



SCIENCE AND TECHNOLOGY

Week I

HUM 101
Spring semester 2013-2014



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Lecture hours: Monday 13:00-14:50

Tuesday 14:00-14:50

Office hours: Monday 15:00-17:00

Tuesday 15:00-17:00

Definitions

- **SCIENCE**

- **The intellectual and practical activity encompassing the systematic study of the structure and behavior of the physical and natural world through observation and experiment.**
- The **goal of science** is often to describe, explain, and predict relationships that occur naturally.
- In other words, science tries to explain objects and events.

E.g., How do changes in the kind of soil affect how abundantly mushrooms grow?



Definitions

- **TECHNOLOGY**

- **The application of scientific knowledge for practical purposes, especially in industry**
- The goal of technology is to try and change the relationship that exists to achieve desirable results.
- In other words, technology tries to change objects and events.

E.g., how can we stop mushrooms from growing on lawns?



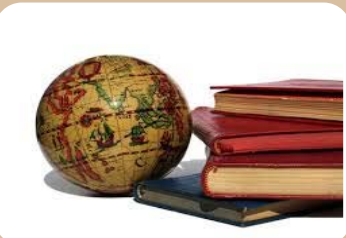
Science vs Technology

- A scientist would attempt to explain how the changes in soil affect how abundantly mushrooms grow.
- A technologist would attempt to develop ways to stop mushroom growth on lawns.
- These fields have much in common. Often the information gathered by the scientist is used by the technologist to make a useful product.



Natural Science

Seeks to elucidate the rules that govern the natural world by applying an empirical and scientific method to the study of the universe.



Social Science

Social science is an academic discipline concerned with society and the relationships among individuals within a society.



Formal Science

Formal sciences are disciplines concerned with formal systems. Whereas the natural sciences seek to characterize physical systems, the formal sciences are concerned with characterizing abstract structures described by sign systems.



Applied Science

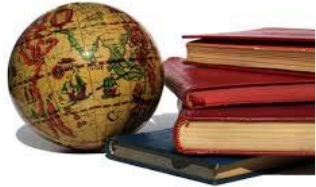
Applies existing scientific knowledge to develop more practical applications, such as technology or inventions.



Natural Science

- Seeks to elucidate the rules that govern the natural world by applying an empirical and scientific method to the study of the universe.

- Physical science
 - Physics
 - Chemistry
 - Earth science
 - Ecology
 - Oceanography
 - Geology
- Meteorology
- Life science
 - Biology
 - Zoology
 - Human biology
 - Botany



Social Science

• Social science is an academic discipline concerned with society and the relationships among individuals within a society.

- Anthropology
- Archaeology
- Business administration
- Communication
- Criminology
- Economics
- Education
- Government
- Linguistics
- International relations
- Political science
- Psychology (especially social psychology)
- Sociology
- In some contexts
 - Geography
 - History
 - Law



Formal Science

- Formal sciences are disciplines concerned with formal systems. Whereas the natural sciences seek to characterize physical systems, the formal sciences are concerned with characterizing abstract structures described by sign systems.

- Logic
- Mathematics
- Theoretical computer science
- Information theory
- Systems theory
- Decision theory
- Statistics



Applied Science

applies existing scientific knowledge to develop more practical applications, such as technology or inventions.

