Round 1 – Physics – multi choice

1) In 1921 Albert Einstein was awarded the Nobel Prize in physics for his explanation of:
   a) Brownian motion
   b) Special Relativity
   c) General Relativity
   d) The Photoelectric effect
   e) The non-stick frying pan

2) The heliocentric model of the Earth and the other planets revolving around the Sun was first theorized:
   a) 3rd century BC
   b) 12th century AD
   c) 16th century AD
   d) 19th century AD
   e) Last Saturday

3) The current president of the Institute of Physics, Jocelyn Bell Burnell, is best known for discovering the first:
   a) quasars
   b) pulsars
   c) black holes
   d) brown dwarfs
   e) women in physics

4) An example of a boson is a:
   a) photon
   b) electron
   c) proton
   d) neutrino
   e) fermion

5) In a standard kitchen sink the main cause of water spiralling clockwise or anticlockwise down the drain is most likely:
   a) the Centrifugal force
   b) the Centripetal force
   c) the Coriolis force
   d) the exact shape of the drain
   e) the full moon

6) A neutron consists of:
   a) an up and a down quark
   b) two up quarks and a down quark
   c) two down quarks and an up quark
   d) two up quarks and two down quarks
   e) two Higgs bosons

7) Overhead power lines are made to sag because of potential problems with:
   a) electrical resistance
   b) thermal expansion of materials
   c) resonance effects due to wind
   d) birds sitting on the lines
   e) aesthetic perception

8) The majority of known exosolar planets to date have been detected by:
   a) observing the change in brightness of the stars they orbit
   b) direct imaging using ground based telescopes
   c) direct imaging using telescopes in space
   d) measuring changes in the position or radial velocity of the stars they orbit
   e) deciphering encrypted messages from aliens

9) The Second Law of Thermodynamics is violated if:
   a) entropy decreases locally
   b) entropy increases locally
   c) entropy decreases globally
   d) entropy increases globally
   e) entropy is ignored completely

10) The existence of Dark Matter was first postulated due to measurements of unexpected:
   a) velocities of stars near galactic centres
   b) velocities of stars near the edge of galaxies
   c) luminosities of stars near galactic centres
   d) luminosities of stars near the edge of galaxies
   e) dark particles

Round 2 - Geography

1) What is the largest lake in Africa?

2) Which is farthest west – Dublin, Glasgow or Lisbon?

3) What is the capital of Albania?

4) Which countries border Luxembourg? (there are three)

5) What does the Greek word 'Polis'mean – as in Metropolis

6) What country's flag flies over the Azores?

7) The Galapagos Islands belong to which South American country?

8) What geographical term is the fourth letter of the Greek alphabet?

9) What US state has the longest border with Canada?

10) What colours are on the Indian flag?

Round 3 – Physics general

1) In which county was Robert Boyle born?

2) Boyle had an assistant in Oxford also with the first name Robert who became famous in his own right for his work on elasticity. Who was he?

3) With whom did Ernest Walton win the Nobel prize for splitting the atom?

4) What is the 2nd nearest star to the Earth?

5) What is the name of the path amongst the stars which the sun follows?

6) Which is the quantity that equals the rate of change of momentum with respect to time?

7) What is the current record for the distance over which teleportation between two atoms has been achieved? (to the nearest metre)

8) Who was the Irish physicist who said: "Theoretical physicists live in a classical world, looking out into a quantum-mechanical world"

9) The charged particles entering the Earth's upper atmosphere, which cause the aurorae at the Earth's magnetic north and south poles, originate from exactly what phenonemon?
(Many answers were accepted for this question)

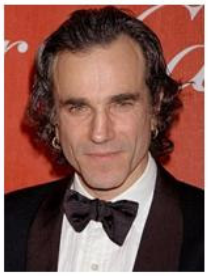
10) What is the name given to a shape which can be split into parts that are at least approximately smaller copies of the whole shape?

Round 4

1. What do you think the circles in this picture are?

2. Who in greek mythology is this cartoon depicting?

3.



4. What artist created this lithograph?

5. What name is given to this remnant of a star's supernova explosion?

6. Name this famous physicist who worked in Ireland

7.

8. What illness are the young people being treated for in this picture from 1938?

Bonus point if you can name the machine

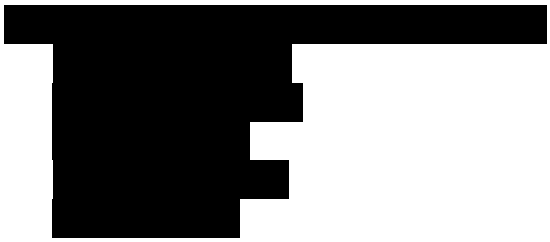
9. What do the red markings illustrate on this world map?

10. Name this sitcom show. Bonus point if you can name the character's first name on the right.

Round 5 - Physics multichoice

1) The formation of protons and neutrons from quarks in the early universe first began roughly:

a) one microsecond after the Big Bang
b) one second after the Big Bang
c) one year after the Big Bang
d) one million years after the Big Bang
e) after the decline of the Holy Roman empire



3) The Navier-Stokes equations would most likely be used in:

a) Quantum Field theory
b) Magnetostatics
c) Optics
d) Fluid mechanics
e) The next Bond film

4) Boyle's law, one of the constituent parts of the ideal gas laws, states that:

a) The volume of a gas is directly proportional to its temperature at constant pressure
b) The temperature of a gas is inversely proportional to the pressure applied for a constant volume
c) The number of gas particles is directly proportional to the volume at constant pressure and temperature
d) The volume of a gas is inversely proportional to the pressure applied at constant temperature
e) No ideal gases exist

