International Research Session for Next Generation 2017 Poster Abstracts

ESD

No	Subject	School	Presnter		
1	BETWEEN TRADITIONAL FISHING AND RESORT DEVELOPMENT	Chiba Prefectural Narita Kokusai High school	KOYANO Kaho	KOZASA Rinako	SHIINA Hikari
2	Brexit and Impact on Japan	Shibaura Institute of Technology Kashiwa High School	TAKAHASHI Tomoya	FUKUI Ryuma	
3	Bubble Economy	Shibaura Institute of Technology Kashiwa High School	YASUNISHI Yuki		
4	Chiba Reimei High School 2017	Chiba Reimei High School	YAMADA Hideto	SATO Manami	HATAKEYAMA Hayate
			SUGA Sana	SUGAWARA Daiki	
5	Culture of STAND UP MEALS	Makuhari Junior and Senior High School	OTAKE Yuki	KUDO Kaya	MAKINO Misa
			HASHIMOTO Manami		
6	Does true coexistence really exist?	Chiba Prefectural Narita Kokusai High school	ITO Miyu	NOZAWA Kira	MATSUTA Megu
			MIYAZAKI Saya	WATANABE Momoka	WATANABE Yukino
			TAKEUCHI Aika	KHALID Zain	
7	Dream・Enthusiasm・Challenge ～Enjoy learning and open up the future～	Nagareyama Otakanomori High School	HIRAOKA Karen	MIYAUCHI Kotomi	YAMAMOTO Uta
			NISHIGAKI Moe	MARUTANI Yuna	TANAKA Runa
8	Education in Japan	Chiba Prefectural Chiba Higashi High school	KOSHIZUKA Aya		
9	ESD in Sakura Minami High School	Chiba Prefectural Sakura Minami High school	CHINEN Yumi	MAGARA Machiru	YOKOYAMA Keisuke
			KOUBO Kanki		
10	Fair Trade in the Future	Ichikawa High School	ISHIDO Ikoi		
11	Global Leaders from Japan!	Reitaku Junior & Senior High School	ITO Akane	KAWAHARA Hitomi	
12	HOW TO TELL MORE PEOPLE ABOUT WAR	Chiba Prefectural Sakura High school	NAKAZONO Yuna	TAKITA Sae	WAKI Chihiro
			KIMURA Hitomi	HOYA Keito	
13	How would the ideal tourism development look?	Chiba Prefectural Narita Kokusai High school	KAWABATA Yui	SUZUYA Akihiro	HARADA Yukako
14	2016-2017 About our resarch	Chiba Prefectural School for the vidually impaired	ISHI Genki	ICHIKAWA Ryosuke	MIZUOKA Asami
15	Ichihara Chuo High School Activity report	Ichihara Chuo High School	KASHIWABARA Miyu	JANG Taehyun	

No	Subject	School	Presnter		
16	Japanese Blood Donation 〜Until Now and Into the Future〜	Ichikawa High School	SATI Yuhi		
17	Japanese Fermented Foods	Chiba Prefectural Yakuendai High school	YOSHIZAWA Rei	NISHIMOTO Yuri	NEGISHI Rei
18	Japanese live together with foreigners	Chiba Prefectural Narita Kokusai High school	UMEDA Maika	AIKAWA Misa	ITO Nozomi
19	LEARN FROM YOKAI 〜THE DIFFERENCE BETWEEN JAPAN AND OVERSEAS〜	Chiba Prefectural Sakura High school	UEDA Ibuki	NODA Ryoma	
20	Newspaper During WW Ⅱ	Shibaura Institute of Technology Kashiwa High School	SUEHIRO Taketo	TERADA Kento	YAMAZAKI Yuki
21	Only learning English will become obsolete	Chiba Prefectural Chiba Higashi High school	KANEKO Emi		
22	Origin of Japanese	Shibaura Institute of Technology Kashiwa High School	SAITO Motoki		
23	The Best Choice of Evacuation Routes	Chiba Prefectural Sakura Minami High school	TANIFUJI Momoe SAKURAI Tasuku	IZUMI Nao OONO Takahiro	TSURUTA Jukiya
24	The efforts of JICA in Africa and future international cooperation	Chiba Prefectural Chiba Higashi High school	KAMIYAMA Yuriko		
25	THE TRANSITION OF THE LAW SYSTEMS IN JAPAN	Shibaura Institute of Technology Kashiwa High School	IIDA Sachiyo	SATO Asami	SATO Takumi
26	TTBiz Program	Ichikawa High School	OSAKI Tomoyo		
27	What do you think is Japan like?	Chiba Prefectural Chiba Higashi High school	HASEBE Mao		
28	What we can do to make a sustainable society	Chiba Prefectural Kamagaya Nishi High school	ARISAKA Miyuu SAKAKI Natsuki	HOUKOU Marin	FURUKAWA Saya
29	WHY THE YOUTH ARE ATTRACTED TO ISIS	Shibaura Institute of Technology Kashiwa High School	KUROHA Satoru	YOSHIOKA Yuya	

AP Physics

No	Subject	School	Presenter		
1	The Darkness Sensitizes the Phototaxis Sensitiveness of The Stink Bug	Chiba Prefectural Sakura High school	KASHARA Yuichiro		
2	ばね電話	Ichikawa High School	NEKOMOTO Rin	OMORI Hanaki	
3	ジュールーフシーフを用いて乾電池から エネルギーを引き出す	Ichikawa High School	INOUE Yuki		
4	Water drops on various surfaces	Ichikawa High School	MASUDA Syoujun		
5	Stability of Chinese yoyo	Ichikawa High School	AKINO Toshimune		
6	Angular Velocity and Record time of Eddy	Chiba Prefectural Chosei High School	MUTO Sayaka		
7	Ultraviolet radiation intensity in several different conditions	Chiba Prefectural Chosei High School	KOIDE Makiko		
8	Siphon Principle	Chiba Municipal ChibaHigh School	OHTSUKA Kouki	OWA Takuji	
9	Shape of instruments,Material and Tone	Chiba Municipal ChibaHigh School	IMURA Miu	KIKUNO Haruto	
10	Congestion caused at Junctions	Chiba Municipal ChibaHigh School	MIZUKAMI Shouhei	KOJIMA Takuma	
11	Relation between a rise and the lift	Chiba Prefectural Yakuendai High school	YOSHIDA Hisanari	NAGAI Akira	
12	Visualization of an earthquake wave	Chiba Prefectural Yakuendai High school	MATSUDA Kaede IWAASA Hiromasa	DOBASHI Ryouya KAWAJIRI Kanae	WASHIZU Takato
13	Study of Dye-sensitized Solar Cells	Chiba Prefectural Awa High school	KAGEYAMA Takumi	KAWABATA Yuta	KANSAKU Yoshitaka
14	Study of Piezoelectric Element with Sodium Chloride	Chiba Prefectural Awa High school	KOICHI Ryosei		

AP Chemistry

No	Subject	School	Presenter		
15	Bouncing Jet	Ichikawa High School	MURAKAMI Masaki		
16	Making of Cellulose Nanofiber	Ichikawa High School	HAGIMORI Ayumi	YAMAMOTO Kaho	
17	The stickiness of Natto ～The reason of mixing NATTO～	Chiba Prefectural Chiba Higashi High school	NAKAO Shiho	OKIKAWA Yuki	
18	Generation of Sodium Carbonate by Leblanc Method	Shibaura Institute of Technology Kashiwa High School	TAKAHARA Masaki	KANO Kazuma	
19	Synthesizing amino acids applying Miller-Urey Experiment	Shibaura Institute of Technology Kashiwa High School	HASHIZUME Masafumi MATSUMOTO Naoya	FURUKAWA Takahiro	FURUYA Kazuma
20	The sterilization action of Polyphenol	Shibaura Institute of Technology Kashiwa High School	OOHATA Youhei	KASAO Shunsuke	KURAMOCHI Yusuke
21	Let's make a strong soap bubble!	Shibaura Institute of Technology Kashiwa High School	KAJI Yuki	KISHINAMI Akane	CHIBA Yukina
22	Produce of Preserved Flower with Natural Dye	Chiba Prefectural Awa High school	NISHIMURA Hoshimi		
23	Study of Optimal Planting Time of a Fuel cell Catalyst	Chiba Prefectural Awa High school	NEMOTO Masahiro	KONDO Kazuki	
24	Study of the Biodegradation of Artificial Salmon Roe	Chiba Prefectural Awa High school	CHUGO Soma	KAMIYAMA Yosuke	

AP Biology

No	Subject	School	Presenter		
25	Effect of footbath on body temperature, blood, pressure and pulse	Chiba Prefectural Higashi Katsushika High school	TAGUCHI Rin		
26	Relationship between atmospheric pressure and headache	Chiba Prefectural Higashi Katsushika High school	IMADA Akane	INOUE Hiro	AISO Rina
27	Plants grown up restraint action and recycling by coffee	Ichikawa High School	SAKAI Takuto		
28	Antibacterial effect Phelldendron amurense	Chiba Prefectural Chiba Higashi High school	MIYAZAKI Hirokazu	KIMURA Aoi	KAIZUKA Haruka
29	Eatable flower	Chiba Prefectural Kisarazu High school	ABE Yayoi	KITAMURA Aoi	KUWADA Momoka
			YAMADA Nene		
30	Japanese Rice	Chiba Prefectural Kisarazu High school	SAITO Tamano	KANEKI Rena	TAIRA Sachiko
			MIDORIKAWA Mahiro		
31	The ecology of loggerhead turtle	Chiba Prefectural Kisarazu High school	UNOKI Mio	KAGEYAMA Yui	OKUNO Takumi
32	The genelation of LM pectin under several conditions	Chiba PrefecturalChosei High school	KOIDE Mana		
33	The Growth of Kaiware Using Different Liquids	Shibaura Institute of Technology Kashiwa High School	ASAOKA Haruka	ENOMOTO Yuki	
34	What Kind of aqueous Solutions can Grow Spring Onions Faster?	Shibaura Institute of Technology Kashiwa High School	SAITO Haruka	SANO Yuka	TAKENAGA Saki
			MIZUKOSHI Saki	YAMAMOTO Yuzuki	
35	Whether Drosophila Grows Big	Shibaura Institute of Technology Kashiwa High School	SOMEYA Kyoka	NAKAZAWA Sayaka	WATANABE Hodaka
36	Study of Chlorophyll	Chiba Prefectural Awa High school	SUZUKI Moe		
37	Differntial sensitivity of trypsin digestion of egg proteins caused by its cooking methods.	Toho University attched Toho High School	ICHIJO Sayori		

AP Mathematics

No	Subject	School	Presenter		
38	The Decimal Parts of Powers	Shibaura Institute of Technology Kashiwa High School	KATO Taiki	KAWAZU Akihiro	KEITOKU Ryo
			YAJIMA Tomoaki		
39	Was the Fermat's margin really narrow?	Shibaura Institute of Technology Kashiwa High School	OTAKI Tomoya	KAMIMAE Masatomo	KUBOTERA Kei
			KOBAYASHI Fumiya	TACHIBANA Takuro	

<< *Brexit and Impact on Japan*>>

Shibaura Kashiwa Institute of Technology High school

<<Member>>

2-4 Tomoya Takahashi, Ryuma Fukui

<< Introduction>>

The motive that we tried to research this topic is that the U.K. withdrew from the EU.

<<Content >>

・The purpose of the EU

・Changes of the EU member states

ECSC:6 countries

↓

EU:28 countries

(1951)

(1973)

(2013)

・History of the EU

1. The Establishment of the ECSC
2. The Establishment of the EEC, EURATOM and EC
3. The Establishment of the EU

・Until the U.K. becomes the EU members

1. British conditions in those days
2. Establishment of the EFTA
3. After

・The reason why the U.K. would perform a referendum of the EU secession

・The result of the referendum

POLL		
	Votes cast	%
Remnant	16,141,241	48.11%
Defection	17,410,742	51.89%
Ballot	33,578,016	100.00%

・The factor of victory of the EU secession group

・What effects are there in Japan?

<< Consideration >>

<<Reference>>

http://www.y-history.net/appendix/wh1701-055.html
http://www.mofa.go.jp/mofaj/area/eu/index.html
http://manapedia.jp/text/1348
http://www.y-history.net/appendix/wh1701-055.html
http://www.bbc.com/japanese/features-and-analysis-3662834
3
http://www.yamamototetsu.com/entry/ridatsu-eu

BETWEEN TRADITIONAL FISHING AND RESORT DEVELOPMENT

NARITA KOKUSAI HIGH SCHOOL

KOYANO KAHO
KOZASA RINAKO
SHIINA HIKARI

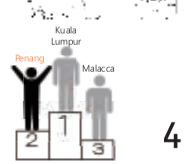
01 Introduction

We went to Malaysia to study about relation between development and environmental problems.

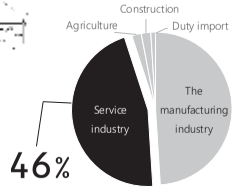
02 Story of Penang

Trading port in the colonial period by the U.K.

Grew up by the manufacturing and service industry

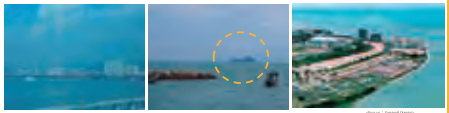


▲The popular states to foreign tourists

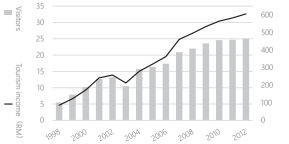


▲Industrial structure of Penang state

03 Current situation of resort development



▼Trends in the number of visitors from overseas & tourism income in Malaysia



Resort development is **essential** to the Malaysian government

04 Crisis of traditional fishing

DEVELOPERS — Construct condominiums

GOVERNMENT — Supports development

DEVELOPERS — Reclaim land

FISHERMEN — Have to go far

FISHERMEN — ①Demonstrate against government ②Plant mangroves ③Establish "PIFWA"

Give land transfer for resort development!

Sea — Be polluted

Mountains — Be leveled

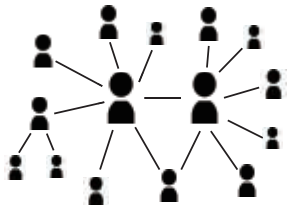
Costs of fuel — Increase

Marine animals — Can't live

Forests — Be destroyed

Price of fish — Rise

05 Conclusion



Environment is something that always exists around us

It is also relevant to **Japan**

Chiba Reimei High School 2017

Activity 1

Volunteer work (communication with the community)

Learning support at primary school

Open-school lecture at PC room

Seeing off athletes leaving for Rio-Paralympics (at the Narita international airport)

Event staff for child Footballers under the age of 6 (from the soccer club)

ESD that serves community needs

What can I do?

Welcoming regional primary school students as their field trip

Other volunteer activities

- Kids summer camp leader
- Helping regional events
- Interaction with Sodegaura special support education school
- Volunteer staff for elections
- Managing flowers with JEF UNITED CHIBA and Chiba city
- Special Olympics Program
- Street fund-raising for Red Feather Campaign and Year End Campaign
- Volunteer staff for regional joint antidisaster drill
- Volunteer staff for the regional public library etc..

Activity 2

Program focusing on international understanding

Bruce H.Bessert,professor from Concordia University, visiting our school and attending calligraphy and English class.

Activity 3

Program for preparation against natural disasters

School trip (to see areas devastated by the Great East Japan Earthquake) Interaction with TORYO HIGH SCHOOL at Miyagi prefecture.

Outcome

Practicing ESD gives us a sense of exaltation, which is totally different from what we feel from conventional lectures. ESD provides invaluable opportunities for students to feel and think about our community,which are only accessible outside the classroom.Through the program,many students starts to think "what can we do for our society?" and "how can we contribute to our society?" as they develop a greater sense of responsibility as a member of the society, as well as awareness of current problems in society.

<<Bubble Economy >>

Shibaura Institute of Technology Kashiwa high school

1-5 Yuki Yasunishi

<<Summary >>

・What is the bubble economy?

・The bubble economy that happened in Japan

<< Introduction >>

I have heard the name called "the bubble economy" many times.

However, we don`t know what triggered the babble, and what kind of things happened in detail. Therefore I intended to check "bubble economy" in this study.

<< Research Content >>

At first I checked the basic of bubble economy from the three viewpoints according to principle, outbreak, and the collapse. I checked what the state called "the bubble" was on the principle of the economy. I clarified how the bubble occurred and what triggered the collapse of the babble. And I checked the bubble economy that ever happened in Japan concretely.

<< Result >>

At first I knew that babble is the state that real estate, stocks price greatly became estranged from an original price with "the bubble economy", and continued rising.

I found that the occurrence and collapse of the babble economy was related to the psychology of investors. When the rise in price happens, investors expect a further rise and purchase stocks and real estate. It causes further hike price, and a price soars. Many inventors do the same, and the rise in price happens so as to be abnormal. However, the price decreases when the price will not rise anymore when a certain investor turn to a seller from a buyer. Because other investors suppress the loss of own, they sell the stock which they have in sequence and cause the sudden fall of the price. This is rough flows from bubble outbreak to collapse.

The price of real estate caused bubble economy in Japan. Because Japan has little land which can be used effectively, "Land myth" that the land in Japan rises in price by all means as economy of Japan develops, and "The money management" by borrowing money, and increasing money for investment in land or stocks is one of the factors that bubble economy accelerated. Because the bank believed "Land myth", they were able to borrow money to a security in land. They borrow money from the bank, and buy land, and borrow money again... The bubble went up by repeating this action and has finally collapsed. As a result, this will build the mountain of the debt more than 1 quadrillion yen.

<<Consideration >>

I understood that the bubble economy happened by the psychology of investors. In addition, when the debt that became the problem of Japanese economic increased rapidly then, I found it and was surprised.

I would like to keep checking the bubble economy that collapse can expected in China near future by using this study and want to check it from now on.

<< Reference Literature>>

・好景気不景気ウォッチング
http://www.parof.jp/global-economy/27.html

・ウィキペディア
https://ja.wikipedia.org/wiki/%E3%83%A1%E3%82%A4%E3%83%B3%E3%83%9A%E3%83%BC%E3%82%B8

・バブル崩壊 RHAPSODY
http://www.bubble-break.com/chapter01/02beginning.html

・日経 Biz アカデミー
http://bizacademy.nikkei.co.jp/

Narita Kokusai High School SGH

Does true coexistence really exist?

What is "coexistence"? We had an image that people understand the differences with each other and build a good relationship. However, we realized it was not so simple through Malaysia Fieldwork…

Public School
SMK Sungai Pelek

Malaysia

- Capital City Kuala Lumpur
- Population 29,950,000
  - ↳Malays 67% Chinese 25% Indians 7%
- National Religion Islam……etc
- Language Malay (National Language), Chinese, Tamil, English

Private School
Seri Cahaya School

	Public school (SMK Sungai Pelek)	Private school (Seri Cahaya School)
Language used in classes	Malay	English*
Casual conversation	Malay, Chinese Tamil, English	English
Mixing of ethnic groups	Separated	Mixed
Understanding of other ethnic groups	Well understood	Well understood

～Considering with historical background～

- Before independence

Malays × Chinese

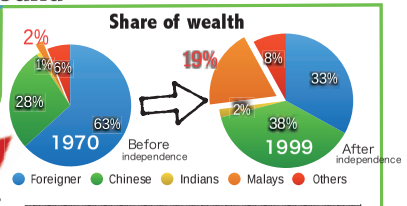
- After independence

Bumiputera policy (1971～1990)

Malaysian government

Good points

Bad points



	Chinese	Indians	Malays
Primary School	Chinese	Tamil	Malay
Junior HighSchool	Malay	Malay	Malay

- Present

Malays × Chinese and Indians

Why always only Malays!! It's unfair!

Make the people united

One of the reasons that people are separated??

Malaysian government

→ Necessity of a united nation

One Malaysia ! (slogan)

Conclusion

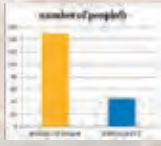
Public school (SMK Sungai Pelek)	Strong sense of identity related to their ethnic group	Grouped by ethnic groups
Private school (Seri Cahaya School)	Socialize with peers regardless of ethnic group	Their identity is not strongly tied to ethnicity.

both schools have strong and weak points we cannot say which one is better.

CULTURE OF STAND UP MEALS

Benefit

- for Shops: Not having chairs
  --> customers turnover rate goes up ↗
  --> profit rate per area goes up ↗
- for Customers : Compared with restaurants
  --> price is lower
  -> can eat quickly



History of Stand-up Soba

1680's
Soba-eating stalls are created

1950-1990's
Soba-eating stalls near stations become highly popular

1990's
Stalls die out due to regulations banning street stalls

After 1990's
Regains popularity due to:
Provide consumers cheap, fast and tasty food

2010
New franchise stores start providing new stand-up meals with food such as steak and sushi

WORLD

Common Filipino street foods
- Hygiene problems
- Small amount

@Manila, Philippines

booths/ stalls
- No tables
- Stand up and eat a small meal
- Outdoors

@India

Stand up bars with appetizers

- wine + bread
- very light meals

@Paris

Example of Stand up Meals


Steak


Italian


Sushi

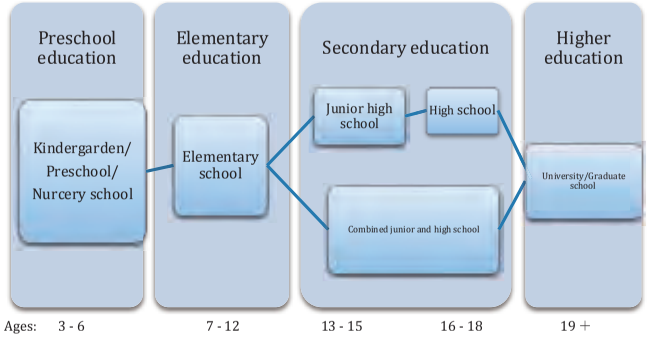

Soba

学校法人 渋谷教育学園 幕張中学校・高等学校
MAKUHARI JUNIOR AND SENIOR HIGH SCHOOL

Education in Japan

Aya Koshizuka

1. What is educational system in Japan like?



2. Merits of education in Japan

- All students keep up with their studies at least at the standard that Japanese Government defines.
- Japanese tend to have hesitant and it improves the way of surviving in a social community.

