International Prelude: Science English at Kakogawa Higashi High School

兵庫県立加古川東高等学校
教諭　辻　祐子
ALT　Jennifer Saunders

2013年6月8日（土）関西国際大学尼崎キャンパス
スーパーサイエンスハイスクール（SSH）

- 文部科学省が、科学技術、理科数学教育を重点的に行う学校を指定して、将来の国際的な科学技術系人材の育成のための取り組みを推進する事業
- 平成25年度指定校 201校
- グローバル人材の育成
  →英語の果たす役割が大きくなっている
加古川東高校のSSH

第1期：平成18年度～23年度
「KAKOから未来へ」

第2期：平成24年度～28年度
「Challenge The World」
ノーベル賞受賞者
宇宙飛行士等

「Challenge The World」
グローバルな視点を持ち、人類の将来に貢献する科学者としての素養を身につけた人材の育成

| 3年 | 課題研究+自然科学部
（国内外の高校・大学との共同研究等） |
|-----|-------------------------------|
| 2年 | 課題研究+自然科学部
（国内外の高校・大学との共同研究等） | 理数英語Ⅱ | 理数国語Ⅱ | 理数英語プレゼンテーション |
| 1年 | 自然科学部
（国内外の先端科学施設での研修等） | 自然科学基礎演習 | 科学倫理 | 理数英語Ⅰ | 理数国語Ⅰ | 統計学 |

※ の科目は平成25年度から開講予定
△ の科目は名称変更
理数英語プレゼンテーション
(Science English Presentation)

● 情報の代替科目
● 週1時間
● ティームティーチング
  －英語科教員2名
  －ALT
  －理科教員
  －情報科教員
目的

(1) 科学に関するトピックについて、パワーポイントを用いて、英語でプレゼンテーションができるようになる。
(2) 発表された内容に関して、英語で質疑応答ができるようになる。
(3) 情報器機を効果的に用いて必要な情報を集め、適切に処理できるようになる。
授業計画

4月〜5月 ディベート
6月〜7月 プレゼンテーションⅠ
（『英語対訳で読む科学の疑問』実業之日本社より）

9月〜10月 プレゼンテーションⅡ
（絶滅危惧種）
11月 外国人研究員による講義
12月〜3月 「英語による課題研究発表会」準備

3月19日頃 「英語による課題研究発表会」
課題研究とは
● 理数科2年生40名が数班に分かれ、自分たちで決めたテーマについて、教員や地域アドバイザーの指導のもと研究活動を行う。週2時間。
● スケジュール
4月より本格開始
9月　中間発表会（日本語）
1月　クラス内発表会（日本語アブストラクトのみ英語）
2月上旬　SSH発表会（日本語アブストラクトのみ英語）
2月中旬　論文作成（日本語アブストラクトのみ英語）
3月19日頃　英語による課題研究発表会
3年生　4月〜7月　論文作成（英語）
2013年3月19日
英語による課題研究発表会
International Prelude
How to Teach Students how to Communicate Science
COMMUNICATION
What’s the point of doing great work if you can’t communicate it?
How do we help students share complex scientific information?
Many surely feel like this...
As a result, the sky is filled with too much light to see the stars. Light pollution can disturb the way plants grow. Some wild animals also fall victim to light pollution. In the United States, the International Dark-Sky Association has been trying to solve the light pollution problem. As the city grew over the years and artificial lights increased, it became difficult to see the Milky Way. The artificial light from the streets and building is reflected on dust or drops of water in the air. As a result, the sky is filled with too much light to see the stars. Light pollution can disturb the way plants grow. Some wild animals also fall victim to light pollution. In the United States, the International Dark-Sky Association has been trying to solve the light pollution problem. As the city grew over the years and artificial lights increased, it became difficult to see the Milky Way. The artificial light from the streets and building is reflected on dust or drops of water in the air. As a result, the sky is filled with too much light to see the stars. Light pollution can disturb the way plants grow. Some wild animals also fall victim to light pollution. In the United States, the International Dark-Sky Association has been trying to solve the light pollution problem. As the city grew over the years and artificial lights increased, it became difficult to see the Milky Way. The artificial light from the streets and building is reflected on dust or drops of water in the air. As a result, the sky is filled with too much light to see the stars. Light pollution can disturb the way plants grow. Some wild animals also fall victim to light pollution. In the United States, the International Dark-Sky Association has been trying to solve the light pollution problem. As the city grew over the years and artificial lights increased, it became difficult to see the Milky Way. The artificial light from the streets and building is reflected on dust or drops of water in the air. As a result, the sky is filled with too much light to see the stars. Light pollution can disturb the way plants grow. Some wild animals also fall victim to light pollution. In the United States, the International Dark-Sky Association has been trying to solve the light pollution problem.
1st

