

Visit to our Alma Mater: Kanagawa

Prefectural Koshigayakita High School

[Overview]

Visit location: Saitama Prefectural Koshigayakita High School

Day of visit: September 3rd, 2016 (Saturday)

Visitors: Kengo Nakahara, Miki Nishimori

Target people: 43 first-year students and 43 second-year students belonging to the SS. (1 Guidance teacher)

[Objective]

In a previous visit to our Alma Mater, when we asked what image did the students had about *E. coli*, they answered “yogurt” or with names of bacteria completely unrelated. There, by giving a lecture about the specific mechanisms of gene recombination, as well as a lecture about *E. coli*, we intended to enhance high school students’ interest and attention to *E. coli*.

In a previous school-visit to Kanagawa Prefectural Atsugi High School, dissemination of synthetic biology was still remained as a problem. Therefore, before giving a lesson, we asked for advice from Mr. Ogawa, a science communicator. Taking advantage of what we had obtained from him, we aimed to let high school students get more knowledge of synthetic biology through the lesson.

Then, we put high school students through tests before and after the lesson to check how much knowledge about *E. coli* they got.

Finally, we aimed to apply the advice we got from the high school students to our project.

[The dialogue with a science communicator, Mr. Ogawa]

People who major in different fields cannot share the same ideas.

As a science communicator, I explain while exploring the knowledge people have. Additionally, I deliver scientific topics with a consciousness of finding the common knowledge between people and me so that they feel an affinity to my talk.

The dialogue with Mr. Ogawa awakened us that we should explain while exploring the public. Considering these keys, we prepared for the lesson.

【Flow of the class】

In the previous day' s HR•••Giving high school students mini-tests and questionnaires

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On the day Our introduction and explanation about genetic modification and a lesson for 25 min

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Explanation of synthetic biology for 10 min

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Obtaining questions regarding synthetic biology and genetic modification

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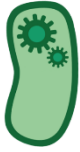
Explanation of iGEM and our project

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Obtaining to questions and feedbacks regarding our project

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Giving high school students mini-tests and questionnaires again



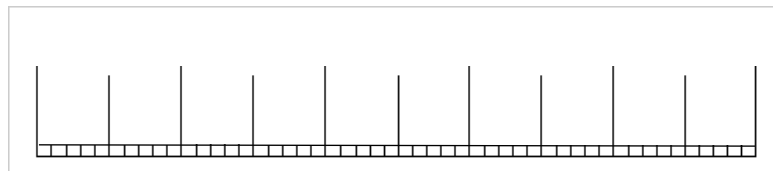
E. Coli Mini test / Gene recombination
awareness survey
Pre-lesson examination



E. coli mini test

Circle the alternative you think is correct

I. How big do you think *E. coli* is? What unit is used to represent an *E. coli*?



(a) \longleftrightarrow nm (10^{-9}m)

(b) \longleftrightarrow μm (10^{-6}m)

(c) \longleftrightarrow mm (10^{-3}m)

II. Apart from the intestines, where else do *E. coli* inhabit generally?

- (a) Flowers
- (b) Rivers
- (c) Cormorant, Oysters

III. What is the name of *E. coli* in English?

- (a) *A.coli*
- (b) *C.coli*
- (c) *E.coli*

Gene recombination awareness survey

Circle the option closest to your own opinion

I. What kind of image do you have on gene recombination?

(Good · Normal · Bad · I don't really know)

II. Do you want to use a product (food, medicament, etc.) which has been genetically

modified?

(Strongly agree · Agree · Slightly disagree · Disagree)



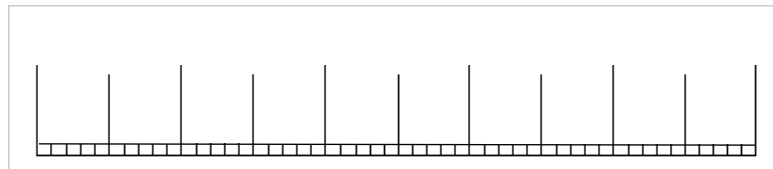
**E. Coli Mini test / Gene recombination
awareness survey
Post-lesson examination**