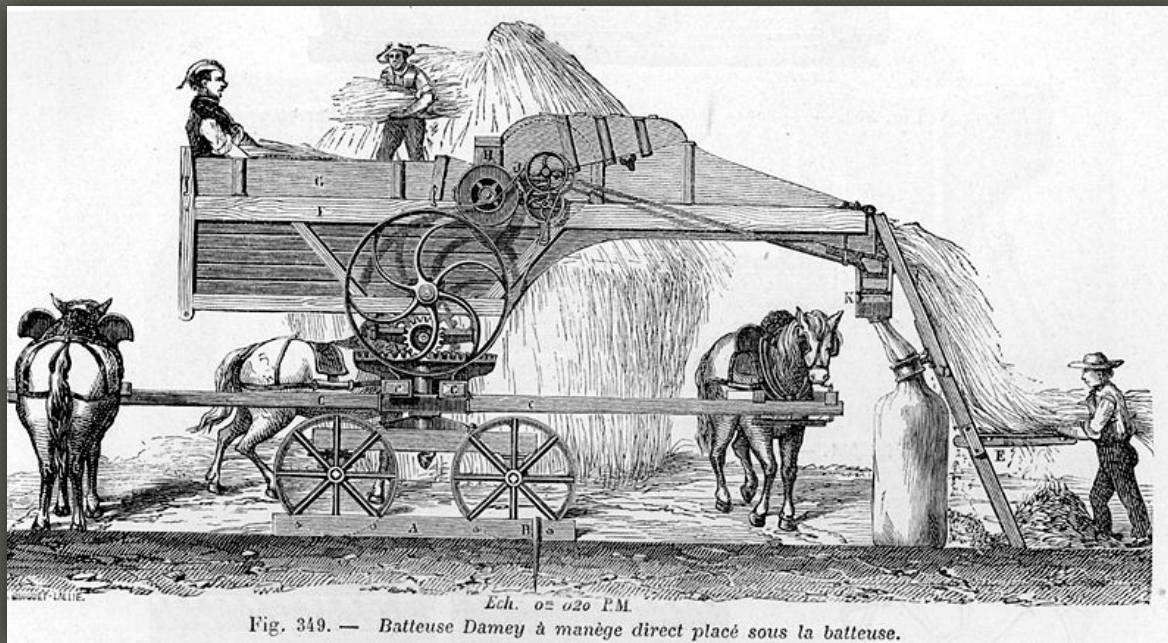
- **Applied mathematics**
- **Applied physics**
- **Medicine**
- **Computer science**

Question!

- Which of the following comes closest to your own view?
 - A. We should emphasize tradition more than high technology.
 - B. We should emphasize high technology more than tradition.

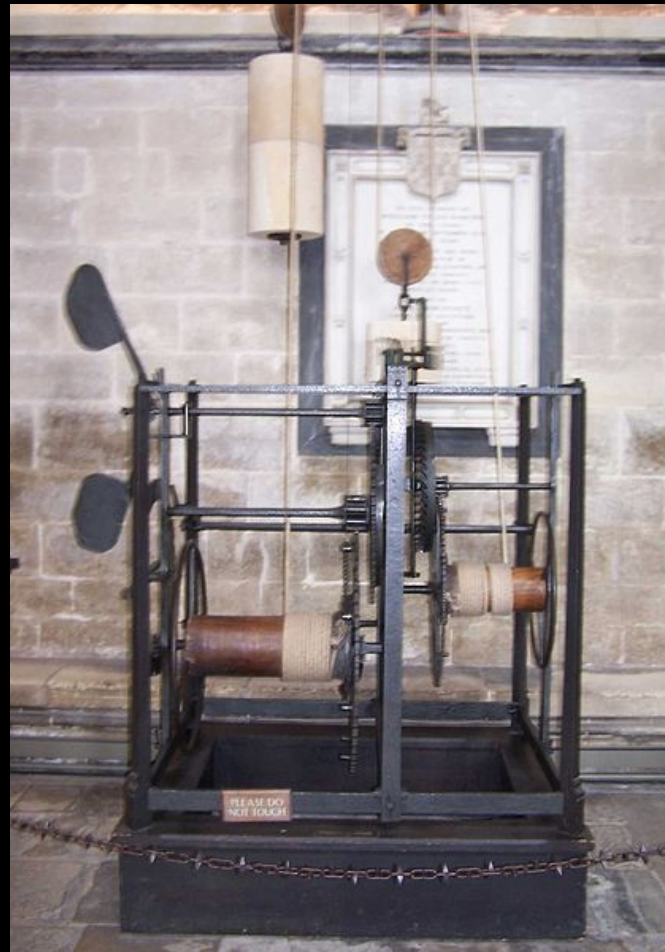
Mechanization

- Dominant in an agricultural society, the use of tools to accomplish tasks previously done by hand.



