Super Science High school Onuma Environmental Research

～Preparation classes~

A cross-curriculum class among biology, world history and English communication

Aim　　　Before students visit Onuma, they will learn about Onuma while they study each
　　　　　subject and become motivated to learn.

Students　240 1st grade students

Period　　June 8th – June 22nd

Teacher　Biology: Junji SEKIZAKI　World history: Koji OMURA・Takashi KOMATSUZAKI
　　　　　English communication: Asuka KOSHIMIZU・Hiroshi TSURUKI・Keisuke KIMURA

＜Biology＞

●Contents

＜Various creatures and ecosystems＞

1. Various vegetation and transitions

　　・Various vegetation around us

　　・Forest vegetation's layered structure and various light environment

　　・Deciduous and evergreen trees

　　・The relationship between vegetation and soil

2．Vegetation's transition

　　・The first transition

　　・Vegetation's mechanism

　　・Climax

　　・The second transition

＜Biomes and their distribution＞

1．Climate and biomes

2．Land biomes

　　・Climate factors

　　・Japanese biomes

＜Ecosystems and preservation＞

1．The ecosystem and energy flow

　　・Ecosystem's structure

　　・Generating thermal energy by biogenic

　　・Energy flowing through the ecosystems

2．Substance's circulation in the ecosystem

　　・Carbon's circulation

　　・Nitrogen's circulation

　　・Lakes' and ponds' eutrophication

＜World History＞

●Content

1. Geographical learning: Onuma's formative process
   ・Mt. Komagatake's eruption and a dammed lake
2. The origin of places names
3. Historical learning: Introduction of Onuma sources
   ・Ezo traveler's journal and Ezo diary
   ・Takeshiro MATSUURA's achievement
4. Civics: The establishment of Ramsar Convention
   ・Ramsar Convention
   ・The present situation of Onuma's industrial development and environmental problems
5. Geographical learning: Nanae's industry and Gaertner's achievement
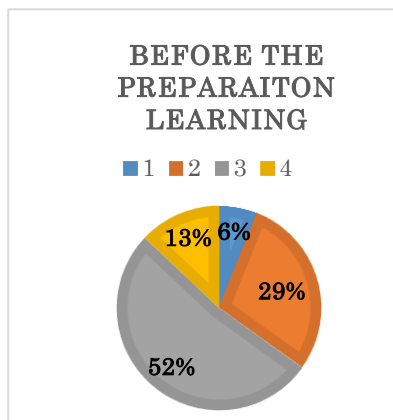
<Communication English＞

●Content

1. Onuma Research
   ・There are five categories:
      1. Nature(plants and animals)　2. Geography and Geology　3. History
      4. Sightseeing　5. Food
   ・Using website and other subjects' handouts

2. Preparation for presentations
   ・Writing about each topic
   ・Making posters
   ・Practicing pronunciation with grammar checks

3. Presentation about Onuma
   ・Giving presentations
   ・Questions and answers in English

●The result of Onuma's learning questionnaire results

Q1. What do you think of learning about Onuma(park)?

1. I'm not interested.   2. I'm not so interested.   3. I'm interested.   4. I'm very interested.

BEFORE THE PREPARAITON LEARNING

■1 ■2 ■3 ■4

6%
29%
52%
13%

AFTER THE PREPARATION LEARNING

■1 ■2 ■3 ■4

6%
21%
54%
19%
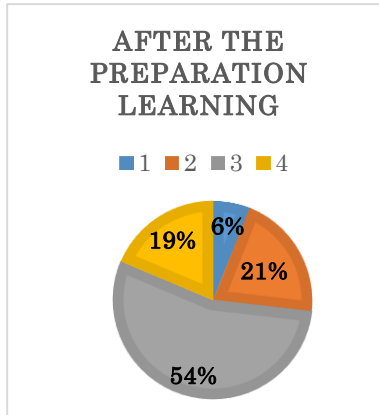
When comparing student attitudes before and after learning. We can see a slight increase in student interest. We may say that the it was useful for increasing students' motivation.

Q2. How much do you know about Onuma's nature?

