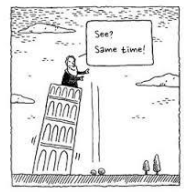
RESULTS OF THE PHYSICS QUESTIONNAIRE FOR FRENCH STUDENTS

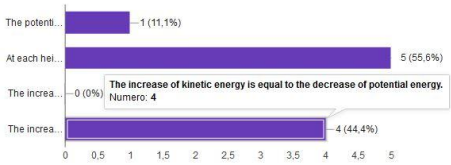
Here is a summary of the results with comments and feed-back for the 10 students who answered (8 have written their name + 2 anonymous)

1) An iron block and a wooden one have the same volume; they fall from a tower at the same time.
(10 risposte)



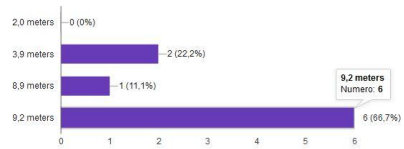
The two blocks arrive <u>at the same time</u> (true if you ignore the fricition).
It was Galileo who first found it out by dropping objects from the leaning tower of Pisa …

2) A stone falls from a height without friction. (9 risposte)



Correct answer is nr.4 .
Nr.2 “At each height, the potential energy is inversely proportional to the kinetic energy” is wrong! This would mean their product is constant, <u>instead it is the sum which is constant</u>!

3) Simon is pushing a 3 kg box on a horizontal floor without friction, applying a force of 13 N in a direction that forms a 77° angle with the floor. If Simon is doing a work of 27J, how much does the box move?
(9 risposte)

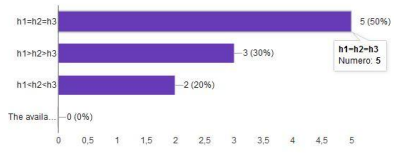


Correct answer: 9,2 m. Here you did very well!!

4) Carlo is quickly climbing the stairs with a speed which is 2 times the speed of Giulio. What can you say about their kinetic energy?
(10 risposte)

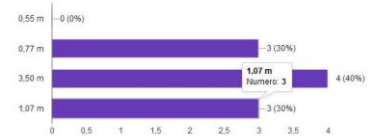
This is a tricky question because you don’t know the masses of Carlo and Giulio, so the correct answer is n.4 (The available info is not enough)

5) Three rubber balls weighing m1 = 0,17 kg m2 = 1,0 kg, m3=1,5 kg, are dropped from the same height without any friction. How are the heights of rebound?
(10 risposte)



Correct answer nr.1 . Most of you were right !!
If there is no friction then the mechanical energy is conserved so the balls will rebound at the same height from which they were dropped!

6) A cart faces a hill with the initial speed of 5 m/s. On the top its speed has reduced to 2 m/s.The chart weighs 90 g. If frictions are negligible, which difference in level has the chart overcome?
(10 risposte)



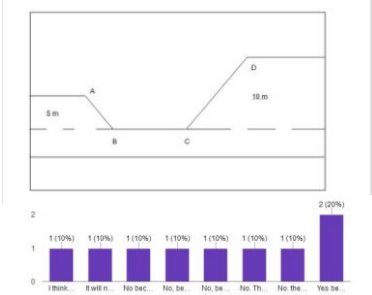
Correct answer is 1,07 m.
If you conserve energy, at the beginning there is only kinetic, at the end there is potential and some kinetic left, you get: h= (25-4)/2g =1,07 m
You don't need the mass of the object to answer.

7) You throw a bouncing ball to the ground with an initial speed of 5 m/s. If there is no friction, will the ball reach the same height as it was thrown? Motivate your answer.
(8 risposte)

No because it also depends to the mass and the speed
No because it also depends on the speed and the mass
Yes because there is no friction so it will lost no speed.
It depends on the angle value between the ground and the launch direction.
No because some of the kinetic energy of the ball is lost during the collision with the floor and the ball will not return to the original height.
Yes. Indeed, if there is no friction, the energie rest the same.
Yes, it can be reach this point because there is no friction so the speed don't change.
no, because my boucing ball has inital speed not equal to zero. the height reached is higher.

