



Comparing the ratio of Aluminum migration to  
the food from different kinds of aluminum foil

***ISO School- Jordan***

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**Team members grade: 7<sup>th</sup> Grade**

**The StarT theme to which the project is linked: My LUMA**





## Project diary

We came up with the idea of this project when we noticed the high using of aluminum in different sectors in Jordanian society.

Aluminum could be dangerous, it was proved that if aluminum transferred to our food and into our body, it could move to our brain in certain places, and this might lead to

**Alzheimer's disease.**

		
Aluminum pot	Aluminum foil	Aluminum tray

**The aim : to compare the percentage of aluminum migration to food .**

### **Our hypothesis**

**The Aluminum foil that we use for rapping our sandwiches has more carry-over ratio for food than an aluminum pot; it might be as we think because aluminum foil has the least thickness and the least price, while aluminum pot has most thickness and most price.**



**1<sup>ST</sup> January 2022**

**We started a ZOOM meeting because of quarantine (Covid 19 ) , and discussed the idea of the project. Our idea was to compare three types of aluminium (Aluminum foil, Aluminum**

pot, aluminium tray ) and see which one has the most carry-over ratio to food when it's used for cooking or rapping.

7<sup>th</sup> January .2022



We went to our school (ISO SCHOOL) and discuss about the chemistry of aluminum with our teacher Mrs Hadeel .



In the amazing library in our school , We started our scientific journey with a literature review about aluminum foil and its expected effects on our health.

The research plan is clear now , We designed the our controlled scientific experiment and determined its factors.

**15<sup>th</sup> January .2022**

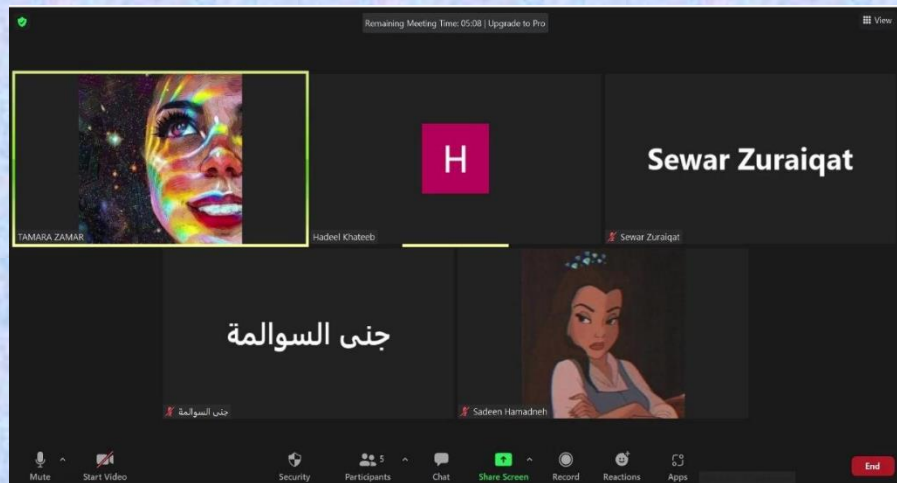
After completing the scientific reading, we went to the school laboratory to make a prototype before the real laboratory work. The work lasted from 9am to 3pm and during that time we got lots of new information with the help of the professionals and by ourselves.



**25<sup>th</sup> January .2022**

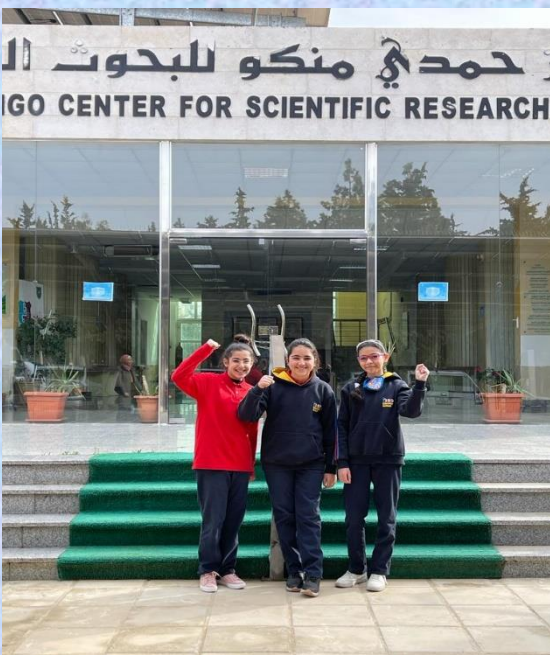
Today's work meeting was held from home via zoom. Our meeting lasted for two hours and during that time we planned the backgrounds of the