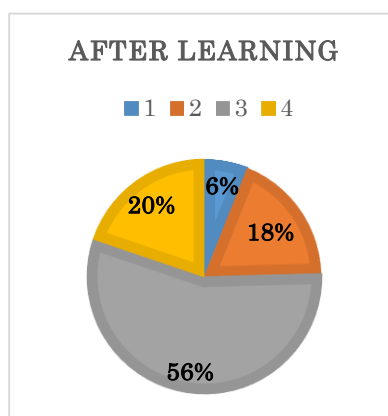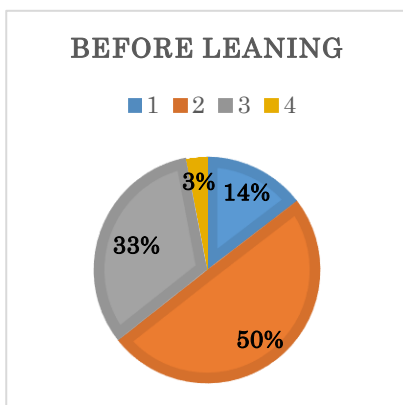(geography, plants, animals, ecosystem, water quality, ect)

1. I don't know anything.   2. I don't know much.   3. I know something.   4. I know a lot.

BEFORE LEARNING

■1 ■2 ■3 ■4

5%
24%
17%
54%

AFTER LEARNING

■1 ■2 ■3 ■4

7% 3%
25%
65%
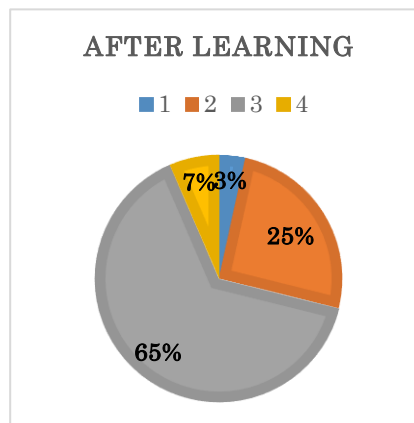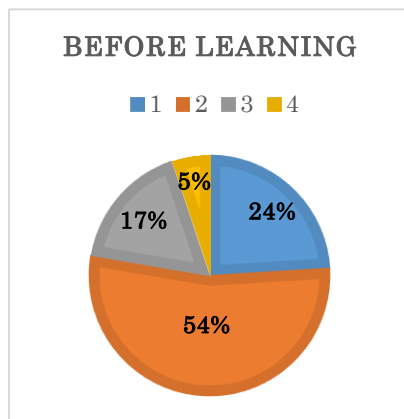
Before the preparation classes, leaning 78% of students answered 1 or 2 but, through basic biology and English communication classes, students could learn about Onuma's ecosystems geographical and geological features. They understood Onuma's nature more deeply.

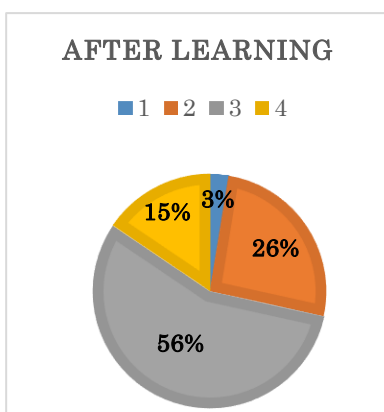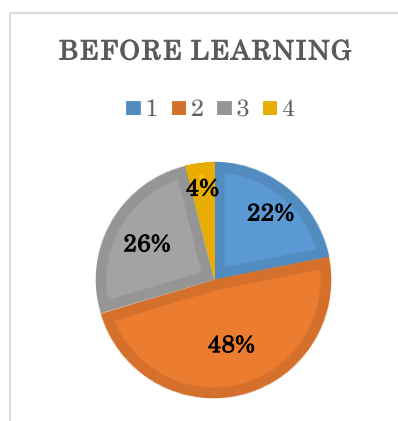Q3. How much do you know about Onuma's specialties?

1. I don't know anything.   2. I don't know much.   3. I know something.   4. I know a lot

BEFORE LEANING

■1 ■2 ■3 ■4

3% 14%
33%
50%

AFTER LEARNING

■1 ■2 ■3 ■4

6%
20%
18%
56%

Before the preparation classes 64% of students answered either 1 or 2, but through communication English class, they researched them and gave their presentations about the specialties. As a result, they could understand Onuma and around its surrounding environs' specialties.

Q4. How much do you know about Onuma's history?