3. Demerits of education in Japan

- Students are afraid of being scolded by teachers, and it causes them to become passive to answer in a class.
- Education is provided to students with a prescribed curriculum in each school, and they can't select all their subjects that they're interested in or they'll use in the future, even when they become high school students.
- University tuition in Japan is more expensive, especially in private universities than in other developed countries.

4. Tasks for education in Japan

Incorporating an active attitude to survive in difficult communities and overseas educational systems, as students will be able to learn what they're really interested in and enjoy their study.

Ichikawa high school 1-9 Ikoi Ishido

Fair Trade in the Future

"Shopping is about voting for the sort of society you like"

The important key words are "consumption voting"
If you pay attention to the destination of money you pay for what you buy, it's just like "voting"; society will change.
Let us compare fair-trade chocolate and other similar (but non-fair trade) products, to discover what fair trade is.

	Fair Trade chocolate	Ghana chocolate	Frappuccino at Starbucks
Daily sales	Some 5,000 bars	Some 5,000,000 pieces	Some 140,000 cups
Price	¥350 expensive	¥70 cheap	¥600 expensive
The reason for its price	Fair trade	Not Fair trade	Brand name
taste	Good!	Up to you.	Good!

<What the table shows>
Ghana chocolate is cheap and sells well. "The cheaper, the more sales?" Not necessarily, since Frappuccino, rather expensive, sells well. That is, quality i sometimes more important than the price. Further, expensive fair-trade chocolate seems more justifiable than expensive Starbucks Frappuccinos.

Then why are the sales of Fair trade products not so good?
The sales of Ghana chocolate went up rapidly because of its red package. Meanwhile, Starbucks Frappuccino has the transparent cup (with a logo) through which the colorful content can be seen. Youngsters find the design so "cute!", and, every time the company makes a new line up of drink, they love to upload photos through SNS.

From this, it seems there are two differences between fair-trade chocolate and Ghana chocolate (or Starbucks Frappuccino).
・Package design
・Gaining popularity because of SNS
And then, there are already well designed Fair trade products. I'm going to introduce some of those products.

<people tree>

Chocolates


Candles


Cards

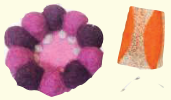
Earrings

<Atelier Likha>

Book covers

<Shaplaneer>

Soap

<sisam>

Brooche Lamps

<The Third World Shop>

Coin cases

<Kru Khmer>

Hand cream

<scoo>

Bags

<Namakemono coffee>

Coffee

I really do not want to recommend all these products (since they will not be "my own"). Atelier Likha, a Japanese NGO in the Philippines, where I served as a volunteer, produces a nice book cover, and it is my favorite. Thus, there are already so many well designed fair trade products. The next step is to consider how to make those fair trade products better known. Since my mother is selling fair trade products, I often have fair trade chocolates, cocoa, jam, and curry powder. I also use a fair trade commuter's purse.
I know there are students who research fair trade and make their "advertisements" in their social studies classes. I do think they are interested in fair trade; then I would like to ask them: "Are you spreading the idea of fair trade after actually eating or trying fair trade products to know them better?"
You know, fair trade products are really tasty. They are cute. And they have such a high quality.
Of course, the reason why we should spread the concept of fair trade is precisely their fairness-orientation. If that is everything, however, youngsters would eventually avoid going for fair trade products. They are tasty and they are fashionable. I hope to introduce fair trade products for these reasons.
One of the tools for me in this context is using social network service (SNS).
I am also planning to introduce fair trade products during school cultural festivals. I would like to display those fair trade products in a hallway and not in a classroom, so that everyone who passes by can have a look at them. Then, even after the festival, those who did not purchase the displayed fair trade items might later think: "Oh this a fair trade product, which I saw in the cultural festival!"

<How to improve the concept of fair trade>
Some companies engage in fair trade activities since they are concerned with their own public image or reputation. In Japan, that sort of "abusing the image of fair trade" might not be so common, but in other countries where fair trade business is common, such abuse is happening, I hear.
A few people might be interested in fair trade but they might think "Is this information on fair trade really trustworthy?" For the benefit of those people, companies should clearly indicate to consumers how their fair trade enabled some children to go to school, or made changes in their income levels.

<Reference>
『スタバの「フラペ」が 1 日 40 万杯売れる理由』
http://toyokeizai.net/articles/-/98226
『ロッテのガーナミルクチョコレート国内Ｎｏ．１売上げの板チョコ　パッケージが売上げの鍵だった！』
http://www.p-matsuura.co.jp/パッケージマーケティング/3095.html
『People Tree』
http://www.peopletree.co.jp
『シサム工房』
http://www.sisam.jp
『Atelier Likha』
http://likha.shop-pro.jp
『Shaplaneer』
https://www.shaplaneer.org

<To sum up>
I thought I already knew a lot about fair trade, but through more investigation, I noticed that there is more room for improvement in the fair trade business.
I am planning to visit the U.K., the birth place of fair trade. I hear that in the U.K., there are lots of charity shops on busy streets like Japan's Ginza district. However, I should bear in mind the fact that some companies do abuse the image of fair trade. With this in mind, I wish to find "real fair trade".

ESD in Sakura Minami High School

Community involvement


Green baton


School road cleaning


PET bottle caps

Volunteer work

Let's start with what we can do

Inclusive Education

Interaction with students in special needs school.

Disaster Prevention

Learning the importance of anti-disaster facilities.

Elderly Simulation

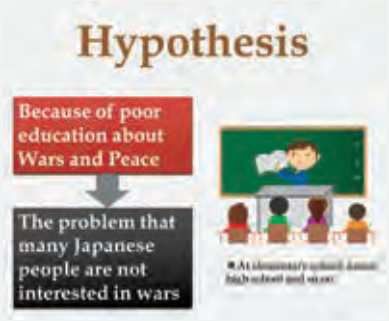
Aged person experience program.

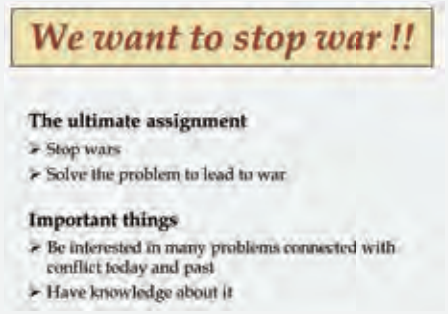
International Understanding

Visiting Malaysia and working with foreign students.

HOW TO TELL MORE PEOPLE ABOUT WAR HISTORY

1-G Group 3 Takita Sae Waki Chihiro Kimura Hitomi Nakazono Yuna Hoya Keito Aso Takahumi





Reitaku High School
The International Leadership Course

Learn about the World

Through our ELA classes every day, we learn, think, and talk about our world.

Cross-Cultural Communication

With a 6-week-long study trip to Australia, we learn to live in another culture, experience unusual things, and understand that we are all the same human beings.

Global Leaders from Japan!

It is very difficult to communicate well with people from different backgrounds. We learn how we can do that by doing many presentations, speeches, and debates.

We learn about Japanese culture because we believe that it is important to know our own before we learn about others.

Learn about Japanese Culture

Present Ourselves to the World

2016－2017　About our research　　Chiba Prefectural School for the visually impaired

Research subject :

Curriculum according to the educational needs for each student

Research theme :

We examine the contents of learning students with visual impairments experience foreign cultures and deepen exchanges with utilizing ICT and so on.　We research the ways to send actively and to be necessary for their improving language and communication skills.

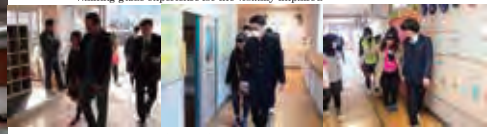
The reason
When students with information disability participate in society and get more information and send out it from themselves, ICT is an effective means.
And, to send their own thoughts actively for others with different cultures is based on "self-understanding" "regional understanding" as well as "challenging spirit" and "toughness to overcome difficulty". In order to acquire the ability to respond to a keen society by globalization rapidly, it is necessary to utilize highly convenient ICT, accumulate highly versatile practical examples such as educational content and support method.

Expected result
(1) While deepening understanding of different cultures, we can respect others and enhance communication skills to collaborate.
(2) By utilizing ICT tools which are presently highly versatile, and verifying the effect, consolidation of their examples can be a guide for our domestic weak-eyed education etc.

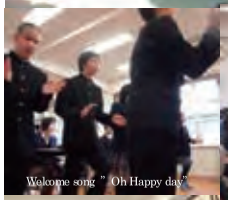

Direct contact with international students at Chiba University


Photo shoot with the Rio Paralympic Marathon Medalist
Walking guide experience for the visually impaired


Japanese drum performance

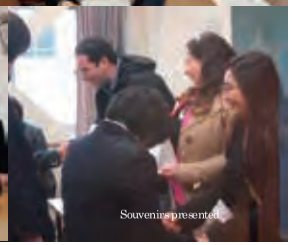

Sound table tennis experience


Game Arabian pot


Welcome song " Oh Happy day"


Impressions


Commemorative photography


Souvenirs presented

We are planning to continue exchanging with e-mail and skype in the future.
Those who can cooperate, please call out.
Thank you.

How would the ideal tourism development look?

Narita Kokusai High school
Kawabata Yui,Naitou Masayuki,Harada Yukako,Suzuya Akihiro

ABOUT

"George town" is located on the Penang island and registered as a world heritage site. There are many tourist spots and resorts placed in this city. There are some problems here. We will talk about these issues and think of solutions.

PENANG ISLAND

・Population:1600000
・Independent from Britain in 1957
・Industrialization policy and tourism development have caused big economic growth

Disagreement with fisherman
Pollution
Changes its appearance
Increasing of land price
Traffic congestion

The development in the coastal area

Registration as World heritage

Increase of Tourists
Economic effect
Increase of employment

Companies Government Fishermen Tourists Civilians... and more!!

How would the ideal tourism development look?
＝Making everyone satisfied without hurting towns and people
＝Use "Things that have been there for many years" wisely to provide good service to tourists

Residents Architecture Food People Nature

What PHT have been doing
"Tourism featuring Traditional Architecture in George town"

Example of Iriomote island

・Succeeded with tourism that makes use of nature
Ex. Canoe tour

http://ebeing2012.blogspot.jp/2012/11/resim-building-1-penang-heritage-walk.html

Japanese Blood Donation ~Until Now and Into the Future~

Japanese blood donating character "Kenketsu-chan"

Blood donation is a far more important thing than people realize. These days, the Japanese health care industry has a serious lack of blood. It is said that the amount of blood that 850 thousand injured people will need annually will be lacking. There are many reasons for this situation, such as low birth rate and longevity.

1. What is "blood donation"?

I think some people are not aware of blood donation. These are the particular conditions for donating blood in Japan.

System	Blood component donation		Whole blood donation	
Kinds	Platelet	Blood plasma	200mL	400mL
Applied purpose	Time: About 50 to 100 minutes. How it is mainly used; Replacement of lost platelets; Correction of the tendency to bleed due to platelet malfunctions.	Time: About 40 to 100 minutes. How it is mainly used; To stop bleeding or the tendency to bleed due to clotting factors.	Time: About 20 to 30 minutes. How it is mainly used; for the lack of all components due to massive bleeding, and the need to supply both red blood cells and blood plasma at the same time.	
	Blood plasma maintains for a year, but platelets only last for 4 days, and you need to get a medical checkup for a day so you can use them just for 3 days. Whole blood donation maintains for 21 days, but you can only keep the amount of blood that you will use in 3 days.			
Age	16 to 64*	Male:17 to 69* Female:18 to 69*	18 to 69*	Male:18 to 69* Female:18 to 54
Weigh	Male: More than 45kg. Female: More than 40 kg.	More than 50kg.	Male: More than 45kg. Female: More than 40kg.	It depends on your weight.

* If you were over 65, you can donate only you've donated when you were at the age of 60 to 64.

2. Blood donation for pets

What about our pets? Can I donate blood for my dog? The answer is "No". But other dogs can.

However, there are no "public blood donating banks," so to serve fresh blood we need "blood donation animals" and "blood donor animals.

"blood donation animals" means the animals who are owned by veterinary clinics, and "blood donor animals" means pets..

The former donate blood as per clinic needs, and the latter donate blood periodically.

But there are 13 kinds of blood types for dogs, so it is difficult to serve blood only by "blood donation animals."

There are 3 blood types for cats, 13 for dogs, so it is desirable for many pet owners to have their pets donate. .

3. World Blood Donor Day

We have the "World Blood Donor Day" on every June 14th. The first one was held in 2004. This is the day to thank blood donors and make people around the world to know how blood donation is important to save other people's lives.

The theme of the day this year is "Blood connects us all." This means to thank all the donors. It also means that blood donors and receivers are sharing and connecting. The slogan is "Share life, give blood." This means that blood donations will make people kinder and more unified.

4. Japanese and other countries

How about other countries? This is a poster made by the "Hellenic Association of Blood Donors" in Greece. The arm drawn in the poster is of a certain hero. His weapon, a spider thread, is a medical tube and the arm is connected to it with a blood bag. The poster says "You can be someone's superhero!"

In Pujiang country, Zhejiang China, if your parents donated 4 liters of blood total, you will be guaranteed to do well at the entrance ceremony for private high schools.

When you donated blood in Germany, 500mL is fundamental. It is a little much for Japanese.

In Poland, when you donate 18L of blood total, you don't have to pay taxes forever!

5. References

<The Japanese Red Cross Society>http://www.jrc.or.jp/rule/

<The Japanese Red Cross Society blood business headquarters>

<JARMeC information>http://www.jarmec.jp/bloodbank.html

< The Japanese Red Cross Society>http://www.jrc.or.jp/activity/blood/news/160601_004305.html

< ©PR TIMES INC. ALL RIGHTS RESERVED. > http://adgang.jp/2014/04/59243.html

<Cyber Agent>http://headlines.yahoo.co.jp /hl?a=20141006-00050137 -yomint

<houritu no madoguti zeirisi nyusu>http://houritsu¥ madoguchi.com/ zeirishi-news/502/

6. In the end

Did you know about this? I think many people didn't know and were surprised a lot. I didn't know either before I searched about it. But we can change everything by what to do from now on. Please think about it and do something you can. How about me? I will donate other things (such as money, clothes, my heart, etc) as well as donating blood and trying to help many lives.

Thank you!

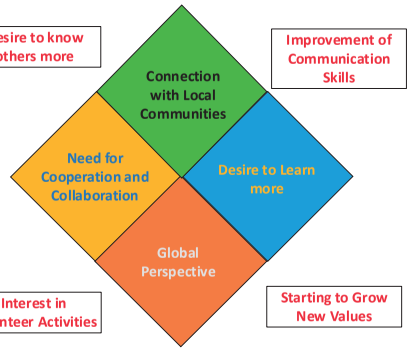
Activity Report

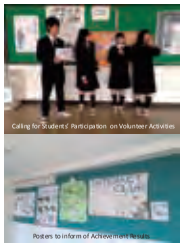
Education for Sustainable Development

Ichihara Chuo High School

Presented by Miyu Kashiwabara & Taehyun Jang

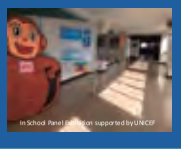
To know not just the world and connect with the world, but expand our values through international exchanges





Students-Centered Activities

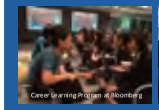
Volunteer Activities

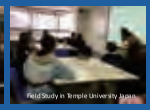


Cultural Exchange Activities

Interacting Tour in Malaysia, Taiwan and Australia

Other Activities





Skype sessions with Korean students
UNESCO Study in Team Teaching Lessons
Netiquette Lecture with DeNA

Learning and Interacting with People from Different Countries and Cultures Expand Our World View

Environmental Protection
Energy Resource Issues
Human Rights
World Heritage Protection
Food and Water Supply Problems
Fair Trade

Japanese live together with foreigners

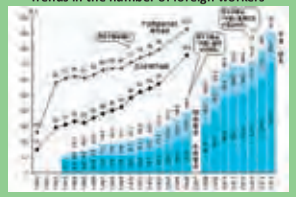
Narita Kokusai High School

Aikawa Misa
Ito Nozomi
Umeda Maika
Onaka Chinatsu

① Assignment

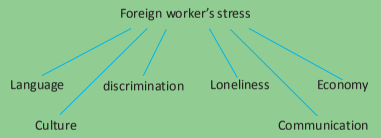
The number of foreigners has been increasing

Trends in the number of foreign workers



Ministry of Health, Labour and Welfare

Foreigners have these concerns in workplace



Geonsil Lee, "Job stress and mental health among high-skilled foreign workers (HFWs) in Japan: Comparative analysis between HFWs and Japanese workers"in *Stress Science Research*30(2015)

②Our activities

①Interim presentation

Two pieces of advice
1.Information gathering
2.fieldwork

②"Hello Work" in Narita

To introduce jobs for foreigners
A:Communication by Japanese
→Classification of goods
B:Hiragana, Katakana
→Cleaning
C:Kanji
→The hospitality industry

③AEON in Malaysia

	Japan	Malaysia
Ethnic group	Japanese	Malay, Indian, Chinese
Language	Japanese	English
Facility	5 malls	Each floor

④Interview for Japanese companies

- Treatment
- Promotion tests
- The contents of job

Same condition as Japanese

③Summary

- Jobs without the use of Japanese
- Understanding differences
- Pleasant workplace

But It is difficult for us to make working places better than now

So

How about our school?

④Practice

Problems for Muslims in our school? ★ "TONJIRU"(Pork miso soup) → A wish to eat together

For realization 1. Taboos →2. Menus →3. A questionnaires →4. Supporters→5. Ingredients →6. The day of the marathon race

Japanese Fermented Foods

YOSHIZAWA Rei, NISHIMOTO Yuuri, NEGISHI Rei, ARAI Yuzuki
Chiba Prefectural Yakuendai High School

SUMMARY

【Introduction】 Japan is said that the most a powerhouse of fermented food in the world.

【Reason】 • Japanese climate is suitable for fermentation.
• Koji mold was produced in Japan. (Scientific name : *Aspergillus oryzae*)

【Definition】 Food which processed by characteristics of microbe.

【Merit】 1. Excellent preservation
2. Food's flavor is improved
3. Nutritional value increases

【Conclusion】 Japanese fermented food level is famed in the world.

[*Koji*] rice molt

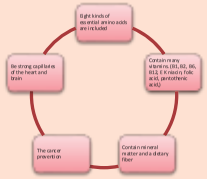
Steamed rice,barley,and soy which are bred as Koji spores.

Spore diameter 0.005mm
The source:
http://jakuyu.shizuoka-ed.jp/

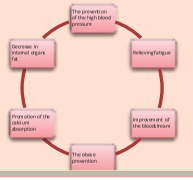
Aspergillus oryzae

Representative food using the malted rice and the effect

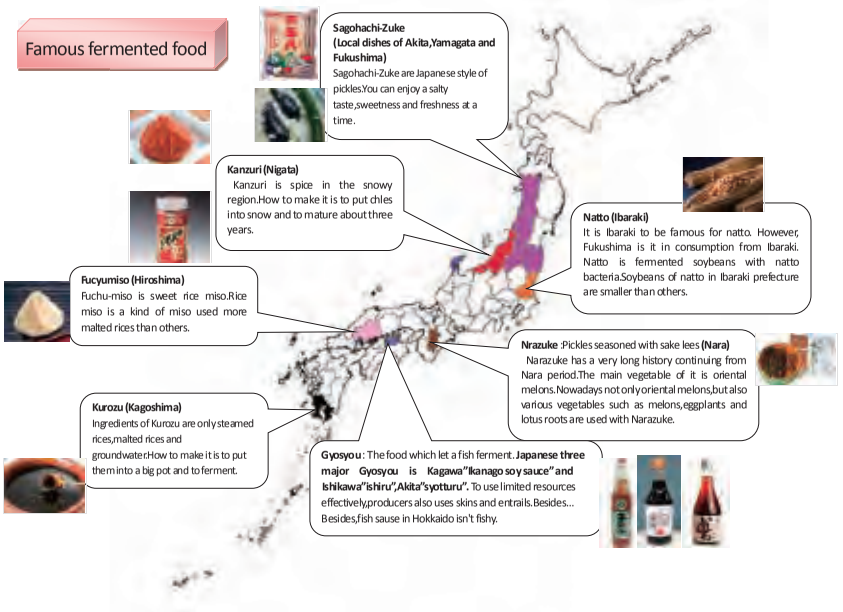
❑ **Miso Soup**



❑ **Vinegar**



Famous fermented food



Sagohachi-Zuke (Local dishes of Akita,Yamagata and Fukushima)
Sagohachi-Zuke are Japanese style of pickles.You can enjoy a salty taste,sweetness and freshness at a time.

Kanzuri (Nigata)
Kanzuri is spice in the snowy region.How to make it is to put chles into snow and to mature about three years.

Natto (Ibaraki)
It is Ibaraki to be famous for natto. However, Fukushima is it in consumption from Ibaraki. Natto is fermented soybeans with natto bacteria.Soybeans of natto in Ibaraki prefecture are smaller than others.

