



The practical guide to a “Reconstruction and Disaster Risk Reduction (R-DRR) Mapping”

Understanding the natural environment and
the lives of those in your hometown

Editor: The International Collaborating Center of Disaster Education Research
and Implementation (ICCDERI), International Research Institute of Disaster
Science (IRIDeS), Tohoku University, Japan

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This guide is available on the Reconstruction and Disaster Risk Reduction (R-DRR) Mapping Website.

▶ <http://drredu-collabo.sakura.ne.jp/mapping>

1 Introduction

The “Reconstruction and Disaster Risk Reduction (R-DRR) Mapping” program is a school-based program for R-DRR in the City of Ishinomaki, one of the areas devastated by the Great East Japan Earthquake and Tsunami that occurred on March 11, 2011, which was started, under the support of the city’s Board of Education, by researchers at Tohoku University, Yamagata University and Kobe University, together with the international NGO Save the Children, and in collaboration with teachers at school.

When this program first began in school year (SY) 2012, one and a half years after the Great East Japan Earthquake and Tsunami, it was set as a future-oriented disaster education program focused on reconstruction so that the children at schools in the coastal areas who directly experienced the great earthquake and tsunami could recover from its trauma and keep their love for their hometown. While reconstruction has made progress in the city in the five years following the great earthquake and tsunami, it has been expanding its targets from those in the coastal areas to the central part of the city of Ishinomaki and further towards the Kanan area, which wasn’t directly affected by the tsunami, and has been implemented, so far, at ten elementary and junior high schools as “R-DRR mapping,” aiming to make it a sustainable R-DRR program that is rooted in each community through its cooperation with schools.

As the number of pupils, students, teachers and local residents who didn’t directly experience the great earthquake and tsunami has been increasing with the further passage of time, the importance of disaster education in which the community is fully involved has been growing in order to learn from the experiences of the disaster and to prepare for and reduce the risks from damage in the next disaster, based on these experiences and the lessons learned. Therefore, the International Research Institute of Disaster Science (IRIDeS), Tohoku University, organized this practical guide to R-DRR mapping, based on the five years of practical experience at the ten schools, to promote further implementation hereafter. The authors hope it will become a guide for all who are interested in R-DRR mapping, not only in Ishinomaki but across Japan and around the world.

Aiko Sakurai

Deputy Chief, International Collaborating Center of Disaster Education Research and Implementation (ICCDERI)
Assistant Professor, International Research Institute of Disaster Science (IRIDeS), Tohoku University

1.1 What is R-DRR mapping ?

“Reconstruction and Disaster Risk Reduction (R-DRR) Mapping” is a learning program for R-DRR education, which is taught in the “Period of Integrated Study” (sogoteki na gakushu no jikan) at elementary and junior high schools in the City of Ishinomaki, one of the areas that were heavily affected by the Great East Japan Earthquake and Tsunami that occurred on March 11, 2011.

It aims to encourage children in the City of Ishinomaki, who experienced the Great East Japan Earthquake and Tsunami, to gather information about their community’s natural environment and history, as well as its efforts in R-DRR, through “town watching” and “map making,” and to rediscover good and attractive parts of their hometown. Furthermore, it aims to encourage children in the city under reconstruction to maintain their interest in R-DRR through community study, and to eventually contribute to a disaster-resilient town development.

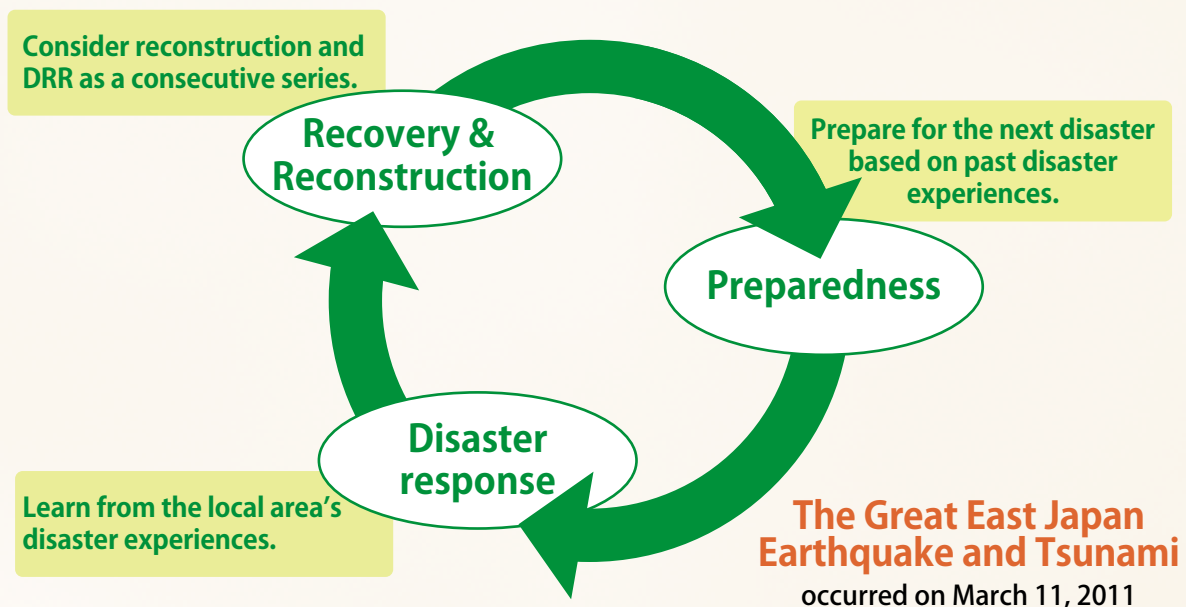


Fig.1: R-DRR mapping in the context of disaster cycle

R-DRR mapping basically takes place in the following process. It can be modified as needed, in accordance with the actual situations of the school, children and the community, as well as the theme and class hours. Map making can be included as a part of a unit.

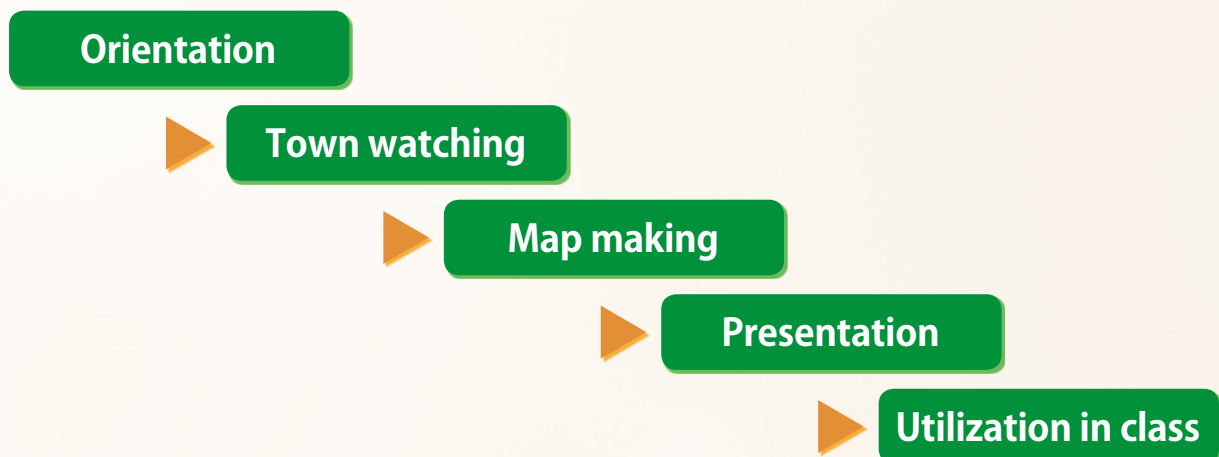


Fig.2: Process of R-DRR mapping

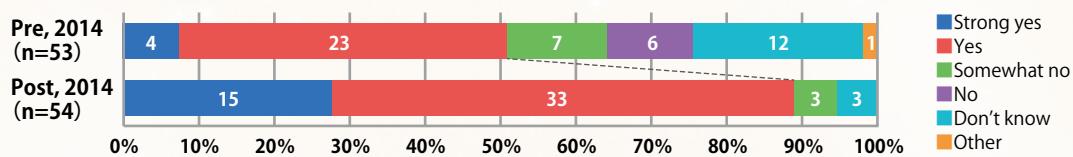
1.2 Expected outcomes

The following outcomes are expected through implementation of R-DRR mapping.

- Children rediscover attractive parts of their hometown and start to like it.
- Children become motivated about the reconstruction of their hometown.
- Children learn about the transitions in land forms and townscapes in their hometown, as well as its history and disaster record, find that its vulnerability to a disaster changes from time to time, and become capable of thinking about community-based disaster prevention.
- It gives children an opportunity for social self-realization by knowing that they can be of help in their community.
- It raises awareness of disaster prevention among children by learning about R-DRR in their community.
- By continuing the activity, it fosters ties among children beyond grades as a school's achievement.
- The learning activity develops ties between adult community members and children.
- It develops increased receptiveness among those, including adults, throughout the community toward R-DRR.
- It fosters future leaders in town development, which results in sustainable town development.