1. I don't know anything.   2. I don't know much.   3. I know something.   4. I know a lot.

BEFORE LEARNING	AFTER LEARNING
■1 ■2 ■3 ■4	■1 ■2 ■3 ■4
4% 22% 26% 48%	15% 3% 26% 56%

Before learning 70% of students answered 1 or 2, but in world history and English communication classes, they researched and gave their presentations. As a result, they could understand better Onuma and its environs' history.

Q5. How much do you know about Onuma's geography?

1. I don't know anything.   2. I don't know much.   3. I know something.   4. I know a lot.

BEFORE LEARNING	AFTER LEARNING
■1 ■2 ■3 ■4	■1 ■2 ■3 ■4
5% 25% 20% 50%	9% 3% 33% 55%
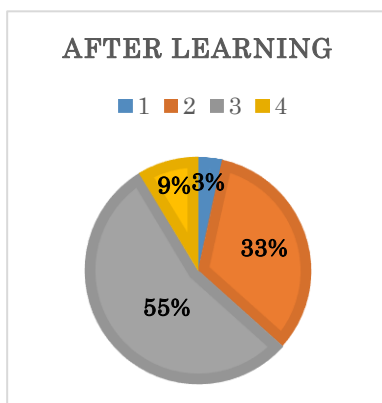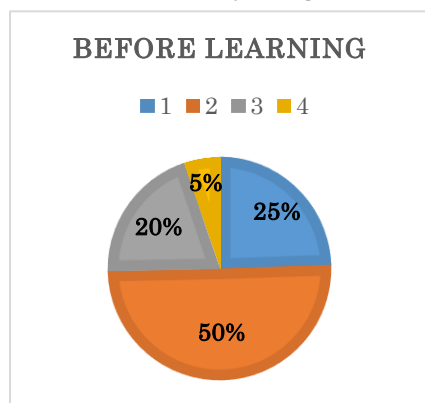
Before the preparation classes 75% of students answered either 1 or 2, but through each subject, students learned about Onuma's geographical features. However, when compared with other categories, geography is a little more difficult. Therefore, they had a low level of understanding in this category. .

Q6. Can you introduce Onuma to foreign people in English?

1. No, I can't.   2. I can introduce it briefly.   3. It depends on fields and contents.   4. Yes, I can.

| BEFORE LEARNING	AFTER LEARNING
■1 ■2 ■3 ■4	■1 ■2 ■3 ■4
6% 12% 42% 40%	6% 3% 45% 46%
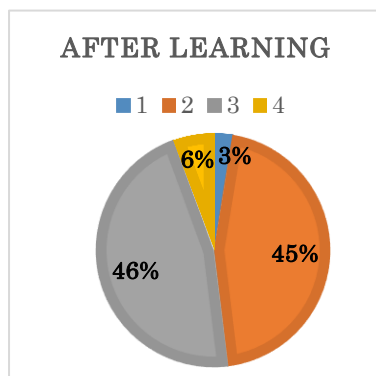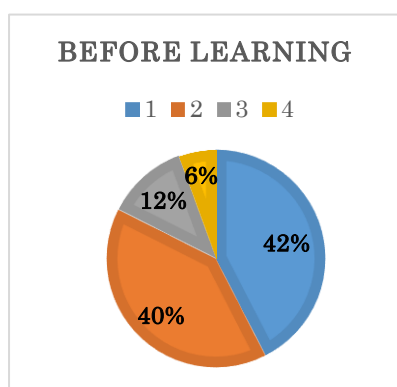
Before preparation classes, 82% of students answered either 1 or 2, in this case, over 40% students answered 1. A lot of students had difficulty introducing Onuma in English.

Students had only 2 weeks from deciding their topics to giving their presentations. However, they cooperated with their group members and gave great presentations.

After their presentations, around half of them answered 3 or above.

Q7. Did you understand the preparation classes' basic biology and world history?