Fucyumiso (Hiroshima)
Fuchu-miso is sweet rice miso.Rice miso is a kind of miso used more malted rices than others.

Nrazuke :Pickles seasoned with sake lees **(Nara)**
Narazuke has a very long history continuing from Nara period.The main vegetable of it is oriental melons.Nowadays not only oriental melons,but also various vegetables such as melons,eggplants and lotus roots are used with Narazuke.

Kurozu (Kagoshima)
Ingredients of Kurozu are only steamed rices,malted rices and groundwater.How to make it is to put them into a big pot and to ferment.

Gyosyou: The food which let a fish ferment. **Japanese three major Gyosyou is Kagawa"Ikanago soy sauce" and Ishikawa"Ishiru",Akita"syotturu".** To use limited resources effectively,producers also uses skins and entrails.Besides... Besides,fish sause in Hokkaido isn't fishy.

<<Newspaper During WWⅡ >>

Shibaura Institute of Technology Kashiwa High School

2-4 Terada Kento/ Yuki Yamazaki/ Taketo Suehiro

<< Main points >>

How different were the newspaper stories from the facts?

What were the specific features of the newspapers during the war?

The fake reports started to spread after the Battle of Midway occurred.

However, they disappeared at the same time as civilization was involved.

There were various figures, for example, the size of characters, the expression and the report's timing.

<< Motivation >>

We're interested in the history that newspaper told us wrong information during WWⅡ. Moreover, we want to search what circumstances were, by researching its reason.

<< Research Method>>

1. Contrasting Asahi newspaper during WWⅡ with the facts we can know from books or the Internet and finding difference
2. Finding by features of newspaper's expression
3. Studying how the Pacific War went and comparing the changes of reports with the changes of the war situations

<< Attack on Pearl Harbor >>

In those days, it seemed that the Pearl Harbor was the best naval base because of its high defensive capability. Therefore, America did not pay attention to Japan.

At that time, the reports were almost exact, and if they contained wrong information, they were corrected later.

<< Battle of Midway>>

The target was the breakdown of the task force of the American army in Midway Island.

But in the end, Japan lost and this lost affected the after war situation greatly, and this was a turning point of the war and reports.

<< Battle of Saipan>>

During WWⅡ, if the American army had occupied the Saipan Island, they could have attacked most parts of Japan. So this battle was important for both U.S and Japan. But the Japanese army in Saipan was completely destroyed by this battle. However, there are few false reports about military success. There was not any information about the concrete number of damages.

<< Result >>

Ex) In the battle of Midway

○Military success

Newspaper		Fact
American aircraft carrier	2	1
American aircraft	150	150

○Military loss

Newspaper		Fact
Japanese aircraft carrier	2	4
Japanese cruiser	1	2
Japanese aircraft	35	289
Japanese destroyer	0	1

<< Discussion >>

1. As a feature of expression, there were some strong textures and big characters on papers

⇒They insisted strongly to boost the morale of the citizens.

2. There was a time difference between when a battle happened and when the information was transmitted to the nation.

⇒It seems they needed the time gap for the manipulation of numbers and contents.

<< Reference>>

・Asahi Newspaper Database

・The perfect guide of Old battlefields of Saipan & Tinian

— walk on the island of Honorable death and Suicide

(Author: Makoto Konishi)

・Imperial Headquarters announced

(Author: Masanori Tsujita)

・Wikipedia

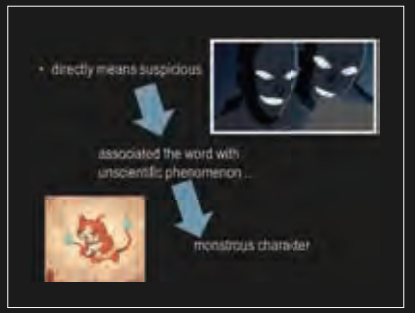
LEARN FROM YOKAI

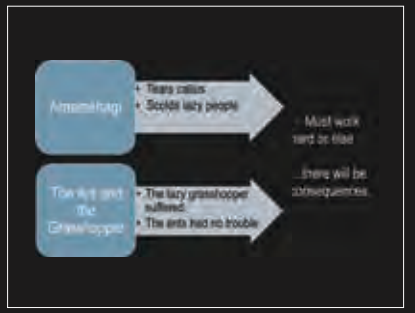
～ THE DIFFERENCE BETWEEN JAPAN AND OVERSEAS ～

1-G group 1

Ruri Itoh, Ibuki Ueda,Mikako Ohmura,

Ryoma Noda, Hana Suzuki





<< Origin of Japanese language >>

SHIBAURA INSTITUTE of KASIWA High School
1－5 Motoki Saitoh

<< **Point** >>
・Japanese language history
・Altaic hypothesis ・A common point and difference with Korean

<< **Introduction**>>

Japanese is the language whose origin and the connection with other languages are not understood well. After survey, however, I understood that there were many common points with Korean.

Therefore, I checked relations with Korean in order to investigate the Japanese origin.

<<**Research Content** >>

At first, I checked how languages are classified and which classification Japanese language belongs. Next I checked when Japanese was separated from other languages, and was formed as "Japanese". As a result, I found that Japanese is classified in agglutinative language, and then I looked into the characteristic of the Altai languages that have a close connection with agglutinative language. Finally, I compared the characteristic of Korean that might be classified as one of Altai with Japanese.

<< **Result** >>

Ⅰ. Classification of the language

Languages are classified into four groups.

① Agglutinative language
The language that changes its meaning by adding an important element in grammar after the word
EX. Korean, Mongolian, etc.
② Inflected language : Greek, Latin, etc.
③ Isolating language : Chinese, etc.
④ Incorporating language : Ainu、Eskimo, etc.

Ⅱ. Japanese language history

From the viewpoint of half-life of the important business word that is a method to check the similarity of words, if the language is separated from other languages for more than 5,000years, the phenomenon that the same word is used accidentally happens, and it is said that we cannot investigate the link with other languages. Because we cannot check the connection with the similar language even by this method, Japanese is generally said to be concluded more than 5,000 years old.

Ⅲ. Characteristic of Altai

(1) To avoid that two consonants come in prefix
(2) "R"sound does not exist in the prefix
(3) Interrogative is used at the end of the sentence in the question form. Etc.

Ⅳ. Common points and differences between Japanese and Korean

～common points～
・The pronunciation of R and L are the same.
・There is no person changes.
・Honorific expressions develop complicatedly.

～different points～
・Disagreement of the basic words
・Korean does not have passiveness form.
・There is the sound using only consonants.
・The number of vowel sounds is different.

<<**Consideration**>>

I understood from my study that I could not say that Japanese assumed Korean as an ancestor. Considering many common points, however, Japanese and Korean should have some kinds of relation in a basic place. I think the key to elucidation of the origin is to find many basic words or find words that the etymology accords.

<< **Reference documents**>>

「日本語のルーツをさぐったら…」 あべせいや （アリス館）
日本語系統論と内的再構
koto8.net/kisogakusyu/kiso_data/keitouron_sougou.pdf
日本人のルーツ III 日本語の起源と結論
http://owlowlowl.net/SLLQYcorner/soliloquy13.html

Learning only English Will Become Obsolete

Chiba Higashi Senior High School
Emi Kaneko

<Current> We learn English to see the world.

School system:
- Learn English from 5th grade
- Interact with Australian and American high school students
- Only 5 English classes in a week (my high school)

the worst score in Asian countries!

<Future> We can see the world better when we understand other languages.

Reason:
・The population and economy are growing rapidly in Asian countries.
・Using only English, our 2nd language, can be a filter to see the

Goal:
- Learn English more (from 3rd grader from 2020~)
- Interact with Asian countries
- Learn 3rd language from junior high. (Especially Chinese)

<What can we do from now? >

①Know more about our neighboring countries with take filters away
→Start learning Asian languages
②Realize that we are a member of Asia
→Collect info and feel neighboring countries close to us.
③Communicate with Asian countries
→Make contact with other Asian schools regularly

Future international cooperation

Chiba Higashi Senior High School
Yuriko Kamiyama

1. Africa's potential
   - The population of Africa is increasing.

     Now 1.2billion → 2050 1.7billion → 2100 3.6billion
   - About 40% of African is under 15 years old

2. We should invest money in Africa
   - The sum of investment in Africa from over the world is over that of help
   - 20 out of 54 countries is independent in economy

What is needed for investment?

i) Traffic infrastructure

ii) Increasing the self-sufficiency rate for staple food

iii) Education

Many organizations are making efforts of improving them.
Although it is necessary for Africa, but it will a long time to complete all of them.

3. How can companies reconcile both investment and the preparation for that?

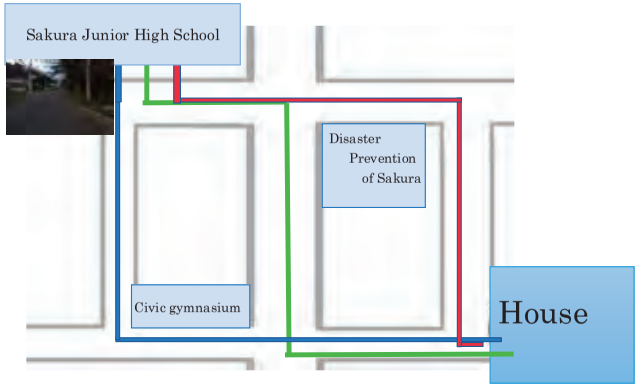
→Projects one by one with JICA.
- making employments
- maintaining infrastructure and system for investment
- human resource development

  ex) Mozal in Mozambique

4. The things that we must be careful in help and investment in Africa
   - We have to be careful for the differences of situation from country to country
   - We mustn't do all things by ourselves. We should keep paces with themselves.

The Best Choice of Evacuation Routes

Chiba prefectural Sakura Minami High School



Red route↓ Blue route↓ Green route↓



Route	Merit	Demerit
Red route	You can arrive safely as long as you climb to a top of the slope.	You may be involved in the Land slide while climbing the slope.
Blue route	This route is the nearest way.	There may be some traffic accidents on the way.
Green route	You don't get stuck in traffic.	You can't see very far ahead along this road. Because the road is narrow

TTBiz Program

Travel and Tourism Business Program Junior Achievement

~Connect with world, connect to future~

Students from Japan and other countries in Asia work together as a group to create a travel plan
⇒Conduct meetings over the internet using Skype, Facebook, iMessage, Google slides/docs etc…
⇒Present each plan through video chat

Different Expectations!

Japan (High school students in Japan)
- Traditional construction, castles
  Ex) Kyoto Castle,
- Traditional Japanese *Ryokan*
- Experience *onsen*
- Osaka Castle, Doton bori, Kyoto Gion…
- Length/duration; 3-7days

Historical structures from past
Traditional Japanese food

Asia (High school students in Philippine, China, and Korea)
- Skyscrapers in Tokyo and Osaka
- Cheap business hotel
- Osaka Kaiyukan, HEPFIVE, Shopping malls
- Length/duration; 2 weeks or more

Japan = High Technology!
Interest in modern buildings

What we have learned throughout the TTBiz program;
- Understand different **aspects, cultures, values** we share
- Respect for **traditional culture, history**
- Understand more about Japan
- **Teamwork**
  ⇒learn more about each other
  ⇒create environment where everyone can speak up
- The importance of Compromise/Balance
- Use English for communication and creating materials
- Chance to put academic studies into use

⇓

Theme "Connect to future…"
- **Learn about ourselves**
- Learn to work with teammates from different cultures and backgrounds
- Use internet to connect globally

⇒**No borders/division working together, all countries, backgrounds, genders equally**

<< THE TRANSITION OF THE LAW SYSTEMS IN JAPAN >>

Shibaura Institute of Technology Kashiwa High School

2-4 Takumi Sato/ Sachiyo Iida/ Asami Sato

1, The Discrimination for Illegitimate Children in The Eyes of The Law

2, The "My number" system and other systems which are similar to My number

<The process to change the Civil Code>

・In the 1989,the united nations Commission on Human Rights confirmed"Convention on the Rights of the Child".

・In the 1991,The first trial to plead that Article 900-4 of the Civil Code was unconstitutional was held and the result was constitutional because all judges judged the law was constitutional.

・In the 1994, the Japanese Government ratify "Convention on the Rights of the Child".

・In the 2013, the trial was held in the highest court's grand bench and the result was unconstitutional.

In December the 2013, Article 900-4 of the Civil Code was amended and it was removed to provide that the share in inheritance of a child out of wedlock shall be one half of the share in inheritance of a child in wedlock.

<The law that applies only to children out of wedlock>

・Article 900-4 of the Civil Code; already be amended.
・Article 49-2-1 of the Family Register Act
・Article 779 of the Civil Code : about their affiliation.
・Article 790-2 of the Civil Code : about their surname.

<Consideration>

・Both Article 779 and Article 790-2 of the Civil Code are providing for the difference between legitimate children and illegitimate children, so I think it does not need to amend them.

・I think Article 49-2-1 of the Family Register Act should be removed because it is not needed to distinct illegitimate children after their births since the distinction between legitimate children and illegitimate children is not needed except Article 779 and Article 790-2 of the Civil Code.

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・Asahi Shimbun Article Database Kikuzo Ⅱ Visual
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My number

<Introduction>

・The my number systems a. number of 12 digits Every Japanese has it.
It is used for social security, tax and the disaster countermeasure.

・The systems which are similar to My number are the Citizen's total numbering system
Green card in Japan and Basic Resident Register Card.

<Contents of research>

・Merits of My number
Realization of a fair society
Administration becomes efficiently.
Procedure for administration become simple.

・Practical use of My number
1, to unify the health insurance
2, to use the services of delivering at a convenience store
3, to use as a staff card
4, to use as an identification with oneself on the Internet
They are the ways government expected.
There are many ways for an individual ,local government body and a company.

① Citizen's total numbering system
The government give people numbers which is different each other and control people by getting individual information.
② Green Card
It is "small saving user's card" in Japan.
③ Basic Resident Resister Card
It helps administrative affairs to be efficient and improves convenience of using IC card which is exactly protected and enables us to be delivered easily in town we live in.

・These three systems had many criticisms.
And My number system has criticisms about security.

・Mina Portal is going to be used.

<Reference date>

http://www.soumu.go.jp/
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What do you think Japan is like?

Chiba Higashi Senior High School
Mao Hasebe

What kind of role should Japan take for the future?

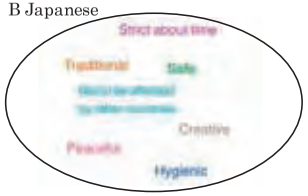
⇩

I will propose how Japanese behave in a global society.

Q1. What do you think Japan is like?

A Australian

B Japanese



Q2. What do you think Japanese people are like?

A Australian

B Japanese

Q3. What do you know about Japan?

Q. How much do you agree these opinions about Japanese qualities? (Multiple answers allowed)

	Disagree very much	Disagree	Don't know	Agree	Agree very much
Creative	0%	5%	15%	67%	12%
Polite	0%	7%	11%	58%	24%
Intellectual	0%	1%	11%	73%	14%
Friendly	0%	8%	15%	70%	7%
Shy / Modest	1%	15%	19%	59%	6%
Traditional/Cultivated	0%	2%	6%	68%	24%

(Quote from the Foreign Minister, 2009)

→Then I suggest…

1. Have more confidence in ourselves
2. Preserve our politeness
3. Spread accurate knowledge about Japan

WHY THE YOUTH ARE ATTRACTED TO ISIS

Shibaura Institute of Technology Kashiwa High School
Grade 2 Class 4　Satoru Kuroha, Yoshioka Yuya

"What attracts the youth to the ISIS?" We started with a simple question.
Japan is a country with little connection to Islam in means of the world and so it is difficult for us to understand the ways of Muslims. However, at the same time, being a country with almost no religion gives us the advantage of acceptancy.
Today, the wars in Syria and Iraq are getting heavier day by day due to the acts of ISIS, and many people are joining forces with the ISIS including ones from developed countries targeted by the ISIS. The factors behind this may be the advance in technology and the use of the Internet. We desire to find what attracts youth to the ISIS and research about the environment surrounding the ISIS.

<<Introduction>>
At first, we suspected why the youth join the ISIS; Nevertheless, the news media broadcasts ISIS is dangerous group. The reasons why young people are attracted by the ISIS are different among them, but we found that SNS becomes the media broadcasting the ISIS and impacts on them. We found that SNS connects people with ISIS, and felt dangerous next to us.

<<The results of our research >>
◎We arranged our research and split to 3 captors
1 , Why the youth are attracted to the ISIS?
2 , The story of agitator in the ISIS
3 , The surroundings around the ISIS

① The youth in French, Germany…, go across the ISIS 400~500 the youth per year. Besides, there was a man who went to Syria from Japan and attempted to fight against many advanced countries. But the number of people who reach ISIS from Saudi Arabia, Tunisia and others, these are located in the Middle East, is large. We think "Arab Spring" impacts on administration in the North Africa.

Also, in advanced countries, they are scared by homegrown terrorist. The homegrown terrorism, which is not able to prevent from doing it, becomes a serious problem. For example, news media in Japan broadcasts the Charlie Hebdo shooting, the 2016 Brussels bombings and the Boston Marathon bombings. We found that the homegrown terrorism occurs all over the world after America under Attack.
In addition, we researched the number that women who believe in Islam went to the ISIS is increasing despite the fighters or the terrorists. They seem to go there for the purpose of getting married with the fighters and supporting them because they watched instigating with SNS. We investigated the British woman, who has the experience that she went to Syria.
As a result, the ISIS instigates people with low social status by the way they use SNS skillfully, and brainwash people with that, which is related on advancing the Internet. So we felt it dangerous to approach the backside of our living world.

② In chapter 2, we did research on the Agitators of the ISIS and the operations they conduct through the internet using tools like SNS. The job of an Agitator is to find an individual with the potential of becoming a terrorist, and persuade the person in to joining the ISIS. The people who are targeted by Agitators have some specific characteristics. The people suffering from poverty, and the people who are discontent to the mechanism of their society, are just a few examples. Agitators target people with dissatisfaction in their current situation since it is easy to turn their dissatisfaction against their country. To persuade these kinds of people, Agitators go through the three-step method. First, they approach the target, pretending to be a good person. Then they try to become close friends with the target. Finally, after gaining trust of the target, they begin to persuade. In alteration, they also use the Internet to do these things. In this case, they reveal the damage of the cities caused by the air strikes of the U.S. air force and target people with a strong sense of justice or a spirit of volunteering.

③ In chapter 3, using the information we gathered last year about the connection between Islam and terrorism, we researched about the environment surrounding the ISIS. Although not frequently mentioned in Japan, terrorist groups are frequently operating in Africa and Middle East Asia too. The ISIS was formally a group within the Alkaid, which was operating all over the Middle East and also the northern part of Africa known as the Maghreb. This part of Africa is rather poor and easily becomes a target for terrorists to recruit warriors since they are mostly Muslims. The ISIS being part of the Alkaid, they started from these parts.

<< Conclusion >>
Although terrorism is something unfamiliar with us Japanese, their footsteps are right behind us as a result of the advance in technology. The internet is the biggest of them and the spread of SNS such as Facebook and Twitter allows many thoughts of extremism to be able to reach almost all of the people around the world. Even specialists say it is impossible to stop this.
Therefore, we think that it is important to make more opportunities to listen to the poor and the Muslims. If we do not change, the gap between the rich and the poor will keep on growing bigger and making the poor more vulnerable to these kinds of threats. Shouldn't' t we listen to their opinions and think of an appropriate plan before making a move?