***E. coli* mini test**

Circle the alternative you think is correct

I. How big do you think E. coli is? What unit is used to represent an E. coli?



(a)  nm(10^{-9} m)

(b)  μ m(10^{-6} m)

(c)  mm(10^{-3} m)

II. Apart from the intestines, where else do E. coli inhabit generally?

- (a) *Flowers*
- (b) *Rivers*
- (c) *Cormorant, Oysters*

III. What is the name of E. coli in English?

- (a) *A.coli*
- (b) *C.coli*
- (c) *E.coli*

IV. Is E. coli a prokaryote or a Eukaryote?

- (a) *Prokaryote*
- (b) *Eukaryote*

V. Fill the blank in the following sentence

Generally, in order to perform a gene recombination,
instead of the genome DNA(left picture), a () DNA(right picture), is needed



VI. Fill the blank in the following sentence

The field which artificially creates creatures with new mechanisms by applying the
genetic modification technics is called ()

Gene recombination awareness survey

Circle the option closest to your own opinion

I. What kind of image do you have on gene recombination?

(*Good* · *Normal* · *Bad* · *I don't really know*)

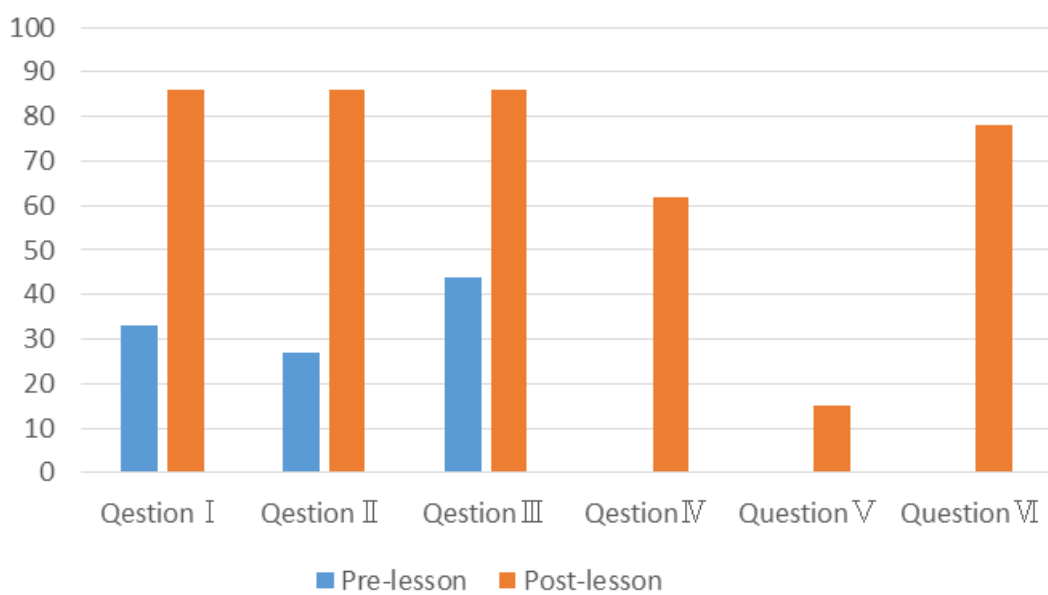
*II. Do you want to use a product (food, medicament, etc.) which has been genetically
modified?*

(*Strongly agree* · *Agree* · *Slightly disagree* · *Disagree*)

【Mini test results】

	Question I	Question II	Question III	Question IV	Question V	Question VI
Pre-lesson	33	27	44			
Post-lesson	86	86	86	62	15	78

