

# Fall 2016 Selected Processes.

Music: King  
Africa: La  
Bomba.

**שלושת כללי ההנדסה:**

**אל תאמין לשום דבר**

**יש נקודות מבט שונות לכל נושא**

**התעלמו מדעות מוקדמות**

כָּל־רֵאשִׁוֹן

אֶל־תִּצְמִינֵנוּ לֵאמֹר דְּבַר שִׁאֲתֶם שׁוֹמְעִים  
רוֹאִים אֵן קוֹרֵאִים  
לִפְנֵי שַׁעֲבַד בְּדִיקַת נְכוֹנוֹת בְּשִׁכְלֶכֶם

Is this real?



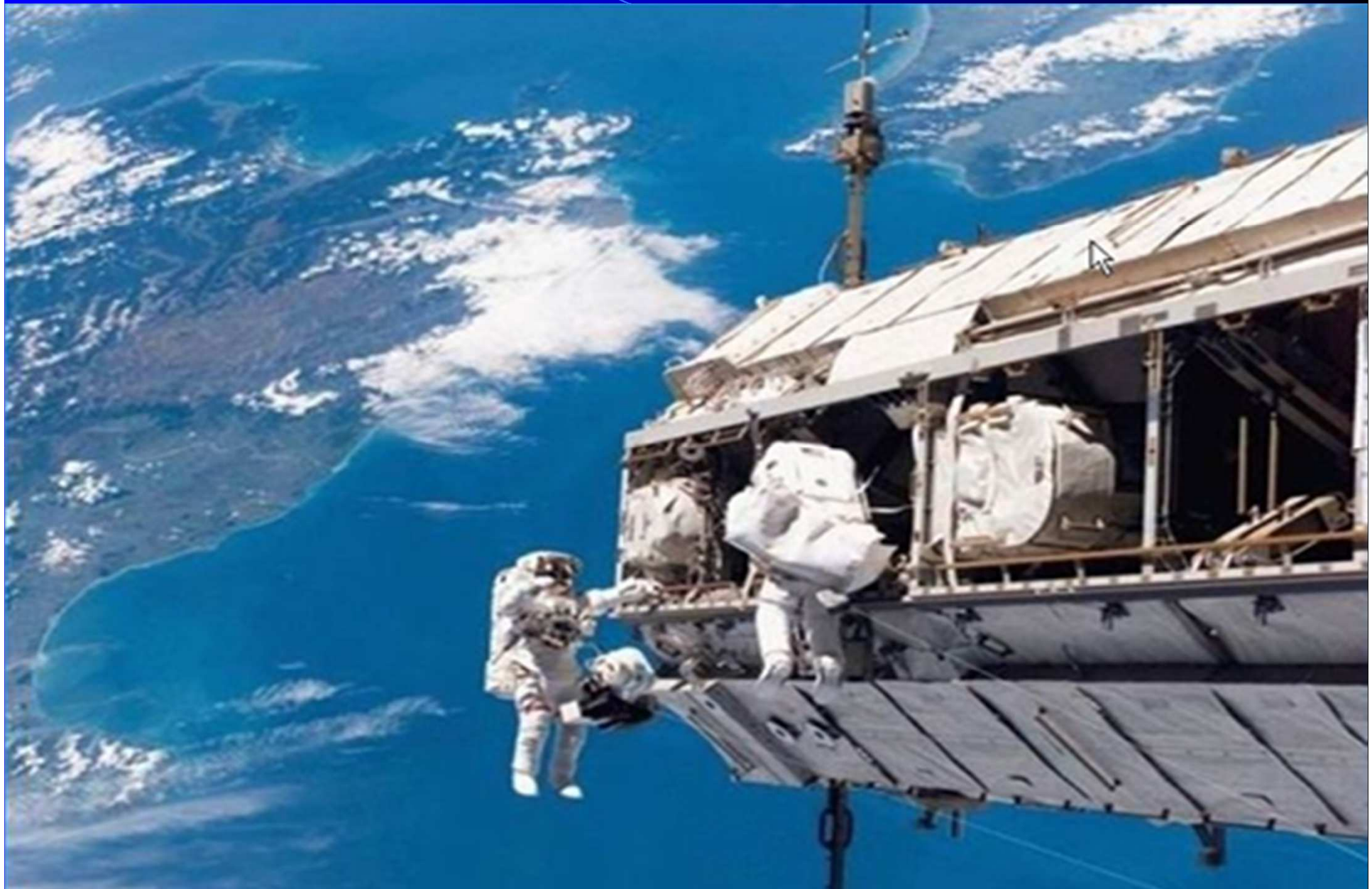
# Black sheep



# Good or Bad?



Unbelievable?