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http://www.yomiuri.co.jp/feature/yokoku/20150203-OYT8T50221.html

学校法人市川学園　市川高等学校

ばね電話

高校２年　大森　華希
猫本　凜

序論

目的

ばね電話でも、糸電話と同様に、張力が大きいと音の速さは速くなるのか、また、ばね電話の場合でも$\sqrt{T/\rho}$の公式は成り立つのか調べようと思った。

背景

私たちは、はじめ、糸電話の研究をしていた。その結果、糸電話の線密度が大きくなればなるほど、長さが短くなればなるほど、振幅が大きくなることが分かった。糸電話についてさらに研究を重ねていくと、糸電話の糸の部分をばねに変えたばね電話というものがあり、それは発した音がエコーして聞こえることを知った。

研究対象と方法

実験方法

下の写真のように実験装置を組んだ。

紙コップと紙コップの間のばねの長さを 0.2m, 0.4m, 0.6m, 0.8m の４種類で変化させて、受信側の紙コップの内部にマイクを設置し、発　生した音を受信するまでの時間とその音量を測定した。

板の上に同じ高さからゴルフボールを落とした時の衝撃音を音源として利用した。

また、マイクで拾われた音はイージーセンサーによってグラフ化された。

予備実験として、音源からマイクまでの距離を 0.2m, 0.4m, 0.6m, 0.8m の４種類で変化させ、発生した音を受信するまでの時間とその音量を測定した。

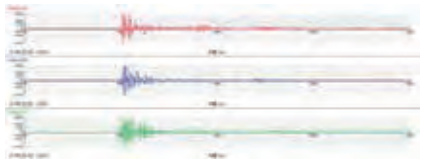
そのときのグラフと結果１のグラフを比べて、発生した音は直接結果には影響しないことがわかった。

結果

1

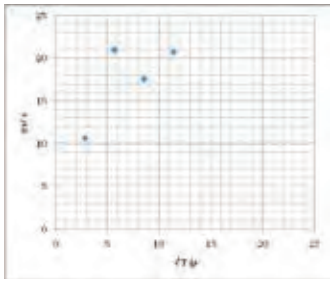
下のグラフは、上から、ばねの長さを 0.4m, 0.6m, 0.8m　としたときのマイクが受信した音の波形をあらわしたものである。

ばねの長さが長くなるほど、ばねを伝わる音の速さは遅くなることがわかった。



2

下のグラフは横軸に$\sqrt{T/\rho}$から求めた速さの値、縦軸にばねを通る音が一往復するのにかかった時間から求めた速さの値をとったものである。



考察

1

振幅が大きくなっているところ（以下、これを山と呼ぶ）が、糸電話で同じ実験をすれば、糸の長さが長くなればなるほど山が発生するまでの時間は短くなるはずである（張力が大きくなり、線密度が小さくなるため）。しかし、結果１のグラフから分かるように張力が大きくなるほど山の発生が遅くなっていることが分かった。

このことからばねの長さが長くなるほど、ばねを伝わる音の速さは遅くなることがわかった。

2

弦を伝わる波の速さの理論値を求める公式は$\sqrt{T/\rho}$であり、これにあてはめて求めた速さの値は以下の通りである。

2.847　m/s　(0.2m)
5.694　m/s　(0.4m)
8.540　m/s　(0.6m)
11.39　m/s　(0.8m)

実験から求めた速さは

10.62 m/s　(0.2m)
21.00 m/s　(0.4m)
17.56 m/s　(0.6m)
20.69 m/s　(0.8m)

もし$\sqrt{T/\rho}$の公式がばねの場合でも成り立っているのであれば、結果２のグラフは原点を通る傾き１のグラフになるはずである。しかし結果より傾きはほぼ１であるが、原点を通るグラフにはならなかったため、ばねではこの公式は成り立たないことがわかった。

まとめ

このことからばねの長さが長くなるほど、ばねを伝わる音の速さは遅くなること、ばねでは弦を伝わる波の速さの式は成り立たないことから、糸とばねの性質は大きく異なることがわかった。

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The Darkness Sensitizes the Phototaxis Sensitiveness of The Stink Bug

Chiba Prefectural Sakura High School　Kasahara Yuichirou

Introduction

When I used a LED black light, stink bugs gathered around it. I found that the stink bugs caught recently had a nice reaction to the LED black light. The stink bugs breaded for the two weeks had no reaction to the LED black light. I think the different light environment caused change in the phototaxis of stink bug. I decided to perform an experiment.

Insects for experiments

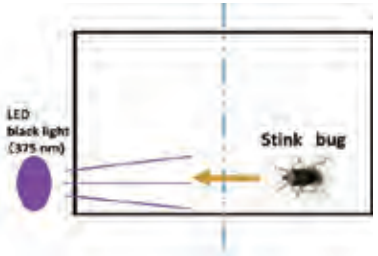
Kusagi Kamemusi
Halyomorpha halys
１３mm～１８mm

Tyabane ao Kamemusi
Plautia crossota stali
１１mm～１２mm

Experiment 1 Research stink bugs phototaxis

Method

- I put several stink bugs in the insect cage.
- I inspected which stink bugs were attracted to the LED black light.
- Then I counted how many stink bugs have crossed the center line toward the LED black light.



Result

Six out of seven stink bugs had phototaxis.

Experiment 2 Light and dark environment cause changing stink bugs phototaxis

Method

I researched the difference in phototaxis of stink bug in bright and dark environments.

Case A:
Raised in complete dark environment for three days.

Case B:
Raised with 14-hour light and 10-hour darkness per day for three days.

Result

	Case A	Case B
Positive phototaxis	(2/2)	(0/2)

Consideration

Stink bugs lose phototaxis if they are left in a bright environment for a long time.

Bright and dark environments influence the phototaxis of stink bugs.

Next experiments

- I couldn't research on many stink bugs because adult stink bugs died after they laid eggs. Therefore I was breading some eggs.
- The eggs hatched and some of them became adults. I need more adult stink bugs to do more experiments.
- I have to research which environment bright or dark give phototaxis to stink bugs.

Referents

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Water drops on various surfaces

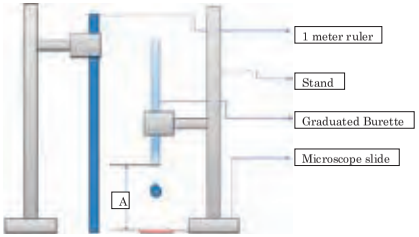
Shojun Masuda

Introduction

The impact of a liquid drop with various surfaces is a phenomenon that can easily watch in daily lives, such as in shower and with rain falling. The time scale of the process is only a fraction of a second, so we can't watch all the process by naked eyes. I became interested in revealing the whole picture of dropping and started experiments by using a solid, liquid surface, and a high-speed camera. I released a drop of water adjusting the height and diameter. In a result, when a drop of water hit various surface, it bounced in the lower height, and splashed in the higher height. There are closely related factors causing this outcome; Surface tension and inertial force.

Method

~Liquid drop with a solid surface~



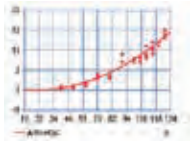
1. Treat a microscope with soot from a burning candle.
2. Set up equipment like above.
3. Place a high-speed camera in front of the ruler and the slide.
4. Measure the length of "A", and start taking a video
5. Add a water drop and wipe water from the slide. Repeat these 3 times.
6. Measure the height of the bounce from the camera.
7. Change "A" and do 4~6.

~Liquid drop with liquid surface~

1. Change a microscope slide to an aquarium and graduated burette to pipette. Put water in the aquarium.
2. Place a high-speed camera in front of the ruler and the water surface.
3. Measure the length of the surface to end of the burette, and start taking a video.
4. Add a water drop and repeat 3 times.
5. Measure the height of the bounce from the camera.
6. Change "B" and do 3~5.

Result

Diameter of the pipette: 1.05mm
Diameter of the burette: 2.10mm
The thickness of the slide: 1.03mm
Contact angle of a water drop on a surface: 149.8±0.8°



Left graph is from solid surface (x-axis: "A", y-axis: Bouncing height)
Right graph is from liquid surface (x-axis: "B", y-axis: Rising height of surface)

Discussion

~Liquid drop with a solid surface~

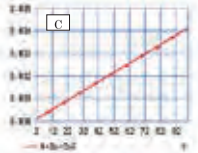
-Splash occurred when x=7.3(one time), 7.8 (two times) and after x=8.2, all water drop splashed.
-When "legs" occurred, bouncing became unstable and was likely to splash.
-By considering the graph, there are no consistencies between the bouncing and the height.

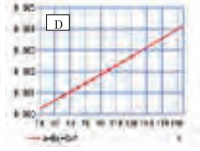
~Liquid drop with liquid surface~

-The graph can be represented by following formula. $1.2 * 10^{-3}x^2 - 4.8 * 10^{-2}x + 0.42$ $(40 \leqq x \leqq 130)$
-Correlation coefficient was 0.97.
-When x=90,100,105, some bounce occurred. After x=135 the all drop bounced.
- By considering the graph, there are consistencies between the rise and the height.

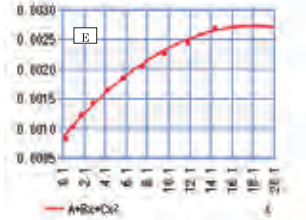
~Considering results by making graphs of Weber number~

The weber number is a measure of the ratio of the kinetic energy and surface tension and is defined as, $\rho v^2 d/\sigma$ (ρ=fluid density, v=velocity at impact(m/s), d=drop diameter before impact, σ=surface tension). Since the most values are constant in all trials, I used the relative Weber number $v^2 d$.





C (x-axis: "A", y-axis: Weber number, formula: $4.6*10^{-9}x^2 + 2.0 * 10^{-5}x + 2.7*10^{-5}$) shows that when the Weber number is $3.1*10^{-3}$ (x=75), bounce changes to splash.
D (x-axis: "B", y-axis: Weber number, formula: $-5.8*10^{-6}x^2 + 2.1 * 10^{-4}x + 8.2*10^{-4}$) shows that when the Weber number is $2.8*10^{-3}$ (x=135), rise change to bounce.



E (x-axis: Rising height of surface, y-axis: Weber number, formula: $-5.8*10^{-6}x^2 + 2.1 * 10^{-4}x + 8.2*10^{-4}$, $0 < x \leqq 15$)

-When the Weber number is high, which means surface tension is low or kinetic energy is high, the droplets will splash on the solid surface, and bounce on liquid surface. The reason why is because, the droplet won't contract when it hit the surface if the surface tension is low and consequently splashes.
-C should have a straight line, but various causes made it parabola.

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ジュールシーフを用いて乾電池からエネルギーを引き出す

高校２年　井上　祐輝

序論

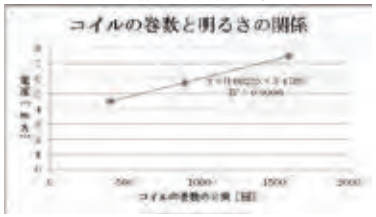
目的　どの機械で使ってもある程度のエネルギーを残したまま使用不能になってしまう乾電池から、どうすればより多くのエネルギーを引き出せるのか調べる。
背景　LED を使うと乾電池１個から比較的多量のエネルギーを引き出せることがわかった。そこで、ジュールシーフと呼ばれる乾電池１本で LED を光らせることができる昇圧回路を用いて効率良くエネルギーを引き出す方法を調べた。

原理

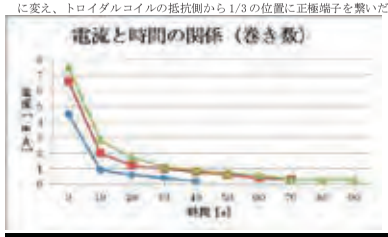
① トランジスタの B(ベース)に少量の電流が徐々に流れる。
② トランジスタが ON になるので、C（コミッタ）にも電流が流れる。ここではトランジスタの増幅作用により、B に流れる電流よりも C に流れる電流のほうが大きい。
③ コイルに流れる電流が急激に大きくなるので、②の電流の向きと逆に逆起電力が発生する。
④ ①の B に流れる電流を後押しし、さらに②の C に流れる電流が増幅される。そしてさらに、③の逆起電力も大きくなる。このように、①～③が繰り返され C に流れる電流が大きくなる。
⑤ やがて、C に流れる電流が飽和状態に達し、逆起電力が発生しなくなる。B 方向への電圧が減少するので、B に流れる電流が減少し始める。
⑥ ここでトランジスタの増幅作用により、C に流れる電流が急激に減少する。
⑦ コイルは⑥の減少を遅ろうと C 方向に大きな電圧（逆起電力）が発生する。
⑧ B 方向へ流れる電流が減り、C に流れる電流が増幅されて減少する。そして、C 方向への逆起電力が大きくなる。このように⑤～⑦が繰り返され C にかかる電圧が大きくなる。
⑨ C 方向に電流が引っ張られ B に流れる電流が０になる。
⑩ トランジスタが一旦 OFF になり、C 方向にも電流が流れなくなる。
⑪ すべての電圧と電流が LED にかかる。
⑫ そして、①に戻り、①から⑪を繰り返す。LED が光るのは一瞬だが、人間の目には見えないスピードで点灯しているので連続点灯しているように見える。

結果

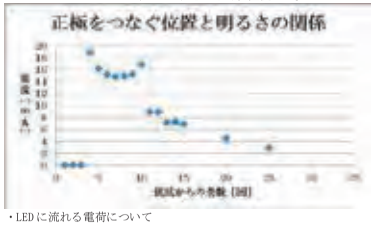
(1)トロイダルコイルの巻数
・明るさ
トロイダルコイルのちょうど真ん中に正極端子を繋ぎ、コイルの巻数と明るさの関係を調べた。
明るさは LED に流れる電流の大きさで判断した。



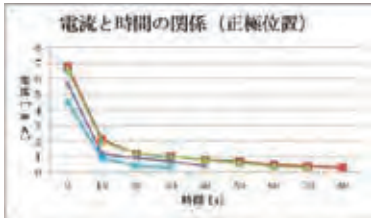
・LED に流れる電荷について
電源を１．５V 乾電池で充電したスーパーキャパシタ（５．５V、１．０F）に変え、トロイダルコイルの抵抗側から 1/3 の位置に正極端子を繋いだ。



(2)トロイダルコアに正極をつなぐ位置
・明るさ
トロイダルコイルに対して正極をつなぐ位置変えた。



・LED に流れる電荷について
電源を充電したスーパーキャパシタに変え、正極をつなぐ位置によって LED に流れる電荷の量がどう変わるか調べた。
３０回巻きのトロイダルコイルに対して、抵抗側から５周、１０周、１５周、２０周の位置にスーパーキャパシタの正極に繋いだ。



考察

(1)トロイダルコイルの巻数
トロイダルコイルのインダクタンスの式。

$$L = \mu_0 \mu_r \frac{N^2 r^2}{D}$$

L：インダクタンス
μ_0：自由空間の透磁率　$4\pi \times 10^{-7}$ H/m
μ_r：コア素材の比透磁率
N：巻数
r：コイル自体の半径

ここで、巻数以外の条件は一定であり、コイルの巻数を増やすとその二乗に比例してインダクタンス（つまり自己誘導の起電力）が大きくなる。
よってコイルのインダクタンスが大きくなると、それに比例して LED に流れる電流が大きい（つまり、LED が明るく光る）と考えられる。
また、コイルの巻数が多いほど LED に流れる電荷が多いことが分かった。
つまり、インダクタンスが大きいほど、LED が明るく長く光ると考えられる。
(2)トロイダルコイルに正極をつなぐ位置
抵抗から４周の時（スーパーキャパシタの時は、抵抗から５周の時）、最も LED が明るく光った。これは、LED が光る範囲内で最も正極から LED までの距離が遠く（巻数が多く）、コミッタ方向へのインダクタンスが大きくなるからだと考えられる。
また、抵抗から１０周（1/3）の時も LED が明るく光った。これは『トランジスタ 2SC1815 は Vb（ベース電圧）が０．６６V の時最も好ましい状態で増幅される』と言うことが関係していると考えられる。

まとめ

ジュールシーフについては、コイルのコミッタ方向へのインダクタンスが大きくなるほどエネルギーを多く引き出せる。つまり、コイルの巻数（とくに正極からコミッタ方向への巻数）を増やせばいい。また、トランジスタの増幅作用をうまく引き出すような電圧がベースにかかるようにするというような方法も有効であった。

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Angular Velocity and Record time of Eddy

Tomonori.Kataoka Sayaka.Muto Chosei High School

1 Motivation

Eddy is defined as circular movement of water causing a small whirlpool. We often see it in daily life, but we don't know about it.

2 Purpose

Investigate the relationships between condition and angular velocity or record time.

Revolution velocity
Number of revolution → **Angular velocity**
Record time

3 Tool

Three plastic buckets

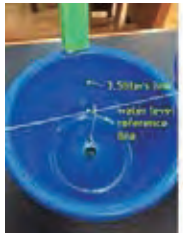
No.1
Hole
Handle
Acrylic panel

No.2
Removed a bottom

No.3
Unchanged

4 Method

1: 3.5liters of water or sugared water placed in the bucket.
2: A metronome was set at decided tempo.
3: The bucket No.1 was turned 10 or 20 times to the tempo of metronome.
4: Bucket No.1 and No.2 were lifted up and kept at a constant height.
5: The eddy generated and was recorded by video camera.

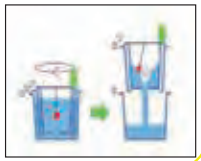


Angular velocity

the speed of acrylic panel

Record time

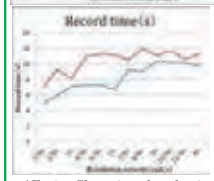
the time from beginning of an eddy to reaching the level reference line

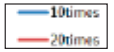


4 Results

＜Ex.1 Changing the revolution of the bucket＞

- 1/3π(rad/s)~12/3π(rad/s) (every 1/3π)
- 3.5L
- **Revolution number: 10,20times**





・Revolution velocity didn't affect the angular velocity.

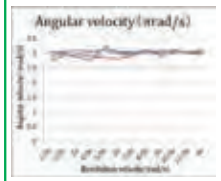
・20times' angular velocity is little faster.

・Record time increase as the revolution increased.

・Revolution number also expand record time.

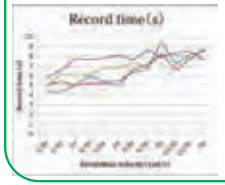
＜Ex.2 Changing the physical properties＞

- 1/3π(rad/s)~4π(rad/s) (every 1/3π)
- **Amount of sugar: 300g~1200g (every 300g)**
- 3.5L
- 10times



・Angular velocity did not change by revolution velocity.

・Relation with sugar amount couldn't be seen.



・Record time became longer by revolution velocity.

・Relation with sugar amount couldn't be seen.

5 Consideration

Angular velocity

・Don't change by revolution velocity of buckets
・Become faster by increase of revolution number
→**It is changed by amount of given energy.**

Record time

・Become longer by increase of both revolution velocity and number
→**It is changed by centrifugal force.**

学校法人市川学園 市川高等学校

Stability of Chinese yoyo

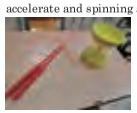
High school grade 2 Toshimune Akino

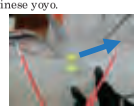
Introduction

Objective The condition which stabilizes on it a Chinese yoyo was studied. The angle of the corn of Chinese yoyo on the market is about 40 degrees angle, but it is most stable when the distance of center of gravity to a weight is the farthest and the angle of the corn of the Chinese yoyo is 0 degree angle.

Method①

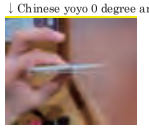
How to use Chinese yoyo. Sift up and down right stick direction of the arrow accelerate and spinning a Chinese yoyo.



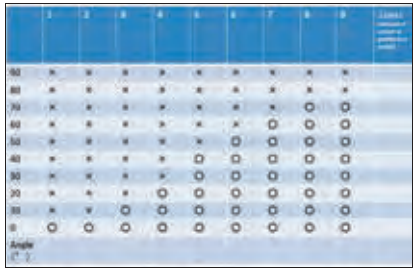


Make a Chinese yoyo. Changing angle of orange and line of orange.
0° .10° .20° .30° .40° .50° .60° .70° .80° .90°
1cm.2cm.3cm.4cm.5cm6cm.7cm.8cm.9cm I summarized whether it was stale. Definition of stability, it is assumed that it is stable when it can spin more than 10 seconds.

↓Chinese yoyo 0 degree angle.



Result①



①Stable when the position of the weight is far.
②It got more stable as approaching 0 degree angle.

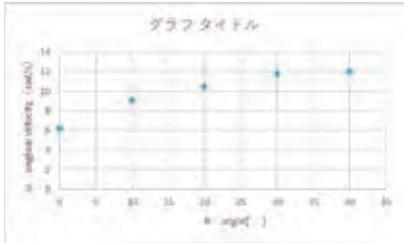
Consideration①

①Because the inertia of rotation has increased.
②Because there is no arrow moment when 0 degree angle.

Method②

Make Chinese yoyo just like Method①. 0°.10°.20°.30°.40°
The distance of center of gravity to a weight is the farthest,9cm
Their weight is all 121g.
I measured the speed after accelerating 30 times, with a camera movie.

Result②



ω converges with 12π/s

Consideration②

There is almost no change from 30 degrees angle to 40 degree angle,
I conclude that the angle of ideal A is 30 to 40 degrees, considering that it stabilizes as approaching 0 degrees of experiment ①.
The angle of the umbrella of Commercially available Chinese yoyo on is about 45 degrees so it is correct
Consider the equation of moment of inertia $I = mr^2$.
In this experiment, the applied force is almost constant, the weight is also constant, there is almost no friction
It is considered to be the length of action line of Chinese yoyo from the formula of conservation law of angular momentum causes cause of speed change

←commercial Chinese yoyo

Summary

It is most stable when the distance of center of gravity to a weight is the farthest and the angle of the corn of the Chinese yoyo is 0 degree angle.
Chinese yoyo is fastest when it is over 40 degree angle.
The shape of commercial Chinese yoyo is the most stable and fast

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http://physnotes.jp/mechanics/angular-momentum-conservation/

Siphon Principle

Ohtsuka Kouki(8)　Owa Takuji(9)

Summary

Motive

In2010, An Australian physicist started discussing about the principle of siphon. Until now, It was thought it is caused by atmospheric pressure. However, An Australian physicist said it is caused by gravity. We will examine if it is really caused by gravity or atmospheric pressures.

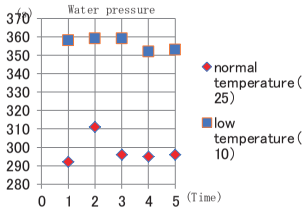
Principle explanation

The siphon phenomenon is that water continues to flow if a hose is filled with water if it becomes higher than the water surface before moving. It is used for some dams and kerosene pumps.

Preliminary experiment ~water pressure~

In preliminary experiments, Fig1 shows that the viscosity o water is highly related. because the lower temperature where mass of water per 1 L is larger is slower.

Fig1



Experiment ~atmospheric pressure~

First we should find a liquid with less change in viscosity, the we want to lower the atmospheric pressure. But if the pr is lowered, the temperature of the water will also decrease.

This experiment ~atmospheric pressure~

First we make something like a *Jyubunhai* (Fig2)

Then we Measure the time to put 500 ml of water through the instrument, calculate the change in viscosity at 1℃

(Fig2) like a ***Jyubunhai***

Conditions

The temperature is measured at every 5℃ from 10℃ to 25℃.

The atmospheric pressure is about 1 atm, and humidity and weather ignored.

Outlook

We want to try the experiment liquids other than water, for example honey, Saline, and Lubricant, and continue to perform an experiment to lower the atmospheric pressure.

