

Subject: Science

Grade level: Secondary

Topic: Solid pressure

Required time: 80 minutes

Prior knowledge about the subject:	Not known (possible confusion between the terms pressure and force) => brainstorming
Learning objectives:	Students will: <ul style="list-style-type: none">- make observations on a given situation and being able to explain them- recognize the role of an experiment in examining a phenomenon and designing a valid and reliable experiment- explain the factors which solid pressure depends on: the more force and lesser surface area exposed, more pressure is produced- recognize and explain situations from everyday life relevant to solid pressure effect [$P = F/A$, units: pascal (Pa), equal to one newton per square meter]
Materials/Resources:	Pictures of human and camel footsteps on the sand from flickr Plastic boxes filled with flour Matchboxes with plasticine wrapped in paper Sinkers Working sheet Video: http://www.youtube.com/watch?v=XDaqaaHPXEI Ppt slideshow Evaluation sheet
Procedure	
Introduction:	The teacher shows online (on flickr) two images that represent the footprint left by a camel and a man, respectively, on the sand. Students are asked to make few comments about the two pictures. (Which is the deepest? Which is the greatest? Why?) Students are asked to express their views possibly based on their experience and their initial thoughts. The flow of the discussion is based on the views of students while the teacher records the students' ideas on the board.
Exploration:	The teacher asks the students to consider how they are going to examine what has been said and recorded in the list from the previous activity (particular emphasis on two factors affect the pressure: weight-force and surface area). As soon as the discussion is led to the experimental method, the teacher gives to the students several materials to include in their experiment. (Materials per group:

	<p>matchbox full of plasticine, plastic boxes filled with flour, sinkers [few of them -at least three- have the same weight]). Students are asked to indicate possible ways in which they can use these materials to consider whether the factors on which they are being focused affect, or not the solid pressure. In order to create a common experimental path for students, the teacher makes some additional questions: e.g.: What do we need to check? How many experiments must be designed? What will possibly happen in each case and why? What you need to keep constant and what will change in each case?</p> <p>Students begin to carry out the experiments while teacher goes from group to group providing feedback. In the meanwhile, students filling the working sheet they've been given concerning their predictions, experiment designing, observations and experiment outcomes. After the completion of this procedure, each group's results will be announced and discussed to the class. Then, the teacher demonstrates a video concerning the matter under-discussion.</p> <p>Taking into account the results of the two experiments and the video watching, students are asked to comment on a range of pictures-slides, which represent everyday examples of solid pressure and give their explanations for the illustrated situations. They are also welcome to mention their own examples and experiences.</p>
Assessment:	After activities completion, an evaluation sheet is given. The students are asked to recall what was observed and discussed during the lesson. Students work individually.
Class description-organization:	Mixed ability class. Students work in group of 4 people.
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