KISS

Keep It

Simple, Silly
Simple is better!

It’s more important to get the message across, not impress others with vocabulary.

Clearly define scientific terms
Redundancy
I wanted to do research on spotted owls because I wanted to know their present situation. So, I researched the present situation of spotted owls.
I wanted to do research on spotted owls because I wanted to know their present situation. So, I researched the present situation of spotted owls.

Is there something we can do without?
I wanted to do research on spotted owls because I wanted to know their present situation. So, I researched the present situation of spotted owls.
I wanted to do research on spotted owls because I wanted to know their present situation.
I wanted to do research on spotted owls because I wanted to know their present situation.

Can we make this sentence shorter?
I wanted to do research on spotted owls because I wanted to know their present situation.

Can we make this sentence shorter?
I wanted to do research on spotted owls because I wanted to know their present situation.

Now, how do we make the sentence correct?
I wanted to do research on spotted owls because I wanted to know their present situation.

Now, how do we make the sentence correct?
I researched spotted owls because I wanted to know their present situation.
I researched spotted owls because I wanted to know their present situation.
I researched spotted owls because I wanted to know their present situation.
I researched spotted owls to learn their present situation.
Exercise Time!
Redundancy Exercises

1. Astronomers have just discovered a new discovery of what they believe to be the second largest black hole ever found.
Redundancy Exercises

1. Astronomers have just discovered a new discovery of what they believe to be the second largest black hole ever found.
Redundancy Exercises

1. Astronomers have just discovered a new discovery of what they believe to be the second largest black hole ever found.
2. The reason we researched killifish is because we were shocked to learn that they are endangered.
Redundancy Exercises

1. Astronomers have just discovered a new discovery of what they believe to be the second largest black hole ever found.

2. The reason we researched killifish is because we were shocked to learn that they are endangered.
Redundancy Exercises

1. Astronomers have just discovered a new discovery of what they believe to be the second largest black hole ever found.
2. The reason we researched killifish is because we were shocked to learn that they are endangered.
3. The melting of polar ice has added 11mm to global sea levels over the past two decades, raising sea level height.
Redundancy Exercises

1. Astronomers have just discovered a new discovery of what they believe to be the second largest black hole ever found.

2. The reason we researched killifish is because we were shocked to learn that they are endangered.

3. The melting of polar ice has added 11mm to global sea levels over the past two decades, raising sea-level height.
Be concise!

“to the point”
Being clear is more important than using a lot of English words!
Wordy: Any particular type of dessert is fine with me. (9 words)
Concise: Any dessert is fine with me. (6 words)
Ask yourself: “What is my main message?”
And then...
And then...

