

# Szenariobeschreibung

Diese Vorlage dient zur Beschreibung von Lehr- und Lernszenarios für das BMUKK. Es ermöglicht eine einheitliche Strukturierung der verschiedenen Szenarien die im Rahmen von Projekten durch das BMUKK erstellt werden.

Grundinformation			
Szenario-Acronym Kurzbezeichnung	„ Cosmic Velocities“		
Szenario-Name Titel	„ COSMOS - Cosmic Velocities“		
Lehrfächer	Physik, Chemie, Englisch	Dauer (in min)	300 min
Altersgruppe	10-14 German 14-18 English	Teamgröße	individual or small groups
Sprache	German, English	Version	1.0

Kontaktinformation / Autorenkontakt			
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Voraussetzungen und Zusatzinfos	
Benötigte Hardware	Computer with access to the Internet
Benötigte Software	Internet Browser
Ortsangabe Indoor/Outdoor	Classroom
Erforderliche Grundkenntnisse	Basics in gravity and chemistry
Weblinks / Referenzen	

Szenariovorlage Version 2.0

Szenariodetails	
Lernziele	<p><b>Knowledge</b></p> <ul style="list-style-type: none"> <li>• The learners should know and understand newton´s law of gravity and apply it correctly.</li> <li>• The students should understand the relevance of the cosmic velocities.</li> <li>• To differentiate between circular, elliptic, parabolic and hyperbolic paths.</li> </ul> <p><b>Skills</b></p> <ul style="list-style-type: none"> <li>• The students should be able to:</li> <li>• to use java applets independently and understand the physics behind it.</li> <li>• calculate the cosmic velocities from newton´s law.</li> </ul> <p><b>Attitudes</b></p> <p>The learners should be able to acquire an appreciation for basic mechanics and astronomy matters through the exposure in similar topics.</p> <p><b>Interdisciplinary aspects:</b></p> <ul style="list-style-type: none"> <li>- Chemistry: Chemical reactions</li> <li>- Computer science: Internet research</li> </ul>
Einführung	<p><b>Presentation and Discussion</b></p> <p>Presentation of photos and videos of satellites and rockets. (geostationary satellites,...)</p> <p>Teacher discusses with students about the necessary velocities for satellites or for leaving the gravitational field.</p>
Aufgabenstellung	<p><b>Scientific Prediction</b></p> <p>Students are performing hypotheses and predictions and making suggestions for confrontation with the problem.</p> <hr/> <p><b>Setting-Up the Experiment</b></p> <p>The students are setting up the experiment of Cavendish and some other simulations related with the cosmic velocities with the guidance of the teacher.</p> <p><b>Measuring-Recording</b></p> <p>The students are making measurements and are recording their findings.</p> <hr/> <p><b>Predictions Compared to Results</b></p> <p>At first the students should calculate work needed to move within the gravitational field of the earth. Afterwards they should calculate the equations for the 1<sup>st</sup> and 2<sup>nd</sup> cosmic velocities. The teacher facilitates the process.</p> <p><b>Discussion</b></p> <p>Discussion of the theoretical issues arising from the experimental activities</p>
Nachbereitung	<p><b>Questions, Exercises and Tasks</b></p> <p>The teacher is making questions and assigning exercises and tasks aiming at consolidation of the acquired knowledge. The students should calculate the height and velocity of a GPS satellite.</p>