Salisbury cathedral clock

1386



Automation

- ◉ Dominant in an industrial society, the replacement of human labor with machinery and equipment that is self-operating.



Programmable logic controllers (PLCs)



Cybernation

- Dominant in an industrial society, the replacement of human labor with machinery and equipment that is self-operating.



Self Parking Car



World is getting smaller



- The world was made a smaller place in the late 1800s by the Pony Express.
- Today, the iPhone, combining a number of technological feats, makes the world even smaller.

WORLD INTERNET USAGE AND POPULATION STATISTICS

June 30, 2012

World Regions	Population (2012 Est.)	Internet Users Dec. 31, 2000	Internet Users Latest Data	Penetration (% Population)	Growth 2000-2012	Users % of Table
<u>Africa</u>	1,073,380,925	4,514,400	167,335,676	15.6 %	3,606.7 %	7.0 %
<u>Asia</u>	3,922,066,987	114,304,000	1,076,681,059	27.5 %	841.9 %	44.8 %
<u>Europe</u>	820,918,446	105,096,093	518,512,109	63.2 %	393.4 %	21.5 %
<u>Middle East</u>	223,608,203	3,284,800	90,000,455	40.2 %	2,639.9 %	3.7 %
<u>North America</u>	348,280,154	108,096,800	273,785,413	78.6 %	153.3 %	11.4 %
<u>Latin America / Caribbean</u>	593,688,638	18,068,919	254,915,745	42.9 %	1,310.8 %	10.6 %
<u>Oceania / Australia</u>	35,903,569	7,620,480	24,287,919	67.6 %	218.7 %	1.0 %
<u>WORLD TOTAL</u>	7,017,846,922	360,985,492	2,405,518,376	34.3 %	566.4 %	100.0 %

Question!

- How likely is it that you would be willing to pursue an Internet romance?
 - A. Very likely
 - B. Somewhat likely
 - C. Unsure
 - D. Somewhat unlikely
 - E. Very unlikely

What do you think?

- While abortion has been technically possible for years, millions of the world's citizens live in countries where abortion is prohibited or limited.
- The degree to which technology is good or bad is often a function of time and place.
- Can you name other technological developments that likely to be rejected by large segments of the population?

Postmodernism and the Technological Fix

- **Postmodernism** is the view that rational thinking and science are limited in their ability to provide “truths.”
- Many people think social problems can be resolved through a technological fix:
 - A social engineer might approach a water shortage by asking people to use less water.
 - A technologist would develop new technologies to increase the water supply.

Structural-Functionalist Perspective

- Science fulfills the need for an assumed objective measure of truth.
- If society changes too rapidly, problems may emerge.
- **Cultural lag** is a condition in which the material part of culture changes faster than the nonmaterial part.

Conflict Perspective

- ① Technological advances are motivated by profit.
- ① Funding of research is determined by dominant groups.

Private Industry and Research

- Motivated by profit, private industry spends more money on research and development than the federal government does.



Symbolic Integrationists Perspective

- ◉ Knowledge is relative, it changes over time and between societies.
- ◉ Scientific “truths” are socially constructed and result from interactions between scientists, researchers, and the public.
- ◉ Who becomes involved in what aspects of science and technology is socially defined.

Question!

- Science and technology furthers the interests of dominant groups to the detriment of others. This view is held by which theorists?
 - A. conflict theorists
 - B. structural functionalists
 - C. symbolic integrationists
 - D. strain theorists

Answer A

- Science and technology further the interests of dominant groups to the detriment of others. This view is held by **conflict theorists**.

Teleworking

- A form of work that allows employees to work part- or full-time at home or at a satellite office.

Genetics

- Molecular biology has led to a greater understanding of the genetic material found in all cells, DNA, and with it the ability for genetic screening.
- **Gene therapy** involves identifying defective or missing genes to get a healthy duplicate and transplant it to the affected cell.
- **Genetic engineering** is the ability to manipulate and alter the genes of an organism.