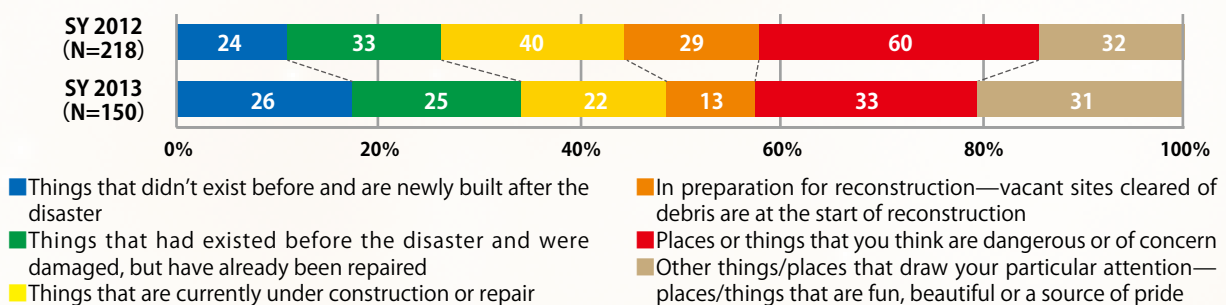
Increased receptiveness toward getting involved in reconstruction has been observed among children through their R-DRR mapping.

Fig.3: Do you want to be of any help in the reconstruction of Kazuma?



Steady progress in reconstruction in the local area was verified by children by comparing the Kazuma Reconstruction Maps of one year after (SY 2012) and two years after (SY 2013) the disaster.

Fig.4: Transitions in points discovered on the Kazuma Reconstruction Maps by category



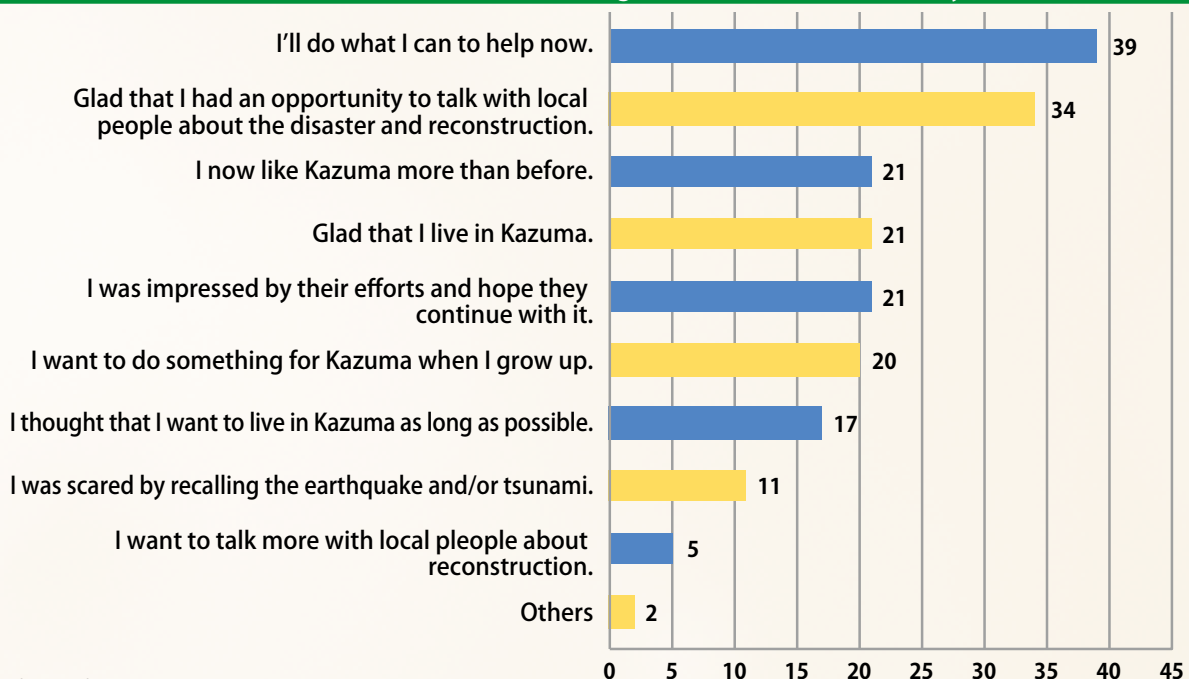
1.3 Key points during implementation

Please keep the following points in mind and carry them out as an each school's original program while referring to this guide when implementing Reconstruction and Disaster Risk Reduction (R-DRR) Mapping.

- Set a learning theme or a focus point that is unique to a local area that has recovered from the Great East Japan Earthquake and Tsunami.
- Make it an opportunity for children's active learning.
- Make contact with the local community--interviewing; getting parents, guardians and the local community to participate in watching the children for their security during town watching; making presentations to parents, guardians, the local community, etc.
- Link it with other subjects—applying the knowledge on disasters, disaster risk reduction, etc., gained in other subjects in their hometown and making it an opportunity to attain community-based disaster education.
- Try to utilize Ishinomaki's unique education materials and information, including the City of Ishinomaki's *Disaster Risk Reduction Supplementary Reader*, social studies supplementary readers, etc.
- Make the plan continuable at school—avoid putting in too much effort and expectation.
- Try to compile the information and records collected by children as a unique learning material of the school and utilize it as an education material.

It has been observed, by interviewing during the town watching, that the experiences of the Great East Japan Earthquake and Tsunami have been passed down from adults to children, interactions have been created between them in their communities, and the children have become more attached to their local areas.

Fig.5: What did you think about what the adults and shopkeepers in Kazuma said during the interviews about the disaster and reconstruction? (Fourth graders at Kazuma Elementary School, SY 2014)



Reference for Fig3, 4 and 5:
Sakurai A, Tokuyama E, Sato T and Murayama Y 2014 Implementation of the reconstruction mapping program at elementary schools in Ishinomaki. *The Japanese journal of safety education*, vol. 14 pp. 47-61

1.4 Actual operations at the schools that have implemented R-DRR mapping

The program that started as “Reconstruction Mapping” in Kazuma Elementary School in SY 2012 had been implemented as “Reconstruction and Disaster Risk Reduction (R-DRR) Mapping” at ten elementary and junior high schools in Ishinomaki as of SY 2016, as shown in the following Fig.6 and Table 1

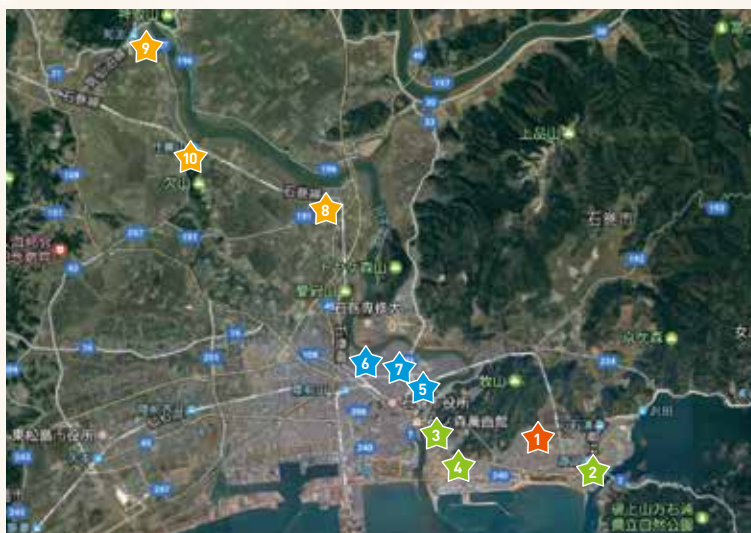


Fig.6: Locations of the ten implemented schools

Table 1: Overview of actual operations at the implemented schools

School name (Location in Fig.1)	Started year	Target grade	No. of hours	Main activity or theme
1 Kazuma Elem.	SY 2012	4th	Approx. 35	Preserve the records of reconstruction of the town and think about the future of the local area
2 Watanoha Elem.	SY 2014	3rd	Approx. 70	Become interested in the situations around the time of the disaster and look to the future
3 Minato Elem.	SY 2014	4th	Approx. 10	Check the evacuation rules, routes and assembly areas, and think of the town 10 years later.
4 Minato J.H.	SY 2014	All	1	Disaster risk reduction mapping in your residential area, apart from the school district
5 Sumiyoshi Elem.	SY 2015	4th	Approx. 20	We who get on with our life--knowing our hometown and becoming connected to it
6 Nakasato Elem.	SY 2015	5th	Approx. 22	Let's deliver what we've learned--providing information from Nakasato Elementary School
7 Sumiyoshi J.H.	SY 2015	1st	Approx. 10	Know your hometown and live safely with peace of mind
8 Kanomata Elem.	SY 2016	6th	Approx. 15	Make use of what you feel now to make the future of 10 years later--through the map making for the future
9 Wabuchi Elem.	SY 2016	6th	Approx. 25	Let's find something good in Wabuchi through town watching and map making
10 Kanan Higashi J.H.	SY 2016	1st	Approx. 6	Let's share your points of concern found around the route to school with other pupils and parents/guardians using the disaster risk reduction map of each elementary school district

● For the details of the actual operation at each school, please refer to the supplemental volume “Collection of case studies at schools.”

2 Unit planning

So far, “Reconstruction and Disaster Risk Reduction (R-DRR) Mapping” has been implemented by utilizing the “Period of Integrated Study” (sogoteki na gakushu no jikan). It is important during unit planning to follow the steps below in order to implement it in accordance with the actual situations of the school, community and children.

STEP1



Clarifying actual situations of the school, children and community

STEP2



Projecting a unit plan

STEP3



Making a unit plan

2.1 Planning steps for customizing the program to your school's particular circumstances

STEP1

Clarifying actual situations of the school, children and community

Let's clarify the actual situations of the pupils/students, school and community by considering the following aspects in order to also narrow down the focus of the theme for "Reconstruction and Disaster Risk Reduction (R-DRR) Mapping" in accordance with the actual circumstances around the school.

■ Circumstances around pupils/students

- Family structures, family situations, living environments, etc.

(E.g.) Having a high proportion of pupils coming to school from outside of the school district, having those coming to school from temporary housing and/or disaster recovery public housing, having those whose family members were disaster victims, having those who have been supported by school counselors, etc.