1. No. I didn't.   2. I didn't understand it well.   3. Yes, I did.   4. Yes, I understood well

COMPREHENSION LEVER OF BIOLOGY AND WORLD HISTORY

■1 ■2 ■3 ■4

6%
18%
13%
63%
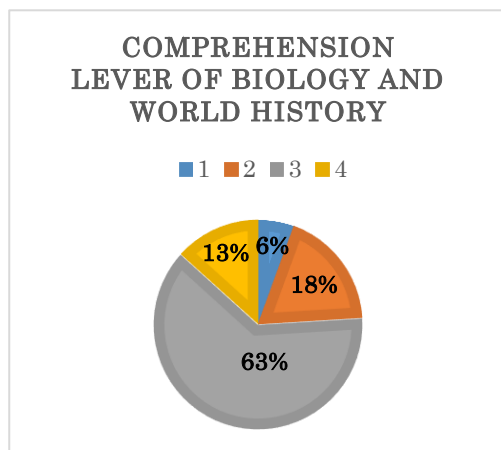
In both basic biology and world history classes, about 80% students understood the contents of the Onuma's preparation classes. We can say that students understood what they should learn in Onuma and realized the things that they wanted to learn. They referred to this knowledge when they made their presentation in English class.

Q8. Did you learn more deeply about biology and world history's previous learning when you gave your English presentations?

1. No, I didn't.   2. No. I didn't learn much.   3. Yes, I did.   4. Yes, I learned a lot.

LEARNING MORE DEEPLY WHEN THEY MADE PRESENTATIONS

■1 ■2 ■3 ■4

6%
31%
19%
44%
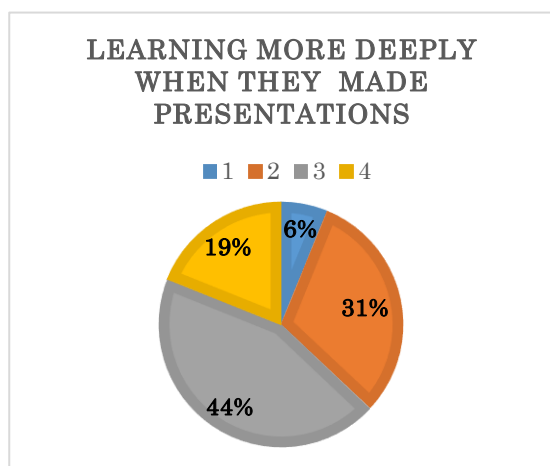
63% of students answered either 3 or 4. In their presentations, two of the five categories were "food" and "sightseeing". Therefore, the students who presented on these two topics aren't coherent with biology and world history. Therefore, some students may think that they couldn't make use of this subject's learning.

Q9. Did you imagine Onuma environmental research through the previous learning?

1. No, I didn't.   2. No. I didn't imagine well.   3. Yes, I did.   4. Yes. I could imagine well

AFTER LEARNING, THEY COULD IMAGINE ONUMA RESEARCH

■1 ■2 ■3 ■4

5%
19%
31%
45%
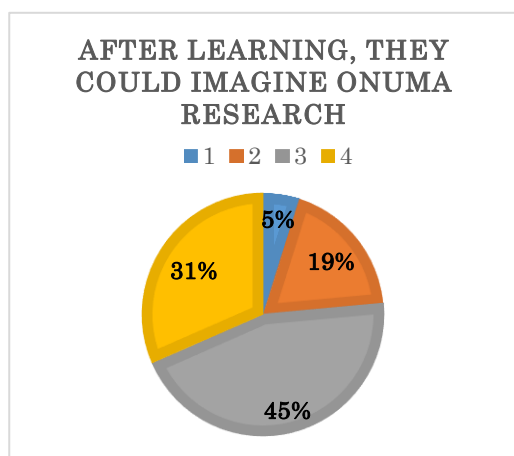
Nearly 80% students could learn about Onuma more deeply and thought why they learned about it. They also clearly thought about what they would learn in Onuma. However, a quarter of students answered 1 or 2. This is the assignment for the next preparation classes.

●A reflection on the Onuma Environmental research's preparation classes and cross-curriculum classes among biology, world history and English communication classes.

　This was the first attempt at the above activities. Therefore, we couldn't describe the plan on our syllabus and consider our teaching plans well. For the next cross-curriculum class, we should discuss our teaching plans with not only teachers who have a cross-curriculum class but also first grader's teachers and SSH committee teachers. If so, we will be able to critically analyze our curriculum and improve the content. In addition, we should improve the way of evaluating our students' achievements and share the method with all teachers.

　As far as we analyzed the data, according to the preparation classes' effects, we think that students are able to learn about Onuma and transmit their knowledge in English. We should consider the previous learning level and its content in detail at the next cross-curriculum class.