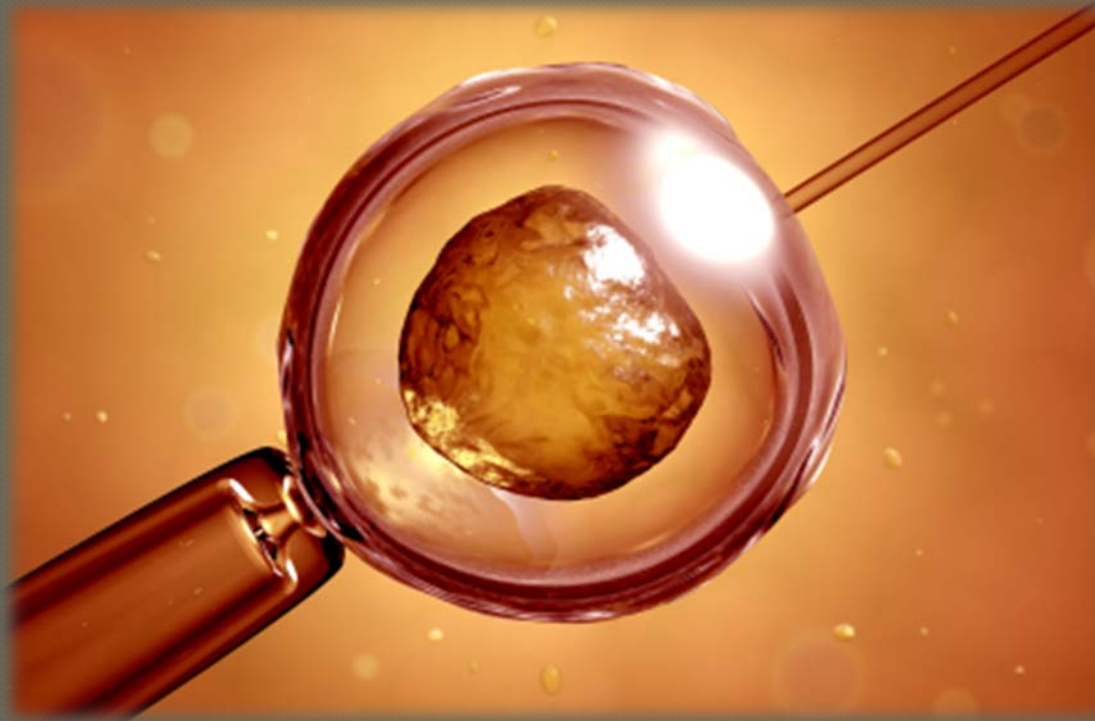
Genetically Engineered Food



- The first genetically engineered crop was introduced for commercial production in 1996.
- Today, there are more than 200 million acres devoted to these crops with the United States being the largest producer in the world.

In-vitro fertilization

- An egg and a sperm are united in a laboratory dish or test tube.



In-vitro Meet

- is an animal-flesh product that has never been part of a living animal with exception of the fetal calf serum taken from a slaughtered cow.
- The first in vitro beefburger, created by a Dutch team, was eaten at a demonstration for the press in London in August 2013.

<http://www.nydailynews.com/life-style/health/world-test-tube-burger-close-meat-short-flavor-article-1.1417763>