“Get to the point”
SIMPLE IS GOOD
The aurora borealis (the Northern Lights) and the aurora australis (the Southern Lights) have always fascinated mankind, and people even travel thousands of miles just to see the brilliant light shows in the earth's atmosphere. The auroras, both surrounding the north magnetic pole (aurora borealis) and south magnetic pole (aurora australis) occur when highly charged electrons from the solar wind interact with elements in the earth's atmosphere. Solar winds stream away from the sun at speeds of about 1 million miles per hour. When they reach the earth, some 40 hours after leaving the sun, they follow the lines of magnetic force generated by the earth's core and flow through the magnetosphere, a teardrop-shaped area of highly charged electrical and magnetic fields.
The aurora borealis (the Northern Lights) and the aurora australis (the Southern Lights) have always fascinated mankind, and people even travel thousands of miles just to see the brilliant light shows in the earth's atmosphere. The auroras, both surrounding the north magnetic pole (aurora borealis) and south magnetic pole (aurora australis), occur when highly charged electrons from the solar wind interact with elements in the earth's atmosphere. Solar winds stream away from the sun at speeds of about 1 million miles per hour. When they reach the earth, some 40 hours after leaving the sun, they follow the lines of magnetic force generated by the earth's core and flow through the magnetosphere, a teardrop-shaped area of highly charged electrical and magnetic fields.
Aurora Borealis

• A natural phenomenon that occurs when highly charged electrons from the solar wind interact with elements in the earth's atmosphere, exciting them.

• When the excited elements return to a normal state, they give off light.

• Also called the “Northern Lights”
It’s better......

...but...

We can do even better...
Aurora Borealis

• A natural phenomenon that occurs when highly charged electrons from the solar wind interact with elements in the earth's atmosphere, exciting them.

• When the excited elements return to a normal state, they give off light.

• Also called the “Northern Lights”
Aurora Borealis

- Natural light display in the night sky
- “Northern Lights”
Aurora Borealis

• A natural phenomenon that occurs when highly charged electrons from the solar wind interact with elements in the earth's atmosphere, exciting them.

• When the excited elements return to a normal state, they give off light.

• Also called the “Northern Lights”
electrons and ions

electrons hit air molecules
molecules are "excited"
molecules give off light as they calm down

Earth

magnetosphere
Visuals are great for understanding.
Color can also be used for emphasis.
However......
This is a PRESENTATION!!!
I am saying something important!
However, what is wrong with this slide?
KISS
Keep It
Simple, Silly
So, how do you give a good presentation?

First, let us show you an example...
Tips to Give a Good Presentation

• You want to get your audience’s attention
• You can help get your audience’s attention by speaking in a loud enough voice
• Start off well – You want to make sure you give a good first impression
• End well – You want to leave your audience with one or two good key points to remember
What did you think?
2nd Key Point:
Get the audience’s ATTENTION
How?

Make eye contact

Speak up

(Use a loud voice)

Use gestures
Exercise Time!
Eye Contact

3 Seconds
Hello, my name is ________. It’s nice to see you.

It’s nice to see you too. My name is ________. 
3rd Key Point:

Confidence
Yet, how can we help our students (and ourselves) gain confidence?
2 minute exercise
Amy Cuddy,
Social Psychologist
and Professor at
Harvard Business
School
Body Language
Body language says a lot about someone
Our body language influences how other people think and feel about us.
Can our body language influence how we think and feel about ourselves?
Can our bodies change our minds?
Testosterone

Power hormone

Cortisol

Stress hormone
High power poses
Low power poses
Cortisol Change (pg/ml)

<table>
<thead>
<tr>
<th></th>
<th>High Power</th>
<th>Low Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Values</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The chart shows a decrease in cortisol levels for both high and low power conditions.
Testosterone (Power) \[\uparrow\]

Cortisol (Stress) \[\downarrow\]
“Fake it until you make it”
Try a Power Pose
Thank you all for being here today.
Challenge Time!
Challenge Time!

Make a short presentation describing what light pollution is using the slides provided.
Light Pollution
Light Pollution

Artificial light that is allowed to illuminate areas not intended to be lit.
Dust!
Water!
Droplet!
Excess!
Light!
Pollution!
How Light Works!
Light pollution can disturb the way plants grow.
Light pollution can disturb wildlife.
Light pollution can disturb humans
What can we do?
Thank-you for listening!

For more information, please contact:

The International Dark Sky Association
www.darksky.org
How did you feel?
You’re invited!

Research Presentation Conference in English

May 18\textsuperscript{th}, 2014

Kakogawa Higashi Senior High School

For details, please contact:
YTsuji@hyogo-c.ed.jp
Or Jennifer.M.Saunders@gmail.com