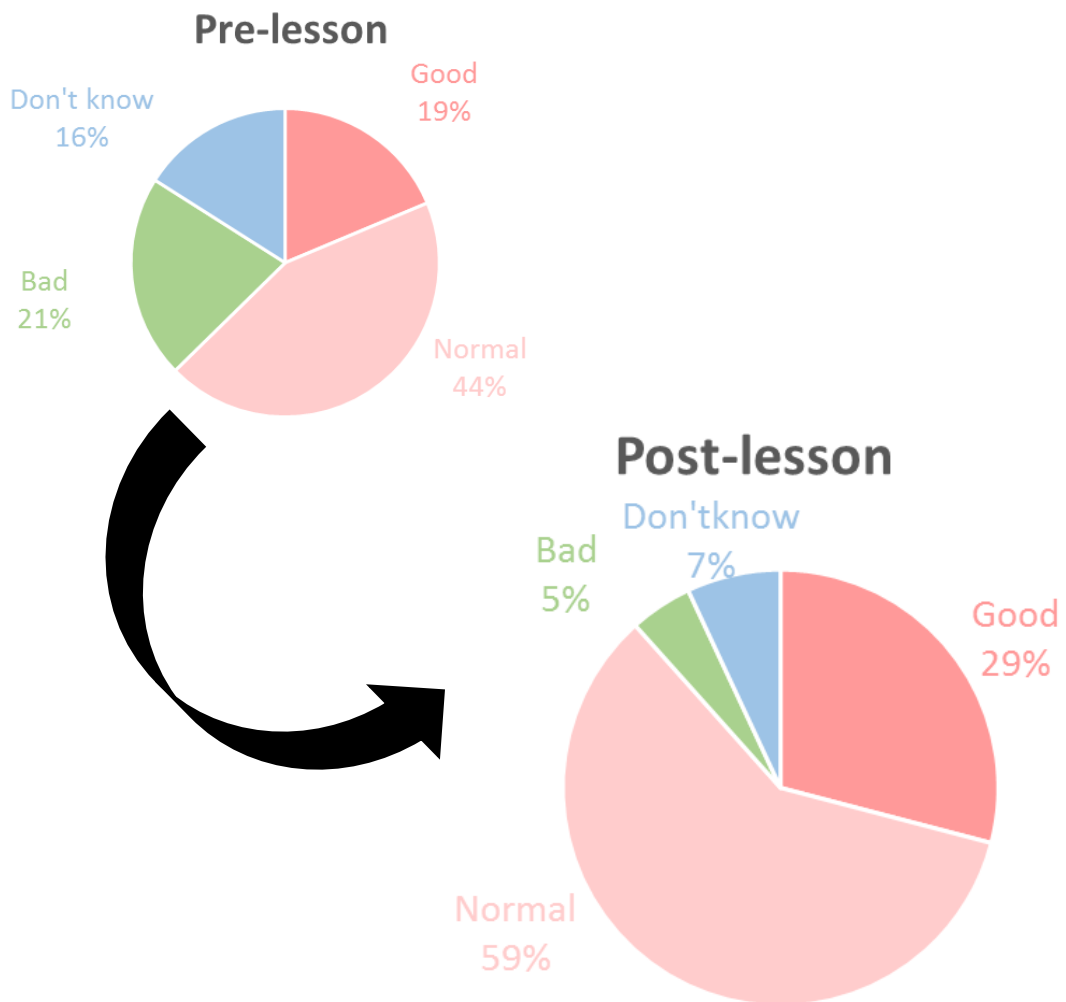
Number of people who answered correctly



【Awareness survey results】

1. What kind of image do you have on gene recombination?

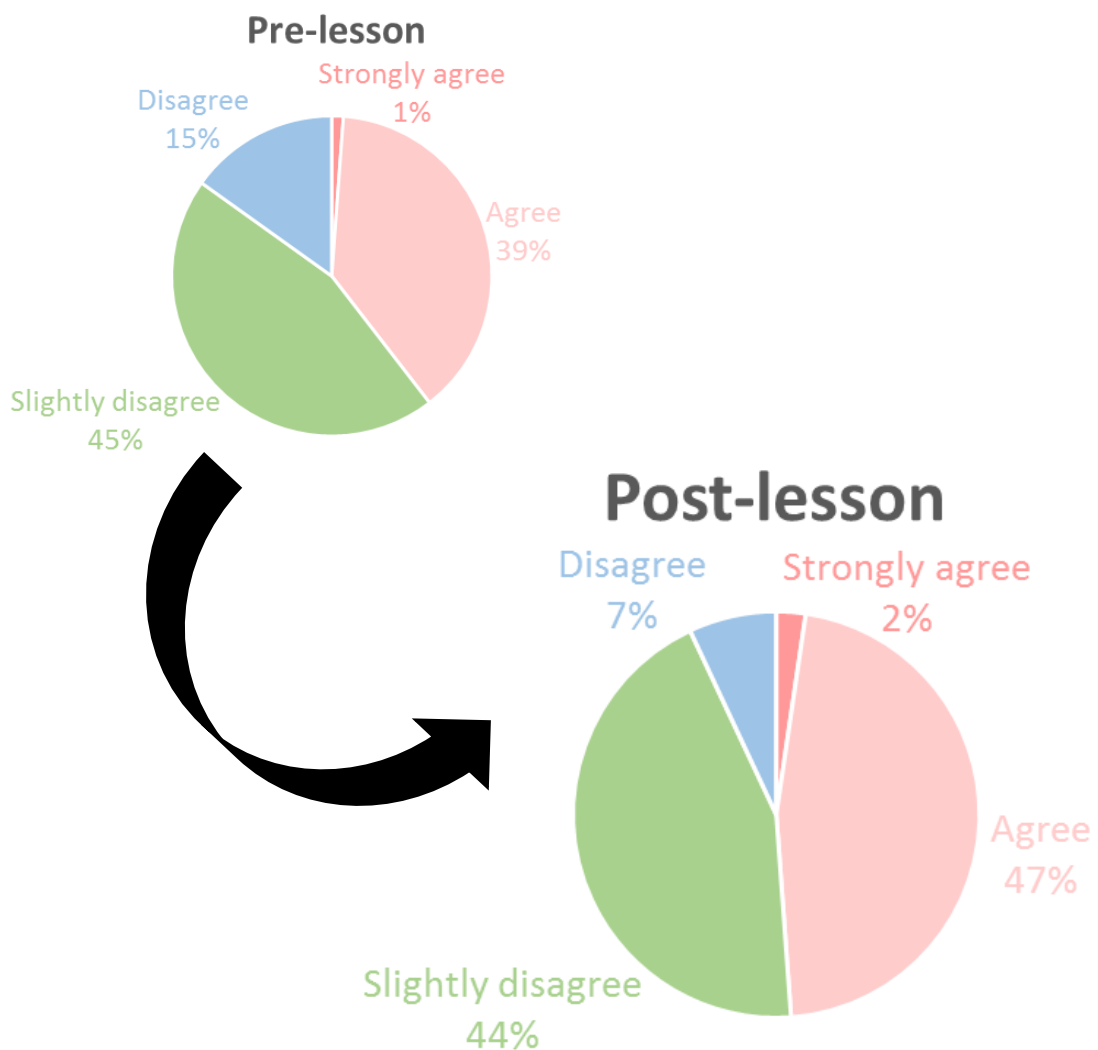
	Good	Normal	Bad	Don't know
Pre-lesson	14	34	16	12
Post-lesson	25	51	4	6



What kind of image do you have on gene

2. Do you want to use a product (food, medicament, etc.) which has been genetically modified?

	Strongly agree	Agree	Slightly disagree	Disagree
Pre-lesson	1	33	39	13
Post-lesson	2	40	38	6



Do you want to use a product (food, medicament, etc.)

3. Impressions of high school students

- I wanted to know more about genetic modification.
- I did not know anything about synthetic biology, but was catching on it and found it interesting.
- I thought that making a story with *E. coli* was amazing.
- I was surprised that genetic modification makes *E. coli* turn into a state of apparent death.
- At the beginning of the lesson, I did not know anything about *E. coli*, but I got various knowledge through the lesson.

【Summary】

Before and after the lesson, students took mini-tests.

As a result, the percentage of correct answers increased compared to mini-test before the previous. It means that high school students deepened their understanding of *E. coli* and genetic modification. Also, we got the opinions from them, such as, "Initially I did not know anything about *E. coli*, but I got a variety of knowledge through the lesson."

"I wanted to know more about genetic modification."

After the lesson, the percentage of correct answers was over 80% both first-year students and second-year ones. We succeeded in the objective regarding dissemination of synthetic biology.

From the questionnaire result, more students answered "genetic modification is good/not bad." and less students answered "it is bad." This result shows that high school students got better impressions of *E. coli*.

Additionally, more students thought that they wanted to use genetically modified food. Also, we got good results in terms of genetically modified food.