■ Degrees of disaster damage in the school district

- As for the school

Totally/half collapsed and/or flooded by the tsunami, operating in a temporary building, rebuilt and returned, re-opened at the original location, damaged/not particularly damaged by the earthquake, etc.

- As for the school district

All/part of it suffered flood damage caused by the tsunami, houses and other washed out by the tsunami, not particularly damaged by the tsunami, damaged or not particularly damaged by the earthquake, etc.

■ Natural environmental conditions and disaster records in the area

- Natural environmental conditions

(E.g.) land forms (low-land, upland, hilly, etc.), locations (near the sea/river, by the mountains, etc.)

- Disaster records

(E.g.) river and/or inland floods, typhoon and/or storm surge damage, etc.

■ Availability of local human resources

(E.g.) Supporters/collaborators for school management, regional center for school support, local non-profit organizations, PTA, fathers' association, local voluntary disaster prevention groups, etc.

■ Socioeconomic background of the area

(E.g.) history, population composition, industry, presence of festivals, etc.



STEP2

Projecting a unit plan

Based on the results of STEP1, project a unit plan while examining the feasibility upon diverse points of view, including target grade, class hours, learning environment, learning form, teaching structure and linkage with other subjects.

STEP 3

▶ Making a unit plan

- 1 Unit name, 2 Purpose of setting the unit, 3 Unit objectives,
4 Evaluation criteria, 5 Teaching plan**

- The unit name can be changed in accordance with the theme and purpose set at each school.
- Explain the purpose of setting the unit in consideration of what pupils/students are interested in and concerned about, their capabilities and capacity that are expected to be expanded, attitudes to be improved, teachers' wishes, characteristics of the local area and school, linkage with other subjects, etc.

The following are two case studies of the unit planning—one by an elementary school in a coastal area which received enormous tsunami damage with the main focus on reconstruction and the other by a junior high school in the central part of the city with the main focus on disaster risk reduction. Furthermore, please refer also to the “teaching flow” of each school in the supplementary volume *Collection of case studies at schools*.

2.2 Case study of unit planning for “Reconstruction Mapping”

1 Fourth grade “Period of Integrated Study” (sogoteki na gakushu no jikan)

● Unit name: “Reconstruction Mapping” (12-17 hours equivalent)

2 Purpose of setting the unit

This area—Kazuma Elementary School district—was completely affected by flooding due to the tsunami in the Great East Japan Earthquake and Tsunami, the coastal part of the district in particular incurred catastrophic damage, which resulted in the collapse of neighborhood associations, and their reorganization was nowhere in sight, and therefore it was difficult to coordinate with the local communities. Large numbers of children came to school from temporary housing and other facilities by bus, which had limited their opportunities to walk in the district. Up to that point, teachers had been trying not to mention the disaster so as to avoid causing the children stress.

Reconstruction mapping was projected based on the above circumstances.

- 1 Avoid putting the main focus on disaster risk reduction during map making out of consideration of the children’s mental welfare.
- 2 Encourage the children to rediscover the attractive parts of their hometown from their own points of view, despite how the town was damaged by the disaster, and highlight the positive elements.
- 3 Encourage them to face their experiences of the disaster and to put priority on active engagement in their community.

Furthermore, the unit was set expecting them to become attached to and proud of their hometown and to build a responsible attitude toward social participation with which they think of what they can do themselves and try to adopt it in their life, through this work.

3 Unit objectives

We aim to develop, through the “town watching” activity, an attitude with which children themselves think of the future of their hometown with pride and love for the local society as a member of the community. During the “town watching” that is to be carried out in the area around school, children are expected to actively research and experience things themselves, and to keep a record, in the form of a “Reconstruction Map,” of the circumstances at this moment where their hometown is recovering from the earthquake and tsunami.

“Children who have dreams for the future, love their hometown and engage themselves in what they can do”
(Ishinomaki DRR’s “Desirable figure of children” for elementary school pupils)

**The objectives of disaster education at the elementary school level
(Ministry of Education, Culture, Sports, Science and Technology, March, 2013)**







**Pupils who understand risks of disasters,
that could occur in various situations of everyday life
and are capable of behaving safely
and also paying attention to the safety of others.**

Knowledge, ways of thinking and decision making	Risk prediction and proactive response	Contribution to society and capacity to be supportive
<ul style="list-style-type: none"> ● Understanding about the disasters that the area is prone to and past disasters in the area, as well as making use of this understanding to make decisions on safe behavior. ● Understanding things that can be useful during the time of a disaster, including those that help us reduce damage. 	<ul style="list-style-type: none"> ● Recognizing disaster risks, and, through daily training and such, being capable of securing one's own safety. 	<ul style="list-style-type: none"> ● Respecting one's own life and those of others, and, during and after disasters, being capable of securing the safety of other people, groups and the community at large.

4 Categorizing points discovered

Based on the unit objectives, categories for points discovered are set. Generally, for town watching and map making as part of disaster education, they are often divided into categories such as places/things that look dangerous, of concern or useful in times of a disaster. Additionally, for R-DRR mapping, certain considerations need to be made during category setting to encourage children to rediscover good and attractive parts of their local area and to become positive toward reconstruction of the area.

Table 3: Categorizing points discovered

Code	Color	Category
A		Places/things that look dangerous or of concern
B		Things that have existed since before the disaster and were damaged, but have already been repaired
C		Places/things that are currently under construction or repair
D		In preparation for reconstruction--vacant sites already clear of debris are at the start of reconstruction
E		Things that weren't there before and were newly built after the disaster
F		Other places/things that draw particular attention--places/things that are fun or beautiful or a source of pride

Here, color coding was set by degree of reconstruction.

By setting "vacant, level land, clear of debris equals 'start of reconstruction'," "places/things that are fun or beautiful or a source of pride" and such, certain considerations were made in order to encourage children to become positive toward the reconstruction of their hometown and its attractive parts.

5 Evaluation criteria

Viewpoint	Evaluation criteria
I. Capabilities to find problems and solve them	<ol style="list-style-type: none"> 1 Capable of engaging with the local area and its people and finding problems by facing the disaster experiences. 2 Capable of solving the problems by gathering information on the circumstances of reconstruction in the area by various means
II. Learning attitude and ways of thinking	<ol style="list-style-type: none"> 1 Capable of selecting and utilizing necessary information from the gathered information. 2 Capable of describing and presenting by one's own means what was found.
III. Proactive and creative attitude to solve problems	<ol style="list-style-type: none"> 1 Interested in the circumstances of the area that has been recovering from the earthquake and tsunami and trying to cooperate in the area's recovery. 2 Discovering good parts of the area and willing to utilize the achieved results for it.
IV. Quest for one's own way of life	<ol style="list-style-type: none"> 1 Aware of one's own growth and capable of thinking of what one can do and to utilize this awareness in daily life hereafter. 2 Having pride and love for one's hometown as a member of the community.

While the viewpoints above are set in accordance with the objectives of the "Period of Integrated Study" (sogoteki na gakushu no jikan) defined in the Ministry's Education Guidelines, evaluation viewpoints need to be set in accordance with the objectives and contents defined at each school as well as capabilities, capacity and attitude expected to be gained there.

(Other examples)

- Ways of learning, self-management, engagement with others and society
- Capability of goal-setting, capability of information gathering, capability of designing own future, capability of social participation
- Interests and concerns, willingness and attitude, ways of thinking, decision making and presentation, skills, knowledge and understanding

6 Teaching plan (12-17 hours)

For **WS-***, please refer to the corresponding pages in the supplemental volume *Collection of worksheets for Reconstruction and Disaster Risk Reduction (R-DRR) Mapping*.

Stage	Main learning activities	Teacher's instructions and support	[Viewpoint] Evaluation criteria (Evaluation method)	Items to be prepared in advance
Capture it (3 hours)	Studying the Great East Japan Earthquake and Tsunami	<ul style="list-style-type: none"> ● By interviewing family members about the Great East Japan Earthquake and Tsunami, increasing their interest in the subsequent study (Cooperation between family and school) 	[I - ①] Through interviewing, facing the disaster experiences and recognizing problems (Behavior, worksheet)	<ul style="list-style-type: none"> ● Pre-questionnaire → WS - ③ ● Interview sheet (for home) → WS - ⑤

Stage	Main learning activities	Teacher's instructions and support	[Viewpoint] Evaluation criteria (Evaluation method)	Items to be prepared in advance
Capture it (3 hours)	Learning about "reconstruction mapping"	Researching the current situation in Kazuma around school through "town watching," keeping it as a record of reconstruction (recovery) and thinking of a future image of Kazuma.		
	① Knowing the learning content	● Clarifying the purpose and giving an overview of the study		
	② Learning about maps	● Preparing an area map for each group so that children can imagine the locations and circumstances of places		● Area map for each group
	③ Clarifying what to discover	● Specifying what to discover and the categorization of points discovered, as well as clarifying the aim of "town watching"	[III - ②] Being concerned about the current situation of their local area and trying to plan and prepare in cooperation (Behavior, worksheet)	
	④ Preparing for interviews	● Letting children identify the interviewees for each group on the map and think of questions respectively		● Interview sheet → WS - ⑧
⑤ Planning a town watching	● Letting children distribute roles to each of them to increase motivation to participate in the activity		● Town watching planning worksheet → WS - ⑥	
Deepen it (6-10 hours)	Let's do "town watching"			
	① Go "town watching" by group	● Paying full attention to safety and security		