Ultraviolet radiation intensity in several different conditions

Chosei High School　Kimika Matsumoto　Makiko Koide

1 Motive and Purpose

2 About Ultraviolet radiation

Ultraviolet rays :　length 10- 400nm

UV-A I : the longest wave length 315-380nm.

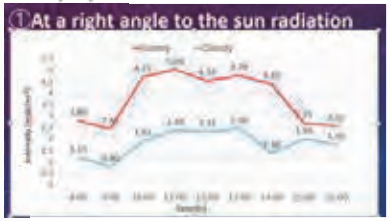
Most ultraviolet rays are absorbed by ozone layer.

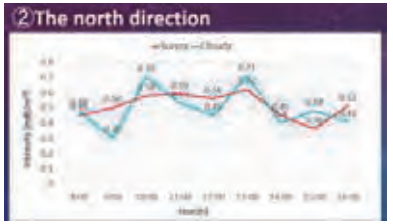
3 Device and Method

- Location : roof top of chosei high school
- Direction: ①Right angle to the sun　radiation
  ②The northern sky
- Period :　7/25, 7/28, 8/3, 8/4, 8/18,12/28
- Time :　AM8:00~PM4:00 Every hour

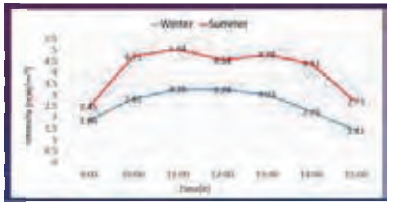
4 Result

- Comparison UV-A intensity between sunny day and cloudy day

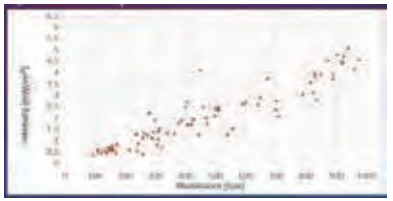




▸Difference with seasons



▸Relationship betw een UV and illuminance



5 Consideration

- UV-A intensity increased from morning to noon, and decreased from noon to evening regardless seasons.
- UV-A might be diffused by fine dust in the air.
- Weaker UV-A which was radiated from the northern sky could have come from the diffusion of the sun light by the clouds or dust.
- There is q correlation between illuminance and UV-A radiation intensity. So if the visible light is strong, we have to prepare the protection against the UVradiation.

Congestion caused at Junctions

Chiba municipal chiba high school

Kojima Takuma　Mizukami Shohei

Motive ・ Hypothesis

Motive

3.81 billion hours are lost by traffic jams every year all over Japan (the Ministry of land)

- Cause of traffic jams
- Method to solve traffic jams

We focus above in this research.

Hypothesis

Cars' speeds influence the length of traffic jams. So we will do experiments by changing cars' speed.

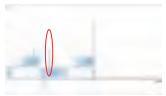
Preliminary experiment ・ Analysis method

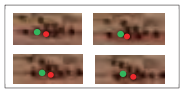
Motion analysis software

Using motion analysis software, can obtain speed change and trajectory of marbles. Comparing speed change with pictures and make hypothesis.

Graph's marbles
Influence marbles

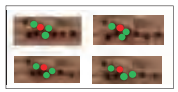
Right lane





The marbles was crashed and the speed went up by the back marble.

Left lane



The marbles was crashed and was stopped by surrounding marbles.

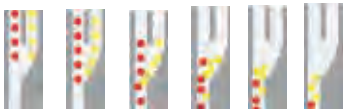
Cellular automaton

Cellular automaton is regularly lined up cell aggregate model to use cellular automaton.

Decide movement condition of marbles. Move marbles models according to the condition. Compare marbles movement in experiment and marbles model in simulation.

In preliminary experiment, left lane marbles stopped for a while in junction.

We analyzed this phenomenon using this cellular automaton.



Experiment Method

〈Experiment Instruments and materials〉

- marbles (12mm)
- junction model
- high-speed camera (30fps)

〈Condition〉

- All marbles are same standard.
- All marbles start at the same time.
- To be same distance marbles.
- One side marbles only change speed.

〈Method〉

① Made *Y*shaped road to use foaming panel. And, put device to add resistance.

② Roll 5 marbles each lanes on road of ①.

First, roll marbles one by one. And obtain time between the head and the end of lane start and end t, t'.

Next use same marbles, start at equal intervals, left-right parallel, at the same time start. And obtain time between the head and the end of lane start and end t_n, t'_n

Calculate degree congestion level based on data.

Congestion level $=(t-t')-(t_n-t'_n)$

The traffic jam becomes bigger as the congestion level increases.

Future outlook on research

- Experimental analyze of y-shape lane.
- Congestion simulation using C language base on analysis

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Shape of instruments, Material and Tone

Chiba Municipal Chiba High School Science and mathematics course

First grader Miu Imura, Haruto Kikuno

Motive

Wind instruments are a kind of musical instruments are played by blowing the breath. There are two kinds of wind instruments: brass instruments and wood instruments. These are different in tone color.

We decided to make a research on relation between the tone color and the shape or material of instrument.

Ways of doing experiment

From the preceding studies difference of tone is difference of waveform. The waveform change by peculiar frequency to the instruments.

We record sounds of ten kinds of wind instruments (Flute, Oboe, Clarinet, Saxophone, Bassoon, Trumpet, Trombone, Horn, Euphonium, Tuba) used Easy Sense's sensor. We change the waveform into frequency spectrum by frequency analysis software. Because we research how the waveform contains each overtone. We consider relationships between the tone and the waveform, frequency spectrum, shape, of instruments, and material.

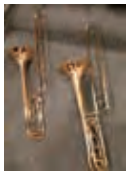


Fig. example of the instrument

Preliminary experiment

We sound tuning fork(A:440Hz) and record it. Then change the waveform into Fourier transform.

We make sure that one tuning fork with only one frequency contains one frequency.

But In order to be able to hit the tuning fork with a constant force as much as possible, we made the device and carried out an experiment.

We record it on Easy Sense and analyze it used Excel.

Perspective

In general, a wind instrument can't take out many sounds at the same time. We think we may be able to create instruments which can take out many sounds at the same time if we can find relationships between the tone and the waveform, frequency spectrum, shape, of instruments, and material. (for example, things used vegetables, snack foods, foaming polystyrene, paper, and so on.)

Visualization of an earthquake wave

MATSUDA Kaede, IWAASA Hiromasa, DOBASHI Ryouya, WASHIZU Takato, KAWAJIRI Kanae
Earth science Club in Chiba Prefectural Yakuendai High School

Abstract

Many earthquakes, for example the Great Kanto Earthquake, Great South area of Hyogo Earthquake, and the Great The Pacific offing of the Tohoku district Earthquake, have striked Japan so far. Then they will happen from now on too. We live fearing them. However, have you ever seen the earthquake wave? Parhaps the answer is "No."

Then, we made the model which visualise the earthquake wave. You can realize the difference of speed between the primary wave and the secondary wave. When you understand real scare to know the earthquake, this study finally succeed.

A motive of this experimentation

Primary wave and secondly wave appeared in our classes for many times. "How can we believe the invisible things ? Let us know the identity of earthquake by making it visible." This is why we did this experimentation.

What I did and the result

Visualization of Seismic wave using an oscilloscope.
Two speakers were connected to an oscilloscope like a picture of the lower left. And I hit the side of the wooden desk with a hammer and made vibration occur.

The vibration transmitted to the respective loudspeakers is shown to an oscilloscope of a picture of the lower right as a corrugation.

Comparing the two waves, you can see that the yellow (lower) wave is starting to oscillate first, so this is P-wave. Therefore, the blue (upper) wave is S-wave which is slower than P-wave. The difference in arrival time of these seismic waves is, as you know, duration of preliminary tremors.

We decided that the point ① whre the change of the yellow waveform starts is base point. The time to the point ② where the change of the blue waveform starts is the time taken to transmit P-waves. The time to the point ③ where the blue waveform suddenly changes and become a regular oscillation is the time taken to transmit S-waves.

Production of earthquake wave reproduction model using inverted pendulum

This device is a seismic wave reproduction model which makes seismic waves appear three dimensionally.

If you pull the end leader ball in the same direction as the rubber string and pull the Primary wave forward,you can see the Secondary wave.

Also,if you pull towards the center of each pulling direction,you can generate Primary wave and Secondary wave at the same time and you can see the difference in arrival time of each wave.

Attention: Unnecessary vibration may occurs when you pulls the lead ball so that you can't see how earthquake wave travels clearly.Please accept reservations beforehand.

Relation between a rise angle and the lift

YOSHIDA Hisanari, NAGAI Akira
Chemistry Club in Chiba Prefectural Yakuendai High School

❑Summary

The height of the peak where we stuck a skewer into the one with the shape of the airplane made with styrene foam, fixed, turned a current of air by an electric fan from the front and rose was compared with something else.
We paid attention to a change in a rise corner by this experiment. The rise square was being raised each 10 times from 0 times specifically and it was checked to the angle where an aerial flow becomes estranged.

❑Motive

Since we are interested in an airplane, we have seen the form that an airplane is taking off, have thought I'll examine how it's flying and have begun this study.

❑Purpose

It's examined how the flight distance changes according to the rise corner.

❑Hypothesis

The angle when an actual airplane takes off, thought so 30 times might fly most 30 times.

❑Materials

styrofoam (450mm×230mm×30mm) ,rubber band, string of a kite, weight, straw, takehigo ,paperwork of the airplane
(downloaded free material of ANA)

https://www.ana.co.jp/dom/promotion/paper_airplane/pdf/airplane_vol22_02.pdf

❑Consideration

It was like a hypothesis, but in most experiments the plane was flying with an arc. So I can not say that this airplane flew using lift. Therefore, in order to produce the wing which produces the lift, I thought that I should go using the lift force formula. Also, in order to use the lift sufficiently and to fly, we thought that we should make the wing three-dimensional, and generate a difference in atmospheric pressure between the upper and lower surfaces of the wing.

❑Preliminary experiment

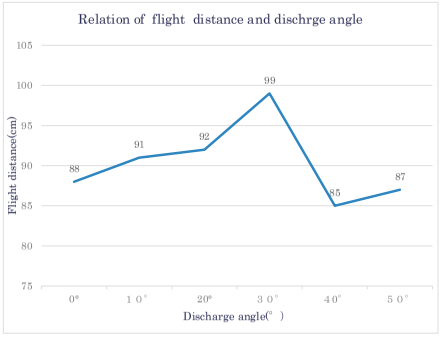
We bite a bamboo chick in the form of an aircraft made of Styrofoam and fixed it and compared the height of the highest point raised by blowing wind from the front with another fan.

Materials : styrofoam / rubber bands/ kite string/ weights/ airplane papercrafts
Method : By attaching a straw in a state standing on the left side and the right side of the fuselage of the airplane and fixing the straw to the horizontal base, by sending the wind from the front with a fan from the front.
Result : The wind wound a whirlpool and did not rise well.

❑The experiment

We actually skipped the paper airplane in wind-free environment and examined the flight distance.

Materials : styrofoam/ rubber bands/ kite string / weights /airplane papercrafts
Method : 1 Place a notch of 4 cm x 4 cm x 3 cm at the center of the 23 cm side of the foamed polystyrene and hang a rubber band there.
2 Attach the kite string to 50 g (8 pieces) of weight and attach the tip of the kite string to the rubber band.
3 Paper craft paper airplane on a launch pad made of up to two.
4 Put a paper craft paper airplane on this launch pad.



❑ Future Prospects

In this research, I realized the difficulty of fluid dynamics. In the future, we plan to reduce the weight while reducing the size of the aircraft and experiment with an airplane flying with lift. And this time I studied only the "relationship between lift angle and lift", but I would like to investigate "relationship between wing position and lift" from now on.

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千葉県立安房高等学校　化学部　圧電素子班

塩化ナトリウムを使用した圧電素子の開発

1年　古市　亮生

目的

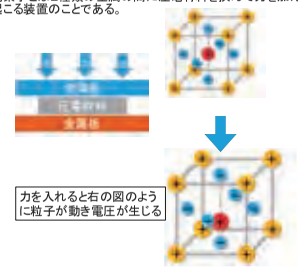
圧電材料としては酒石酸ナトリウムなどがあるが，身近なもので代用できないかと考え実験を行った。身近にあるものが圧電材料になるか調べるため，実験を行った。

結果

・ロッシェル塩の方が電圧の値が高かった。
・5 mmよりも10 mm,20 mmよりも10 mmの電圧値が高かった。

圧電素子とは

圧電素子とは2種類の金属の間に圧電材料を挟んでカを加えると電気が起こる装置のことである。



カを入れると右の図のように粒子が動き電圧が生じる

今回使用する圧電素子の構造

①塩化ナトリウムを乳鉢ですりつぶした
②厚さの異なるゴム板を筒状に切った
③②のゴム板の中に塩化ナトリウムを入れ，金属板で挟んだ

実験

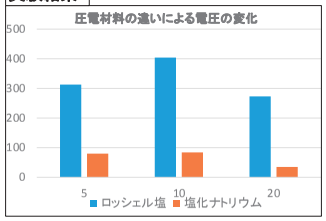
＜実験の目的＞

塩化ナトリウムとロッシェル塩の違いを調べるため厚さを定め測定を行った。

＜実験の手順＞

圧電素子をテスターに繋ぎ万力に挟んで電圧を測定した

実験結果



グラフの通り,塩化ナトリウムよりもロッシェル塩の方が電圧の値が高くなった

考察

塩化ナトリウムよりロッシェル塩の方が値が高いことが分かった。原因は結晶構造に違いがあるからだと考えられる。その理由としては結晶構造の違いで粒子の動く距離や速さが変わったからだと考えられる。

展望

・2種類を比べた結果，ロッシェル塩のほうが値が高い理由の追求
・今回の構造で圧電効果が得られた理由の追求
・圧電素子の構造の追求

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Study of Dye-sensitized Solar Cells

Awa High School
KGEYAMA Takumi, KAWABATA Yuta, KANSAKU Yoshitaka

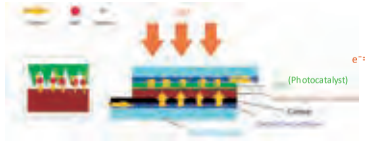
Introduction

Inspired by the research of iodine (Using local seaweed ecklonia), dye-sensitized solar cells for research. The first goal is that exceed the capabilities of commercially available products.
Dye-sensitized solar cells research content is divided into parts. I tried to improve our dye sensitized solar cell capacity, by doing research for each.

Conclusion

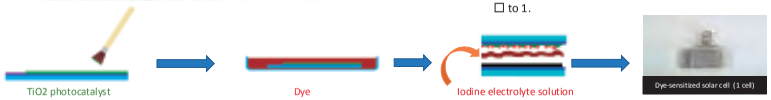
Photocatalyst
We succeeded in producing our dye-sensitized solar cells by using acetic acid to create photocatalysts. But our dye-sensitized solar cells behind to commercial products yet.
Dye
Pigment extraction when the temperature is too high lead to degradation of the electromotive force. Want to know the relationship between the wavelength and the fading of carthamine.
Film shape
Thin dye-sensitized solar cells can use in more cases.
But power is lower than those based on electrically-conductive glass. We should think about the overall shape.

What's the "Dye-sensitized solar cells"? ~Structure~



1. The sollar cells were irradiated by the light.
2. Pigment is excited, and it emits electrons.
3. Erectorons pass through the circuit.
4. Redox reactions happen in iodine electrolyte solution.
5. Erectrons back to the dye.

☐ to 1.

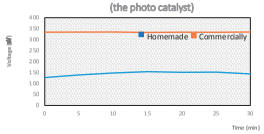


Experiments for improvement (photocatalyst and dye)

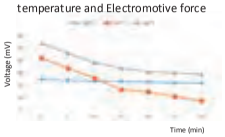
Photocatalyst
We prepared photocatalytic titanium dioxide, compared to what is used in dye-sensitized solar cells commercially. Photocatalyst is fabricated by acetic acid and titanium dioxide and ethanol.
Dye
Examine the relationship of dye-sensitized solar cells in photovoltaic and dye extraction temperature.

Results and Discussion

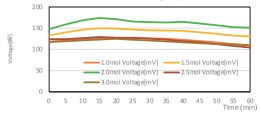
Compared to commercially available products (the photo catalyst)



Relationship between pigment extraction temperature and Electromotive force



Molar concentration changes (acetate)



Dye-sensitized solar cells using photocatalysis based on acetic acid showed values close to the electromotive force of dye-sensitized solar cells on the market. Extraction temperature is 80 degrees when the electromotive force were highest.

Making method Dye-sensitized solar cells(Film shaped)

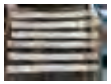


Fig1

(1)Cut stainless mesh into 24 equal pieces.

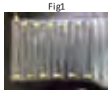


Fig2

(2)To create a titanium oxide paste. Stainless mesh is formed by coating and baking the titanium oxide paste.(Fig.1)

(3)Stained with a hibiscus dye.(Fig.2)


Fig3

(4)We apply the Stainless mesh with carbon applied to a surface to the laminated film. At this time, we have a nip at copper mesh.(Fig.3)

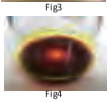


Fig4

(5)Using potassium iodide, dimethyl sulfoxide, iodine, we created a electrolytic solution.(Fig.4)


Fig5

(6)Deliver electrolytic solution by drops into stainless mesh./ (Fig.5)

学校法人市川学園　市川高等学校

Making of Cellulose Nanofiber

Ayumi HAGIMORI, Kaho YAMAMOTO

Introduction

Purpose: Considering various kinds of the way to make Cellulose Nanofiber (CNF).
Background: CNF is a substance which made by cutting Cellulose into small pieces. Recently CNF is becoming popular as a new material.
However it's difficult to make it, and making it involves too much production costs.

<CNF from vegetables>

・sticky
・very thin

<Paper made from straw>

<CNF from Cuprammonium rayon>

Ⅰ Study of extracting CNF from pulp

Hypotheses Ⅰ

By using H_2SO_4, KOH, cellulase (an enzyme which can decompose pulp), it's possible to decompose pulp into appropriate long cellulose, CNF.

Experiment Ⅰ

1. Dissolve paper in water and Cut into small pieces by mixer
2. Put three reagents into 1. (i)H_2SO_4 (ii)KOH (iii)cellulose
3. Make them react in oven(40℃) for 22.5h.
4. Cool and Concentrate them.
5. 1) Pour them into a petri dish covered with water poof spray.
   2) Dry it up with a vacuum oven. (40℃)

Results/Discussion Ⅰ

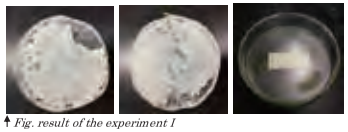


Fig. result of the experiment Ⅰ

H_2SO_4 and KOH couldn't decompose pulp at this temperature. Cellulase could decompose pulp. However, it was sticky, and we could observe Fehling's reaction, so there is not only CNF but glucose. Therefore, we found that 22.5h is too long for decomposing pulp into CNF.

Ⅱ A comparison of reaction time

Hypotheses Ⅱ

We should be able to extract only CNF by stopping reactions before cellulose turns into sugar.

Experiment Ⅱ

1) Making pulp pulverise (same procedure as Ⅰ)

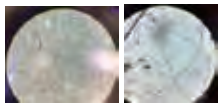
2) Devided it into three based on time for reaction (i) 4hours (ii) 7hours (iii) 15hours

3) The same procedure as Ⅰ 3.~5. (The procedures are the same as Ⅰ 3.~5.

Results/Discussion Ⅱ

They were transparent.

Fig. result of experiment Ⅱ (from the left, 4h, 7h, 15h)



CNF is finer than common paper.

Common paper　　CNF

Fig. micrograph(×150)

Future Prospects

1. To improve reproducibility　2. Study of making stronger CNF　3. Study of another applications of CNF.

References

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学校法人市川学園　市川高等学校

Bouncing Jet

Masaki Murakami

Background

Purpose　About Bouncing Jet(Bouncing),a phenomena that sticky fluid spits when it crashes into same liquid, Two hypothesis were set up, and proved.
Principle of spitting hadn't been proved yet.
Focused on concave made when crashing and, shape of parabola after spitting.
Hypothesis 1 : At any point, the velocity of liquid is same.
Hypothesis 2 : Formation of air layer. This phenomena is caused by air layer.

Research

Using silicon 100cS, the principle of bouncing was investigated.
① Silicon was injected by syringe in hand.
② By slow-shooting-function with iPhone6, the states of bouncing were recorded in movies and analyzed.
③ Keeping Bouncing occurring the firing port into the surface of liquid was put.
④ Changing caliber, I did same operations

Result

① When larger caliber syringe was used, Bouncing hardly ever occurred.

②At the moment firing port touched into the surface of liquid, Bouncing stopped.
③Under Hypothesis 1 is true, this calculation(Illustration①) is true.

Consideration

When fluid moves at high velocity, atmospheric pressure around the fluid become low and air stream in, so air layer is made. It push up fluid, and causes Bouncing. Moreover, the result② proves that it is necessary for occurrence of Bouncing to touch into air. These two evidence shows that hypothesis② is right.
Result③ suggest that Hypothesis 1 is true, and new hypothesis that the force except gravity is applied.(Maybe van der Waals force)

Conclusion

Bouncing will be useful in high molecular textile industry, in particular interface field.
Bouncing may be caused by combination of two or more forces.