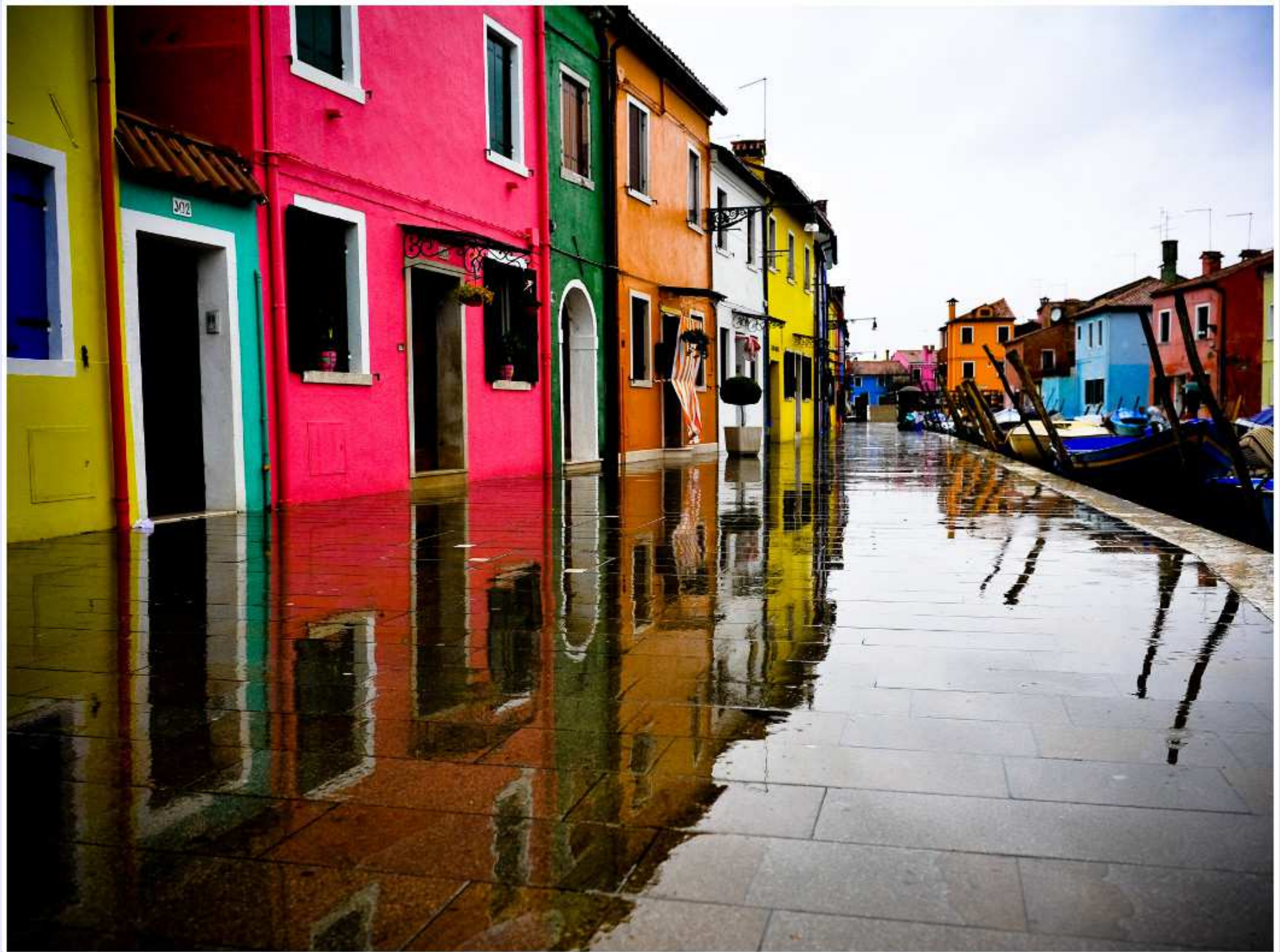
# Believable? Worthwhile?

