



Science Communication – Dr. Jennifer Manyweathers at the University of Tsukuba

I teach science communication in the biology department at the University of Tsukuba. I am a vet by training and it was while working in Australia that I discovered the importance of science communication for the progress of science and research. Without good communication, scientific knowledge and research has no real meaning.

So what is science communication? It is about being able to explain science ideas and research to any audience, whether they are children or adults, whether they have existing science knowledge or none at all. Even people who have no science training can think about science and may have some good ideas for the progression of

research. Also, science is all around us and it is important for everyone to think about how science can help them live a better life and to ask questions about the things they see around them. I hope that all of you who go on to careers in science research and teaching will understand the



importance and excitement of science communication.



The Use of Japanese Around the World

The Japanese language, as a mother tongue, is only spoken by the people living on the Japanese archipelago (population approx. 128 million). However, far less measurable is the influence of the words of the language. Why is it that some Japanese words are now spoken the world over? Examples include "mottainai", "kawaii", "sumo", "tsunami", "manga", "sushi", and "samurai". See the attached table for meanings if you don't already know.

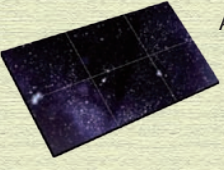
"Mottainai" (勿体無い) can be translated into English to mean "wasteful". This is a useful translation but the original Japanese expresses a number of meanings. In fact, "mottainai" has four meanings, "reduce", "reuse", "recycle" and "respect". The Kenyan ecologist, Wangari Muta Maathai, who won the 2004 Nobel Peace Prize, turned "mottainai" into a popular catch-phrase which has since spread all over the world. She used this word precisely because it carries all these ecological meanings.

"Kawaii" (かわいい), now exported worldwide, is often used to express the characters of Japanese comic books or animated films. In these modern times it means "small", "a dear thing" or "a cute girl", all of which connote a lovely innocence. Yet, the original meaning of "kawaii" is "pity", or "poor." That is an interesting linguistic evolution!

The two examples above show us that Japanese is often a language of words with multiple meanings and a single word can be enough to explain something more complex. Maybe that is why some Japanese words have become popular around the world. Maybe many more will follow?

| JAPANESE | MEANING |
|----------------|--|
| sumo 相撲 | Japanese-style wrestling |
| tsunami 津波 | a huge wave caused by an earthquake etc. |
| manga 漫画 | Japanese comic books |
| sushi 寿司 | a type of Japanese food |
| samurai 侍 | ancient Japanese warrior |
| kawaii かわいい | cute, pretty |
| mottainai 勿体無い | wasteful |

Living creatures have some amazing characteristics that we humans continue to learn from and apply to even our most complex technologies. For example, the folding mechanism of the solar panels on the International Space Station was modeled on a wing folding pattern of a certain creature. Which one provided the model?

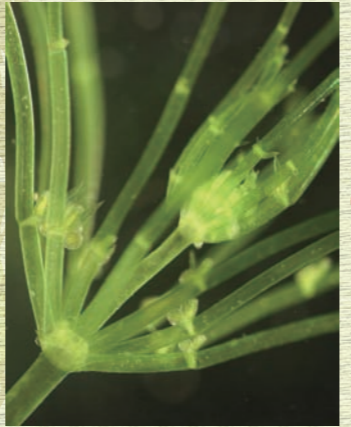


- A. the cicada pupa B. the peacock C. the cockroach

Answer to yesterday's quiz: B

One grain grows up to about 20 ears. One ear would fruit about 80 grains. So one seed of rice becomes 1600 grains. By the way rice is also called "Hitotsubu manba" meaning many can be harvested from just one grain of rice.

LOCAL LIFE



Nikko

Stoneworts: Endangered Jewels of the Lake

Do you know what stoneworts are? They are green, immobile and very beautiful plants. However, you don't usually see them in your daily life because they are hidden under water. Yes, they are a group of freshwater green algae. Their main axes (stems) have whorls of short lateral branches at intervals so they look like axles and wheels. This is why they are called *shazikumo* in Japanese (*shaziku* = axle; *mo* = algae).

The stoneworts are an important group within the evolution of plants as they are the closest relatives to land plants. They play an important role for the environment because they can help clear muddy lake water. They also supply safe and comfortable homes for many lake creatures. As such, they are a vital element within the lake environment.

Unfortunately, most species of stoneworts are now endangered. There is little opportunity to see them in Japan. In Nikko, however, there are two famous lakes—Lake Chuzeiji and Lake Yuno—which are home to large communities of two such endangered stoneworts, *Nitella flexilis* and *Chara braunii*.



Today's Quiz

Students' Community of IBO (SCIBO) Team-J
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Matsuri Time!

The exams were over, and it was time to celebrate! Tsukuba Night, a perfect *matsuri*, ("festival" or "celebration"), was readied for all to enjoy.

