



# Real Life Examples in Mechanics of Solids

Lesson plans and solutions

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## **INTRODUCTION**

These notes are designed to enhance the teaching of a sophomore course in mechanics of solids, increase the accessibility of the principles and raise the appeal of the subject to students from a diverse background. The notes have been prepared as skeletal lesson plans using the principle of the 5Es: Engage, Explore, Explain, Elaborate and Evaluate. These are not original and were developed by the Biological Sciences Curriculum Study<sup>1</sup> in the 1980s from work by Atkin and Karplus<sup>2</sup> in 1962. Today they are considered to form part of the constructivist learning theory and a number of websites provide easy to follow explanations of them<sup>3</sup>.

These notes are intended to be used by instructors and are written in a style that addresses the instructor, however this is not intended to exclude students who should find the notes and examples interesting, stimulating and hopefully illuminating, particularly when their instructor is not utilizing them. In the interest of brevity and clarity of presentation, standard derivations and definitions are not included since these are readily available in textbooks which these notes are not intended to replace but rather to supplement. Similarly, it is anticipated that these lessons plans can be used to generate lectures/lessons that supplement those covering the fundamentals of each topic.

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<sup>1</sup> [http://www.bsccs.org/library/BSCS\\_5E\\_Instructional\\_Approach\\_July\\_06.pdf](http://www.bsccs.org/library/BSCS_5E_Instructional_Approach_July_06.pdf)

<sup>2</sup> Atkin, J. M. and Karplus, R. (1962). Discovery of invention? *Science Teacher* 29(5): 45.

<sup>3</sup> e.g. <http://www.science.org.au/primaryconnections/constructivist.htm>

*Sophomore Solids Course: Suggested exemplars within lesson plans*

## **NOTES FOR INSTRUCTORS ON EXAMPLE APPLICATIONS**

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