Stage	Main learning activities	Teacher's instructions and support	[Viewpoint] Evaluation criteria (Evaluation method)	Items to be prepared in advance
Deepen it (6-10 hours)	<ol style="list-style-type: none"> 2 Taking photos with a digital camera, taking a brief note, marking the location on the map and putting a serial number on it 3 Reviewing own activity and writing it down on the sheet 	<ul style="list-style-type: none"> ● Arranging to let children not just look around but interview local people to make a relationship with them ● Making sure that children specify category codes, which provide a clue when describing on the card later ● Letting each group start filling out the review sheet once the groups have returned to school 	<p>[I - 2]</p> <p>Capable of noticing the situations of local area's reconstruction and gathering necessary information through "town watching" (Worksheet, review sheet)</p>	<ul style="list-style-type: none"> ● Town watching worksheet → WS - 7 ● Interview sheet → WS - 8 ● Review sheet → WS - 9⑩
	<p>Let's make a reconstruction map</p> <ol style="list-style-type: none"> 1 Organizing information 2 Writing down the information noted on the worksheet onto the information cards and interview cards for display 3 Putting color code stickers on each group's area map 	<ul style="list-style-type: none"> ● Letting children share the gathered information in each group ● Letting children attach photos, color code stickers marked with numbers and write down information onto the information cards and interview cards for display ● Letting children correctly attach color code stickers marked with numbers on each group's area map 	<p>[II - 2]</p> <p>Information on the things discovered or noticed during the town watching well organized in an easy-to-understand original way (Information cards, interview cards)</p>	<ul style="list-style-type: none"> ● Information cards ● Color code stickers ● Interview cards → WS - 11 ● Personal comment cards

Stage	Main learning activities	Teacher's instructions and support	[Viewpoint] Evaluation criteria (Evaluation method)	Items to be prepared in advance
Deepen it (6-10 hours)	④ Writing the personal comment card	<ul style="list-style-type: none"> ● Letting children review their activity and write down their feelings and impressions about the disaster ● Letting children fill out the card while referring to the review sheet and home interview sheet 		
	Let's decide a title of the reconstruction map	<ul style="list-style-type: none"> ● Letting children discuss the future of their hometown in each group 	[II - ①] Thinking of a title on one's own, based on the information acquired in the town watching (Remarks, title card)	<ul style="list-style-type: none"> ● Worksheet for the title → WS - ⑩ ● Title cards
	Finalize	<ul style="list-style-type: none"> ● Letting children attach the completed cards and area map on the DRR map 		
Utilize it (3 hours)	<p>Let's hold a presentation assembly</p> <ol style="list-style-type: none"> ① Preparing for the presentation assembly ② Holding the presentation assembly 	<ul style="list-style-type: none"> ● Inviting those who gave support during the town watching, as well as parents and guardians, to provide them with an opportunity to see how the children's activity was carried out and to more deeply understand it 	[IV - ②] Having a sense of pride and attachment as regards their hometown, perceivable in the presentation (Remarks, piece of work)	<ul style="list-style-type: none"> ● Worksheet for presentation → WS - ⑬ ● Worksheet for presentation feedback → WS - ⑭⑮⑯

Stage	Main learning activities	Teacher's instructions and support	[Viewpoint] Evaluation criteria (Evaluation method)	Items to be prepared in advance
Utilize it (3 hours)		<ul style="list-style-type: none"> ● Letting children gain satisfaction ● Letting children receive a sense of accomplishment in their activity so as to foster their self-confidence and motivation for further activities 	<p>[III - ②]</p> <p>Finding good parts of the local area and willingly trying to tell research results, as well as ideas and wishes, to other pupils in other grades, parents, guardians and people in the community (Remarks, piece of work)</p>	
	Let's review the year-long activity and exchange with each other what you feel now	<ul style="list-style-type: none"> ● Letting children review the year-long activity while being reminded of the reconstruction of their hometown and the warmth of the people in the community, gaining satisfaction from the activity 	<p>[IV - ①]</p> <p>By reviewing the activity, noticing one's own growth, thinking of what can be done individually and trying to adopt this in daily life hereafter (Remarks, questionnaires)</p>	<ul style="list-style-type: none"> ● Post-questionnaires → WS - ⑰ ⑱ ⑲

2.3 Case study of unit planning for “Disaster Risk Reduction Mapping”

1 “Period of Integrated Study” (sogoteki na gakushu no jikan) for freshmen in junior high school (seventh graders)

● Unit name: “DRR Mapping” (10-hour equivalent)

The unit name can be changed in accordance with the theme and purpose set at each school, such as “Making ____ Map,” etc.

2 Purpose of setting the unit

With this unit we aim to encourage children who experienced the Great East Japan Earthquake and Tsunami to face their own disaster experiences and to foster willingness to become engaged in DRR against natural disasters in their local area and to contribute to the future of their hometown.

Also, children are expected to learn about ❶ the transitions in land forms and town scapes, ❷ history and ❸ the disaster record of their hometown, to find that its vulnerability to disasters changes from time to time, and to become capable of thinking about community-based disaster prevention.

It is in fact meaningful for children—the bearers of this town’s future—to think about the relationship between the community and themselves and what they can do on their own in regard to preparing for disasters, their actual behavior during such events and their sharing with local people the outcomes obtained from this study.

While it is always difficult to secure study time at junior high school, the case herewith was chosen to give an example of implementing it by relating it to the education materials that had increased DRR-related contents with the SY 2016 textbook revision, including those of social studies (geography, etc.) and science. In addition, it aims to let children learn about their locality by utilizing local materials such as the City of Ishinomaki’s supplementary readers, *The Book of DRR* and *History of Ishinomaki*, as well as *Our Town of Monou*, *Our Town of Kitakami*, *Our Town of Kanan*, and others. These can be searched for on Miyagi Prefecture’s Official Website, understood in more depth and worked on in terms of R-DRR mapping. Likewise, R-DRR mapping has also been implemented at elementary schools. (Refer to the supplementary volume *Collection of case studies at schools*.)

3 Unit objectives

Through the DRR mapping, we aim to let children understand natural disaster risks in the hometown, developing their increased willingness to think of the necessity of preparation and utilization of information, and to try to reduce damage. Moreover, we aim to foster their motivation to contribute to the future of their hometown with pride and love to it.

“Children who have dreams and visions and devote themselves to learning, believing that their current efforts will eventually result in helping reconstruction.”

(Ishinomaki DRR’s “Desirable figure for children” for junior high and high school students)

Reference: Reference material for disaster risk reduction at school “Deployment of disaster education that nurtures a ‘zest for life’”

**The objectives of disaster education at the junior high school level
(Ministry of Education, Culture, Sports, Science and Technology, March, 2013)**

Students who proactively take action based on ordinary preparations and appropriate decisions, understand the importance of the local community’s disaster risk reduction activities and mutual assistance at the time of disaster and participate in such activities voluntarily.

Knowledge, ways of thinking and decision making	Risk prediction and proactive responses	Contribution to society and capacity to be supportive
<ul style="list-style-type: none"> ● Capable of understanding basics of disaster occurrence mechanisms and risks assumed from previous cases, thinking of the necessity of preparation and utilization of information and making use of it in decision making for safe behavior 	<ul style="list-style-type: none"> ● Capable of making appropriate decisions in daily life based on knowledge and practicing safe behavior proactively. ● Capable of thinking about and preparing for disaster risk reduction and post-disaster life. ● Capable of predicting risks and taking evacuation actions at own discretion. 	<ul style="list-style-type: none"> ● Understanding the importance of the local community’s disaster risk reduction activities and mutual assistance at the time of disaster and participating in such activities proactively.

4 Categorizing points discovered

Below is an example of the categorization of points discovered in the DRR mapping. This should be set in accordance with the actual situations of each school.

Related to land form or land use → Use a yellow card		
a) High place, slope, low place b) Rice paddy, vegetable field, mulberry field c) Settlement	d) Levee, drainage pumping station e) Name denoting nature	<ul style="list-style-type: none"> ● Study the points beforehand on the map, etc., and verify them during town watching. ● Other approaches include grasping a full picture of the school district and then checking the details in their own part of the area.
Place/thing that seems unsafe or unsecure → Use a blue card		
f) Place/thing that seems unsafe in terms of road/traffic g) Place that seems unsafe in terms of land/soil condition h) Thing/place that can be unsafe at the time of disaster	i) Place where one or more persons will need assistance at the time of disaster j) Place/thing that signifies traces/damage from past disasters	

Place/thing that seems safe or secure → Use a pink card

- | | |
|--|--|
| <p>k) Place/thing that helps information communication (public phones, community wireless system, evacuation route signs, etc.)</p> <p>l) Place/thing that helps emergency response (fire services, police, hospitals, hydrants, AEDs, etc.)</p> | <p>m) Place/thing that will be useful in evacuation life (evacuation centers, stockpiles, emergency supply warehouses, wells, emergency potable water storage, disaster relief vending machines, electricity generators, solar panels, etc.)</p> <p>n) Other places/things that seem safe and secure</p> |
|--|--|

Other → Use a green card

- o) Historic things
 p) Newly-established facility after the disaster
 q) Other (place/thing that the researcher boasts of and wants to transmit as local information)

5 Evaluation criteria

Viewpoint	Evaluation criteria
<p>I. Capabilities to find problems and solve them</p>	<p>① Capable of thinking about risks based on landforms, history and the past disaster record of the locality and finding out issues.</p> <p>② Capable of gathering information by various means, thinking about its utilization and solving problems as needed.</p>
<p>II. Learning attitude and ways of thinking</p>	<p>① Capable of making decisions in daily life appropriately based on knowledge and engaging in safe behavior.</p> <p>② Capable of thinking about and preparing for disaster risk reduction and post-disaster life.</p> <p>③ Capable of describing and presenting by one's own means what was found.</p>
<p>III. Proactive and creative attitude to solve problems</p>	<p>① Understanding the importance of the local community's disaster risk reduction activities and mutual assistance at the time of disaster and trying to participate in such activities voluntarily.</p> <p>② Discovering good parts of the area and being willing to utilize the achieved results.</p>
<p>IV. Quest for one's own way of life</p>	<p>① Awareness of one's own growth and capability of thinking of what one can do, utilizing this in daily life hereafter.</p> <p>② Having pride and love for the hometown as a member of the community.</p>

6 Teaching plan (10 hours plus 3 days during summer holidays)

Note: Preliminary studies in science and social studies are not included in the 10 hours.