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4) Masaki Kato、Kengo Kawano、Taemi Arai、Sinichiro Harada、Society for Science on Form、27(2), (2012), Form of droplet and liquid current (*in Japanese*) http://katachi-jp.com/paper/27(2).pdf
5) Andrea Bonito, Jean-Luc Guermond1 and Sanghyun Lee, International Journal for Numerical Methods in Fluids 80,53-75,2016　Numerical simulations of bouncing jets
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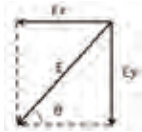


Generation of Sodium Carbonate by Leblanc Method

Masaki Takahara & Kazuma Kano

Introduction

French people needed much sodium carbonate, so the government adopted the Nicolas Leblanc's method to generate it in the 18th century. It is to mix sodium sulfate, calcium carbonate and charcoal, and heat them at 1000℃. After filtration and recrystallization, Sodium carbonate can be extracted.

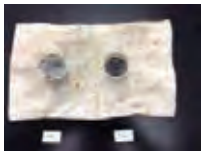
Na2SO4+CaCO3+2C→Na2CO3＋CaS＋2CO2

Purpose

1. To research the collective rate by the shrunk reproducing experiment of Leblanc method.
2. To check whether we can remove by-product correctly.

Experiment

① Put 3 grams of sodium sulfate, 2 grams of calcium carbonate and 1 gram of charcoal into the crucible. Then, heat it with burner and Muffle furnace for 50 minutes.

② Wash that product in water, extract white crystal through filtration and recrystallization, and weigh it.



The weight of the crystal: 2.13g

Verification

① Make 100mL water solution of the crystal. Prepare 3 conical beakers and put 10mL solution into each of them. Take acid-base titration with 0.1mol/L hydrochloric acid three times.

1st step: $Na_2CO_3 + HCl \rightarrow NaHCO_3 + NaCl$

2nd step: $NaHCO_3 + HCl \rightarrow NaCl + H_2O + CO_2\uparrow$

② Prepare other 3 conical beakers and put 10mL solution into each of them. Take oxidation-reduction titration with 5.0×10^{-3}mol/L iodine solution three times.

Result and Discussion

Result of Acid-Base Titration

	1st time	2nd time	3rd time	average
1st step	11.1mL	11.6mL	12.0mL	11.57mL
2nd step	16.0mL	13.7mL	14.0mL	14.57mL
Total				26.14mL

Amount of substance of sodium carbonate: 1.16×10^{-2}mol

Collective rate: 57.9%*

*Theoretical value: 2.0×10^{-2}mol

Purity: 57.8%

Result of Oxidation-Reduction Titration

Titer	Amount of substance	Weight**	CaS Rate
8.80mL	4.4×10^{-4}mol	3.17×10^{-2}g	1.49%

**Converted to weight of calcium sulfide

Conclusion

Though collective rate was better than we had expected, purity was not, so we have to find a way to extract purer crystal.

The stickiness of NATTO ~The reason of mixing NATTO~

Chiba Higashi High School
Shiho Nakao Yuki Okikawa

Motive and Outline

NATTO, the traditional food in Japan, is known that its deliciousness varies due to the amount of mixing. We had a question why deliciousness varied. Therefore we thought "became delicious = the amount of amino acid is and" the decomposition of γ-polyglutamic acid, main component of NATTO's stickiness, increases the amount of glutamic acid. After dialysis of NATTO's extract that contains sticky component, we measured the concentration with ninhydrin reaction. Then we confirmed the increase pf the amount of amino acid in the extract by mixing NATTO. Next, we did experients to examine why the amount of amino acid increased by mixing. Then we thought that it wasn't because enzymes of NATTO worked, but amino acide sticking on NATTO's surface began to dissolve in sticky compunent.

What is NATTO?

NATTO is Japanese traditional foods.
NATTO was made of feremented soybeans.


NATTO's pack on the market


Contents

Put seasoning

When we researched.

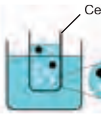

10 times


100 times

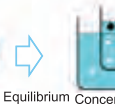
When we ate.


Put on a rice

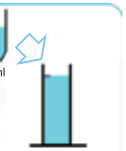
About dialysis


Cellulose tube

○ Amino acid
● Polypeptide


Equilibrium

Concentration became constant


1ml

Determination to 50ml

Experiment 1 -Time on dialysis-

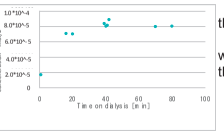

How long become it equilibrium?

Dialyzed the liquid of NATTO mixed 1000 times.

Confirmed ninhydrin reaction*2 and measured of absorbance*3.

Calculated concentration*4.

Result Time on dialysis



Consideration

We could found it is 48 hours that amino acid is equilibrium. Therefore we decided that we will do dialysis for 48 hours from this experiment.

Experiment 2

-Relationship between the number of mix and the amount of amino acid-

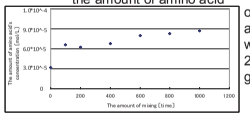

Whether the amount of amino acid with the amount of mix, or not.

Dialyzed the liquid of NATTO mixed 0,25,50, 75,100,200,400,600,800 or 1000 times.

Confirmed ninhydrin reaction*2 and measured of absorbance*3.

Calculated concentration*4.

Result The number of mix and the amount of amino acid



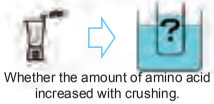
Consideration

We could found that the amount of amino acid increased with the amount of mixing. However, there was difference in how to increase. 25 times increased suddenly but it gradually increased after that.

Why did it increase?

Experiment 3

-Relationship between to crush NATTO and the amount of amino acid-

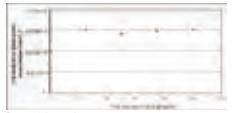

Whether the amount of amino acid increased with crushing.

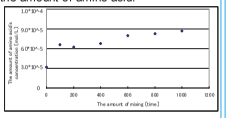
Dialyzed the liquid of NATTO that was crushed by mixer.

Confirmed ninhydrin reaction*2 and measured of absorbance*3.

Calculated concentration*4.

Result To crush NATTO and the amount of amino acid.



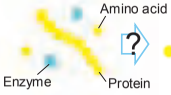


Consideration

If NATTO had been crushed by mix, NATTO would be very thick. Therefore we thought NATTO wasn't crushed by mixer.

Experiment 4

-Relationship between working enzymes of NATTO and the amount of amino acid-



Whether the amount of amino acid increased with working enzymes, or not.

Dialyzed the liquid of NATTO that was mixed 100 times when it was 0℃ or 40℃.

Confirmed ninhydrin reaction*2 and measured of absorbance*3.

Calculated concentration*4.

Result

We couldn't confirm increasing the amount of amino acid.

Consideration

If enzymes of NATTO had worked, it would more increase the amount of amino acid difference of temperature. Therefore, we thought enzymes of NATTO didn't work.

Summary and Future prospects

We could confirm the reason about NATTO became delicious by mixed, so we thought why NATTO became delicious, and we thought by crush and enzymes of NATTO. However, enzymes of NATTO doesn't work hard in shirt time fir mixing, and NATTO wasn't crushed when it was mixed 1000 times. Therefore we don't come to a conclusion.

We want to study that we hypothesize NATTI makes delicious. We want to confirm total amount of amino acid after and before mixing.

*1 The liquid we rinsed NATTO 10g with distilled water.
*2 Heated ninhydrin reagent 5ml and the sample 1ml for 30minutes and cooled.
*3 Did constant volume of the sample to 50ml, after confirmed ninhydrin reaction and measured of absorbance at 570nm.
*4 Made the reference solution with glutamic acid and used calibration curve and measured of absorbance.

Bibliography *5 www.customs.go.jp>foodstuffs , otemae-hs.ed.jp>ssh>dat
Equipment we used APEL corporation Ultraviolet-visible spectrophotometer PO-303UV

<< The sterilization action of Polyphenol >>

Shibaura Institute of Technology Kashiwa High School

2 – 4　Yohei Ohata　Syunnsuke Kasao　Yusuke Kuramochi

<< Main point >>

In recent years,we pay attention,and the substance promotes antioxidant effect.They are studied in that they remove active oxygen,promote metabolic rate,and result in the effect of cancer.In particular,we are interested in how effect the Polyphenol have in sterilization action.

<< Introduction >>

We tend tothrow used tea leaves and coffee stains away, but there are a lot of Polyphenol.Surprisingly,when we add irons to them,they become a powerful catalyst. Fenton reaction(iron+hydrogen peroxide→hydroxide radical).In particular,the materials which are made by putting irons and used tea leaves or coffee stains has more catalysis than the control approach.

<< Content >>

Ferrous irons become trivalent irons easily by touching air.Fenton reaction is known to antioxidant.

(Fe2+ + H2O2→Fe3+ + OH- + ・OH(radical))

When weadd the hydrogen peroxide into irons,the color of irons become the rust of irons.At the same time,however,the radical(・OH) occur and the substacle have the effect of sterlization.But it is hard to use the effect of sterlizationbecause we can't return the trivalent irons which we arehappened in this Fenton reaction to ferrous irons.And then,we utilize the effect of reducing agent in polyphenol.Therefore,irons have difficulty in becoming oxidation.Thus,the radical has the effect of oxidation:the polyphenol the effect of reduction.By using these effect(the oxidation<reduction),they produce the effect of sterilization and ferrous irons andthe effect sustain.

<< Instrument >>

/methylene blue/ferrous sulfate/hydrogen proxide/ /Komagome type pipette/transfer pipette/measuring Cylinder/round bottom flask/

<< Method >>

Ⓐ Preparation

Absorbance(664nm):methylene blue about 0.2 mmol/L FeSO4aq (278g/mol)⇒(0.0278g/500mL) mmol/L H2O2aq(30%)⇒(1.1mol/1L)

Ⓑ Measure

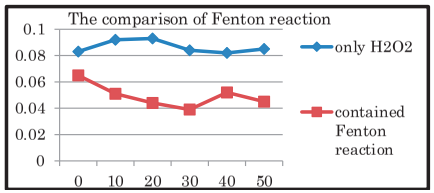
1.methylene blue30mL/distilled water 5mL/H2O2aq 5ml

2.methylene blue 30mL/Feso4aq 5mL/H2O2aq 5mL

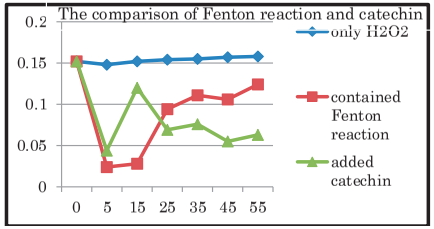
3.methylene blue 30mL/green tea(Healthya company) 9mL/ /FeSO4aq 1mL,H2O2aq 10mL

<< Result>>

The result compared 1 to 2 of symmetric experiment (We added MBaq(methylene blue)10mL and H2O2 5mL after 30minutes.)



The result compared 1 to 2 to 3 of symmetric experiment (We added MBaq 30mL after 15,30,45minutes.)



<< Discussion >>

We understood catechin promote occurance of the hydroxy radical in this experiment.It is by preventing ferrous irons from oxidation because it included by iron sulfate center and create comlex iron by coordination bond of catechin. We understood polyphenol maintains the effect of catalyst by reduction from trivalent irons to ferrous irons by the experiment based on background information.At the next time,we think we want to make sure how polyphenol show the effect of sterilization by using lactic acid bacteria.

Synthesizing amino acids applying Miller-Urey Experiment

Shibaura Institute of Technology Kashiwa High School

Hashizume, Hurukawa, Furuya, Matsumoto

① Abstract

We were interested in Miller-Urey Experiment and reproduced it.

Though Miller carried out this experiment by discharging in the test tube, we did by both discharging and heating the ingredient.

We examined what kinds of amino acids the production contains.

② Experiment method

① Discharge of electricity

Put ammonia and methane into a test tube, and put hydrogen into a plastic bag.

Position instruments like the picture below.

Turn on the machine that introduces high voltage, and circulate hydrogen every 15 minutes.

Go on this for 4 hours.

② Heat coil

Likewise ①, put substances into a test tube and a plastic bag.

Position instruments like the picture.

Heat the coil up by turning on electricity.

Turning the coil red, circulate hydrogen every 15 minutes.

Go on this trial for 4 hours.

③ Chromatography: analytics of amino acids

Confirm if amino acids were synthesized in the experiments of ① and ② by chromatography.

Position the sample in the test tube and standard one of amino acids.

The element is configured by the solution which includes acetic acid, water and butanol at 1:1:3 ratio, and try to develop for about 4 hours by using it.

④ The Consequence of Experiment

We made H_2 (hydrogen) circulate in a test tube and repeated that about 10 times.

Then, the liquid in it became yellow.

The time is short, and the surface area to reaction is narrow in the case of an electric discharge, so amino acids weren't made a lot.

⑤ Conclusion

- In the case of an electric discharge, amino acids were made a little much if we continued the experiment.
- In the case of heating, amino acids were made enough because we prevented oxygen from entering.

Produce of Preserved Flower with Natural Dye

Chiba Prefectural Awa High school
Nishimura Hoshimi , Suzuki Moe

Introduction

We want to make preserved flower that is using natural dye because a general preserved flower is made up of artificial dye .

Conclusion

We succeed in it that makes preserved flower with natural dyes .

This Work

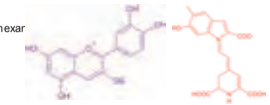
How to make preserved flower
Decolorization →Staining →Drying

Using Dye solution
Flavonoid →Petunia
Betalain →Mirabilis jalapa

Words
Alcohols of various types→5 types of alcohol : Methanol, ethanol, propanol, butanol and hexar

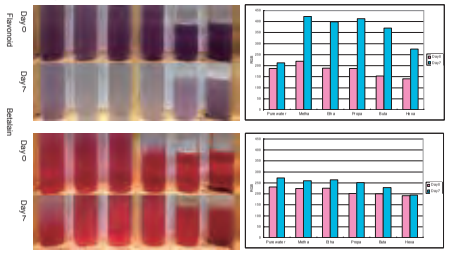
Staining solution→Dye solution that was extracted from petals with pure water

Lubricant →A solution mixed at that ratio (Glycerin : pure water =2 : 1)



Experiment 1 Decolorization ～Decolorizing Dye Solution～

①Adding alcohols of various types to the dye solution
(・Alcohol : 3 mL ・The dye solution : 5 mL)
②Leaving it for a week

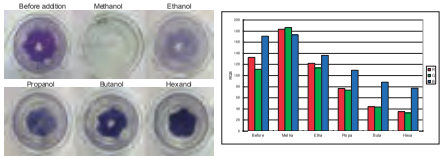


→Results

Flavonoids was faded by that was owing to alcohols .

Experiment 1 Decolorization ～Decolorizing Flowers～

①Soaking the flowers in alcohol
②Leaving it for 3 hours

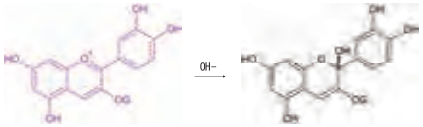


→Results

The flowers faded that have soaked alcohol of smaller molecular weight than larger one .

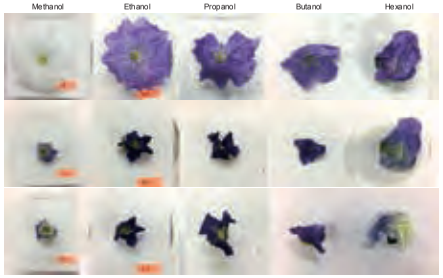
→Discussion

We consider that hydroxy moiety behaved to flavonoids and it be to pseudobase what is transparent , consequently the flowers faded .



Experiment 2 Staining ～Adding Lubricant～

①Soaking the flowers in methanol to decolorize
②Dipping the stalk of a flower into lubricant



→Results

The flowers shrinked that have soaked alcohol of smaller molecular weight than larger one . And original color developed .

Only hexanol faded little by little in a week

→Discussion

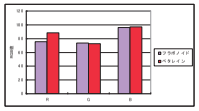
We consider that the flowers shrinked because alcohol of highly hydrophilic was melted in lubricant.

Experiment 2 Staining ～Staining Flowers that using natural dye～

①Soaking the flowers in methanol to decolorize
②Dipping the stalk of a flower into lubricant with natural dye

→Results

The flowers didn't shrink that have soaked natural dye . And it was using betalain was reddish than flavonoid .



→Discussion

We consider that the flowers didn't shrink because it was influence of hormones and enzymes in the staining solution . And using betalain was reddish because staining solution of betalain is red

Outlooks

・Pursuit of making arbitrary color
・Pursuit of reason why anthocyanin does not coexist betalain

Reference

・塚谷裕一 著, 『植物の〈見かけ〉はどう決まる』, 1995, 中央公論社 出版
・武田幸作 著, 『アジサイはなぜ七色に変わるのか』, 1996, PHP研究所 出版
・中原勝儼 著, 『色の科学』, 1985, 培風館 出版

Let's make a strong soap bubble!

Shibaura Institute of Technology Kashiwa High School
2－4 Kaji Kishinami Chiba

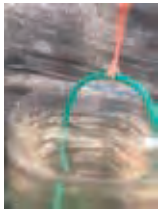
In our experiment, to make a strong soap bubble, we focused on the three points and experimented.
①Water holding capacity ② The viscosity ③ The surface tension

<< Abstract>>

When you were a young child, you may have played with a soap bubble.
At that time, have you thought that if only it would have been able to remain for a long time?
We wondered how we could make such a soap bubble and tried to make it.

<< Methodology &Results>>

1 Water holding capacity



▲The four materials are used.

2 The viscosity

	water	sugar 13g	65g	130 g	super	260g
Time until liquid falls [s]	15. 7	16. 9	18. 1	20. 1	23. 3	40. 0

3 The surface tension

	water	sugar 13g	65g	130g	super	260 g
*Height	1.90	0.63	0.63	0.57	0.60	1.0

＊:The height of liquid in the pipette.

4 The other materials

Although the strong bubble made by carbonated water and gelatin was created, it was broken immediately when it was big.

<<Discussion>>

A strong soap bubble needs the three elements;
①High water holding capacity.
②High viscosity.
③Small surface tension
About 35% of sugar seems to be the best to make a strong bubble.

<<Reference>>

H, Sugiyama &T, Sugiyama, Syabondamanohanashi[The talks of], Tokyo Tosho

Chiba Prefectural Awa High School Chemistry Club Artificial Salmon Roe group

Study of the Biodegradation of Artificial Salmon Roe

Soma Chugo, Yosuke Kamiyama

This Work

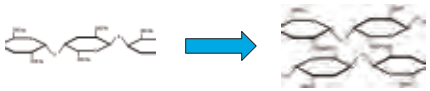
Validation biodegradation for make eco friendly Artificial Salmon Roe have biodegradation through use of beverage container.

Conlusion

We knew Artificial Salmon Roe start beverage about a week. A late starter cracking on the schale than on the dirt. ➡ We knew Artificial Salmon Roe have better keeping quality outside the zone of dirt.

Artificial Salmon Roe

Used alginate sodium($NaC_6H_7O_6$) and calcium chloride ($NaCl_2$).It`s microcapsule enclosed in irresolvability gel coating react to form soluble alginate sodium and calcium chloride.



How to make Artificial Salmon Roe

(1) Soak global ice in alginate sodium and coating of an object with global ice.

(2) Let into the ice bloomed alginate in calcium chloride.

(3) Between whiles spin so that the exposed calcium chloride stays moist all the way up to until fusion.

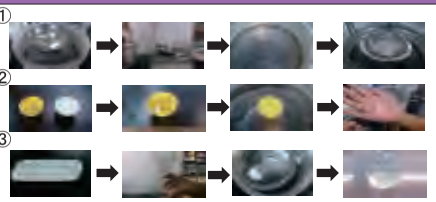
(4) Perhaps you could lift Artificial Salmon roe when fusion ice.

Previous Work

We superimposed many cut and try down to as of now how to make Artificial Salmon Roe.
①First,makd alginate sodium let into ladle sinked.but not got dull.

②And so,used ladle as distinct from half size ping-pong ball. Became globe. But can`t water packaging.

③And so, globe ice coat with alginate sodium abhibit calcium chloride. Conclusion globe fit for water packaging.



Experiments

(1) Make 3 Artificial Salmon Roe.

(2) 2 Artificial Salmon Roe put dirt(kitchen garden soil). A Artificial Salmon Roe put schale(heat-treated schale).

(3) Take a view.

Artificial Salmon Roe start biodegradation a week.
A late starter cracking on the shale than on the dirt.

Discussion

We knew at an early date break on the dirt.We think microorganism was cast dead for heat-treated on the schale. Be crashed reason,start biodegradation.So can`t suffer weight water.

Outlooks

We further investigation about comparing biodegradation speed of margin strength,surround come about biodegradation,water packging and development agriculture item.

Chiba Prefectural Awa High School

Study of Optimal Plating Time of a Fuel Cell Catalyst

NEMOTO Masahiro,KONDO Kazuki

Motivation

We have used copper and palladium as a reagent of fuel cell catalyst. The separation amount calculated, it separated metal soon in solution. And it was performed electrolyzing of water at most time. We studied that it is how to influence separation and electrolyzing of water in fuel cell. We studied copper attention.

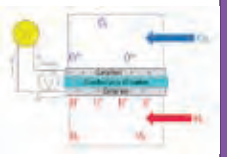
Conclusion

- Copper precipitated short time at five second.
- Experiment 2 indicated tendency in nearly date.
- The electromotive force is high when it plating at nine or ten minute.
- 5 seconds plating is most stable.

About Fuel Cell

Advantage
- Environmentally friendly
- High power generation efficiency

Reaction formula
$2H_2 + O_2 \rightarrow 2H_2O$



About Catalyst

Metal catarlyst of hydrogen erectrode side

$NiCl_2$ 1.0 mol/L 1 ml
$PdCl_2$ 5.0×10^{-3} mol/L 1 ml
H_2PtCl_6 5.0×10^{-3} mol/L 1 ml

Metal catarlyst of oxygen erectrode side

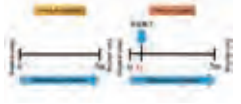
$CuCl_2$ 5.0×10^{-3} mol/L 9 ml
$PdCl_2$ 5.0×10^{-3} mol/L 2 ml

All results are the average of three times.

