

## A Mission in Physics

Students perceive physics as a difficult subject in school. Their previous knowledge is varying. How can we facilitate and motivate students in their physics studies at upper secondary level?

We often, inaccurately, presume that students possess great knowledge about the surrounding world. How many students know what a spark plug is? Is a rock lighter in water than in air? In physics education we often start off with well known items and phenomena but if the students haven't themselves seen and experienced this, physics will become uninteresting and the student uncommitted.

In order to give the students and the teacher a mutual experience, an introductory assignment might be of aid. In this assignment the students are forced to find facts, reflect and decide on a problem. They will thereby be given the experiences required to understand a new theoretical feature. The teacher can always refer to the introductory assignment and say: -You, remember the assignment with the car, where... The students are fully aware of the prerequisites and become motivated to continue.

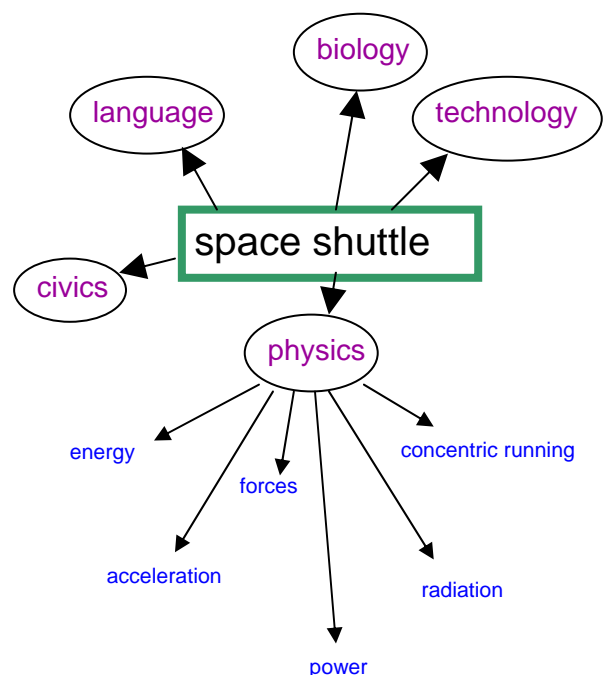
Start by presenting the mission in a challenging and exciting way. Split the class into groups. With some guidance the students will make a presentation in 1-2 hours to the rest of the class. The short time span is due to the few lessons available in physics. When working transgressional the mission may expand in time and proportion; higher levels of performance can then also be expected. Written as well as oral presentations can be done in different languages. Subjects such as biology, chemistry, social studies and technology can be applied.

Here are three examples of introductory assignments:

### 1. Space shuttle

The students get split into groups of 3-6 and are told that they will soon receive an important assignment. The assignment is:  
- In 25 years a manned space shuttle will start its journey into space and other solar systems. You (i.e. the students) are a group of scientists and engineers who are going to come up with the best solution for making this journey. You will get 90 minutes to gather information, compile it and present a solution to the assignment. The students prove to be extremely creative and inspiring. After 90 minutes (which the students always want to prolong) an enjoyable presentation awaits.

Aids: computers with Internet access and visual aids.

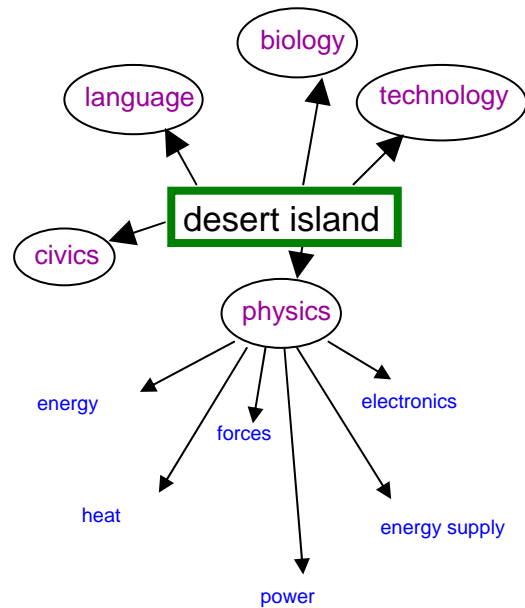


## 2. Desert Island

The students will here too be divided into groups. The assignment is: A group of scientists are going to study a desert island for 20 years. You (i.e. the students) are to suggest which type of research are to be performed. Plan the placement of the research center's buildings and how the researchers are going to get access to food, water and energy.

You will get 90 minutes to gather information, compile it and present a solution to the assignment.

Aids: computers with Internet access and visual aids.

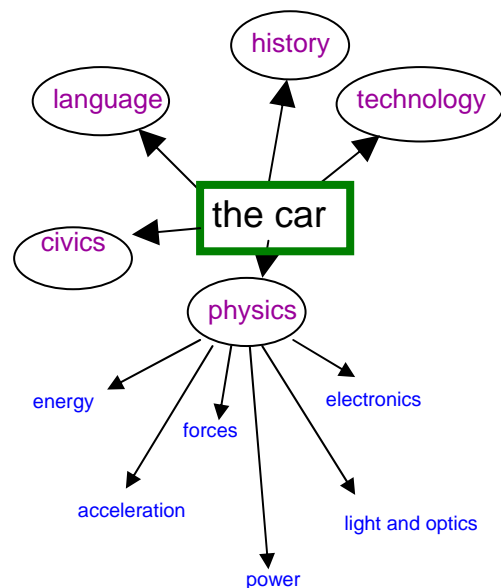


## 3. The Car

What do the students know about cars? Let the students present a solution to producing a new car.

The assignment: You are a group of innovative students hired at a newly founded car company. The company is to specialize on environmentally safe cars. You are to suggest and design a new car model which will be ready for production in 10 years. You get two lessons to gather information and present your dream car of the future. The presentation must contain technical information such as fuel, maximum speed, acceleration, size etc.

Aids: computers with Internet access and visual aids.



In physics you can link the assignment to e.g. energy, power, forces, acceleration etc. The mission can also generate experiences that can be taken into account in additional subjects.