Stage	Main learning activities	Teacher's instructions and support	Materials
Foundation (2 hours)	<p>Study the maps of where you live</p> <p>(Ex.)</p> <ul style="list-style-type: none"> ● Learning about land forms, land use and disasters in Ishinomaki with the city's <i>Book of DRR "Efforts for the future"</i> (p.53-54) ● History of agricultural land and facilities in Ishinomaki (The Miyagi Prefecture's Official Website) 	<ul style="list-style-type: none"> ● Letting children know about transitions of land forms and the townscapes of their hometown, its history and past disaster record, and understanding the types of disasters the area is prone to at this moment. ● Letting children think about what kind of damage can be caused where they live by land form changes induced by natural disasters. 	<ul style="list-style-type: none"> ● Pre-questionnaire → WS - 4 ● The City of Ishinomaki's <i>Book of DRR "Efforts for the future" for Junior High School</i> ● Geospatial Information Authority of Japan's 1:50,000 Topographic Map of year 1913 (an old generation)
	<ul style="list-style-type: none"> ● Disasters in Ishinomaki <i>Supplementary Reader "History of Ishinomaki"</i> (p.104-108) <p>* Section 3: Earthquakes and disasters (p. 227-229), Chapter 2: The moving Earth (5-hour program) <i>Atarashii Kagaku (New Science) 1</i></p> <p>* 5. Natural disasters and risk reduction efforts (p.152-155), Section 1: Natural environment of Japan (6-hour program), Chapter 2: Facts and figures of Japan & Chapter 4: Surveying in your local area (7-hour program) (p.264-281), Volume 2: Various areas of Japan <i>Atarashii Shakai (New Social Science): Geography</i></p>	<ul style="list-style-type: none"> ● Letting children find that efforts are made to reduce damage from natural disasters and think about disaster prevention measures taken in their locality. ● Letting children recognize characteristics of their locality in the context of its natural environment, the connection with other areas and local people's lives, as well as letting them, find problems and become interested in future development. 	<ul style="list-style-type: none"> ● 1:25,000 Topographic Map of the current generation ● Landform Classification Map for Flood Control ● <i>Supplementary Reader "History of Ishinomaki"</i> ● <i>Atarashii Kagaku (New Science) 1</i> (Tokyo Shoseki Co.,Ltd.) ● <i>Atarashii Shakai (New Social Science) Geography</i> (Tokyo Shoseki Co.,Ltd.)

Stage	Main learning activities	Teacher's instructions and support	Materials
Development (2 hours)	<p>Study past disasters in your area, including the Great East Japan Earthquake and Tsunami</p> <p>Learn about DRR mapping</p> <p>① Knowing the learning contents</p>	<ul style="list-style-type: none"> ● By interviewing family members about the Great East Japan Earthquake and Tsunami, increasing their interest in the subsequent study (Cooperation between family and school) ● Clarifying the objectives of DRR mapping and giving an overview of the study 	<ul style="list-style-type: none"> ● Residential map
	<ul style="list-style-type: none"> ● Let's know about your local area and learn through DRR mapping how to keep life safe and secure 		
	② Learning about maps	<ul style="list-style-type: none"> ● Preparing a map for each groups' allotted area so that children can draw their town watching route on it and imagine the locations and circumstances of places of interest. 	
	③ Clarifying the categorization of discovered points	<ul style="list-style-type: none"> ● Specifying what to discover and the categorization of discovered points and clarifying the aim of the "town watching" 	
	<p>④ Preparing for interviews</p> <p>⑤ Planning a town watching (Date, role sharing)</p>	<ul style="list-style-type: none"> ● Letting children identify the interviewees for each group on the map and think of questions respectively ● Letting children distribute roles to each to increase motivation to participate in the activity ● Letting children arrange in each group times and dates within the 3 days in summer holidays in accordance with each member's club activity 	

Stage	Main learning activities	Teacher's instructions and support	Materials
Summer holidays	<p>Let's "town watching"</p> <ol style="list-style-type: none"> Go town watching by group Taking photos with a digital camera, making brief notes, marking the location on the map and putting a serial number on it 	<ul style="list-style-type: none"> Letting children pay full attention to safety and security The teacher in charge also comes to the meet-up point, calls the roll and reports to the school by phone (In the case the teacher is not coming, let children take attendance and call the school themselves) Making sure that children specify category codes (A to F), which provide a clue when describing things on the card later 	
Wrap-up (6 hours)	<p>Let's make a DRR map</p> <ol style="list-style-type: none"> Organizing information Writing down the information noted on the worksheet onto the information cards and interview cards for display Putting coding stickers on each group's area map 	<ul style="list-style-type: none"> Letting children share the gathered information in each group Letting children attach photos and color code stickers marked with numbers, and letting them write down information onto the information cards and interview cards for display Letting children attach color code stickers marked with numbers on each group's area map 	
	<p>In order to improve disaster-resiliency, come up with suggestions and think about the future of your hometown.</p>	<ul style="list-style-type: none"> Letting children piece together all the area maps, review what they have learned and discuss what they have found and thought during map making Then letting them think about the relationship between the community and themselves and include suggestions on the map on what they can do. 	

Stage	Main learning activities	Teacher's instructions and support	Materials
<p>Wrap-up (6 hours)</p>	<ul style="list-style-type: none"> ● What sort of disasters can be expected in the area you researched? ● What can you do to save everyone's life when a life-threatening disaster occurs in the area? ● How can you yourself be of help to make the area disaster-resilient, safe and secure? ● Let's come up with lots of ideas to save lives ● Let's think about what you can do as a junior high school student. 		
	<p>Wrap-up</p> <p>DRR map presentation</p> <p>(Ex.)</p> <ul style="list-style-type: none"> • Exhibition at School Festival • Presentation at a municipal disaster prevention training session • Presentation to elementary school pupils in the school district <p>1 Preparing for presentation</p> <p>2 Giving presentations</p>	<ul style="list-style-type: none"> ● Letting children attach the completed cards and area map to the DRR map ● Letting children think about the structure, contents and ways of presentation in order to deliver one with their thoughts and wishes in an easy-to-follow way ● By reviewing the year-long activity, letting children be reminded of reconstruction of the hometown and warmth of the community people and think about their involvement there hereafter. ● Encouraging children to make it an opportunity to deliver their own messages to the community and to receive a sense of accomplishment in their activity 	<ul style="list-style-type: none"> ● Post-questionnaire → WS - 20

2.4 Maps that reveal transitions of land forms and land use in the locality and examples of its utilization

The following are the points regarding actually utilizing the maps mentioned in “Foundation: Let’s study the maps of where you live” in the “Teaching Plan” (p.21) during the class.

1 Points about utilizing the Topographic Maps of old and new generations and Landform Classification Map for Flood Control during the class

1 Topographic Maps of old and new generations

Topographic Maps of older generations show the land forms and land uses in the past before reforms. The oldest for Ishinomaki is the one at a scale of 1:25,000 surveyed in 1913. Comparison with those of newer generations reveals whether the land use has been changed or not.

Comparison of the both old and new maps on the right, for example, reveals the following.

- ▶ The place name has been changed (from Fukuroyachi to Suimei).
- ▶ The land of Fukuroyachi was mostly used as rice paddies in the past but is a residential district now.
- ▶ Fukuroyachi was surrounded by levees (“waju” ring-levee). Traces of them still can be seen today.
- ▶ Embankments are found in places other than along the river too.

Referring to the legend that explains map symbols, transitions in land use can be traced in more detail.



Fig.1: Ishinomaki in 1:50,000 as of 1913



Fig.2: Ishinomaki in 1:25,000 rev. 2010

Note: Ishinomaki Station and its north side have been adjusted to be displayed at almost the same scale

2 The Landform Classification Map for Flood Control

The Landform Classification Map for Flood Control is a map made for the purpose of advance flood control measures, mainly in lowlands within the watershed areas administered by the central government, which shows landform classification in detail, such as alluvial fans, natural levees, former riverbeds and backswamps and river facilities. As for lowlands, since differences in elevation are small, use the Landform Classification Map for Flood Control to study micro-landforms.

Created in the same area partitions with the 1:25,000 Topographic Maps, it can be used to learn about the landform of where you live now by displaying both of them together on the Internet.

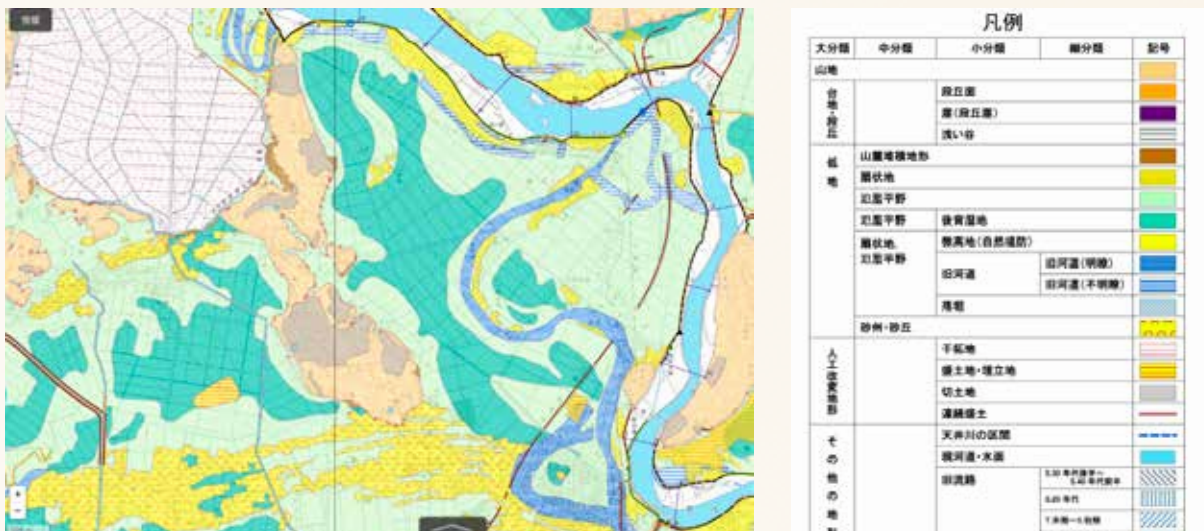


Fig.3: The Landform Classification Map for Flood Control, focusing on the Kanomata Elementary School district

Note: This is a map displayed by laying the Landform Classification Map for Flood Control on the Topographic Map at the Geospatial Information Authority of Japan's website "GSI Maps." Its procedures are shown below.