**project . And we decided to go to the Nanotechnology Centre on 1<sup>st</sup> February . 2022.**



**17<sup>th</sup> February .2022**

**On a beautiful scientific day, and at the University of Jordan, specifically at the Nanotechnology Research Center, the doors to implement the idea of the project were opened for us. We brought with us various aluminum foils and the actual project was implemented.**

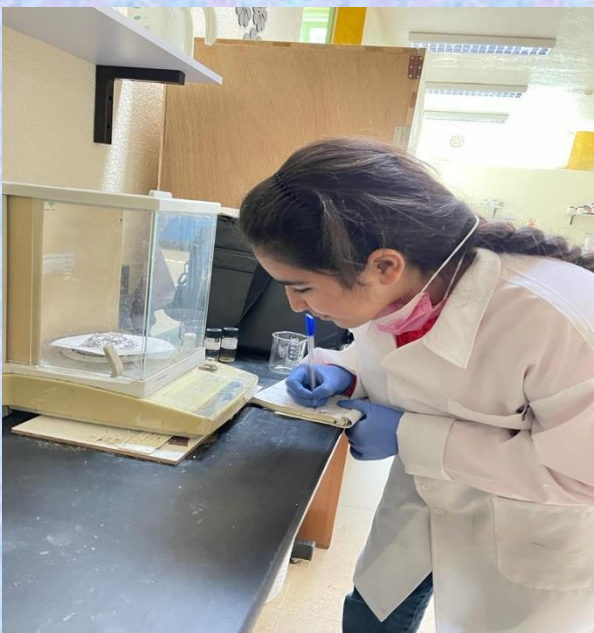


## Experimental Part

**1-Cutting the three types of aluminum (aluminum pots / aluminum tray / aluminum foil) Into small pieces to control the surface area of aluminum foil products.**



**2- Weigh equal masses (approximately 2 grams) of the three types of aluminum foil using the analytical balance.**



**3- Preparing a solution of dilute acetic acid with a concentration of 3% using pipette and volumetric flask .**



**1- Add 35 ml of the dilute acetic acid (3%) solution to the beaker containing of small particles of the aluminum using the pipette.**



**2- Heating the mixture 10 minutes at 80 °C .**



**3- Withdraw 10 ml of the acidic solution after heating it with the aluminum foil sample, and keep it in samples' examination vessels.**



- 4- The experiment was repeated twice for all types of aluminum foil to obtain accurate results.
- 5- The procedures were carried out for a control sample that did not contain any type of aluminum foil.
- 6- Work has been completed at the Nanotechnology Center at the University of Jordan.

**We went to the RSS  
On 17th February 2022, we  
decided to go to the (Automated  
Chemical Laboratories) in the  
(Royal Scientific Society) in order  
to test the -aluminum and acetic  
acid- samples we took at the  
(Nanotechnology Center) and to  
find out the concentration of  
aluminum in it using the  
(Inductively coupled plasma mass  
spectrometry).**