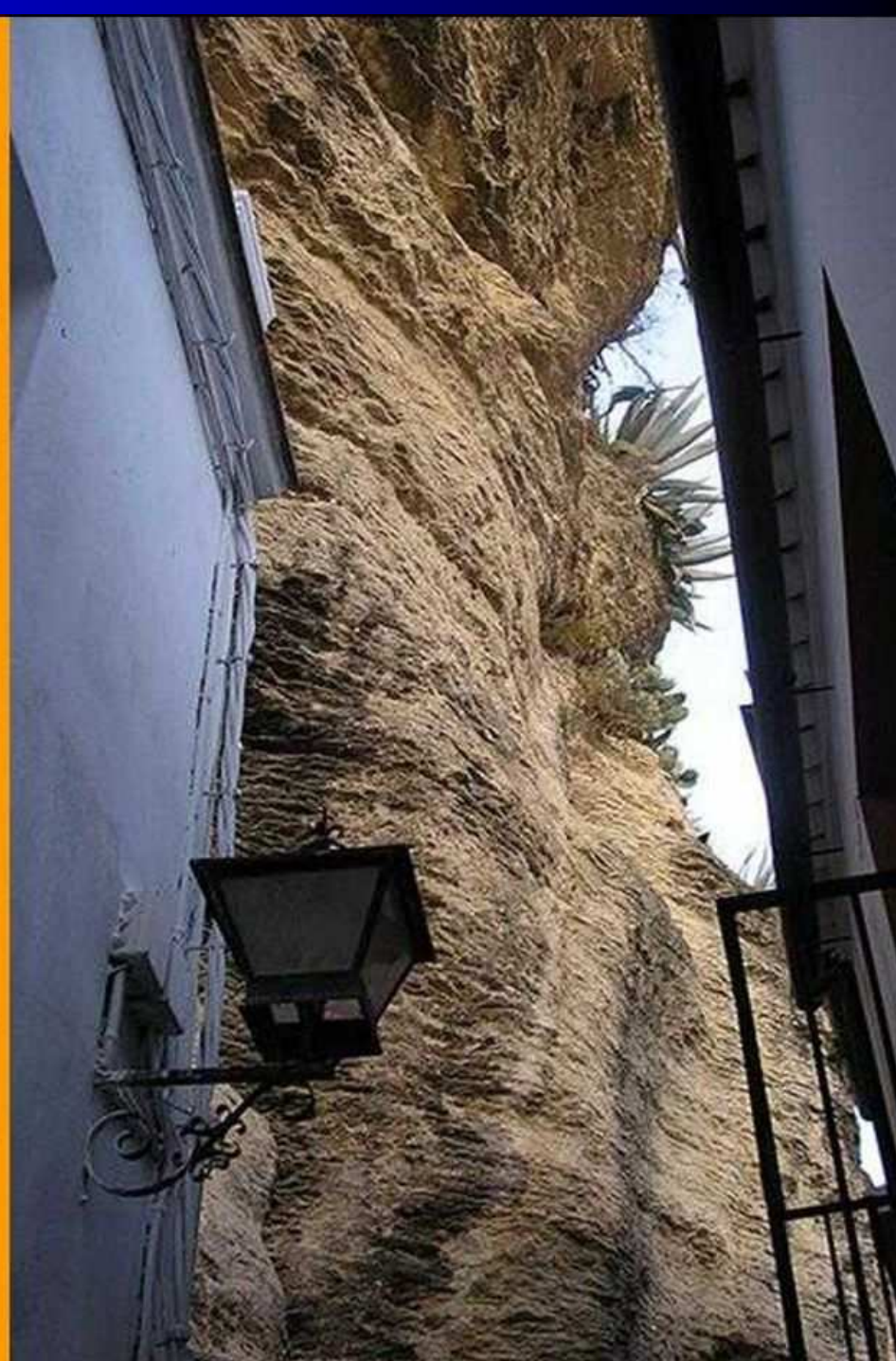




Beautiful! But is it real?







# Buddha

The first  
Rule of  
Engineering

- Believe nothing
- No matter where you have read it or who has said it
- Not even if I have said it,
- Unless it agrees with your own reason and your own common sense.

