Saving Energy Lab Report

Aditya, Jeremy, Nick, Axel

**Objective:** Our objective is the find 3 most effiecient ways to go from Mr. Jared’s class to the gym

**Hypothesis:** My hypothesis is that the first route shall be the most effiecient because by the looks of it, it will take less time and less steps. The second route will be the second most efficient, the third route will be the third most efficient and the fourth will be the last efficient.

**Variables:**

* Independant: The factor we change is the way to go to the gym.
* Dependant: The energy used to go to the gym
* Control: What we control is the starting point and the ending point. We also need to control the lenght of the person’s steps.

**Material List**

* Pedometers

**Method**

* The first route would be going from the back of the school. First when you get out of the door, turn left to the stairs. Go down to the lowest floor where it looks like the back of a canteen. You will then go left, opposite to the direction of the soccer field. You will then see stairs leading to a wide red building, the gym. You should then go down until you reach the gym.
* The second route is going through the canteen. When you get out of science lab, turn right to the stairs. Go down four sets of stairs, now you will arrive at the canteen. Once you are at the canteen, go right where there will be a blue court. Once you are there, there will be a set of stairs to go to the wide red building behind the swimming pool, the gym. Please go down the stairs.
* The third route is going through the stairs from the atrium level. When you get out of Mr. Jareds’s class, turn right to the stairs. But the difference with the second route is that now you should go six sets of stairs. You then should turn right where you will see a swimming pool at the bottom. Behind the swimming pool is a wide red building, the gym. Go down the stairs to enter the gym.
* The fourth and last route is a bit longer but less stairs.When you get out of Mr. Jared’s class, turn right to the stairs. Go down six sets of stairs. When you are there, go to the direction at the back of the stairs where there will also be stairs going down. Go down a total of 18 stairs, once you accomplish that, there will be two directions, right or left. Go to the left where there will be stairs. Once you walk down the stairs, go right where there will be a direction to go left. Go to that direction and go straight, you will then see a red building, the gym. Enter that certain building.

**Criteria C**

**Before Experiment**

What is the difference between time and energy?

The difference between the time and the energy used among the routes is that there are routes which take time longer but energy faster or the other way around. The route that would probably be the fastest and uses less energy would be the first route because it has less stairs and is the most effiecient way. The route which will take the largest amount of energy and longest time would be the fourth route because there is more detail to the route and lots of students or teachers use the certain route. Thinking over this matter is important because we should be aware of the time needed or how much energy it takes. For example, if it takes too much energy, the time will certainly be long.

How did you plan on solving it?

The plan we decided to use is to make a route that would take less stairs because just like the paragraph above, the less the stairs the less the energy is needed. With less energy needed, we won’t get tired easily and it will be more effiecient.

What is the difference between horizontal and vertical?

The difference between horizontal and vertical is that vertical takes more energy. Vertical means the route that goes up, in other words, the stairs. Logically, it would take more energy to go through stairs. Which is why we needed to discover the route which uses more horizontal path ways. But if we go down through stairs, it may take less energy than horizontal path ways.

How you plan on solving it?

The plan we decided to use is to use more vertically down stairs because it would be the most effiecient. Just like route number one, 80 percent of the route is totally going down the stairs. As you can see above, the aim of the route is to go from the science lab to the gym. Which means that most of the routes will consider going down the stairs. Which is why we decided to find the most efficient route, the first one.

**After Experiment**

What happened about energy and time?

After we ran the experiment, we realized that our plan was right.Out of all the routes, route one and three (which has less stairs) was the most efficient ones. Compared to route two and four, the difference is a lot. In route two, it took three calories needed and three minutes while in route three it only took two minutes and two calories. Eventhough the difference is slight, it is still more efficient which is good.

Also comparing route one and route four. In route one it simply took two minutes and two calories while in route four it took four minutes and four calories. These statements are not fake, they have evidence, we did two tests for each route and it is proven that route one and three are the most effiecient over time and energy.

What happened about vertical and horizontal?

Just like we have stated, our plan worked sucessfully even with this matter. Just like our plan, the more stairs the better because we go down the stairs which will take less energy. Route one and three has more stairs and eventually will be more efficient. Going down stairs is more efficient because we are helped by gravity by going downstairs while if we go straight, we use our own force.

**Data Organization**

Test 1st

* Jeremy
  + Time: 2 mintes
  + Steps: 2 76
  + Energy: 3 calories
  + Distance: 0.11 km
* Nick
  + Time: 2 minutes
  + Step: 171
  + Energy: 2 calories
  + Distance: 0.11 km

Test 2nd

* Jeremy
  + Time: 3
  + Steps: 301
  + Energy: 3
  + Distance: 0.12 km
* Nick
  + Time: 1 minutes
  + Steps: 131
  + Energy: 1 calories
  + Distance: 0.10km

Test 3rd

* Jeremy
  + Time: 2
  + Steps: 223
  + Energy: 2 calories
  + Distance: 0.8 km
* Nick
  + Time: 1
  + Steps: 139
  + Energy: 1
  + Distance: 0.5km

Test 4rd

* Jeremy
  + Time: 3
  + Steps: 335
  + Energy: 4
  + Distance: 0. 20 km
* Nick
  + Time: 4 minutes
  + Steps: 200
  + Energy: 4
  + Distance 0.12km

**Data Organization**

**1st Route**

**2nd Route**

**3rd Route**

**4rd Route**

**Explanation**

This is the results of the four tests we ran. As you have seen, route one and three’s bar is less then the other routes. Which clearly states that route two and four is not recomended to go to the gym. Eventhough the time and energy is little, it still makes a slight difference among the four graphs. We saw a pattern from that its gets different from graph one and three to two and four. The pattern is that from graph one and three, the steps and distance are further according to the pedometer but the time and energy are more efficient.

**Evaluation**

From the explanation above, we could see that route one and three is more efficient for both people which were Jeremy and Nick. Eventhough Nick mostly got less numbers for all areas, the numbers are mostly constant for Nick. Jeremy’s steps are more, time and energy are more but it doesn’t make much difference because what matters is the route which is most efficient, the first and third.

**Conclusion**

In conclusion, our hypothesis is mostly correct because our hypothesis stated that route number one will be more efficient. But from the data derived, route number one isn’t the only one that is efficient, route number three is also efficient. But the fact that we assume that route 2 and 4 is the most inefficient route is true because route 2 and 4 is the most inefficient.

**Evaluation**

What we could have improved was determining the movement speed of the person because as they try different routes, Jeremy and Nick got tired and became neither slower or faster. We should have let Jeremy and Nick rest for a while before running the next routes. But we just didn’t have time to do that because we had to rush.

**Extension**

Another experiment that is similar to this would like to find the most effiecient route from the library to the soccer field, or to find the most efficient route from the dorm to the lobby. The way to run the experiment and to make the method will be similar because it will be dealing with time, energy and others.