By referring to the legend, let's actually get the picture of the landform of places where your school and house are. The figure above shows, for example, the following.

- ▶ People live mainly in the slight elevations (natural levees) in the Kanomata Elementary School district. Flood plains and backswamps are used as paddy fields.
- ▶ The former Hirobuchi Marsh was reclaimed and is used as paddy fields.
- ▶ Former riverbeds also are used as paddy fields.
- ▶ The slight elevations extending southwest in the bottom part (south) of Fig.3 are sand bars/dunes, which is evidence that there was once a coastline here.
- ▶ As they are slight elevations, people have long resided there, as with the natural levees.

Landforms can be analyzed in detail on the map, in relation to disasters by referring to the following note describing each landform type:

- **"Slight elevation (natural levee)"** (in yellow on the map): Geospatial Information Authority of Japan defines it as "a depositional landform made of sediment that was brought with flood waters, and accumulated on the bank of a river" and explains that since "it forms a hill-like feature slightly higher than the surrounding area and the risk of receiving damage from floods are smaller in comparison with those in flood plains," "it has been chosen as a habitation area by those who utilize flood plains as agricultural terrain."
- **"Backswamp"** (in green on the map): It signifies "a wetland formed behind a natural levee." Located in a low-elevation area, it is "composed of accumulated mud" brought by floods and is "an area with poor drainage which rarely dries out." Holding water well, it has been used as paddy fields; however, houses and factories have been built in the course of urbanization. Its unstable ground bears risks during disasters, including inundations caused by heavy rains.
- **"Alluvial fan"**: It is "a fan-shaped depositional landform stretching out from the end of a valley to a plain where the stream/river changes its watercourse everytime it overflows." As a stream/river decreases its flow speed and carrying capacity when it comes out from a narrow valley to a wide plain, sand and gravel contained in the water are deposited at the end of the valley. When a flood occurs the stream/river flows in a different watercourse avoiding the accumulated sand and gravel, which results in the deposition of sand and gravel in new areas. Consequently, it forms an alluvial fan. Composed of sand and gravel, it easily allows water to penetrate. The water penetrated into the ground is called the subsurface flow and it comes out above the ground as spring water around the fan toe. The central part of an alluvial fan is highly-permeable and suitable for cultivation of crops that do not need much water, and therefore it has been used for vegetable fields and fruit farms. On the other hand, villages and paddy fields have been made in the fan toe part that has good water access. Originally created by floods, alluvial fan areas are prone to sediment-related disasters caused by heavy rains, etc.
- **"Sand bar/dune"**: Sand bars, including beach ridges (slight-elevations made of sand or gravel stretching along coastlines), are made by ocean waves and coastal currents and are located near a past or present seashore or lakeshore. Sand dunes signify "small hills made of sand brought by winds." The risk of flood-causing inundations is very low in sand dunes. The safety level toward inundations in sand bars is considered to be the same with that in natural levees.

Reference:
 Geospatial Information Authority of Japan's Website → "Toolbox for Geography Education" → "From mountains to the sea: Landforms made by rivers"
 (http://www.gsi.go.jp/CHIRIKYOUIKU/kawa_0-1.html)
 "Handbook for The Landform Classification Map for Flood Control" (Disaster Prevention Section, Geospatial Information Authority of Japan)

③ Comparison with the flood hazard map (<http://portal.disaster.city.ishinomaki.lg.jp/map/hazard>)

Comparing the Landform Classification Map for Flood Control with the flood hazard map, deep floodwater depths are estimated also in the slight elevation to the north of Ishinomaki Station. This is because the estimation is made upon “the case that the Kitakami River, Former Kitakami River as well as Eai River were swollen by heavy rains, causing an inundation with a levee breach, etc.” Such a type of inundation is called “river flooding (gaisui hanran).” Hazard maps need to be referred

to while understanding the estimation basis. Even in the cases where heavy rains do not cause levee breaches, they often make ditches overflow. This is called “overland flooding (naisui hanran).” In cases of overland flooding, while backswamps and former riverbeds are prone to inundations, slight elevations are not, and therefore, ways to respond in each micro-landform are clearer. As for lowlands, people used to take up their residency more predominantly in slight elevations. Keeping these considerations in mind, information on landforms and land uses can be found in the town watching. (④ Categorizing discovered points, p.18)

Reference:
Geospatial Information Authority of Japan's Website → “Toolbox for Geography Education” → “From mountains to the sea: Landforms made by rivers” (http://www.gsi.go.jp/CHIRIKYOUIKU/kawa_0-1.html)

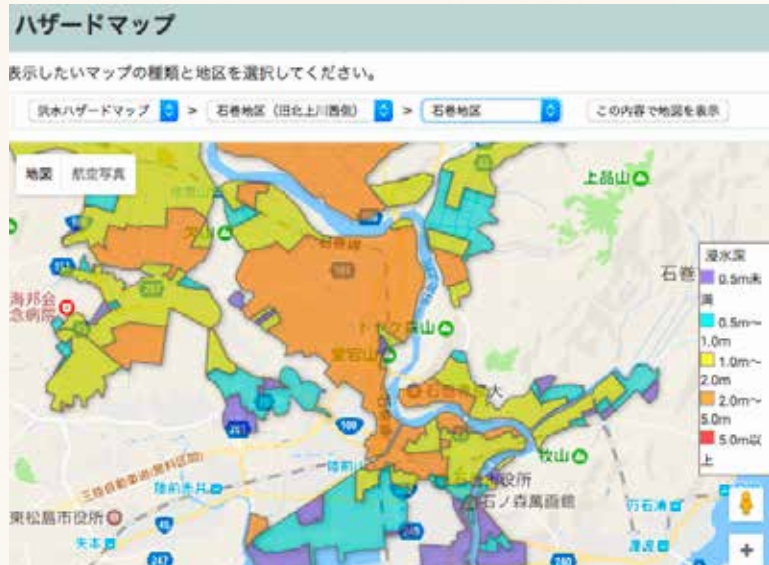


Fig.4: City of Ishinomaki's flood hazard map



Fig.5: The Landform Classification Map for Flood Control, focused on the central part of Ishinomaki

② How to find maps

Let's actually find maps of the area around your school at the Geospatial Information Authority of Japan's Website. (In what follows, the former City of Ishinomaki area is taken as an example.)

① Map revision histories (maps from older generations)

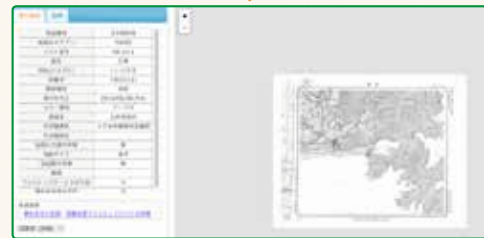
- (1) At the upper central part of the top page (<http://www.gsi.go.jp>) → “Maps/Aerial photos/Geographical researches” tab → Choose “Map revision histories (maps from older generations)”
- (2) Choose “1:50,000 Topographical Maps” in “Revision histories of Landform Maps and Topographical Maps” under “Maps and aerial photos browsing service” on the left side of the page → Click on “Ishinomaki” as indicated on the map.



(3) Click on the area in which your school district is located. (e.g. Ishinomaki) → The list is in chronological order by year of survey (bottom-left) → Click on the list number at the top → “50,000 Topographical Map” (bottom-right). The map can be opened in another window and enlarged. It is grainy and higher resolution copies are available for purchase.