Super Science High School Onuma Environmental Research

A cross-curriculum class among biology, world history and English communication appendix

～Students made posters when they gave presentations～

●Onuma's nature
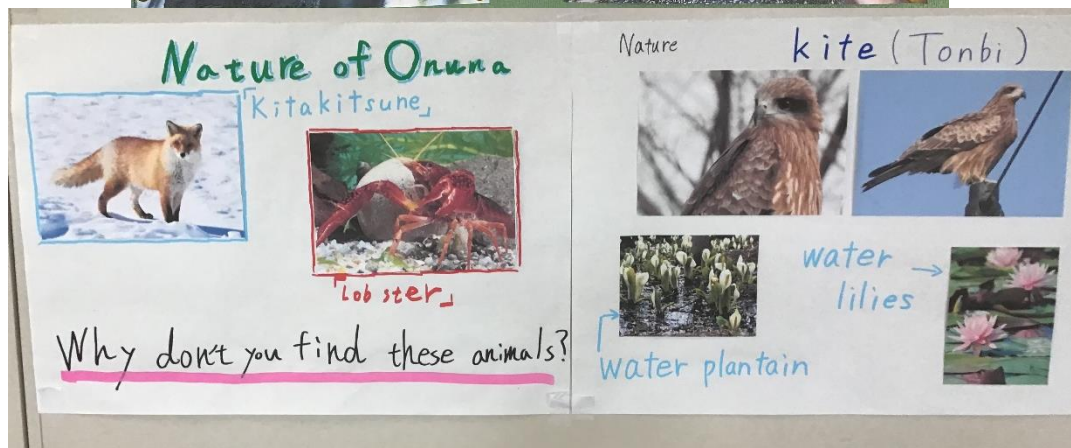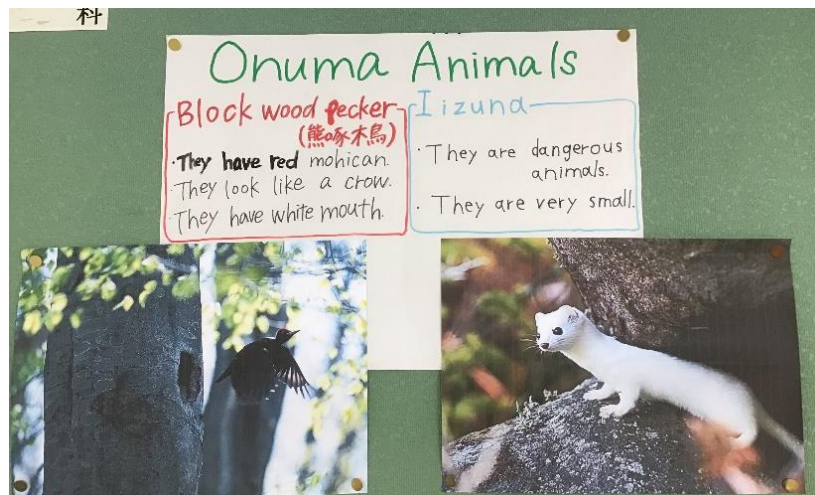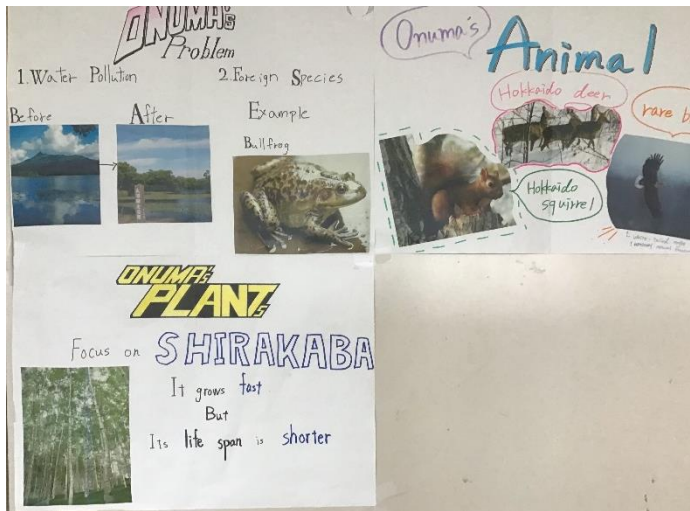
●Onuma's geography