כלל שני

יש יותר מנקודת מבט אחת

על כל נושא

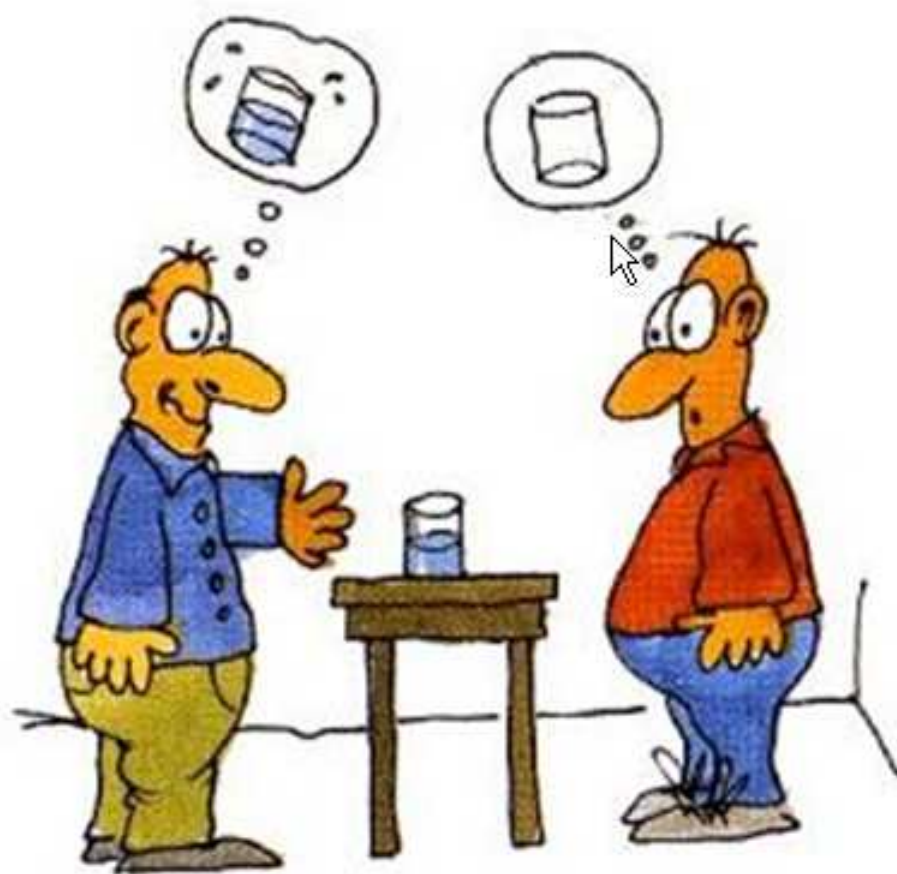


GOOD

Come in

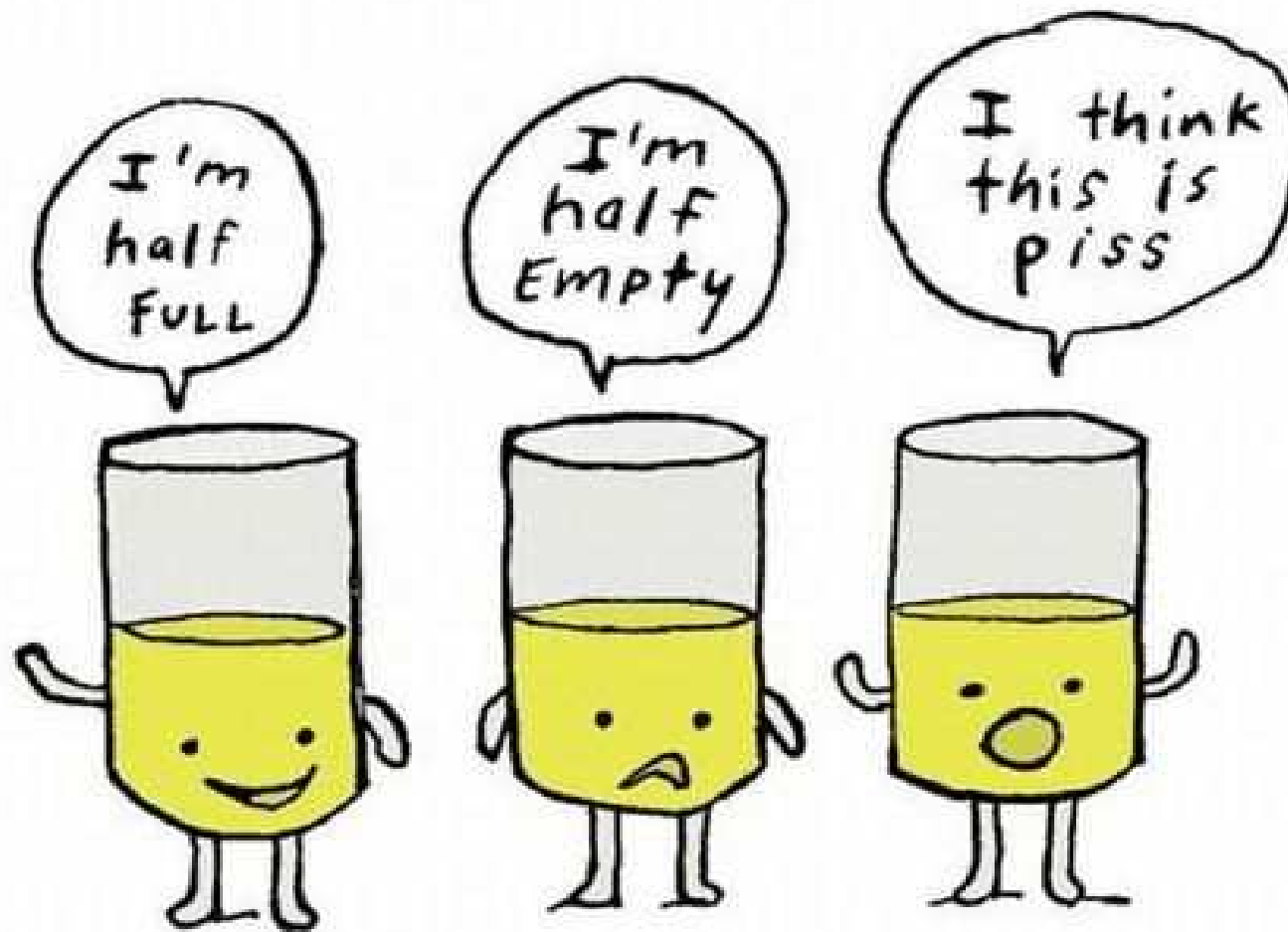
Go away



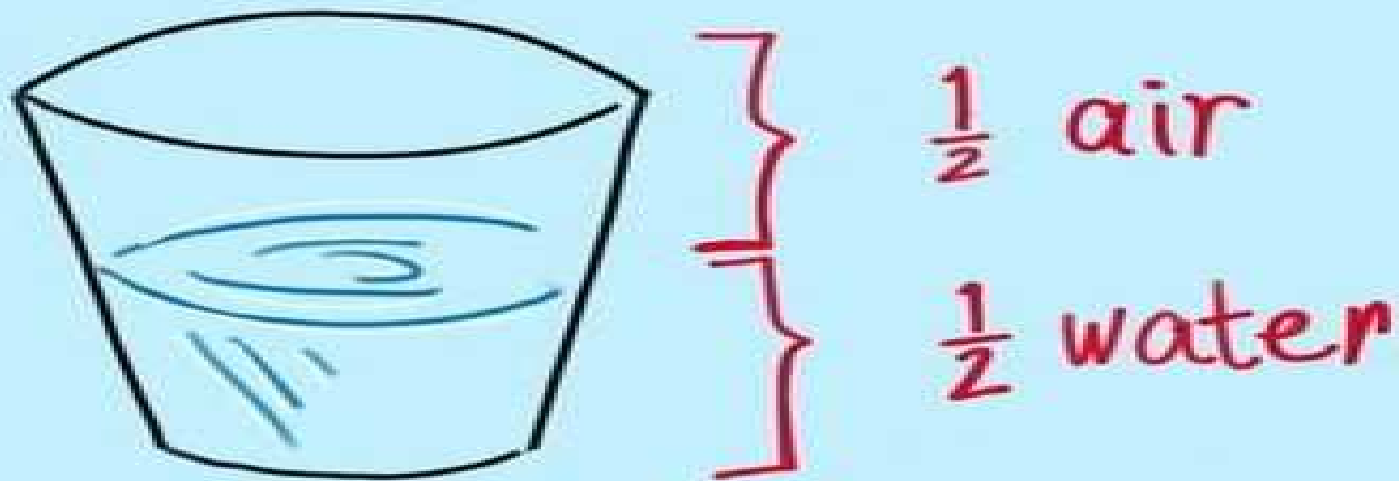


פסימיסט - רואה קושי בכל הזדמנות.  
אופטימיסט - רואה הזדמנות בכל קושי.

קליק להמשך



To the engineer, the glass is twice as big as it needs to be.