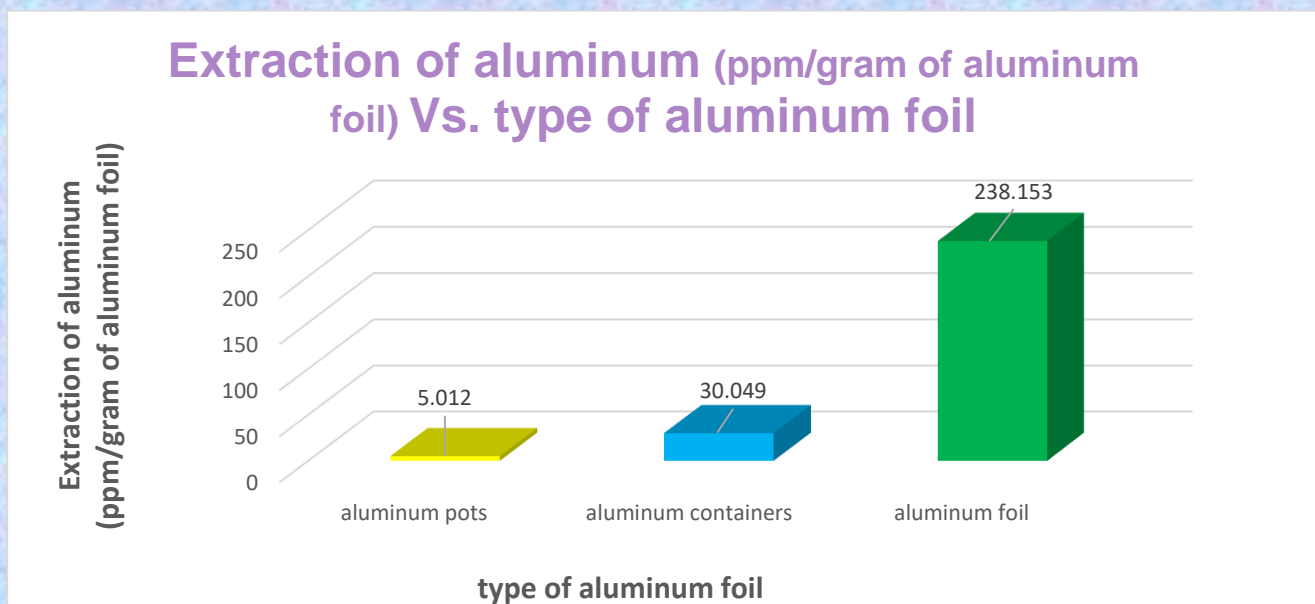
**1 – Arriving to the (Automated Chemical Laboratories)**

**2 - We learned more about (ICP-MS) and how does it work.**

**3 & 4 - Dr. Abdul-Hadi Lafi giving us a lecture about the center's functions and machines.**

**“Results are available now!”**

On 20<sup>th</sup> February 2022, we received the results of the analyzes from the (Automated Chemical Laboratories) that show which type of aluminum is the most harmful to the human body and migrates the bigger aluminum percentage to the food, and the results were like this:



**5 & 6 – The results in a form of graph.**

The results showed that the most harmful type of aluminum is the –aluminum- foil with a high migration ratio of aluminum to the food, while the least harmful type of aluminum is the -aluminum- pot with a low migration ratio of aluminum to the food.

We were very pleased and happy with the results of this experiment, because it agreed with our project hypothesis which said that the most expensive type of aluminum migrates less aluminum percentage to the food, and as we all know that aluminum pot is the most expensive -aluminum- type in the markets though it is the safest.



**Working on the project report in school...**

**Each of us wrote a part of the project report previously, but in order to edit it and make a final copy of it we decided to gather in our school after finishing the**

**classes on 28<sup>th</sup> February 2022.**

**7 & 8 – Project report in progress!**



**9 – Short break from work...**

**Making the project poster...**

In the last week before the (Luma Star T) competition we planned to make a different poster from other schools by making it from A - Z by our hands, starting from choosing the colors of the poster and ending by sticking the important logos on it.



10 – Choosing the poster colors.



11 – Cutting the papers with the main ideas and making a frame for them.



**12 – Sticking the scraps and the logos.**



**13 – Finally... The poster!**

19<sup>th</sup> March . 2022

The day of discussion has come, we went to the university of Jordan and it an amazing day.



## Recommendations

- 1) Aluminum foil should be used only for packaging food not for cooking.
- 2) If we had to use the aluminum foil we can isolate the food by butter paper or banana's leaves.



## OUR REFERENCES

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- Mayo Clinic / Alzheimer's disease  
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THANK YOU

