

CREDO



CLASSES SCENARIO

HOW CAN I JOIN IN COLLABORATIVE SCIENCE?

<p>Tips for teacher:</p> <p>Scenario is dedicated to use in any type of classes with youth (subject lessons, educational hours, optional classes). Teacher, planning his/hers work, should ask students that they bring their smartphones on this particular lesson. It is crucial condition for part of the classes is dedicated to install CREDO Detector app and learn how it work.</p> <p>Lesson is prelude, after which school can join in scientific project and contest. School should encourage students to create one, school team. To CREDO ON START batch was added Navigation slide, thanks to which teacher have easier access to all materials. Depending on form of classes, its time and students age teacher can use all of attachment or just part of it.</p>	<p>The content of CREDO ON START batch:</p> <ol style="list-style-type: none"> 1. Classes scenario 2. Navigation 3. Supporting materials <ol style="list-style-type: none"> a. Movie: Why CREDO? b. Movie: Messengers from space c. Movie: Rice and styrofoam d. Interview part I e. Interview part II f. Attachment 1: Few words about cosmic-ray g. Attachment 2: CREDO finding unexpected h. Attachment 3: Instruction of how to install CREDO Detector app
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Classes scenario: How can I join in collaborative science?

Duration: 45-60 minutes		Age group: 12-16 years	
Main goal:			
<ul style="list-style-type: none"> • Awaking in students need of collaborative science 			
Specific goals:			
Student know: <ul style="list-style-type: none"> • what is CREDO • what is cosmic-rar • what is scientific research and what are they use for 	Student understand: <ul style="list-style-type: none"> • the need of conducting scientific research • how crucial it is to create cosmic-ray detectors network on the Earth 	Student can: <ul style="list-style-type: none"> • install CREDO app on his/hers own smartphone • conduct research using CREDO app • encourage others to join in research projects. 	

Teaching aids: computer, projector, speakers, students smartphones with Android operating system.			
Educational facilities: which can be use to perform game and experiment: soft ball, ventilator, small pieces of paper			
Proposed form of work:			
<ul style="list-style-type: none"> • handing over: lecture, talk 	<ul style="list-style-type: none"> • displaying: presentation, movie, radio broadcast 	<ul style="list-style-type: none"> • activating: discussion, educational game 	<ul style="list-style-type: none"> • practical: install CREDO Detector app

<u>CLASSES PROCESS:</u>	
<u>INTRODUCTION:</u>	
1. Projection of movie <i>Why CREDO</i> (approx. 3 min)	<u>Movie: Why CREDO?</u>
<p>Movie material comes to mind question: <i>What is CREDO</i> Teacher ask students:</p> <ul style="list-style-type: none"> In which context the word appeared in the movie? With what words/sentence was it correlated? <p>The question for now remain open.</p> <div style="border: 1px solid black; padding: 5px; margin-left: auto; margin-right: auto; width: fit-content;"> <p style="color: purple;">Answers on given questions will be starting point to main part of lesson</p> </div>	
<u>MAIN PART:</u>	
<p>1. Game of connotation: (approx. 4 min) Teacher give the soft ball (or other object) to chosen student and give codeword: <i>scientist</i>. Student pass on ball to another person on the same time saying word connote with codeword. When the idea for connotation with scientist end, teacher give another codewords: <i>science, scientific research, experiment</i>.</p>	
2. Projection of animated movie <i>Messengers from Space</i> (approx. 2 min) and talk about cosmic-ray (approx. 5 min)	<u>Movie: Messengers from Space</u>
<div style="border: 1px solid black; padding: 10px; margin: 10px auto; width: 80%;"> <p style="color: purple;">Movie available on YouTube: https://www.youtube.com/watch?v=6rHnW--PZQk&t=7s</p> </div>	
<p>After movie projection teacher encourage students to talk about cosmic-ray and ways of measure it. Example of teachers question:</p> <ul style="list-style-type: none"> Where cosmic-ray come from? What device can be an excellent particle detector? Why scientist want as many people as possible join in research with their mobile phones? 	<u>Attachment 1: Few words about cosmic-ray</u>
3. Projection of movie <i>Rice and styrofoam</i> (approx. 1 min) and conducting an experiment (approx. 10 min.)	<u>Movie: Rice and styrofoam</u>
<p>Filed experiment in simple way show of cosmic-ray action. Students can conduct similar experiment in classroom, changing styrofoam into small pieces of paper.</p>	
<div style="border: 1px solid black; padding: 10px; margin: 10px auto; width: 80%;"> <p style="color: purple;">In order to conduct an experiment you need appropriate amount of time, that is why it is better to perform it during extra-curricular activities.</p> </div>	
4. PART OF AUDITION "THEY WORK ON NOBLE" EMITTED ON-AIR OF RADIO CRACOW 23 JUNE 2018 (9 min)	<u>Interview part I</u>

<p>With professor Piotr Homola from Institute of Nuclear Physics Polish Academy of Science spoke Ewa Szkurlat. Topic of the talk is analysis of CREDO project. What is it and why it is so important for science. In addition to heard part of audition teacher evoke discussion on the topic of project. Key questions:</p> <ul style="list-style-type: none"> • What is CREDO? • Have “finding unexpected” got any sense? 	<p><u>Attachment 2: CREDO - finding unexpected</u></p>
<p>5. PART OF AUDITION “THEY WORK ON NOBLE” EMITTED ON-AIR OF RADIO CRACOW 23 JUNE 2018 (1 min)</p>	<p><u>Interview part II</u></p>
<p>With professor Piotr Homola from Institute of Nuclear Physics Polish Academy of Science spoke Ewa Szkurlat. Topic of the talk is using results of research gathered during CREDO project in practise. Question teacher should ask students after hearing this part:</p> <ul style="list-style-type: none"> • Why do we realize this project? • Does information gathered during project can be of service to science and in which way? 	
<div style="border: 1px solid black; padding: 10px; text-align: center;"> <p>Whole interview is available on: http://www.radiokrakow.pl/audycje/pracuja-na-nobla/credo-detector/</p> </div>	
<p>6. THE INSTALLATION OF CREDO DETECTOR APP ON STUDENTS SMARTPHONES (approx. 12 min)</p>	<p><u>Attachment 3: Instruction of how to install CREDO Detector app.</u></p>
<div style="border: 1px solid black; padding: 10px; text-align: center;"> <p>It is crucial that all students manage to install app on their smartphones on time.</p> </div>	
<p><u>SUMMARY:</u></p>	
<p>7. SUMMARY QUESTION (approx. 2 min)</p> <ul style="list-style-type: none"> • Why is it important to join in CREDO? <p>Teacher encourage student to come by as many answers as possible. He point out that this serious scientific project can be treated like game, arranging meeting to compete in particle hunt with other teams.</p>	
<p><u>HOMEWORK:</u></p>	
<p>Teacher assign students with specific deadline of conducting research. Next day he gather feedback about amount of collected particles by each participant.</p>	
<div style="border: 1px solid black; padding: 10px; text-align: center;"> <p>It is the best to conduct research during night with smartphone connected to charger.</p> </div>	

More information about CREDO project is on
www.credo.science

Films and other materials:

https://www.youtube.com/channel/UCJOYBweH_sIFRQYqGz_XZ_A

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