1 - (3)

図番	図名	発行年	発行元	縮尺	形式	備考	購入可能	購入価格
1:25,000-1	1:25,000-1	2010	国土院	1:25,000	標準地図		あり	1,000円
1:25,000-2	1:25,000-2	2010	国土院	1:25,000	標準地図		あり	1,000円
1:25,000-3	1:25,000-3	2010	国土院	1:25,000	標準地図		あり	1,000円
1:25,000-4	1:25,000-4	2010	国土院	1:25,000	標準地図		あり	1,000円
1:25,000-5	1:25,000-5	2010	国土院	1:25,000	標準地図		あり	1,000円
1:25,000-6	1:25,000-6	2010	国土院	1:25,000	標準地図		あり	1,000円
1:25,000-7	1:25,000-7	2010	国土院	1:25,000	標準地図		あり	1,000円
1:25,000-8	1:25,000-8	2010	国土院	1:25,000	標準地図		あり	1,000円
1:25,000-9	1:25,000-9	2010	国土院	1:25,000	標準地図		あり	1,000円
1:25,000-10	1:25,000-10	2010	国土院	1:25,000	標準地図		あり	1,000円
1:25,000-11	1:25,000-11	2010	国土院	1:25,000	標準地図		あり	1,000円
1:25,000-12	1:25,000-12	2010	国土院	1:25,000	標準地図		あり	1,000円
1:25,000-13	1:25,000-13	2010	国土院	1:25,000	標準地図		あり	1,000円
1:25,000-14	1:25,000-14	2010	国土院	1:25,000	標準地図		あり	1,000円
1:25,000-15	1:25,000-15	2010	国土院	1:25,000	標準地図		あり	1,000円
1:25,000-16	1:25,000-16	2010	国土院	1:25,000	標準地図		あり	1,000円
1:25,000-17	1:25,000-17	2010	国土院	1:25,000	標準地図		あり	1,000円
1:25,000-18	1:25,000-18	2010	国土院	1:25,000	標準地図		あり	1,000円
1:25,000-19	1:25,000-19	2010	国土院	1:25,000	標準地図		あり	1,000円
1:25,000-20	1:25,000-20	2010	国土院	1:25,000	標準地図		あり	1,000円



2 The 1:25,000 Topographic Map and Landform Classification Map for Flood Control of the latest generation

(1) Click on “GSI Maps” in “Geospatial Information Library” in the upper central part of the Geospatial Information Authority of Japan’s Website (<http://www.gsi.go.jp>)

2 - (1)



(2) Set the “+” on the Ishinomaki area of the map and enlarge it. Click on “Information” at the upper left and it will be indicated as “Base Map: Standard Map.”

(3) Click on “+Add Information” in the upper part and “Information List” will appear.

2 - (2)

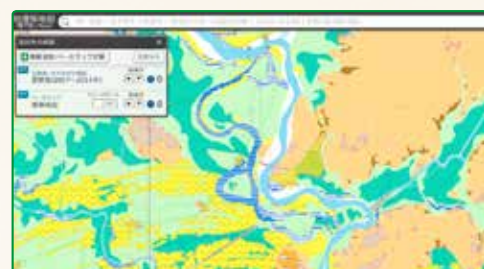


2 - (3)



(4) Click on “Information List” → “Thematic Maps” → “Landform Classification Map for Flood Control.” Then, click on “Updated Version” and the Landform Classification Map for Flood Control will be laid on the map of (2). Click on the blue (i) mark and “Legend” will be shown. If you want to hide the “+” mark on the map, click on “Functions” in white text with black outline in the upper right → “Settings” → Turn off “Central Cross Mark.”

2 - (4)



The map that is displayed can be captured in a screenshot or, if using Windows, with the Snipping Tool. It can be utilized in the class and other activities. When using the map, a clear indication of the usage of “GSI Map” as the source is necessary.

3 Unit implementation

Prior arrangements



Orientation



Town watching



Map making



Presentation



Utilization in class

3.1 Prior arrangements

1 Acquiring a map and deciding on a target area

- To understand the location of and circumstances of where the “town watching” is going to be carried out, acquire a map of the school district. (A residential map of each school district is available at the municipal education board.)
- Decide on an area to carry out the town watching that is covered in the map making, and segmentalize the area into sub-areas.
- It is not necessary to cover the entire school district at once.

2 Deciding groups

- According to the number of segmented areas, divide the target pupils/students into groups. (4-5 persons per group)
- Check in advance with children with special needs, consult with the school counselor, parents/guardians, etc., and allocate an area that is not going to be a burden to them.

3 Preparing equipment

- Prepare equipment necessary for town watching and map making.
(Ex.) Cameras, large pieces of paper, color code stickers, pens, information, colored paper pieces for categorized cards, etc.

4 Asking parents/guardians and the community for support

- Inform parents/guardians and community members of carrying out “R-DRR mapping” in advance and ask for support for interviews, watching children during the town watching, etc.

WS - ①

【保護者への依頼】

〇〇 〇〇様
 「復興・防災マップづくり」におけるボランティアのお願い
 平素より大変お世話になっております。

さて、本校3年生では、災害復興・防災教育の一環として、学区の「復興・防災マップづくり」の活動に取り組んでいます。学区のわが校は、「周辺の〇〇地区の復興のどの程度進んでいるかを調って、復興マップをつくること」と、マップづくりを通して「今後の〇〇の未来像を考えること」です。

つきましては、学区の中でより多きを依頼しております。児童が安全に学習できるように保護者の方々に足守りのボランティアのご協力を頂きたく、ご案内いたします。学習ボランティアにご協力可能な方は、お子さんを連れて学校前までお越し下さい。ご質問やご協力を是非お申し上げます。

記
 1. 日時： 〇〇〇年〇〇月〇日（曜日）（8時～9時～9時～9時まで）
 2. 活動場所：〇〇小学校内
 3. その他：児童は、グループごとにエリア内を歩きます。学校に持ち帰り、足守りは終了となります。

本件に関するお問い合わせは、以下までお願いいたします。
 〇〇地区〇〇学校
 教頭 〇〇 〇〇 学年主任 〇〇 〇〇
 電話 〇〇 〇〇 〇〇 〇〇 以上

WS - ②

【地域への依頼】

〇〇 〇〇様
 「復興・防災マップづくり」におけるインフォメーションの依頼について
 平素より大変お世話になっております。

さて、本校3年生では、災害復興・防災教育の一環として、学区の「復興・防災マップづくり」の活動に取り組んでいます。実際に子どもたちが学区内や施設を「まち歩き」することによって、地域への愛着や復興への意識、防災意識を高めていけるようにしたいと考えております。

つきましては、まち歩き活動に際して、下記の要領で子どもたちが質問を認めて東日本大震災の経験やその後の復興の取組みについて質問やインフォメーションをいただきたいと思います。お考えやご質問をお返答くださるようお願いいたします。

どうぞご協力のほど、よろしくお願いたします。

記
 1. 日時： 〇〇〇年〇〇月〇日（曜日）
 （8時～9時～9時～9時の間に訪問します。時間10-15分程度です。）
 2. 活動場所：〇〇小学校の敷地内
 3. 訪問内容：
 本件に関するお問い合わせは、以下までお願いいたします。
 〇〇地区〇〇学校
 教頭 〇〇 〇〇 学年主任 〇〇 〇〇
 電話 〇〇 〇〇 〇〇 〇〇 以上

3.2 Learning flow

The following is an example of a yearly learning flow for the R-DRR mapping with relation to the worksheets used at each activity.

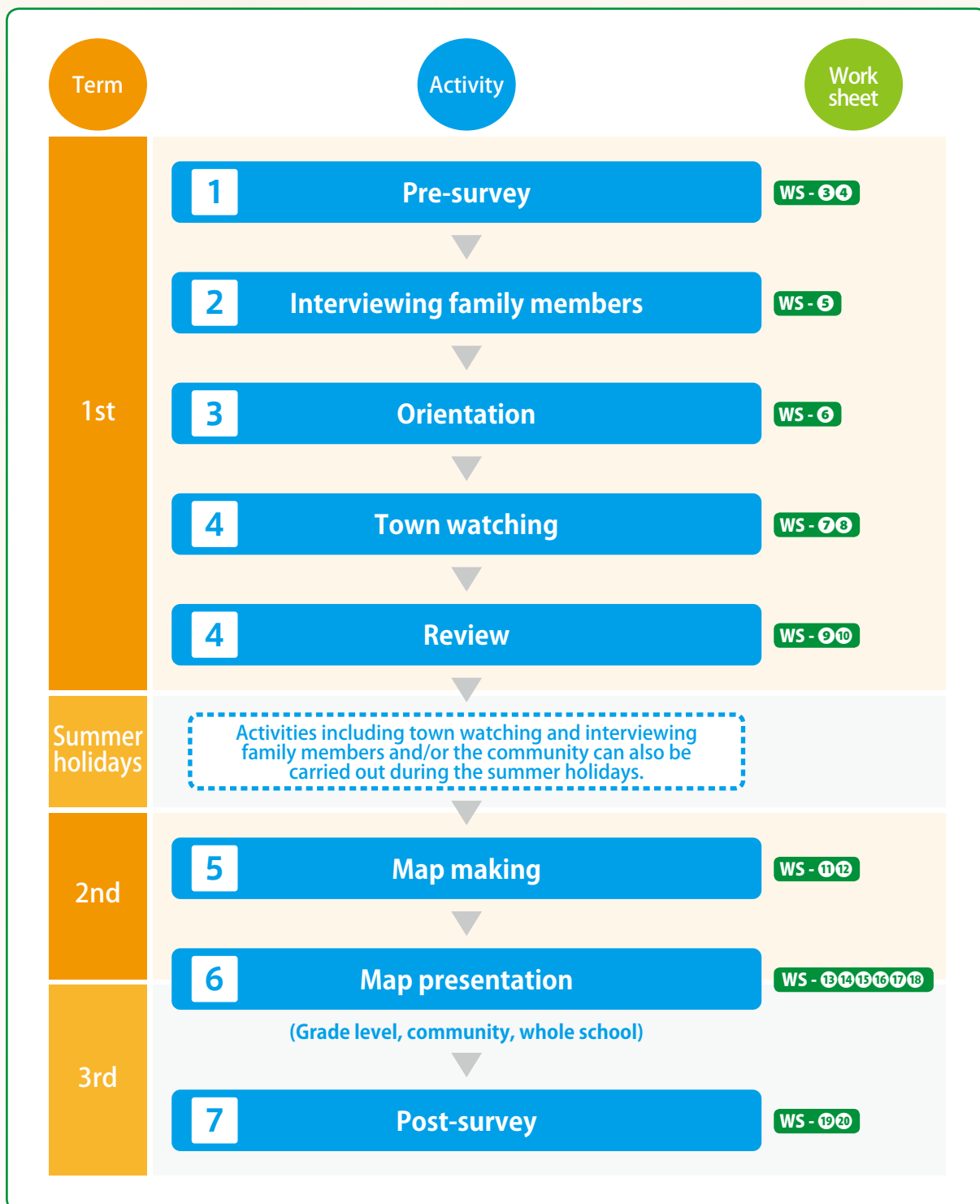


Fig.1: Learning flow and utilization of worksheets

WS - * correspond to the Supplemental Volume *Collection of worksheets*.