The stage was set within the university grounds right next to the exam venue. All those involved in IBO2009—the participants, jury, and team guides—as well as some local residents joined in for the fiesta. Following the first opening address by the Mayor of Tsukuba, Kenichi Ichihara, a speech was given by Yukio Hattori, a food coordinator who supervised the national recipe contest to decide the menu for IBO2009 events. He was followed by Dr. Nobuhiro Yamada, president of the University of Tsukuba, and Dr. Osamu Numata, chairman of the IBO2009 executive committee. With a toast from Dr. Numata, the music sounded and the party began.

But nothing can be started on an empty stomach, and everyone flowed into the cafeteria for food. Tonight, the second and third place dishes from the national recipe

contest were served, as well as many Japanese dishes such as sushi. Aside from the welcome party, this was another occasion to try chopsticks and Japanese food, which many seemed to enjoy.

However, Tsukuba Night was not only for filling up on good food, but more for filling up on great memories. With the drum roll of Tokimeki Taiko-Juku, the show was underway. Many shapes and sizes of traditional Japanese drums (*wadaiko*) combined to create an exciting rhythmic adventure—the dancing drummers making it a spectacular performance not only to the ears, but for the eyes as well. Everyone came out of the cafeteria to watch the scene, and many gathered on the lawn in front of the stage to get a closer view. They were so drawn into the drumming that they needed to move back for the next performance, Yosakoi Soran—one of Japan's traditional dances. The dance was performed by a student group at the University of Tsukuba, Kirikirimai, and a local group called Tsukuba



Yosakoi-ren.

Yosakoi Soran captivated the people present with energetic dances. When asked to stand and join in the dance, participants, jury, team guides, and others danced and enjoyed alike. Many came from the back rows to join the crowd in front of the stage. There were no barriers between them. Where they were from or why they were here didn't matter. All that mattered was to have fun at that moment. They were so

excited that they happily danced Yosakoi Soran a second time.

Everyone's expressions were so bright during Tsukuba Night. It was especially true for the contestants, whose faces shone like never before. The pressure is off for the students, and in the special air of *matsuri*, it perhaps became one of the most memorable nights of IBO2009.

The Last Hurdle

Yesterday was the fifth day of IBO2009 and one of the main events, the theoretical exam, was held.

Several hours before the theoretical exam, the participants were in various states at Ninomiya House. Some were singing songs from their home country, as usual. Others were so nervous that they couldn't eat much breakfast. A few were a little panicked, forgetting some necessary items. It seemed a small commotion, but according to the team guides, the challengers were much more relaxed than they had been for the practical tests. However, there was no disputing that the participants were nervous, and many were studying their notes on their way to the exam venue.

The students had two tests in a single day, each taking more than

two hours apiece. The questions were chosen from a wide variety of areas, with difficulty ranging up to biological concepts normally learned in first and second years of university.

This was the last hurdle for the participants to clear, and the team guides, who have come to form close bonds with the participants, have heard some of their honest thoughts. Reuniting with the jury members, after being completely separated from them since the beginning of IBO2009, is one of the things the participants are looking forward to most. Some of them commented that they could not wait to see the jury, and wanted to tell them how the tests have gone. The special event held last night, Tsukuba Night, was another event on the students' minds. They were



certainly ready to have fun after all the hard work, and to fully enjoy all that awaited them. Hopefully the participants were able to unwind and feel satisfied with all their efforts.



Today's Schedule

Students Schedule
 6:30 - 21:20 Excursion (Nikko)
 21:20 - 22:00 Dinner

Jury & Observers Schedule
 7:00 - 8:00 Breakfast
 10:00 → Jury Session
 12:00 - 13:00 Lunch
 18:30 - 20:00 Dinner

High 23°C
 Low 20°C
 Humidity 80%
 Chance of rain 60%

Dokkoisho!

The heat, the smell, the hustle, the shouts and screams of joy—it all feels like a vivid dream. Last night was a moment when all nations at IBO2009 became one.

What a sound the *wadaiko* drums made! The stage performance at Tsukuba Night kicked off with the low rolling beats of *wadaiko* drums, performed by Tokimeki Taiko-juku. The audience felt the drums resonate with their pulse, and their excitement gradually built up.

The program then proceeded to the Yosakoi Soran "fishermen" dance by Kirikirimai and Tsukuba Yosakoi-ren. As the inspirational *soran-bushi* song started playing, muscular dancers appeared on stage. The students in the front row were startled by the dancers as they rushed up face to face. The third performance, with the *shake* (Salmon) movement seemed to be the favourite of one of

the performers, and some of them competed to see who could jump higher while they were explaining how to dance the "Shake Samba". The music started, and it was at that moment that the audience really switched on.

The excitement built up even more as they moved on to the Yosakoi Soran dance. At every call of 'Dokkoisho!', the barriers between people were blown away. Students, staff, jury members, local high school students, and performers—all fused into one large wave, and together swayed back and forth to the music, their faces glowing with exultation.

Both the drummers and the dancers confidently said that this had been their best performance ever. "We feel so honored to represent the spirit of Japan like this. Everyone here is so psyched—I love these people!"

With the heat of the dance still hanging in the air, people reluctantly headed home to rest.