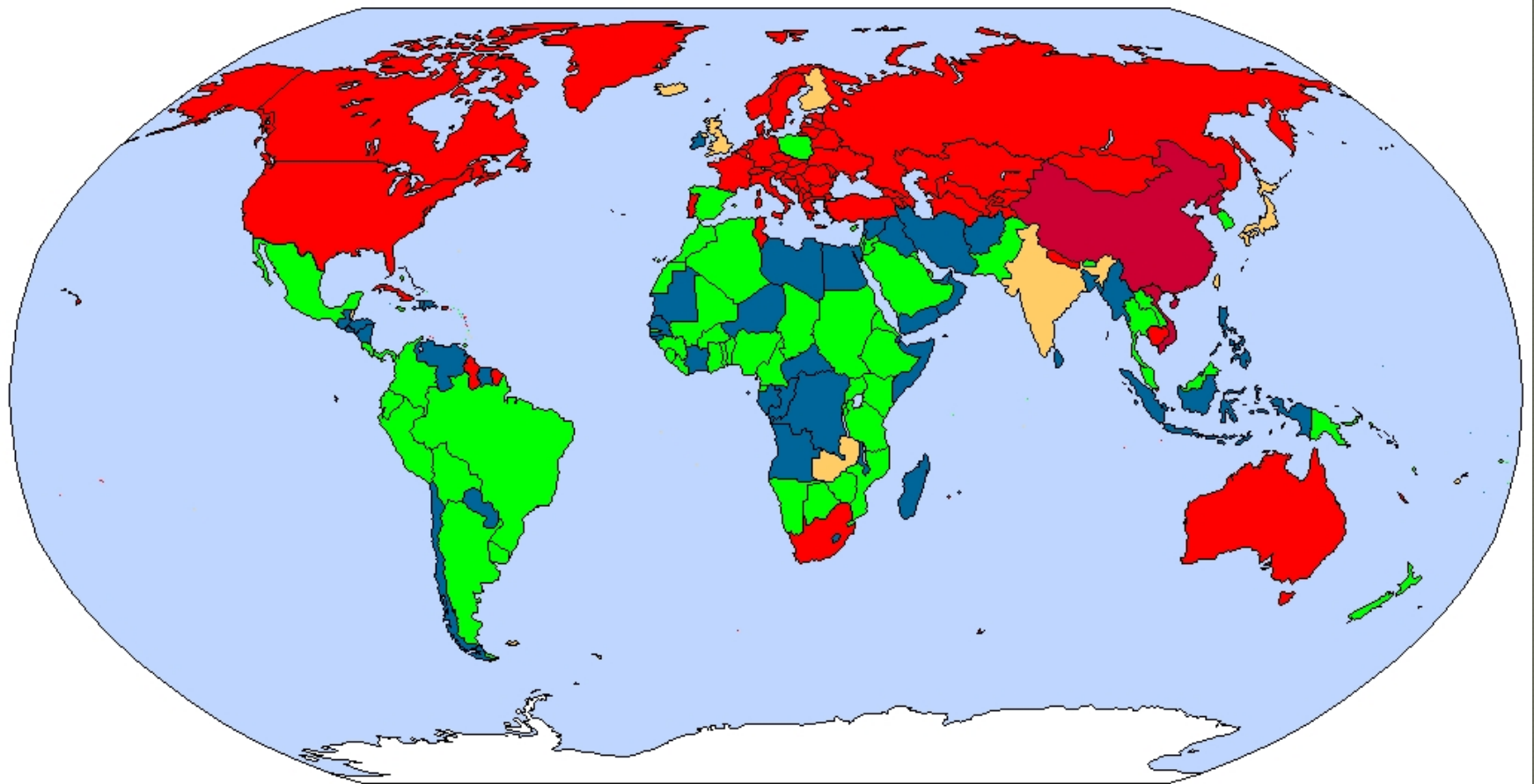
Abortion

- The removal of an embryo or fetus from a woman's uterus before it can survive on its own.
- Intact dilation and extraction (D&X) abortions.
 - Opponents refer to them as partial birth abortions because the limbs and the torso are delivered before the fetus has expired.
 - Performed because the fetus has a serious defect, the woman's health is jeopardized or both.

What do you think?

- If some South Carolina legislators have their way, women seeking abortions will be required to view an ultrasound image of their fetus.
- Mississippi is considering a proposal that would require women to view an ultrasound image of their fetus or listen to the fetus' heartbeat.
- What are the arguments for or against such practices?

<http://worldabortionlaws.com/map/>



- Abortion on demand, some forced abortion
- Abortion on demand
- Abortion for socio/economic reasons
- Abortion for some hard cases
- Abortion banned or permitted only to save mother's life

Worldwide Abortion Legislation, 2007-2011

www.johnstonsarchive.net

Question

⦿ Do you support legal abortion if the women wants it for any reason?