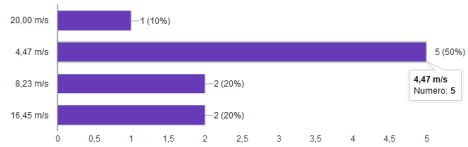
Correct answer: NO
The explanation given in the last answer for on of you is perfect!

8) A ball rolls on this circuit. If the ball has a mass of 1 kg and it starts at point A with a speed of 5 m/s, will it reach point D? Motivate your answer.



Correct answer: NO. Most of you were right!!
Total energy at point A = kinetic + potential = 12,5 + 49 = 61,5 J
Potential energy at point B = 98 J, too big!

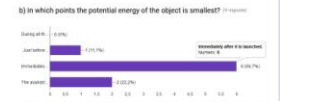
9) A horizontal force of 20 N is applied to a 3 kg box at rest. If the box moves 1,5 m, what is the final speed if there is no friction?
(10 risposte)



Correct answer: 4,47 m/s . Most of you were right!!!
The work done on the box is 30 J and this is its kinetic energy!

10) An object is launched upward. a) If the friction with the air is ignored, its mechanical energy is conserved. In which points the kinetic energy has its largest value?

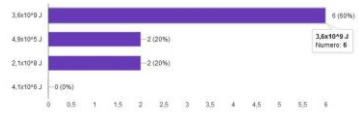
b) In which points the potential energy of the object is smallest?



c) How does the mechanical energy change in time, if the friction with the air can't be ignored?

Well done! Most of you were correct in all three subquestions a), b), c).

11) A plane with a mass of 400 metric ton is flying at an altitude of 3000 feet (one foot = 0,305 m) with a speed of 600 km/h. a) What is the potential energy of the plane?
(10 risposte)



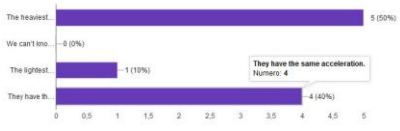
b) What is the kinetic energy of the plane?

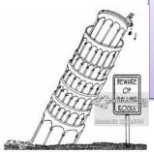
You are very good at conversions! Almost all perfect answers!

12) Which of the following situations doesn't produce about 1 J of work?
(10 risposte)

Correct answer: Work = F * x = 2,7 N X 0,45 m = 1,2 J > 1,0 J

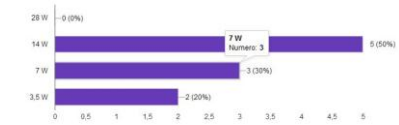
13) If you let two objects with different masses fall, which one arrives to the ground with the largest acceleration (neglect friction)?
(10 risposte)





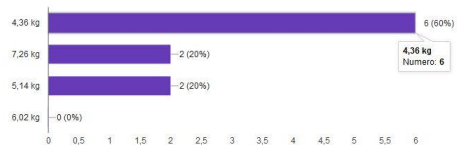
It is Galileo's experiment again… But they tried it on the Moon too!

14) Determine the total power required for stacking 5 bricks of mass 3,5 kg on top of each other, where each has a height 8,2 cm. The average time is 4 seconds.
(10 risposte)



Correct answer: 7 W
This was not easy! You can calculate like this:
Work = g*m*(h1+h2+h3+h4)=
9,8*3,5*(0+0,082+2*0,082+3*0,082+4*0,082)= 9,8*3,5*0,82=28,1 J
Power= Work/time = (28,1 J / 4s)= 7 W

15) A monkey takes a banana and climbes to a branch above him. The branch is distant 4,70 m and the monkey uses a work of 201 J. What is the mass of the banana and the monkey?
(10 risposte)



Correct answer: 4,34 kg. Well done, most of you were right!

THANK YOU VERY MUCH FOR PARTICIPATING
TO THE QUESTIONNARIE.

YOUR THE RESULTS WERE RATHER GOOD !!

HOPE YOU HAD FUN
AND MAY BE REFRESHED SOMETHING ABOUT ENERGY
THAT YOU DID NOT REMEMBER ANY MORE!