 0,5m/s

Barca n. 2

V = 0,75m/s

S = 500 m.

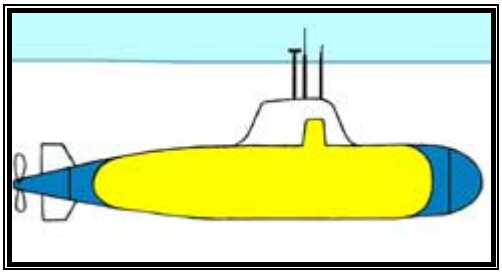
T=?

n. b. V = S/T
T = V/S
S = T/V

► Read the text and make the proper calculations.

You are on a submarine whose uniform speed, on still waters, is Speed= 10 KM/H; you are crossing a river with parallel and straight shores. Looking through your periscope you see that the trajectory AB you have to follow is large 500 M. Determine the time the boat takes to reach the opposite shore, to get from A to B.

A B



s= 10 k m/h
d= 500 m
T=?

CALCULATIONS

SPEED= 10 KM/H

DISTANCE TO CROSS, AB=500 M

TIME= ?

Since the speed is D= 500m

S= 10KM/H=1000M/H=$\frac{10000M}{36000}$/S

S=$\frac{D}{T}$ T=$\frac{D}{S}$ = $\frac{500M}{1000\ M/S}$ = 5 *36 S= 180 S= 3 mines

5th Unit

Assessments

The two teachers shall work together, advising each other and following each steps of the students. The teacher of English will focus on the functions of the objectives and on the Ss' activities, on their vocabulary and ability to paraphrase. The teacher of Physic shall work on the Ss' procedure, in order to evaluate their ability to solve a problem, to build a working object and to make the proper calculations. The total score will be 100 marks for each discipline ,to be finally converted into tenths.

TEACHER OF ENGLISH	**1 2 3 4 5 6 7 8 9 10**
✓ student is able to describe his actions	
✓ student is able to explain how things work	
✓ student is able to use the right vocabulary	
✓ student is able to use the proper grammar structures	
✓ student is able to follow instructions and paraphrase them	
➢ Motivation	
➢ participation	
➢ Interest	

➢ Presence at the lessons
➢ Self-reliance

TEACHER OF PHYSICS **1 2 3 4 5 6 7 8 9 10**
✓ student is able to solve a problem
✓ student is able to make proper calculations
✓ student is able to build a working object
✓ student is able to use E.S.P. (Physic)
✓ student is able to understand E.S.P. (Physic)
✓ student is able to follow instructions
➢ Motivation
➢ Interest
➢ Presence at the lessons
➢ Self-reliance