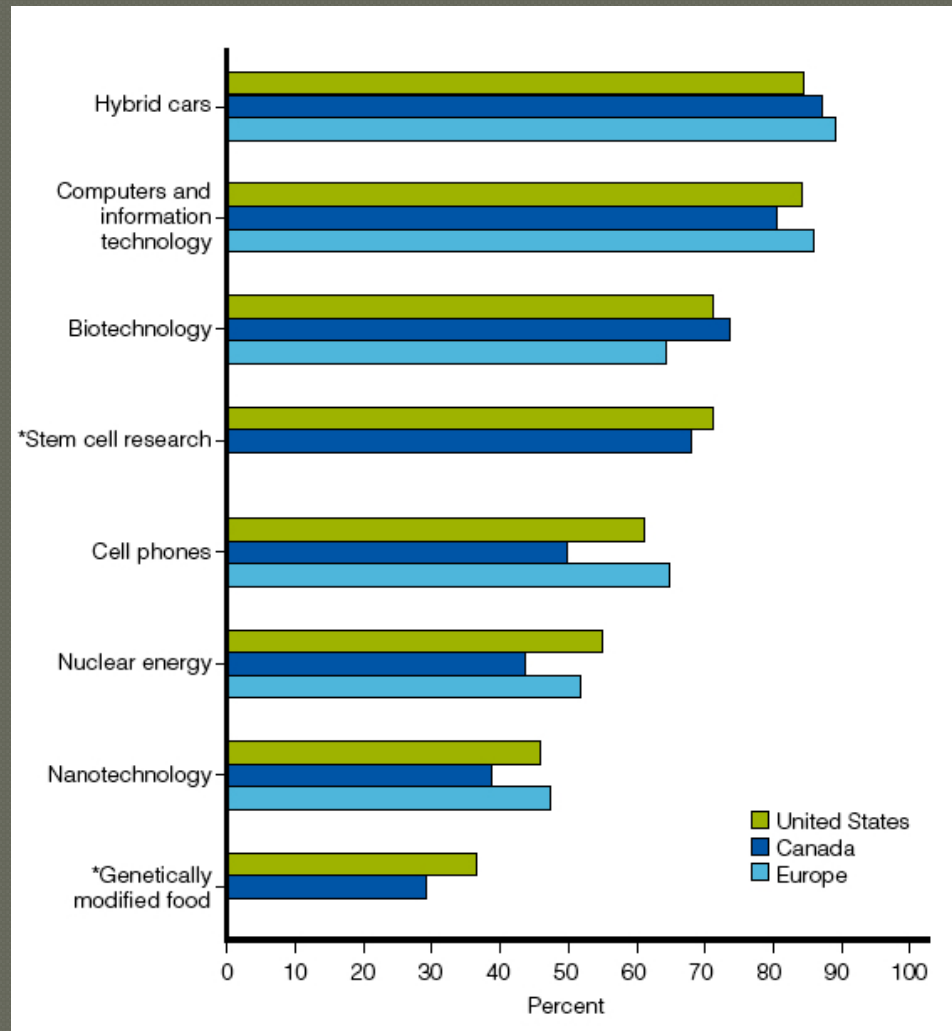
A. Yes

B. No

Deskilling

- Labor requires less thought than before and gives workers fewer decisions to make.
- Upskilling
 - Reduces alienation as employees find their work more meaningful, and have greater decision-making powers as information becomes less centralized.

% Saying New Technologies Will Have a Positive Impact, 2005



What do you think?

- Facebook, MySpace, Xanga, and Bebo are just some of the Internet sites available online for cyber-socializing.
- Do you have a profile online? Is it available to all Internet users or is it restricted access?
- Have you ever felt threatened by any one who contacted you?
- What are some of the benefits and negative aspects of such sites?

