Beginning this month, the Chemical Society of Japan will take steps to encourage its members to increase the degree to which they communicate about science in English. For good or ill, English has become the dominant language for communicating science internationally and science has become increasingly international in almost all respects: research groups are increasingly diverse in the nationality of their members, international journals are now the primary place for scientists to disseminate their findings, research funding often targets international interactions, and as research becomes increasingly interdisciplinary, international collaboration has become the norm. This article will be the first of a series written in English, which will deal with approaches to communicating science more effectively in English.

Before I begin, I would like to introduce myself. I am a chemist, working in the area of photochemistry, spectroscopy, electron spin dynamics, and radical pair based reaction kinetics. In addition, I have a long-running interest in chemical education and in communicating science to people of all ages: from toddlers to pensioners, and at all levels; from the general public to my graduate students. I am originally from the United Kingdom and when I was working there as an academic, it was not unusual to find me dressed as Harry Potter, demonstrating the "magic" of chemistry to primary school children! I first worked in Japan as a postdoctoral research associate at RIKEN for two years in the 1990s and returned in 2008, where I worked first at Tokyo Institute of Technology before moving to the University of Tokyo where I now do my research and teach on the new PEAK (Programs in English at Komaba) undergraduate and GPES (Graduate Program in Environmental Sciences) degree courses in the College and Graduate School of Arts and Sciences. The PEAK program is an excellent example of my earlier point about increasing internationalization and English use. PEAK was launched in 2012 and allows students to study on a four-year undergraduate degree course at the University of Tokyo with all classes conducted entirely in English. Students do not need to have any Japanese language skills to enter the course, but they are required to learn Japanese as a compulsory part of the program. During my time in Japan, I have had many opportunities to help both students and faculty with their English communication skills and through this series of articles, I hope to share with you some of what I have learnt and offer my best suggestions for developing these skills.

The title for this series is "English Scientific Communication" and I would like to begin by taking a look at each of the three words in turn. I have already discussed the increasing importance of English to Japanese chemists. Whether you are a student, a teacher, a researcher or a working chemist of any kind, you will inevitably have to deal with English as part of your work or studies because so much of the existing literature of science is written in English. When you look up a particular reference, it is very likely that the research article you need to read will be written in English and so the ability to understand the contents of such articles is paramount. As chemists, informing both the scientific community and the public about what you know and what you have learned is an essential aspect of your work and the ability to share your understanding and ideas on an international stage through the use of English is a key step in reaching a wider audience.
other ideas will be specific to English, but our goal will always be to better communicate science in English and so both of these skills are equally important.

This leads me into the most important word in the title – “Communication.” It is this word that I would like to spend the rest of this introductory article thinking about. The Irish playwright and co-founder of the London School of Economics, Sir George Bernard Shaw once said, “The problem with communication is the illusion that it has occurred.” It is entirely possible to give a presentation to an audience and for no communication to take place. Communication is very different from “speaking” or “presenting.” The key difference is that these two terms are actions performed by an individual, whereas communication requires the involvement of two people – the one transmitting the information and the one receiving it. In other words, to communicate something effectively to people, we need to consider how they receive the information as well as how we transmit it. This theme will be an important one in this series. By thinking in this way, the prospect of giving a presentation in English can be considered quite differently. Let us consider a number of important ideas related to this distinction.

Many of the best scientific presentations I have experienced were not given by native English speakers. If these presentations were to be assessed in terms of the correctness of the English used, they were a long way from being perfect. However, any audience listening to a scientific presentation in English will not be paying attention to the quality of the grammar used unless the grammar is so poor that they cannot understand the contents. Indeed, many members of the audience probably struggle with English themselves and have had to do this in the past. In the Japanese school education system, English is taught from a relatively early age and I think it fair to say that all Japanese adults with a University education have acquired sufficient knowledge of English grammar to make themselves understood, as long as they have knowledge of the appropriate technical vocabulary. The big difference then, is in using the skills you already have to their maximum potential. We will see in the coming months that there are many ways to try to do this, but they require thought and planning. Many presentations I have seen given by Japanese scientists focus too much on getting the grammar correct and not enough on really trying to communicate the important scientific message.

When a good presenter communicates with an audience, they actually do so by communicating on a number of different channels. Of course the language that they use is important, but they also make effective use of other channels including body language (for example gestures and facial expressions), voice modulation (including changes in both pitch and volume and the use of silence), and visual information (including images, animations and mathematical equations). There is a well known formula used by researchers studying non-verbal communication, that says that communication is 55% body language, 38% tone of voice and only 7% the actual words spoken. This formula comes from the work of Albert Mehrabian and must be considered in the context of his original research, but it is safe to say that effective communication always has a significant non-verbal element. Learning to use non-verbal communication effectively can make a profound difference to the degree of communication that can be achieved.

In this introductory article I have tried to highlight the importance of communication over simply speaking. Each month we will look at different ways in which we can communicate in English more effectively and I hope that by the end of the series, I will have convinced you that you can become effective English Scientific Communicators with the level of English language skills you already have. Of course, developing your English language skills is also a very effective way to improve and should be something you work on, but it is far from the only way. Many of the tips and tricks I will present in the coming months will allow you to make relatively rapid improvements to your presentations through understanding some important concepts and by designing effective preparation strategies.