Experiment 1 : Effect of Copper Plating

- We compared 3 catalysts:

① Pd 5 minutes, No copper
② Pd 5 minutes, Cu 5 seconds
③ Pd 5 minutes, Cu 5 minutes

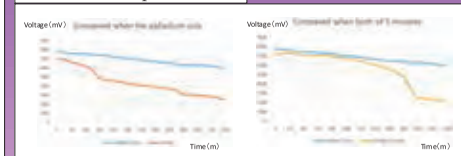


Experiment 2 : Effect of Electrolysis of Water

- We compared the electromotive force by chaging of copper plating time.

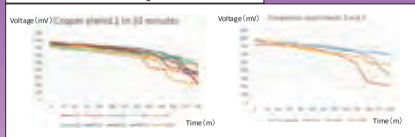
④ Pd 5 minutes, Cu 1 minutes
⑤ Pd 5 minutes, Cu 2 minutes
: :
⑬ Pd 5 minutes, Cu 10 minutes

Results of Experiment 1



- Higher electromotive force was come out of copper plating.
- ② showed higher voltage than ③.

Results of Experiment 2



There is little difference in value.
It was excellent in durability.

Consideration

No big change, changing the time to plating in the case of copper.
It only a little plated to mesh.
There is a cause of lowering of electromotive force during electrolysis of water.

Outlooks

Changing the plating time of other metals .palladium , etc.
We will plating time longer who create fuel cell with a higher electromotive force and durability.
We will explore cause of lowering of electromotive force.

Relationship between atmospheric pressure and headache

Akane Imada, Rina Aiso, Hiro Inoue
Higashikatsushika High School

1. Motive

The phrase "meteorologicfal disease" has become a popular topic in books and TV recently. A meteorological disease is a disorder which is caused by the change of temperature and the atmospheric pressure. We inspected whether there is some kind of relation between headaches and atmospheric pressure.

2. Mechanism of headaches

◎The Atmospheric pressure sensor hypothesis

"The Atmospheric pressure sensor" which is assumed to be present in the inner ear detects fluctuations of atmospheric pressure and sends the signal "body balance has collapsed" but, eyes sends a different signal. The different information from different organs causes sympathetic excitement and headaches. The existence of "The Atmospheric pressure sensor" in humans hasn't been confirmed yet. On the other hand, the experiment which uses mice whose inner ear was broken shows the existence of "The Atmospheric pressure sensor" in living creatures.

◎Vascular theory

It is a classical hypothesis. Blood vessels expand because atmospheric pressure decreases, and squeeze Pain sensitivity nerves, which causes a headache to occur. As a drawback, it is impossible to consider the reason atmospheric pressure increases and the reason for Migraine aura or nausea.

◎Trigemino-vascular theory

Trigeminal nerves around cerebral blood vessels are squeezed by something called the "Generator" (including fluctuations of atmospheric pressure). Then, Trigeminal nerve endings release pain substances for the blood vessels. Thus, the blood vessels expand and irritate the nerves which cause a headache to occur.

We hypothesize that the emergence of cortical spreading is working as another "Generator" and the error in the brain stem is causing the brain stem's nucleus to react.

3. Experimental method

We asked friends and family who suffer from migraine headaches to inform us when they suffered a migraine. We recorded data about their migraines.

We used the Internet to check the atmospheric pressure in the area our subjects live between 12:00 a.m. to 1:00 a.m. every day during the period of the experiment.

(Kashiwa-city: 5 subjects, Nagareyama-city: 5 subjects, Matsudo-city: 3 subjects, Noda-city: 2 subjects, Shiroi-city: 1 subject, Edogawa-ward: 1 subject)

4. Result

●We created these figures by using the data of the all subjects. (N=17)

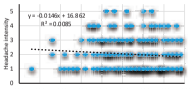


Fig.1 Relationship between atmospheric pressure and headache intensity

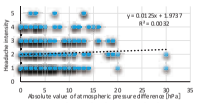


Fig.2 Relationship between absolute value of atmospheric pressure difference and headache intensity

＊Atmospheric pressure difference [hPa] = (Atmospheric pressure on the next day when someone has a headache) − (Atmospheric pressure on the day when someone has a headache)

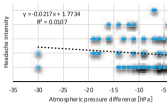


Fig.3 Relationship between atmospheric pressure difference and headache intensity (when pressure falls)

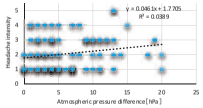


Fig.4 Relationship between atmospheric pressure and headache intensity (when pressure rises)

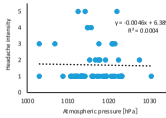


Fig.5 Relationship between atmospheric pressure and headache intensity at the beginning of headache

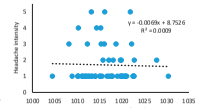


Fig.6 Relationship between average of atmospheric pressure while headache develops and hedache intensity

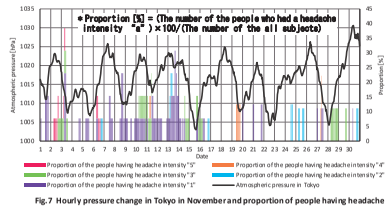


Fig.7 Hourly pressure change in Tokyo in November and proportion of people having headache

5. Discussion

There was no correlation coefficient over 0.2 in the data of the whole subjects, therefore, we found no correlation. Some correlation coefficients in the data of each subject are more than 0.8, however, according to scatter diagrams and the amount of data, we cannot say that's necessarily correct.

We recorded atmospheric pressure once a day to create Fig.1 through 4, but the date was too infrequent. Therefore, to revise the infrequency, we made Fig.5, Fig.6 and Fig.7 by using the data of hourly atmospheric pressure change at Japan Meteorological Agency's observation point "Tokyo" in November. However, with the additional data, there was no correlation between atmospheric pressure change and headache, as well.

From this data collected in this experiment, it is speculated that there is no correlation between headache and atmospheric change. However, there is a possibility that correlations were prevented from being made due to the experimental method and conditions of the subjects, therefore, we cannot conclude that there is truly no correlation.

6. Summary

Our results did not show any correlation between atmospheric pressure and headaches. However, the lifestyles of our subjects vary from person to person, so it is impossible to prove that their migraines were caused by the fluctuation of atmospheric pressure alone. We think that more accurate results could be provided if we measure the atmospheric pressure first in a low elevation, have the subjects climb a mountain, check severity of symptoms, and measure the atmospheric pressure again. We are interested in researching this subject more thoroughly if we can in the future.

◎Reference

Fumiyuki Goto, Haruna Yabe,Takanobu Kunihiro,Kaoru Ogawa: Migraine associated dizziness and treatment. Equilibrium Res Vol.67 (3): 205–210, 2008
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Fumiyuki Goto, Haruna Yabe,Takanobu Kunihiro,Kaoru Ogawa: Migraine associated dizziness and treatment. Equilibrium Res Vol.67 (3): 205–210, 2008
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Junichi Hamada, M.D.: Pathophysiology of migraine—migraine generator—. Clin Neurol, 48: 857–860, 2008

Effect of footbath on body temperature, blood pressure and pulse

Rin Taguchi, Saki Namatame
Higashi Katsushika High School

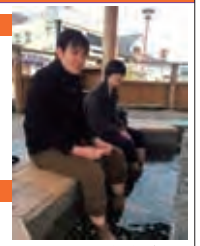
Introduction

■What is a Japanese footbath ?

A hot spring footbath is a bath that bathes only the lower half of our legs using water from a hot spring.
Hot spring footbaths are convenient because we can enjoy taking a footbath with our clothes on.
There are a lot of footbath areas which people can access easily, such as natural hot spring areas and the stations.

■Effects of footbath

1. Keep feet clean
2. Promote blood flow
3. Warms entire body
4. Has a relaxing effect
5. Eases throbbing pain
6. Promotes easier sleep
7. Promotes building various immunities



Method

We investigated the warming effect on the body by measuring the temperature of the foot. We investigated the relaxing effect by measuring blood pressure and pulse. We can consider that parasympathetic nerves hold a dominant position if it can be confirmed that blood pressure decreases. We considered that taking a footbath leads to a relaxing effect because it facilities a resting and fatigue recovery state.

■Details of this experiment

・The subjects were A (female; age 16), B (male; age 48) and C (male; age 81).
・Each subject sat on a chair and took the footbath for ten minutes (the water temperature was 40℃ and the room's was 24 ℃).
・The foot temperature was measured with a thermometer, which was placed between the first and second toes. The blood pressure and pulse were measured with a blood pressure meter.
・The foot temperature, blood pressure, and pulse were measured five times (Before the footbath, soon after the footbath, after 15 minutes, after 30 minutes, after 60 minutes).
・The date was measured three times each subject.

Results

The date is the average of the three measurements. The results of subject A were not clear. Subject B's blood pressure and pulse gradually decreased. Subject B fell asleep 40 minutes of after the footbath. The foot temperature decreased in comparison to the temperature before the footbath. In the case of subject C, the blood pressure and pulse decreased as well. Subject C fell asleep after 40 minutes of footbath in all three trials.

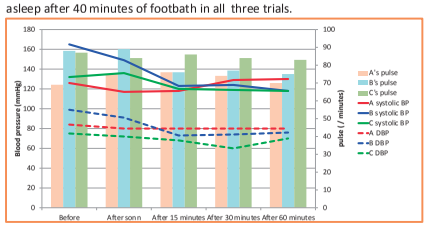


Fig.1 Change of blood pressure (BP) and pulse before and after the footbath

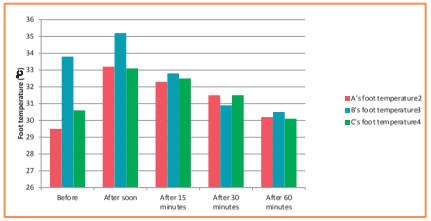


Fig.2 Change of foot temperature before and after the footbath

Discussion

■In the regards to temperature

According to the results, only subject A's foot temperature was maintained 60minutes after experiment. The foot temperature of subject B and subject C decreased. This result seems to be related to the temperature measured before the footbath. It is important to try to keep warm after taking a footbath, for people who have a naturally high temperature.

■In results to the relaxing effect

The results of subject B and subject C show that the blood pressure and pulse decreased after taking a footbath.
According to reference, the parasympathetic nerve is activated when blood pressure and pulse decrease. It seems that footbaths caused the subjects to relax. In addition, it is hypothesized that footbath also have an effect of increasing immunity. This is because the natural killer cell is activated when parasympathetic nerves are activated.

■Additional observations

<In the regards to age>

The results of subject B and subject C are clear in comparison to those of subject A.→It is hypothesized that taking a footbath is more effective to the elderly than to the young.

<In the regards to causation of onset of sleep>

It is hypothesizes that footbaths have an effect on the onset of sleep. This is because subject B and subject C often fell asleep after taking a footbath.

Acknowledgment

● Thank Mr. Sato and Mr. Takaishi for technical assistance.
● Thank Ms. Hiroi and Ms. Janssen for English assistance.

Reference

◆ Kentaro Kaneko, Hideki Kumagai, Yu Ogata.et al. (2009): "Physiological Effects of Footbath on Cardiovascular and Autonomic Nervous Functions" Japanese journal of nursing art and science 8(3), 35-41.

◆ Yuka Kasahara, Keizi Igarashi ,Kaori Kurauchi.et al.(2008):"Study on the relaxation effect of warm footbath" Journal of the Faculty of Human Studies, Bunkyo Gakuin University 10(1), 297-307.

◆ "TOKYO SENTO" : http://www.1010.or.jp/mag-column-07/
Last accessed: 2nd March 2017

◆ "BEAUTY HEALTHY": http://beautyhealty.web.fc2.com/sokuyoku.html
Last accessed: 2nd March 2017

Antibacterial effect of **Phellodendron amurense**

CHIBA HIGASHI HIGH SCHOOL
Haruka KAIDUKA, Aoi KIMURA, Hirokazu MIYAZAKI

<Overview> Phellodendron amurense contains much berberine (Fig. 1) in it endothrlium. It has a strong antibacterial effect, it is also used for traditional Chinese medicine. We report on its antibacterial effect using yeast.

(Fig.1) Structural formula of berberine

(Fig.2) (Fig.3) (Fig.4) (Fig.5) (Fig.6)

<Experiment1> Extracted components of Phellodendron amurense (Yield:9.07%)

【Result】 We could extract the powder of the ingredient of the Phellodendron amurense 7.59 g. (Fig.5)

<Experiment2> Antibacterial effect of Phellodendron amurense .
①No Phellodendron amurense(Fig.7) ②Aqueous solution of Phellodendron amurense(Fig.8) ③10 times higher than B(Fig.9)
【Result】
① and ② : Colonies could be found(Fig. 7)(Fig.8)
Colonies of ① is bigger than ② .
③ : Colonies couldn't be found(Fig. 9)

(Fig.7)

(Fig.8)

(Fig.9)

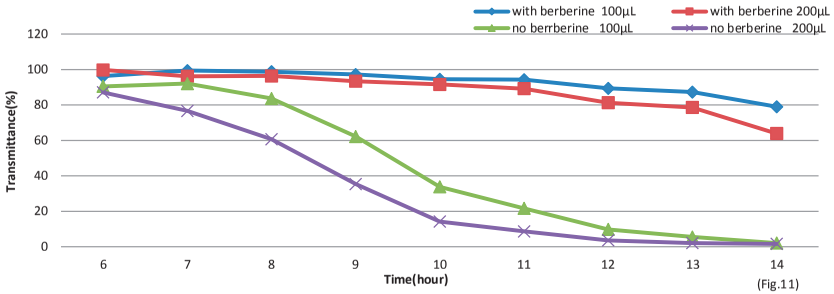
【Consider】The extracted components of Phellodendron amurense have antimicrobial effect , depending on the amount of extracted ingredients, the strength of the antibacterial effect changes.

< Experiment3> Extracted berberine
We confirmed extracted components by TLC (FIG. 9) however, various substances were mixed. We extracted berberine from there. (Yield:1.14%)
【Consider】Yellow crystal were gotten, and it was confirmed from TLC results that it was almost pure berberine.

(Fig.10)

<Experiment4> We researched the effect of berberine on the growth of yeast.

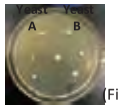
1.We prepared two kind of YPD medium solution which are in berberine and no berberine. Then,we mixed those and yeast.
2.We researched relationship between time and transmittance of those.
{Result} Without berberine, the permeability decreased very much in about 10 hours, but in the solution containing berberine, the transmittance was didn't decrease.(Fig.11)



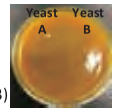
(Fig.11)

<Experiment5> We researched whether there is yeast which isn't affected antibacterial effect of berberine
{Result} In the berberine medium(Fig. 12), yeast A made colonies bigger than yeast B made. In the no berberine medium (Fig. 13), both colonies are about the same size.

{Consider} there was a difference in the growth of the two kinds of yeasts in the medium containing berberine, it is considered that the yeast A has a berberine resistance.



(Fig.12)



(Fig.13)

<Summary · Future prospects>
・The antibacterial effect of Phellodendron amurense and berberine could be confirmed.
・It was found that there were yeast strains resistant to berberine.
In future, We would like to reserch the ratio of berberine-resistant yeast contained in yeast and whether berberine-resistant yeast is resistant to other antibacterial components

<Experimental instruments used>
薬学雑誌 p1143～1144萩庭丈寿, 原田正敏:医療資源の開発に関する研究(第2報)
続・生物工学基礎講座 バイオよもやま話 p149 細胞の増殖を捉える 計測法から比速度算出まで 小西正郎 堀内淳一
黄柏(おうばく):漢方薬、生薬の通信販売－中屋彦十郎薬局「http://www.kanpoyaku-nakaya.com/oubaku.html」

Plants grown up restraint action and recycling by coffee

Ichikawa High school Grade2 Takuto Sakai

Abstract
There are many coffee consumption in Japan, so it thought that a large quantity of coffee residue is discarded. If useful usage of the coffee residue is found, environment load is reduced. In this study, broccoli (*brassica oleracea var.italica*) was inhibited growth by coffee residue or caffeine. It suggests that coffee residue and caffeine could inhibited the growth weeds of the lawn.

Introduction
Purpose I research that coffee makes them restrain plants growth
Background I thought that I made them restrain growth of weed using something to get easily, and weed in a garden was chosen.

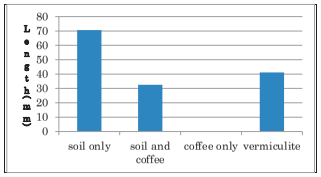
Methods①
『The experimnt that is targeted for the growth restraint with the coffee.』
I measured and water was given for 2 week.
Soil : coffee = 2 : 1
It sowed six seeds to one cup.

Methods②
『Ratio comparison experiment of the coffee.』
I changed coffee and a ratio to mix of soil.
Soil : coffee = 2 : 1 ←A
Soil : coffee = 3 : 1 ←B

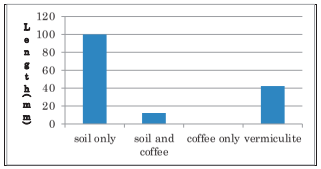
Methods③
『Plant restraint action with caffeine.』
I gave water and caffeine water solution (0.5%、1%、2%)

Results
『The experimnt that is targeted for the growth restraint with the coffee.』

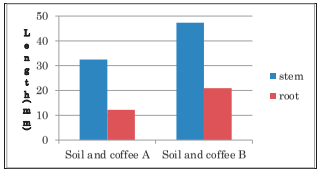
『Table1. The length of the stem average.』



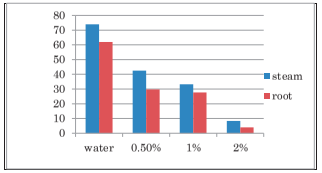
『Table2. The length of the root average.』



『Ratio comparison experiment of the coffee.』



『Plant restraint action with caffeine.』



<Be showed by results>
・The one where I mixed coffee and soil with did not grow up only than soil.
・It did not germinate only with coffee.
・When I mixed soil and coffee, one of the coffee with many ratios did not grow up.
・When I compared it in a stem, as for the thing which I mixed soil and coffee with, only 46% of things which I brought up only with soil grow up When I compared it in a root, as for the thing which I mixed soil and coffee with, only 12.2% of things which I brought up only with soil grow up.
・When I compared it in a stem, In soil and coffee A, only 68.7% grew up than soil and coffee B When I compared it in a root, In soil and coffee A, only 58.4% grew up than soil and coffee B.
・The growth of the plant was restraint by giving a caffeine water solution.
・Compared with water, plant grew up in 59% with 0.5% of density, grew up in 44.8% with 1% of density, grew up in 11.2% with 2% of density in the stem when I gave a caffeine water solution.
・Compared with water, plant grew up in 48% with 0.5% of density, grew up in 44.7% with 1% of density, grew up in 10.6% with 2% of density in the root when I gave a caffeine water solution.

Discussion
・Coffee had plant restraint action from these results.
・I understood that I controlled the growth of the root than the growth of the stem more.
・It concluded that an ingredient of the coffee affects the growth of the root more because it suck water from a root.

<Ingredient of the coffee>
・All polysaccharides (24.0~39.0%)
・Lipid (14.5~20.0%)
・Protein (13.0~15.0%)
・Polyphenol (1.2~1.3%)
・Caffeine (0.9~1.0%)
・Trigonene (0.5~1.0%)
・Inorganic ingredient (3.3~4.5%)

・I concluded that caffeine polyphenol is related to plant grown-up restraint, because when water is absorbed from a root, caffeine and polyphenol are also absorbed together.

Conclusion
I found out that coffee has the ingredient which makes plant growth restrain. The coffee could control the growth of the plant, and it understood that caffeine included in the coffee influenced it. It is thought that caffeine provides plant restraint. I would like to make them restrain plant germination and growth of weed in a garden and a field. Now I research effect green tea instead of coffee

Reference
Field Evaluation of Coffee Grounds Application for Crop Grouth Enhancament,Weed Control,and Soil Improvement
Kouji Yamane
Plant Production Science,17,93-102 (2014)

Japanese rice

Kisarazu high school
Sachiko Taira・Tamano Saito
Rena Kaneki・Mahiro Midorikawa

Contents

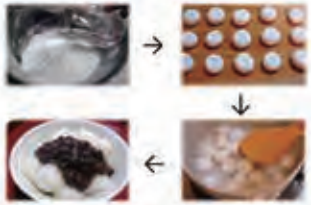
1 Classification of rice

Japan — Japonica rice

Malaysia — Indica rice

2 Food and Drink with Rice

How to make Dango



3 Japanese farmers' one year

Mar. Apl. May. Jun.

←seeding

rice planting→

Jul. Aug. Sep. Oct.~

↑rice reaping

4 Varieties of Rice

The number of rice products in Japan is

700

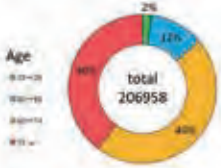
and now about

300

of it are grown

5 Price trends of rice

6 Age of agricultural population



Eatable flower

Kisarazu high school
Abe Yayoi・Kitamura Azu・Kuwada Momoka・Yamada Nene

About our prefecture "Chiba"

temperature	cool	warm
precipitation	much	little

Nanohana's vegetation

Nanohana is distributed from the mediterranean coast to the west Asia

How to use Nanohana in Japan (1)

①Nanohana is used as "Food".