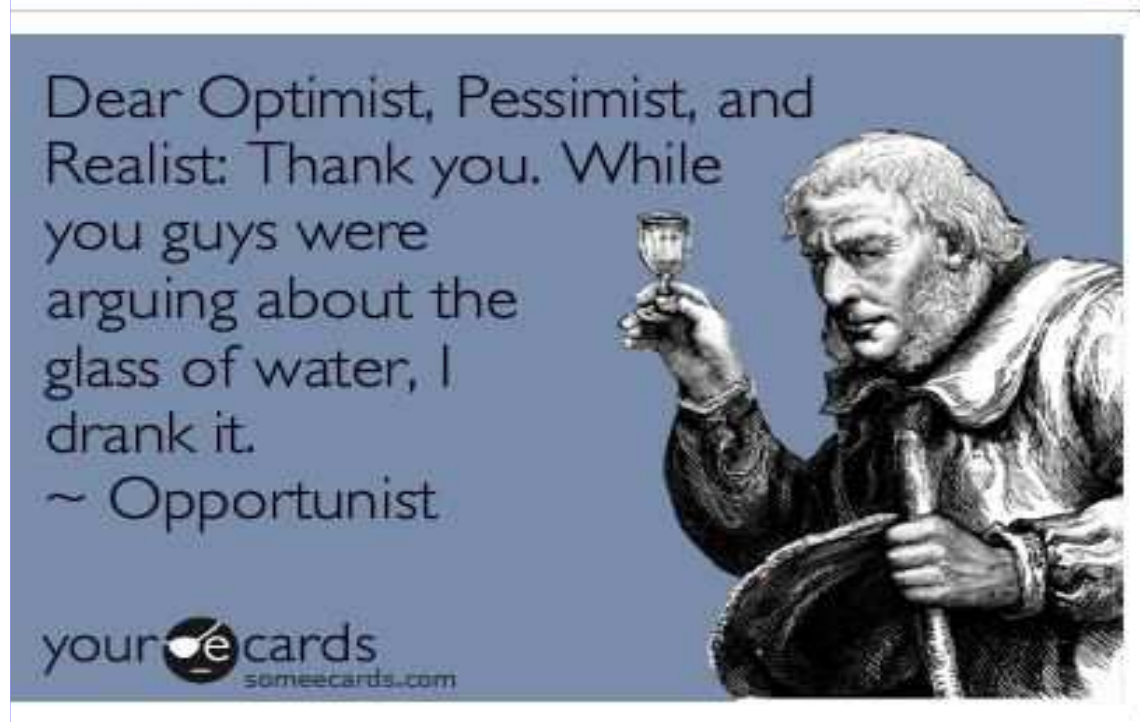
**technically,  
the glass is always  
full.**

## The difference between an optimist, a pessimist and a realist

An optimist sees half a glass of water and says that the glass is half full.

A pessimist sees half a glass of water and says that the glass is half empty.

An realist sees half a glass of water and says it is both half full and half empty at the same time



A Republican says "Who's been drinking out of my glass?"



An analyst says it is neither, it simply contains 50% of its potential capacity.



## שמואל א י"ז נ-נא

וּבַחֲנִית יְהוֹשִׁיעַ יְהוָה כִּי לִיהוָה הַמַּלְחָמָה וְנָתַן אֶתְכֶם בְּיָדוֹ. {ס} מַח וְהָיָה כִּי-קָם הַפְּלִשְׁתִּי וַיִּלָּךְ וַיִּקְרַב לַקְרֹאת דָּוִד וַיִּמְהַר דָּוִד וַיֵּרָץ הַמַּעְרָכָה לַקְרֹאת הַפְּלִשְׁתִּי. מַט וַיִּשְׁלַח דָּוִד אֶת-יָדוֹ אֶל-הַכְּלִי וַיִּקַּח מִשָּׁם אֶבֶן וַיִּקְלַע וַיִּךְ אֶת-הַפְּלִשְׁתִּי אֶל-מִצְחוֹ וַתִּטְבַּע הָאֶבֶן בְּמִצְחוֹ וַיִּפֹּל עַל-פָּנָיו אֶרְצָה. נ וַיַּחֲזֹק דָּוִד מִן-הַפְּלִשְׁתִּי בַקְּלַע וּבָאֶבֶן וַיִּךְ אֶת-הַפְּלִשְׁתִּי וַיִּמָּתְהוּ וַיִּחַרְבּוּ אִין בְּיַד-דָּוִד. נא וַיֵּרָץ דָּוִד וַיַּעֲמֵד אֶל-הַפְּלִשְׁתִּי וַיִּקַּח אֶת-חַרְבּוֹ וַיִּשְׁלֹפָה מִתַּעֲרָה וַיִּמָּתְתְהוּ וַיִּכְרַת-בָּהּ אֶת-רֵאשׁוֹ וַיֵּרְאוּ הַפְּלִשְׁתִּים כִּי-מַת גְּבוּרָם וַיִּנְסוּ. נב וַיִּקְמוּ אַנְשֵׁי יִשְׂרָאֵל וַיְהוּדָה וַיִּרְעוּ וַיִּרְדְּפוּ אֶת-הַפְּלִשְׁתִּים עַד-בּוֹאֲךָ גִיָּא וְעַד שְׁעָרֵי