5) The most tightly bound nucleus with the highest binding energy per nucleon is that of the isotope:

a) ^{12}C
b) ^{56}Fe
c) ^{62}Ni
d) ^{235}U
e) ^{1}H

6) The time taken for light from the Sun to reach the Earth is about:

a) 8 seconds
b) 8 minutes
c) 8 hours
d) 8 days
e) 8 billion years

7) From previous experiments with particle accelerators and theoretical calculations it is known that the mass of the Higgs boson, if it exists, must be a few hundred:

a) keV
b) MeV
c) GeV
d) TeV
e) kg

8) The average strength of the Earth's magnetic field, when compared to that of an average bar magnet is:

a)several hundred times weaker
b)a few times weaker
c) a few times stronger
d) several hundred times stronger
e)mind-boggingly strong

9) The triple point of water, where it can co-exist as a solid, liquid and gas in a stable equilibrium, occurs at:

a) 0 degrees Celsius and very high pressure
b) 0 degrees Celsius and very low pressure
c) 100 degrees Celsius and very high pressure
d) 100 degrees Celsius and very low pressure
e) absolute zero and no pressure

A p-n junction is most commonly used to form:

a) a battery
b) a capacitor
c) a resistor
d) a diode
e) a way of dispersing traffic on busy roads

Round 6 - Literature/Arts and Entertainment

1) Who wrote 'A Short History of Nearly Everything'

2) What famous mathemetician is represented in the book and film: 'A Beautiful Mind'.

3) What painting movement was conceived by Pablo Picasso and Georges Braque?

4) For which film did Martin Scorcese win his only oscar for best director?

5) What does the name of the Russian newspaper Pravda mean?

6) What Shakespeare play featured Shylock?

7) What is the name of the component in the Delorean (car in 'Back to the Future') that allows it to travel through time?

8) What is the name of the play, written by Michael Frayn, in which the story is told of Neils Bohr meeting with Heisenberg during the second world war.

9) What is the name of Oscar Wilde's only novel?

10) Who wrote the short story 'The Curious Case of Benjamin Button'?

Round 7 Physics general (Round 8 Sound)

1) Quantum theory makes use of 'Bell's Inequality'. Where was John Stewart Bell born?

2) How long is a Martian year? (accept +/- 50 days)

3) What is the only part of the sun which is visible during a solar eclipse?

4) What does the acronym LASER stand for?

5) Which famous Swiss mathematician introduced the two mathematical symbols e and i?

6) What is the name given to quantised modes of vibration occurring in a rigid crystal lattice, which give rise to thermal, electrical, optical and acoustic properties of solids?

7) What would be observed on the screen of a standard double slit experiment if electrons are fired at it one at a time?

8) Which important concept does the first law of thermodynamics essentially state?

9) The statement that the equation $a^n + b^n = c^n$ for integer a,b,c and n has no nonzero solutions for the case n>2, which was finally proven in 1995, is known by what name?

10) Which element is the heaviest that can be made from fusion reactions in stars?

Round 9 Politics

1) Who is the Secretary general of the United Nations

2) What was the name of the Chairman of Anglo Irish Bank who had to resign recently admitting to undeclared loans of over 89 million?

3) What branch of Law did Barack Obama lecture when at Harvard?

4) What year did the Irish Free State officially become the Republic of Ireland?

5) Who is the First Minister in Northern Ireland?

6) What is the name of the main index quoted for the Japanese stock exchange called?

7) Who is President of Russia?

8) What is the name given to the first ten amendments to the US constitution?

9) How many countries are currently in the European union?

10) What is the name of the woman who was held hostage from Feb 2002 – July 2008 by the FARC Guerrilas in Columbia.

Round 10 General/Miscellaneous

1) what does Tira mi su literally mean? (it is an Italian dessert).

2) Where were the 2000 Olympics held?

3) What metal was Danish Astronomer Tycho Brahe's nose made of?

4) What tree's leaves make up most of the diet of the Koala Bear?

5) How long to the nearest day does it take the moon to orbit the earth?

6) Which county won the 2008 All Ireland Gaelic Football final?

7) Name one of the only two places that dogs have sweat glands?

8) Who won Euro 2004?

9) What are the usual 'suits' used in the Chinese game MahJong?

10) From which book by James Joyce was the term 'Quark' taken by Murray Gellmann?

Head to head 1:

1) In what year did Einstein publish his famous papers on the photoelectric effect, brownian motion and special relativity?

2) In Roman mythology who rolled the heavy stone all the way up the hill only for it to fall back down to the bottom?

3) The number 10011 in base 2 represents what decimal number?

4) What woman from Ireland won the gold medal for the pentathlon in the 1972 olympics?

5) What woman was awarded the Nobel prize for Physics in 1903 and for chemistry in 1911?

6) What country is Tallinn the capital of?

7) What were Hamilton's first and second names?

8) Which famous philosopher said 'Cogito ergo sum'

9) What Irish born female crystallographer discovered the structure of Benzene in 1929?

10) Who was the Greek god of Victory?

Head to Head 2 continued:

1) What does Ersatz mean?

2) On the Beaufort scale what number is assigned to Storm force?

3) In a Japanese restaurant what is Unagi?

4) What word is L in the Nato alphabet?

5) Which teams were in the final of the 1994 football world cup?

6) What is the name given to hypothetical particles that always travel faster than the speed of light and have imaginary mass?

7) What type of galaxy is the Milky Way?

8) Who was American President from 1981-1988?

9)What year is the Roman Numeral MDCIV

10) Which important hypothesis did Davisson and Germer confirm with their electron diffraction experiment of 1927?