What Teens Share In an Online Environment, 2006

- 82% include their first names
- 79% include photos of themselves
- 61% include their city or town 29% include their last names
- 49% include their school's name
- 40% include their IM screen name
- 39% include a link to their blog
- 29% include their email address
- 2% state their cell phone numbers

TASK

- Present the life of the Scientist. Describe his/her theory, invention or study. The main objective should be analyzing his/her contribution to science and technology.
 - Biography
 - Theory
 - Contribution to science
- Be creative, make impressive presentation. There is no limitation in methods; you can present your scientist with using slides, music, short movies.
- Each group has to submit a short report of presentation in written form just after the presentation.
- Duration of presentations is 15 minutes. After presentation there will be 10 minutes discussion, in this part each presenter is going to answer questions.
- These presentations are going to be 20% of the final grade.

GROUP 1
Amel Sisic
Abdulakdir Ozbek
Haris Lokvancic
Nuriye Rumeysa Gungor
Aykut Yilmaz

Albert Einstein
06/03/2014

GROUP 2
Abdullah Omer Kokuer
Dzana Basic
Halid Kasapovic
Mensur Yilmaz
Seyma Balci

Galileo Galilei
06/03/2014

GROUP 3
Nejra Causevic
Adi Hadziibrahimovic
Hamid Badreldin Mohamed
Selma Avdic

Charles Darwin
13/03/2014

GROUP 4
Afra Nur Aydin
Biset Karaarlan
Elif Kayacan
Jana Alba Raguz
Mustafa Sami Akman

Thomas Edison
13/03/2014

GROUP 5
Nedim Ramazanoglu
Muhammed Yasir Yasar
Recep Erman Terzi
Yigit Celik
Aida Bubalo

Marie Curie
20/03/2014

GROUP 6
Ahmad Faress Arab
Amina Basic
Cihan Elcimler
Hakan Atalay
Ibrahim Abu Kharmeh

Al-Farabi
20/03/2014

GROUP 7
Kenan Mulasmajlovic
Mehmet Fatih Selcuk
Suha Enes Karaca
Ugur Deniz Yetim
Alma Subasic

Avicenna
27/03/2014

GROUP 8
Belma Jusufovic
Ahmed Krajcin
Halis Fatih Gundogdu
Oguzhan Turkdonmez
Redzep Hodzic

Rosalind Franklin
27/03/2014

GROUP 9
Yunus Koyuncu
Omer Faruk Akay
Lamija Arnaut
Hamza Cahid Atilgan

Gregor Mendel
03/04/2014

GROUP 10
Tugay Gul
Almir Demirovic
Turhan Mirac Selcuk
Mirac Aydogan
Semih Bolukbasi

Stephen Hawking
03/04/2014

Group 11**Ahmed Botonjic**

Burhan Akyol
Mustafa Acikalın
Tolga Can
Ahmet Cagatay Ozturk

Isaac Newton
17/04/2014

Group 12**Omer Faruk Ilbay**

Halid Kasapovic
Talha Salkaya
Fatih Zengin
Mucahid Enes Ozkan

Johannes Kepler
17/04/2014

Group 13**Elvedin Kahrovic**

Amila Zimic
Ahmet Burak Ceylan
Cumhur Carkungoz
Semhan Bayir

Ernest Rutherford
24/04/2014

Group 14**Elle Vardic-Kajtazovic**

Alija Trncic
Muhammed Ekrem Ozturk
Bisera Berberkic
Omer Faruk Bostan

Muhammad ibn
Zakariya al-Razi
24/04/2014

Group 15**Berk Kanpalta**

Emina Isic
Omer Faruk Ozyurt
Halil Ibrahim Palaz
Ibrahim Abdibegovic

Alhazen
08/05/2014

Group 16**Mustafa Yazici**

Haris Pleh
Dzelila Bjelic
Melika Tursic
Hatice Kubra Dogan

Louis Pasteur
08/05/2014

Group 17**Huma Betul Aktas**

Ahmet Semseddin Turan
Neim Ramazanoglu
Harun Fazlic
Furkan Kose

Max Born
15/05/2014