炒め物(Stir - fry)

鍋(Nabe)

How to use Nanohana in Japan (2)

おひたし(Ohitashi)

How to use Nanohana in Japan (3)

★Vitamin C
★Mineral
★Iron
★Dietary fibers

How to use Nanohana in Japan (4)

②Nanohana is also used as "oil".

菜種油(Natane oil)

How to use Nanohana in Japan (5)

The plants eaten every four seasons (1)

Spring

The plants eaten every four seasons (2)

Summer

The plants eaten every four seasons (3)

Autumn

The plants eaten every four seasons (4)

Winter

The gelation of LM pectin under several conditions

Chosei High School　Mana Koide　Chika Matsumaru

1 Introduction

We like Fruiche. The gel of Fruiche is made from pectin which is a polysaccharide.

- Pectins are divided into two groups, LM-type and HM-type

- It is said the gelation is influenced by acids, sugars, and calcium ion.

HM-type →acids, sugars　LM-type →calcium ion

2 Purpose

- Investigate **the most effective concentration of calcium ion** for the LM-type gelation.
- Confirm **acids or sugars are really ineffective** for the LM-type gelation.

3 Material and Method

▸How to make gel

1 40g of LM-pectin powder and 500mL of water were mixed and heated at 70℃.

2 Added $CaCl_2$, or sucrose, or malic acid

3 Allowed to cool to 20℃ → gelation.

▸How to make measure the hardness

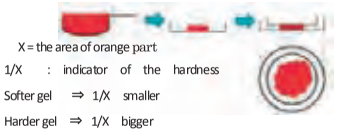
1 15mL of the mixture of pectin gel was taken.

2 Smaller dish was set on it.

3 By the weight of the dish the gel was pushed down and spread. Then measured the area of it.

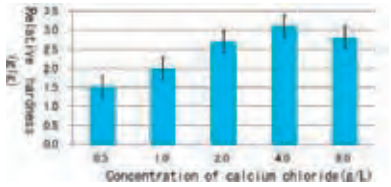
4 The reciprocal number of the area is the indicator of the relative hardness, and determined as our own unit of the hardness.

5 The area of which the circle of radius 3cm long as the standard, to call that reciprocal number 1g/g.



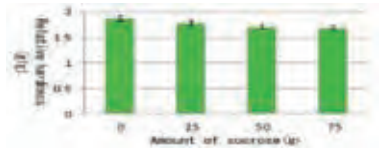
4 Result

- Concentration of $CaCl_2$ and hardness of the gel



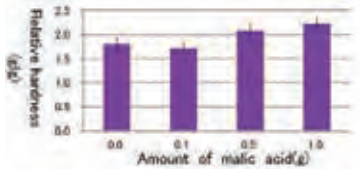
The hardest was 4.0g/L of $CaCl_2$

- Amount of sucrose and hardness of the gel



Sucrose didn't affect the hardness

▸Amount of malic acid hardness of the gel



Malic acid didn't affect the hardness

▸Added $MgCl_2$ or KCl in place of $CaCl_2$,

No gelation came out

5 Conclusion

- Acids and sugars are ineffective for the LM-type gelation
- Only calcium ion is effective for the LM-type gelation
- Same concentration as milk is the most effective
- Potassium ion and magnesium ion are ineffective
- Calcium ions connect pectin molecules together by their positive charge.

The ecology of loggerhead turtle

Okuno Takumi, Uncki Mio, Kageyama Yui, Taniguchi Hayato

1. Introduction

We didn't know sea turtles.
Therefore , we researched its ecology(distribution, food, etc.)
We found the problem of the sea turtle.

Let's discuss the problem and solutions.

2. Distribution

3. Sea turtles

Head : small Nails : one Color of carapace : yellow and mosaic	small one dark green	big two brown

4. loggerhead turtle

Scientific name: *Caretta caretta*
English name: loggerhead turtle
Description: big head
They are endangered species (WWF)

5. Ecology

•Food: benthonic organism (example ; Hermit crab, shell, jelly fish)

•The average length of carapace: 85cm (in north pacific)

•Weight: 70~180 kg

6. Spawing number

7. Problem

8. Cause

①Pollution of sandy beaches　②Decrease of sandy beaches

③ They swallow trashes accidentally

9. Solution

Cleaning sandy beaches

And...please do not throw waste into the sea and river!!

What Kind of Aqueous Solutions Can Grow Spring Onions Faster?

Shibaura Institute of Technology Kashiwa Senior High School

Saki Mizukoshi　Haruka Saito　Yuka Sano　Saki Takenaga　Yuzuki Yamamoto

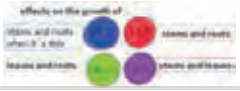
We conducted experiments to research the effects on the growth speed of spring onions by some kinds of aqueous solutions. In the experiment A, we grew onions using water with 2.4-D, IAA, Gibberellin and Kinetin and distilled water. In the experiment B, we grew onions using water, Carbonated water, Vegetable juice, Green tea and Coconut milk. In both of the experiments, we measured the length of them every day.

Motive

We wondered whether the growth speed of onions is changed by the kinds of liquids we use.

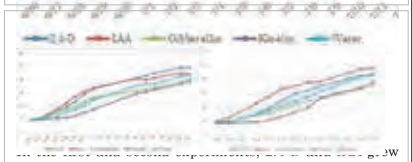
Experiment A (Phytohormones)

About Phytohormones

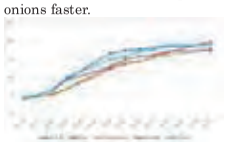


Tools

- Spring onions
- Distilled water
- Phytohormone (2.4-D, IAA, gibberellin and kinetin)



onions faster.



In the third and fourth experiments, the difference between each kind of aqueous solution became little.

As the experiments conducted later, the onions were easy to die and hard to grow fast.
We guess it concerns the temperature because the place conducting these experiments is the hallway that has no air conditioner.

Experiment B (Familiar aqueous solutions)

Tools

- Spring onions
- Water
- Coconuts milk powder
- Green tea powder
- Vegetable juice
- Carbonated water(without sugar)
- Cup×5
- cellophane

Aqueous solutions

First experiment

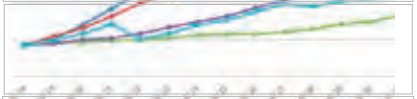
Water

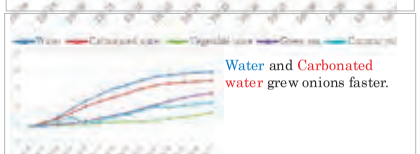
Carbonated water

Vegetable juice…200ml vegetable juice / 200ml water

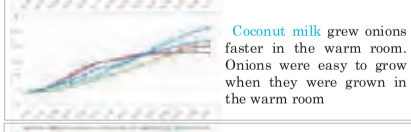
Green tea　…1g powder / 200ml water

Coconut milk　…10g powder / 200ml water





Water and Carbonated water grew onions faster.



Coconut milk grew onions faster in the warm room. Onions were easy to grow when they were grown in the warm room

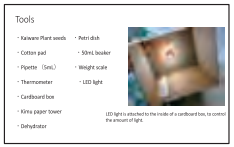
Conclusion

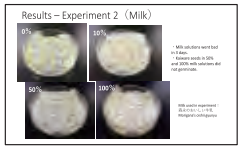
- 2.4-D is used as the herbicide. Therefore, the thicker aqueous solution is, the slower onions grow up. In other words, when onions grow slowly, phytohormones or components may work as repression.
- We think that temperature is one of the reasons why onions in water with gibberellin and kinetin didn't grow fast like we expected.
- We found the temperature concerned with the speed of onions growth. Therefore, we want to study the relation between temperature and growth of onions.

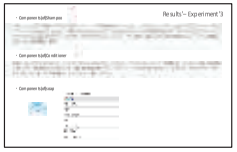
The Growth of Kaiware Using Different Liquids

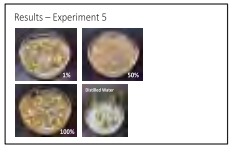
Is water the best option for plants?

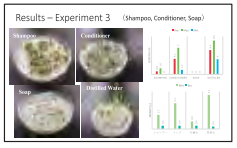
Abstract: This experiment is aimed to study the effects that different liquids have on plant growth. Six experiments were carried out using 6 different solutions, each with different components. In each experiment, one group of plants were grown with distilled water, as the control group.

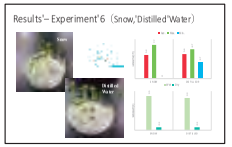


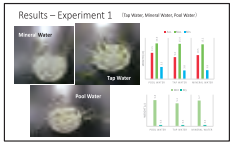


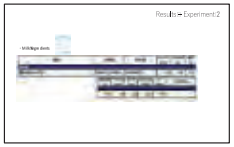


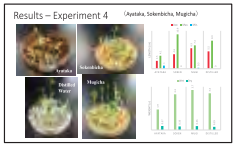












Shibaura|Institute|of|Technology|High|School

Grade|2

Yuki|Enomoto &|Haruka Asaoka

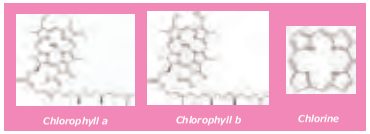
The|End

Study of Chlorophyll

Chiba prefectural Awa high school
Moe Suzuki

The purpose

・Normally *chlorophyll* has **Magnesium ion** in the core of its structure.
By replacing other metal ions instead of magnesium ion, I want to improve this dye's stability by stimulations to light and heat.



Introduction

In these experiments, we used the dye which was extracted from spinaches with ethanol.
And also we call the dye "**The dye solution**".
＊I supposed all dyes are *chlorophyll a* while spinaches have two kind of *chlorophyll*. we'll study and making experiments.

Conclusion

The dye solution's color of a deep green changed to a **browny green**.
We confirmed precipitates which were deep green in all of the solution.
The more we added hydrochloric acid,
the more precipitate appeared.
After the observation, we added copper acetate to the solutions,
Its color changed from browny green to light green.

This work

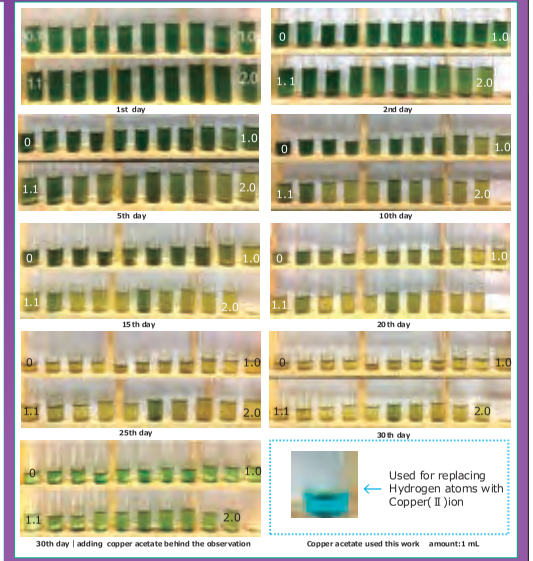
Experiment a Replacing Magnesium ion with Hydrogen atoms.
|To transform *chlorophyll a* into *pheophytin a*.

$2HCl$ +  → $MgCl_2$ + 

Experiment b Replacing Hydrogen atoms with Copper(Ⅱ) ion.
|To transform *pheophytin a* into *Copper chlorophyll*.

$Cu(CH_3COO)_2$ + 

→ $2CH_3COOH$ + 



＊Preliminary experiment

① take 10 g of the spinach's leaves and add 100 mL of ethanol to it.
② Once 20 mL out of the 100 mL of ethanol evaporates out, add another 20 mL. Repeat process above 3 times.
③ Filter out impurities 10 times to 20 times until they disappear from the solution.


The dye solution


Small sample of the solution

＊Major Experiments

A Divide the solution into 21 test tubes and add different internals of **0.1 mol/L** of **hydrochloric acid** to each of the solutions from **0** to **2.0mL**. Then observe them in a dark place for **30 days**.

B Add 1 mL of copper acetate to the solutions after the observation.

Discussion

・I considered that *chlorophyll a* in the dye solution changed into other substance because to its color changed due to adding Hydrochloric acid and oxidation.
・I considered that the precipitates do not appear because of adding Hydrochloric acid, because even without adding it, the solution had the precipitate.
・Also I consider that changing its color, it changed other substance that the solution adding copper acetate after the observation.

However, over such a long term I cannot believe the solution reacted just to Oxygen or acid.
We need to analyze the transformation of *pheophytin a* and *copper chlorophyll*.

Outlooks

・Investigate *pheophytin* and *copper chlorophyll*.
・Study deeper about the dye in spinaches.

Whether Drosophila Grows Big by Changing Oxygen Density

Watanabe Nakazawa Someya

MOTIVATION

Creatures were very big in ancient era.
WHY? We thought and studied the ancient creatures, such as Ancient dragonfly, Meganeura. It was about 70 cm ! But in this era, the biggest dragonfly in Japan, Anotogaster sieboldii was about 10cm. Oxygen density was higher than now. A hypothesis says creatures' size have something to do with oxygen density.

METHODOLOGY

1. To make device to keep oxygen density.
   [Detailed Means]
   LOW: Put body wormer in a water tank.
   $2Fe+O_2 \rightarrow 2FeO$
   It uses oxygen!
   HIGH: Put oxygen in a water tank.
2. To raise Drosophilas.
3. To measure and weigh Drosophilas.

HYPOTHESIS

In high oxygen density, Drosophilas will be bigger than in normal density, but die.
In low oxygen density, Drosophilas won't be big and alive.

RESULT

<Parents>

Average weight	Average size
HIGH: 0.94mg	HIGH: 2.6mm
NORMAL: 0.85mg	NORMAL: 2.2mm
LOW: 1.10mg	LOW: 2.5mm

<Children>

Average weight	Average size
HIGH: 0.94mg	HIGH: 2.5mm
NORMAL: 1.10mg	NORMAL: 2.4mm
LOW: 1.2mg	

TOOL

3 water tanks
An oxygen sensor
3 thermometers
Disposable body warmers
Plastic bags
Clay
Vacuum pump

CONSIDERATION AND TASKS

・Drosophilas' growth has to do with oxygen density.
・To change density of oxygen.
ex) Low→High High→Low
・To test by using another creatures.

The Decimal Parts of Powers

Shibaura Institute of Technology Kashiwa high school 2th grade
YAJIMA Tomoaki KATO Taiki KAWAZU Akihiro KEITOKU Ryo

FACT(Kronecker's Approximation Theorem)

Let r be a positive irrational number and a, b be real numbers with $0 < a < b < 1$.
Then, there exists some positive integer n such that

$$a < \{nr\} < b$$

Explanation: Let $\{x\}$ denote the decimal part of a real number x.

PROOF. Let N be an integer such that $\frac{1}{b-a} < N$. By Pegionhole Principle, we can choose positive integers s, t such that

$$\frac{k}{N} < \{sr\} < \{tr\} < \frac{k+1}{N}$$

for some integer k.

If $s < t$, since $\{(t-s)r\} < \frac{1}{N}$, there exists some integer c such that $a < \{c(t-s)r\} < b$. The second case can be proven like the first case.

We arranged this theorem like that.

Let r be a positive irrational number and a, b be real numbers with $0 < a < b < 1$.
Then, there exists some positive integer n such that

$$a < \{r^n\} < b$$

We can easily obtain that this statement is wrong. Since if $r < 1$, $r^n < 1$ and r^n is a monotonically decreasing function, so is $\{r^n\}$.

Suppose that $r > 1$. Since $(2+\sqrt{2})^n + (2-\sqrt{2})^n$ is an integer and $(2-\sqrt{2})^n < 1$ for any positive integer n, we can get that $\{(2+\sqrt{2})^n\} = 1 - (2-\sqrt{2})^n$. Hence $r = 2+\sqrt{2}$ is a counter example.

Our study shows this.

STATEMENT

Let $r > 1$ be a real number. Suppose that there exists some integral expression f(not a constant function) such that $f(r) = 0$ and the degree of f is minimal.

Given convergence of $\{r^n\}$ as $n \to \infty$, then $|t| < 1$ for any root t of $f(t) = 0$ except r.

REMAINING PROBLEM

(A) $r = \pi$

(B) Whether there exists some r such that the set of $\{r^n\}$ is dense.

Differential sensitivity of trypsin digestion of egg proteins caused by its cooking methods

Sayori Ichijo, Toho University attached Toho High school

Purpose

Why cooking methods affect to antigenicity of egg protein?

《Hypothesis: Difference of heat denature of egg protein by cooking methods affect to trypsin digestion efficiency 》

Background

・Many children suffered by food allergy, especially egg-allergy in Japan. Egg-allergy is serious disease that may cause fatal symptom, so call anaphylactic shock. Therefore, it's very useful if preventive methods of egg-allergy are established for those children.

About egg allergy

・Type I allergy is caused by IgE antibody which react to several environmental substances such as egg proteins.
・Onset of egg allergy shows many symptoms including vomiting and diarrhea. Moreover, sometimes it causes anaphylactic shock and then die without proper treatment.
・Egg allergy caused by IgE antibody which react to egg-white proteins, such as ovomucoid and ovalbumin. Therefore if egg proteins are digested completely to amino acid, ratio of allergy anticipate to reduce.

・Cooking methods of egg changes ratio of egg-allergy onset. According to this observation, heat denaturation of egg protein during cooking probably different from each cooking method. And these difference may affect the protease digestion in digestive organs.
・ In this study, sensitivity of trypsin digestion to heat-denatured egg proteins by several cooking methods was examined.

Material

Egg-white of chicken

Method

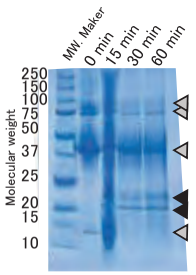
①Cooking eggs by four different method, soft-boiled , hard-boiled, directly boiled in hot water, so call poached egg, or fried.
②Dissolve cooked egg-white by mash in Phosphate buffered saline.
③React trypsin to cooked-egg-white specimens 0 to 60 minutes at 37 degree.
④Analyze egg-white proteins by SDS-PAGE.

Conclusion

Sensitivity of trypsin digestion of egg-white changed by its cooking methods
Especially, hard-boiled egg specimen degrade efficiently by trypsin treatment. Therefore, complete heat denaturation suggested to be important to digest proteins.

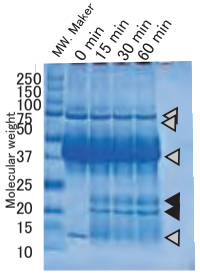
Results

Hard-boiled egg



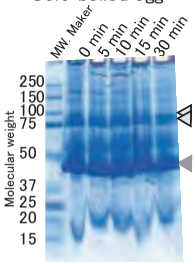
Decrease:80,75,40,14(kD)
Increase:22,20(kD)

Poached egg



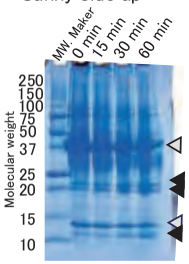
Decrease:80,75,40,14(kD)
Increase:22,20(kD)

Soft-boiled egg



Decrease:80,75(kD)

Sunny side up



Decrease:40,14(kD)
Increase:22,20,12(kD)

Compering sensitivity to trypsin digestion, hard-boiled egg showed higher degradation ratio than other methods.

References:

Reference of food allergy diagnosis 2014. Ministry of Health, Labour and Welfare
M. Okada, et.al., 2011, Note for protein analysis experiment. Yodosha
K. Hagiwara and T. Tada 2014, Fun to learn Immunology. Koudannsha

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Was the Fermat's margin really narrow ?

Tomoya Ohtaki, Masatomo Kamimae, Humiya Kobayashi, Kei Kubotera, Takuro Tachibana

Abstract

A mathematician Pierre de Fermat wrote “this margin is too narrow”. Most people say “It was a lie.”. Even though there are a few possibilities that the margin was really narrow, there was no attempt about this problem.

Finally, we found that his word was true.

Purpose

1. To make sure whether Fermat was a liar or not.
2. To construct a certainly material of this problem.

Method

1. To Process that Fermat knew the proof of Andrew Wiles.
2. To get handwriting of the person who lived in the same period as Fermat, using digital archive service.
3. To Measure the size of total margin of *Arithmetica*.
4. To Measure the text length of proof of Wiles in French because Fermat is French, using Google translate to translate the proof into French.
5. To calculate the needed area for writing the all proof in French, using the handwriting of 3’s.
6. To compare number 3 with number5.

Background

Fermat's Last Theorem was expected by Pierre de Fermat (1608-1665). He built up this hypothesis when he was reading Arithmetica, which was written by a Greek mathematician Diophantus. He had a habit of writing his notice in margin of the book. And he wrote a conjecture like this.

$$x^n + y^n \neq z^n (n \geq 3)$$

“It is impossible to separate a cube into two cubes, any power higher than the second, into two like powers. I have discovered a truly marvelous proof of this, which this margin is too narrow to contain.”

Finally, the conjecture was proved in 1995 by Andrew Wiles. Today, Fermat's Last Theorem is often mentioned in school. Then, teachers say “Fermat didn't know the proof. He only wanted to show himself greater.”...

Results

The size of total margin of Arithmetica
157,209 cm2
The text length in French
192,479 (number of characters)
42,885 (number of spaces)
Calculate the needed area
4.81 cm (space between lines)
3.39 mm (width of characters)
3.20 mm (width of spaces)
6.92 cm (a line length on *Arithmetica*)

Consideration

Judging from those numbers,
The needed area is 373,092 cm2
The real area on *Arithmetica* is 157,209 cm2
If Fermat wrote characters as 1.43 mm width, the margin will be enough. But, it is not realistic.
Therefore, the margin was really narrow.

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