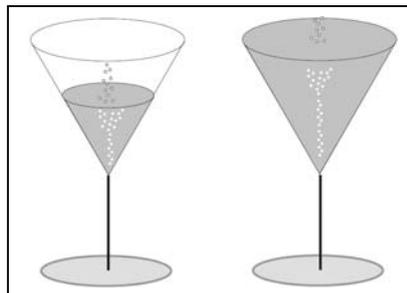


Teaching –learning module compiled by the PARSEL consortium
as part of an EC FP6 funded project (SAS6-CT-2006-042922-PARSEL) on
Popularity and Relevance of Science Education for scientific Literacy



How much Champagne could you afford? Student materials

A grade 8-9 mathematics module on
getting scientific information



Abstract:

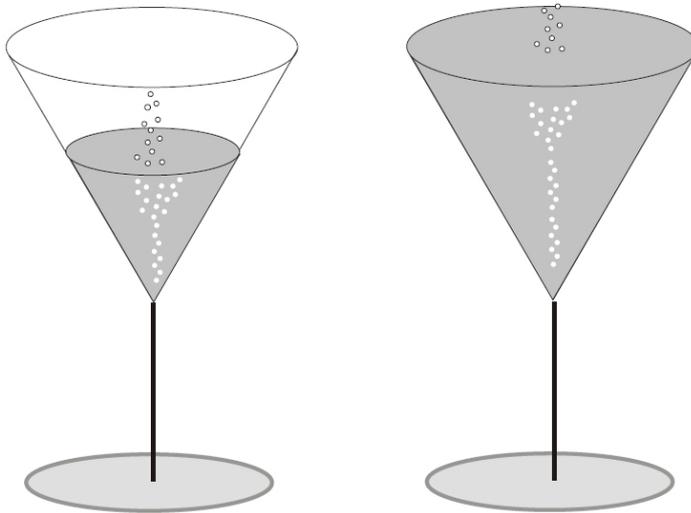
This task needs calculation on the capacity of a champagne-glass to calculate the price and on the risk to go over the limit of the alcohol-content in the blood.

On first sight a glass which is half full should cost only the half of a full one. But if you calculate the capacity of a cone, the complete filled glass contains 8 times more.

It is possible to add to the task is a calculation, how much half full champagne glasses you can drink before you overgo the alcohol-limit of traffic drivers.

Advice: if you want to calculate while you are drinking, you should prefer cylindrical glasses.

Developer: Martin Lindner (adapted from Sinus)
Institution: IPN - Leibniz-Institute of Science Education
Country: Germany



Task

A bottle of champagne is sufficient to fill seven glasses. How many glasses can you fill, if you pour only up to half of the height of the glass?

- Before starting to calculate: share your ideas and try to find a nice reason for your ideas.
- If a half full glass costs 1 Euro, how much should a fully filled glass cost?

Variations

- Make a hands-on activity in the classroom: distribute a bottle of champagne (filled with water)
- How many half-full glasses are necessary to fill one glass completely?
- How high rises the level in a glass when you add one half full glass to another?
- Try to use other forms of drinking glasses

Calculation

Before starting to calculate, try to find out how the difference could be calculated. If you find no answer, ask your teacher for help.

Additional Task:

How many glasses of champagne can you drink before driving?

Which amounts do you have to take into account when you want to determine the blood level of alcohol? A hint: the drunken alcohol is distributed to the whole body. As most of the body is water, you can take the weight of the person as the basis for calculation. Estimatedly 70 % of the alcohol is distributed to the body.

Compare your result with the levels which are given by law in different countries.

0,0 ‰ Promille	 Deutschland (Für Fahranfänger innerhalb der Probezeit sowie für Führerscheininhaber bis 21 Jahren)
	 Estland
	 Kroatien
	 Malta
	 Rumänien
	 Slowakei
	 Tschechien
	 Türkei (für Fahrer von Pkw <u>ohne</u> Anhänger 0,5 Promille)
	 Ungarn
0,2 ‰ Promille	 Griechenland (Für Motorradfahrer und Personen, die den Führerschein noch keine zwei Jahre besitzen)
	 Norwegen
	 Polen
	 Schweden
0,4 ‰	 Litauen
0,5 ‰ Promille	 Belgien
	 Bosnien-Herzegowina
	 Bulgarien
	 Dänemark
	 Deutschland
	 Finnland
	 Frankreich
	 Griechenland (Für Motorradfahrer und Personen, die den Führerschein noch keine zwei Jahre besitzen, gelten 0,2 Promille)
	 Island
	 Italien
	 Jugoslawien
	 Lettland
	 Mazedonien
	 Niederlande
	 Österreich
	 Portugal
	 Schweiz
	 Serbien-Montenegro
	 Slowenien
	 Spanien
0,8 ‰ Promille	 Großbritannien
	 Irland
	 Luxemburg
	 Malta
0,9 ‰	 Süd-(Zypern)