ONUMA's Geography

Water — 『Aoko』 — Phytoplankton Between September and October

Land — Mt. Komagatake — 1131 m high
Area 5.31 km²
Max. water depth 12.2 m
Ave. water depth 4.7m

Onuma's Geography
1 personal history
2 size
3 location
4 The Ramar Convention

Onuma
area 5.3 km
circumference 24 km
depth 12.2 m

Onuma's Geography
Mt. Komagatake
SL (Steam Locomotive)
Hakodate
Onuma
The Ramsar Convention

Geography of Komagatake
1100m 1700m
<< Sunaharatake >>
<< Kengamine >>
<< Sumidamori >>

Geography of Onuma
☐ Onuma ☐ Konuma ☐ Junsainuma
The area of Onuma is the biggest of all lake.

	Area	Water Depth	
		Maximum	Average
Onuma	5.31 (km²)	12.2	4.7m
Konuma	3.8 (km²)	5.5m	2.3m
Junsainuma	0.8 (km²)	4.6m	3.0

Komagatake's eruption
Komagatake has erupted many times.
Ohhhhh!! It's dynamic!!
In 1929 eruption
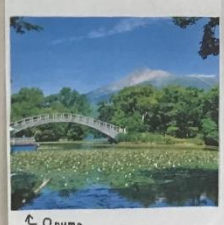
~ Onuma's climate ~
『Temperature』
Summer: Doesn't go 30 degrees.
Winter: Goes to minus 10 degrees.
• It's 100 meters above sea level. 100

GEOGRAPHY
most deepest 12.2 meter
average 4.6 meter
Onuma

●Onuma's history

Komagatake's history

People start living fishing
Fishery association
activities

The Development near Onuma Park Square

Important person
Hideo Ukita

for the foundation

Onuma Park's History

In 1921
Provincial Onuma Park was completed.

In 1958
Provincial Onuma Park became Onuma Quasi-National Park.

Origin of Onuma's name

Polo means "great"
To means "lake"

Onuma History

Onuma National Park

1890 people started to live in Onuma.

1900 Started fish farm.

1906 Started Onuma traditional festival.

WARASAGI

Carp

Mt. Komagadake

Edo piriodo in 1640
Big Eruption Of Kanei
before abalanche tsunami after

1700m → 1130m

Like Mt. Fuji

Showa4
Showa4
Heisei8
2008 11/8

NEW

Onuma's History

Miyazaki Jubei
- Miyazaki hotel

Ukita Hideo
- a farm
- Onuma park
- Onuma park station

Onuma park station

a popular sightseeing area

Onuma park

Do you know that Onumapark is the **New Three Views of Japan?**

Onuma's Beautiful Nature

BAN

1640 Komgatake erupted.

Wow! Beautiful nature.

Komagatake's eruption

Third eruption

Komagatate (now)

Onuma's History

Mt. Komagatake

Erupted four times

1640

Takeshiro Matsuura

I named "Hokkaido"

●Onuma's sightseeing

●Onuma's food

Junsai

We can make junsai into miso soup, nabe, and vinegared food.

We can buy junsai at Miyazaki Koiya.

Carp

KOINOARAI

Unique texture
Smell

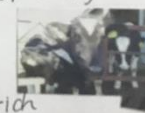Wakasagi (Japanese Smelt)

10~15cm

Tsukudani

Tsuribori
Park

Food of Onuma

〈Holstein Cow〉
Characteristic
Taste of the beef is light

〈Jersey Cow〉
Characteristic
Taste of the milk is very rich

〈Onuma Japanese Black Cow〉
Characteristic
Taste of the beef like black cow

Animals

Red Fox

Ezo
Squirrel

Ezo
deer

Birds

Ohakucho

Oruri

Ojirowashi

Plants

o Special Flower
〈Mizubasho〉

o Big Tree
〈Beech〉

: It lives in the water.   : It lives about
three hundred years.

Fish

hera-
crucian

White-spotted char

carp

New Three Views of Japan

Hakodate Onuma Cow
· Soft red meat
· Sweetness from fat.

~JunSai~
—This is Junsai.
—Very slimy

Junsai's leaf is
like a lotus' leaf

Yanakawa Ranch's foods.

Full blend soft   Provolone

Onuma's fish

Wakasagi (They are cheap)
Raft

Carp