## שמואל ב כא יט

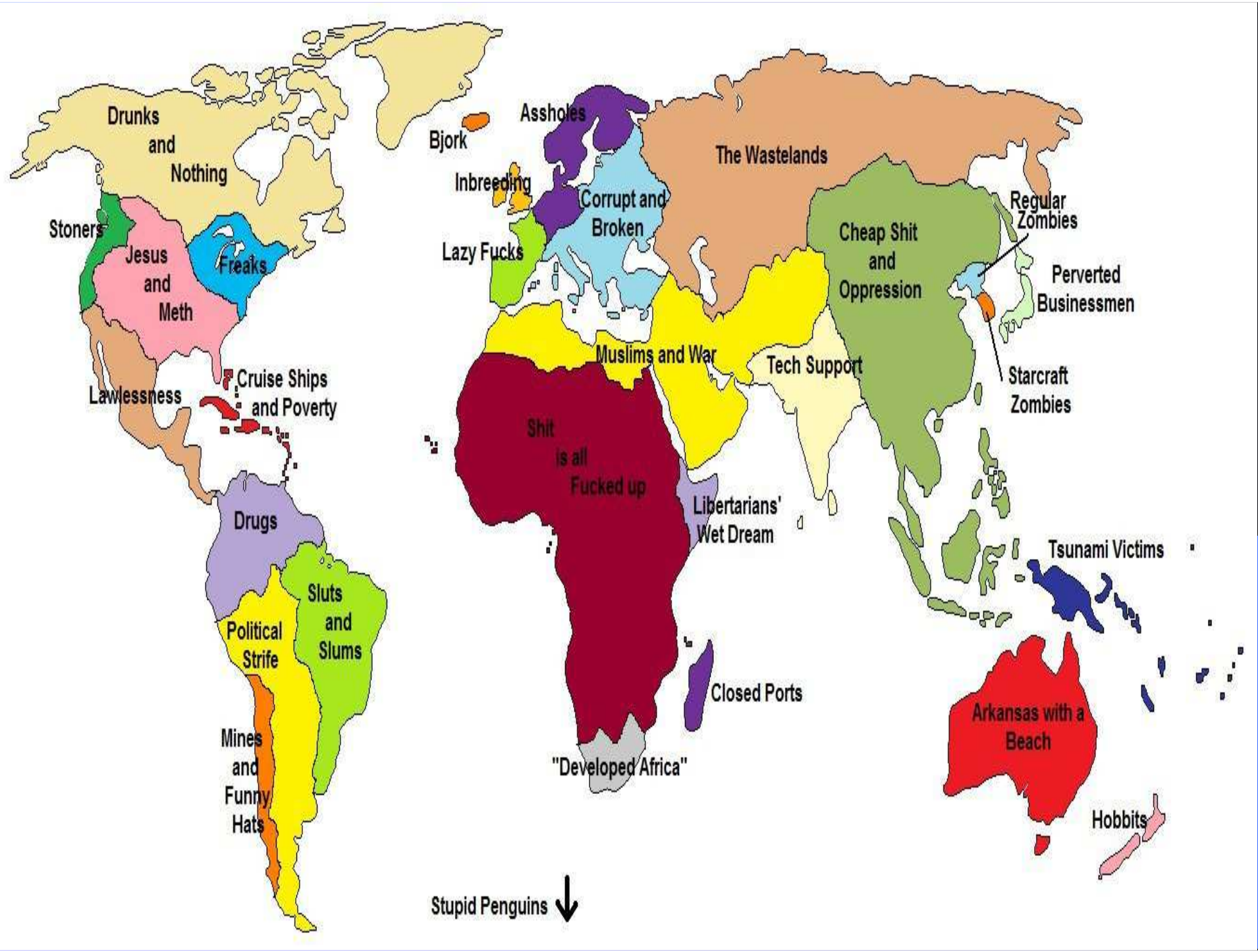
הַרְפָּה. {ס} יט וַתְּהִי-עוֹד הַמַּלְחָמָה בְּגוֹב עִם-פְּלִשְׁתִּים וַיִּךְ אֶלְחָנָן בֶּן-יַעֲרִי אַרְגִּים בֵּית הַלְחָמִי אֶת גְּלִית הַגִּתִּי וְעַץ חֲנִיתוֹ כַּמְנֹר אַרְגִּים. {ס} כ וַתְּהִי-עוֹד מַלְחָמָה בְּגַת וַיְהִי אִישׁ מַדִּין (מְדוּן) וַאֲצַבְעַת

## דברי הימים א כ ה

סַבְכִי הַחֲשָׁתִי אֶת-סַפִּי מִיְלִידֵי הַרְפָּאִים וַיִּכְנַעוּ. ה וַתְּהִי-עוֹד מַלְחָמָה אֶת-פְּלִשְׁתִּים וַיִּךְ אֶלְחָנָן בֶּן-יַעֲוֹר (יַעֲרִיר) אֶת-לְחָמִי אַחִי גְלִית הַגִּתִּי וְעַץ חֲנִיתוֹ כַּמְנֹר אַרְגִּים. {ס} ו וַתְּהִי-עוֹד מַלְחָמָה בְּגַת וַיְהִי אִישׁ

כָּל־שְׁלִישֵׁי

הַתְּעֵלְמוּ מִדַּעוֹת קְדוֹמוֹת



Drunks and Nothing

Stoners

Jesus and Meth

Freaks

Lawlessness

Cruise Ships and Poverty

Drugs

Political Strife

Mines and Funny Hats

Sluts and Slums

Assholes

Bjork

Inbreeding

Lazy Fucks

Corrupt and Broken

Muslims and War

Shit is all Fucked up

"Developed Africa"

The Wastelands

Cheap Shit and Oppression

Tech Support

Libertarians' Wet Dream

Closed Ports

Regular Zombies

Perverted Businessmen

Starcraft Zombies

Tsunami Victims

Arkansas with a Beach

Hobbits

Stupid Penguins ↓



# EUROPE ACCORDING TO AMERICANS

designed by alphadesigner.com  
2009 edition



# EUROPE ACCORDING TO THE FRENCH

designed by alphadesigner.com  
2008 edition

TOO COLD



SLAYERS OF VIRGINS

CATHOLICS

PEOPLE WHO LOVE COLD WEATHER

MEATBALL EATERS

MOBILE PHONES

BAL TIC TRIBES

NAPOLEON'S DREAM

VIKINGS

WHITE-SKINNED RUSSIANS

BEST FRIENDS

PLUMBERS

WASN'T THIS RUSSIA?

FRANCE

WEED

ANTI EUROPEANS

SOME SLAVS

OLD ARCHENEMY

SARKOLAND

POOR BROTHERS

POOR COUSINS

POOR SAVAGES

UNCHARTED

NOISY FRIENDLY PEOPLE

NOISY HAIRY PEOPLE

FLAMENCO DANCERS

ENGLISH ALLIES

FRANCE WOZ HERE

DEFINITELY NOT EUROPEANS

# EUROPE ACCORDING TO THE BRITISH

designed by alphadesigner.com  
2010 edition

LAS VEGAS



FILTHY RICH HEATHEN TRIBES

TRASHY POP MUSIC

MOBILES

BIG SPENDERS

NOT OF SIGNIFICANCE

WHAT AN ODD COUNTRY!