Enjoying a Moment of Freedom

Staying in an air-conditioned room may seem like a pleasant choice for many people, but it was no picnic for the jury members who were in the Congress Center checking, finalizing, and fine-tuning questions for the theoretical exam for hours on Wednesday. By yesterday morning they needed to get some fresh air. Since they had more meetings in the afternoon, time was limited and they were asked to choose between JAXA (Japan Aerospace Exploration Agency) and AIST (Advanced Industrial Science and Technology) for their brief outing. Under the dazzling sun, jury members got onto their allocated buses, with signs of fatigue showing from the long discussions.

The AIST group visited Science Square Tsukuba and the Geological museum. There was one particular exhibit in the Science Square that attracted the visiting jury members. A new device to measure the stiffness of arteries was invented by

AIST, and visitors could experience the new technology themselves. The jury members, who have been working hard these past few days, seemed to be concerned about their "arterial health" and a lot of them tried the redesigned blood pressure meter.

On the other hand, the group that visited JAXA was fascinated by the science of space development, which is quite dissimilar to their own speciality. Everyone walked around studying the exhibits in their own way; having their photo taken with life-size cut-outs of astronauts, enthusiastically throwing questions at the JAXA guide, and so on. Their eyes sparkled with curiosity as if they had returned to their childhoods. Their spirit of inquiry must be one of the factors that keep them young!



"Sakana zukushi - carp" by Utagawa Hiroshige

The artist, Utagawa Hiroshige, is famous for landscapes, but he also drew humans and other living things. This piece, drawing swimming carp, is from his work "Sakana zukushi". The carp is a favorable motif for Japanese people because of its behavior. Carp swim up rapid streams, symbolizing strength, courage, and patience-dispositions that Japanese are fond of.

It's Japanese style happi

reunion of students and jury



Wadaiko drums



Now you can dance Yosakoi Soran

Performance of Tokimeki Taiko-Juku



the rhythm of drums...

a minute away from the exam



Team Brazil



it begins soon...



Using chopsticks for the first time



after the exam



We are young!!



jury in JAXA



receiving question sheets nervously



with Mr. Hattori



waiting and concentrating



Team Tajikistan



Kamae!!



love sweets!!



with Japanese children



Dokkoisho!!



you can be astronaut!



in front of the rocket

It's Over!!

There was a two-hour gap between the end of the exam and Tsukuba Night, and during that time, many smiling faces were seen. Students were chatting and relaxing happily while waiting for the jury members to arrive. An instant victory celebration place sprang up outside the exam venue, with many contestants squinting each other with bottles of water! Release from the enormous pressure of IBO allowed them to be high school students again. When the jury members came, both students and jury seemed to be very delighted to meet each other again. They were excitedly talking about the exams and other events during the days of separation. Some jury members looked much happier than the students—it must be an anxious thing to leave their students alone in a foreign

country. But now they were reunited and ready to have fun at Tsukuba Night.

Comment from a member of Team Tajikistan

The theoretical exam was OK and there was enough time, but the second part, which had many calculations, was hard work. It made me so tired and so were the others, and we were very sleepy after lunch. My teammates and I already talked with our jury about the exams. The result of our practical exam was not like we hoped, but it was quite difficult because we had to use special technologies. There was not enough time, either. But today I did my best and now the whole exam is finished, so I will hope, rest, and wait for the result!

Comment from members of Team Brazil

Two of us were in the last IBO, and we felt that the questions were easier than that time. Also, there was plenty of time to take the exam. But if everyone felt it was easy, then there might be some difficulties finding differences between the results. We are looking forward to seeing our jury because we like them and we missed them after not seeing them for three days! When they come, we want to ask them how they are expecting our result. It was enjoyable to be in IBO2009.

Team Latvia

After the theoretical exam, participants' faces looked relieved.



Jury's Voice Comments on IBO2009

While other jury members joined the excursion to science institutions in Tsukuba, the jury members of Team Nigeria enjoyed a little shopping instead. They went to the Ishimaru electronic shop just in front of the International Conference Center and bought an automatic dish washing machine and a foot massager as souvenirs. They seemed happy and said that these things are difficult to buy in their country.

According to them, the jury conferences are well planned and organized, so they don't have time to feel sleepy or bored. They also said "We feel proud because we are not only the representatives of Nigeria, but also of all of Africa since we are the

only country which joined IBO from Africa."

Team Sri Lanka jury members hoped their students, who have never visited any overseas countries before, enjoy interacting with students from many other countries. They felt that just being able to participate in IBO is important for them.

A German jury member was enjoying a cup of coffee outside, just before a jury meeting started. He was tired because of the demanding IBO schedule. He mentioned that their government expects them to get a good result, such as several gold medals, but that the team doesn't feel so much pressure. He agreed with Dr. Kasemsap's words at the Opening Ceremony; that all students are already

winners in their own countries. He said he wanted his team members to be creative by studying all subjects rather than just getting good scores on a specific exam.

It seems that jury members are hoping for intangible benefits for their students, rather than tangible results.