IMMIGRANTS

OLDMAN

NO PORK MEALS HERE

UNCHARTED

STATUES

SOUP

CAKE

BEER

DIRTY PORN

PEST

DRUGS

SHOPS

COUNTRYSIDE

CHOCOLATE

TANNED MEN WITH GREY HAIR

SUNSCREEN REQUIRED

EVIL FEDERATED EMPIRE OF EUROPE

RASCALS

SEMI-UNITED KINGDOM

# How Americans See Europe

All Europeans Are Obsessed with Soccer



**Iceland:**  
Volcano, Weird Language, Hot Blondes, Bad guys in Mighty Ducks II



**Norway:**  
Vikings turned Fishermen



**Sweden:**  
Home Of The Pirate Bay, Socialism, Elin & her twin, the word "ya"

**Russia:**  
Communism, hackers, Vodka, Anna Kournikova



**UK Scotland:**  
Braveheart, Everyone wears Kilts, Haggis, Golf



**Ireland:**  
Red Hair, Alcoholics, Potatoes, The Color Green, U2



**Denmark:**  
They make LEGOs and wear Wooden Shoes



**Netherlands:**  
Drugs, Hookers, Drugged out Hookers



**UK England:**  
Fish And Chips, Bad Teeth, James Bond, Harry Potter, Can't hold down a colony



**Belgium:**  
Chocolate, National Mascot is a Kid Taking a Piss



**France:**  
Snobby, French Bread, Wine, Can't win a war, Short Leaders



**Germany:**  
Beer, Shiza Videos, Nazis, Sauerkraut, Shitty Food



**Poland:**  
Polish Jokes, Not Very Intelligent



**Czech Republic:**  
Beer! Cheap hookers... Beer!



**Ukraine:**  
Chernobyl, Everyone's Rude

**Portugal:**  
It's not Spain?



**Spain:**  
Bulls, Hot Chicks



**Switzerland:**  
Rich, Secretive, Alps, Ill-Gotten Bank Accounts



**Austria:**  
Little Germany, Lots of Mountains, Classical Music

**Hungary:**  
No thank you, I just ate

**Romania:**  
Vampires that don't Sparkle, Mail Order Brides

**Moldova:**  
Doesn't exist, never heard of it

**Slovenia:**  
Isn't that an electronics maker?

**Albania, Bosnia and Herzegovina, Kosovo, Montenegro, Croatia:**  
Lots of Organized Crime, Went to war

**Bulgaria:**  
Aren't they part of Russia?



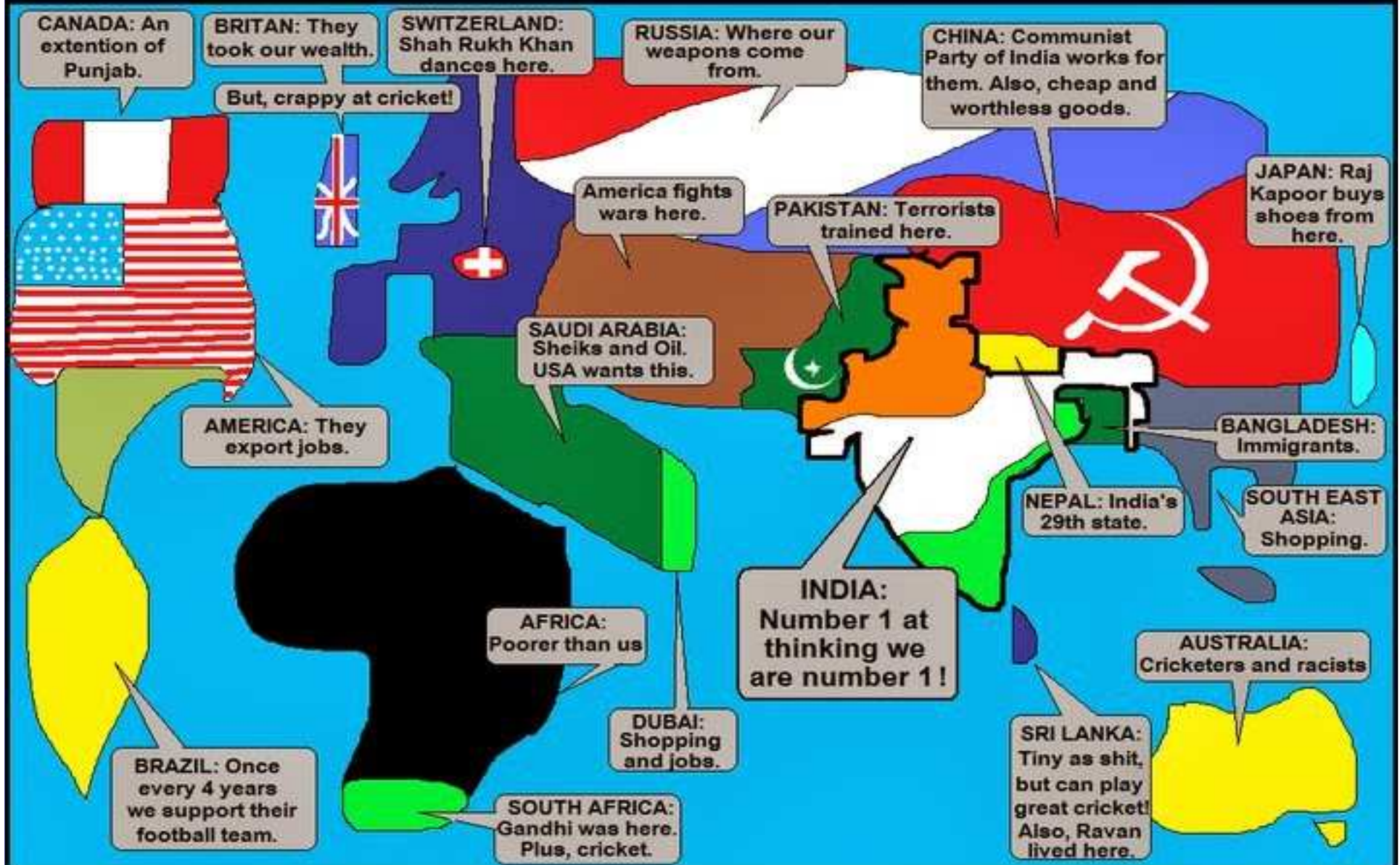
**Greece:**  
Home Of The Gyro, Country Totally Broke

**Italy:**  
Mafia, Spaghetti, Gladiator, Super Mario

**Vatican City:**  
Pope, Child Molestation, The Da Vinci Code

INFO GRAPHIC WORLD

# The World According To India



# THE WORLD ACCORDING TO ISRAEL 2012

from Yanko Tsvetkov's Atlas of Prejudice  
[www.alphadesigner.com](http://www.alphadesigner.com)



# ולסיום המבוא



No. 246-A  
Size 12x16. Original Drawing in colors—all hand-work—\$5.00  
Proof-Prints, 12x16, from original drawings—\$1.00





Animals around the world are losing their habitats due to climate change. By choosing a brand or food option we, you can help prevent that. Take a more right one. [www.wwf.org](http://www.wwf.org)

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# The difference between **school** and **life**?

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**In school,** you're taught a lesson  
and then given a test.

**In life,** you're given a test  
that teaches you a lesson.

Tom Bodett

A photograph of a sign mounted on a corrugated metal surface. The sign features the text "I HAVE SEEN THE TRUTH AND IT DOESN'T MAKE SENSE" in bold, black, sans-serif capital letters. The sign is set against a background of trees and a building. The entire image is framed by a thick blue border.

**I HAVE SEEN  
THE TRUTH  
AND IT DOESN'T  
MAKE SENSE**

Teach  
Learn

## Comprehending Engineers -

- \* The graduate with a Science degree asks, "Why does it work?"
- \* The graduate with an Engineering degree asks, "How does it work?"
- \* The graduate with an Accounting degree asks, "How much will it cost?"
- \* The graduate with a Liberal Arts degree asks, "Do you want fries with that?"

The difference in approach between a scientist and an engineer

The scientist seeks **THE** solution of the problem.

The Engineer seeks the **BEST** solution of the problem.

An engineer keeps an open mind and does not believe any input unless it is corroborated by past experience or logical thought.

סיום המבוא

# וכעת לתוכן

COURSE IN

**SELECTED PROCESSES IN  
THE CHEMICAL INDUSTRY**

# **Selected Processes in the Chemical Industry**

## **Fall Semester 2016**

# **Syllabus**

**Technion Israel Institute of Technology**  
**Semester 1 2016**

**Department of Chemical Engineering**  
**Selected processes in the chemical industry**

**Lecturer:** Prof. Ephraim Kehat, Room 322, Phone 2935, **mail:** cerekek@technion.ac.il

**Istructor:** Riki Maicas Klein, Room 216, Phone 3570, **mail:** rikimai@gmail.com

### **Syllabus:**

**Part-1: General (2 weeks):**

**Information sources, The global chemical industry, The chemical industry in Israel.**

**Part-2: Infrastructure (4 weeks):**

**Energy and fuels, Water, Environment, Recycling.**

**Part-3: Processes (7 weeks):**

**Oil and gas, Petrochemicals, Potash and its derivatives, Phosphates and fertilizers, Bromine and its derivatives, Magnesium and magnesium derivatives, Cryo-engineering.**

**Chemical, engineering and economic aspects of the industry and of important processes for Israel will be discussed. Students will be asked to **participate** in class discussions.**

**Grading:** 100% - Five home projects.

Last updated: August 12, 2015



# Selected Processes in the Chemical Industry

## Fall Semester 2016

### Schedule

Schedule for Semester 1 2016

(Room 4-Tuesdays (1430-1630))

Week	Lecture Date	subject	Due homework
1.	18-10-15	Information Sources	(Room - 2-11:30)
1.	20 -10-15	The global chemical industry	(Room - 4)
2.	27-10-15	The Israeli chemical industry	
3.	3-11 -15	Energy and fuels	
4.	10-11-15	Water	1
5.	17-11-15	Environment	
6.	24-11-15	Recycling	2
7.	1-12-15	Oil and Gas	
8.	15 -12-15	Petrochemicals	3
9.	22-12-15	Potash	
10.	29-12-15	Phosphates and fertilizers	4
11.	5 - 1-16	Bromine	
12.	12- 1-16	Magnesium	5
13.	19- 1-16	Cryogenic Engineering	

Internet sites:

<http://techunix.technion.ac.il/~cerekek/>  
[Moodle](#)

Last updated: August 2, 2015

לקורס יש שני אתרים

# Introduction

Each of the 13 weekly pages is dedicated to one of the class subjects and has the following format:

1. Extended copies of the presentation slides for the weekly class in pdf form (which takes less space)
2. Important additional links
3. Additional reports in some weeks

For those who like to write during lectures it is recommended to print out, in advance, parts of the slides for that week and use the printout for additional notes.

**Note that the number of slides in the internet PDF files is much larger than the number of slides presented in the class.**

The  
End.

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