3 Orientation

At the time of orientation, teachers check the following points and prepare for town watching.

Giving classes related to the activities that children are going to work on and motivating them.

- **Clarifying the study's purpose and providing an overview of it.**
- **If there is a plan to make a presentation to the people in the community and/or other graders, let children know of that in advance to increase their motivation.**
- **As a part of preparation, it is also possible to invite people in the community and have an opportunity to talk with them.**

(Ex.: Minato Elementary)

Letting children learn the rules in Ishinomaki when there is a tsunami warning.

Showing a video of evacuation centers.

(Ex.: Sumiyoshi Junior High)

Having a guest give a lecture to learn about "the transitions of landforms and land uses in the Sumiyoshi area."

(Ex.: Nakasato Elementary)

Having a speech from a disaster management expert Mr. Abe.

"What sort of things are useful at the time of a disaster?"

"What kind of information is necessary?"

(Ex.: Kanomata Elementary)

Interviewing an administrative committee member and a voluntary disaster prevention organization leader.

Utilizing the information sharing platform. (p.40)

Note: For more details please refer to the supplementary volume *Collection of case studies at schools*.

Learning about maps

- **Giving an explanation about the school district map**
 - Preparing a map covering the whole school district to let children recognize the locations of and circumstances around places they are going to "town watch."
 - Learning about maps in accordance with the target grade.
 - Letting children learn about the landforms in the school district with the GSI's Topographical Map, etc., and gaining related information from Ishinomaki City's Hazard Map, etc. (Please refer to "2.4 Maps that reveal transitions of land forms and land use in the locality and examples of its utilization," p.22-25)
- **Letting children identify their own areas of responsibility on the map**
 - Whether the "town watching" targets the entire school district or only a particular part of it should be decided on in accordance with the actual situations of the school and community.

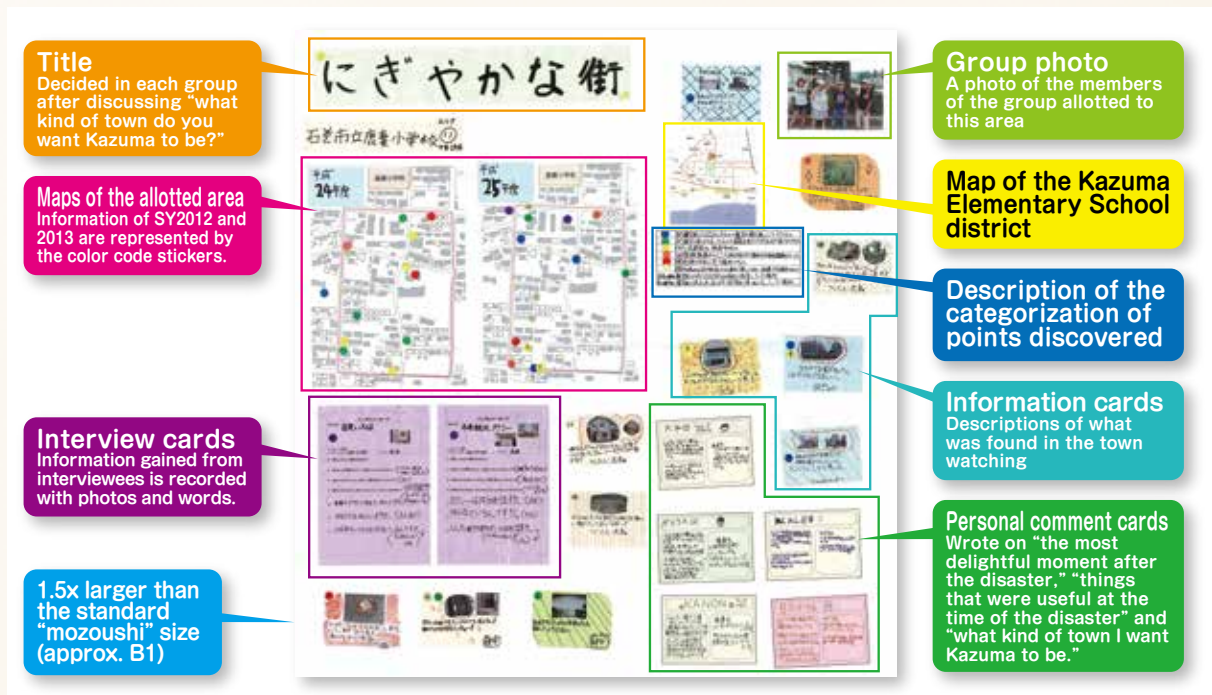
Planning a "town watching"

- **Clarifying the categorization of points discovered**
 - Setting categories in accordance with the objectives set at each school
 - Clarifying the meaning of the categorizing points discovered in the town watching and letting children fully understand what to look for and aspects to pay attention to. That helps children clearly understand the goal of the "town watching."

5 Map making

Map composition

The information to be contained in the “map” is not limited to maps. The pieces of information gathered in the town watching are put together, selected and organized as the “map” with a map of the area allotted to the group.



[In the case of the SY 2013 Kazuma Reconstruction Map]

- Title Decided after discussing the future image of Kazuma
- Group photo A photo of the members of the group assigned to this area
- Map of the school district The assigned area is highlighted in a different color
- Map of the area allotted to the group ... The categories of discovered points are represented by color
- Description of the categorization of discovered points
- Information cards Descriptions of what was found in the town watching
- Interview cards Interviewees’ information and photos
- Personal comment cards Wrote by each of them based on the interview with their family members

What to prepare (for example)

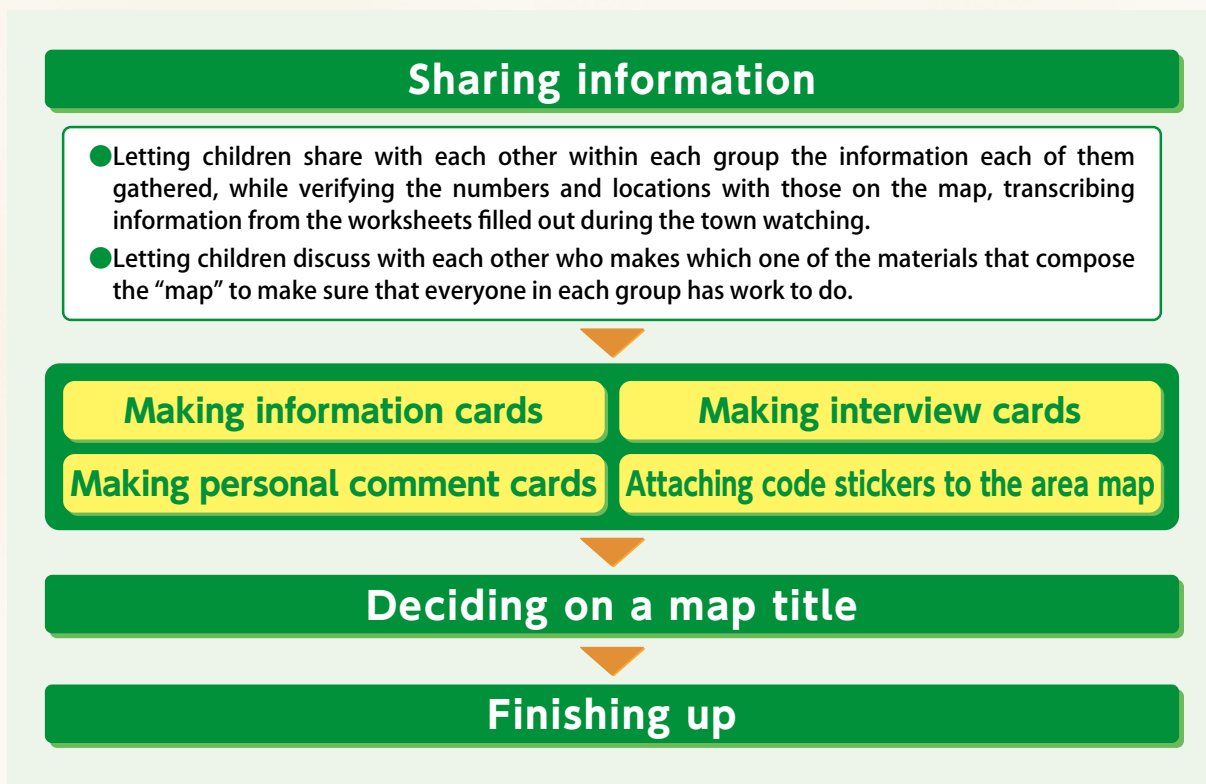
- Large pieces of paper (“mozoushi”)
- Copies of the school district map (obtained from the municipal education board)
- Area maps
- Pens and stationery (colored pencils, fine markers, bold markers, scissors, glues, double-sided tape*¹)
- Photos taken of the town watching
- Town watching sheets
- Interview sheets
- Color code stickers (categorizing discovered points by color)
- Cards to be used for the “map” (information cards, personal comment cards and title cards)*²

* 1: Double-sided tape is for attaching photos to the large piece of paper. Removable tape is also helpful, if available.

* 2: Organizing the information gathered in the town watching into categorized cards allows children to work on it individually and improves work efficiency.

Map-making flow

Organizing what they found and noticed through sharing it with each other and comparing their thoughts with those of friends leads to the cultivation of various perspectives and ways of thinking. (A collaborative discussion)



Making information cards

- Writing their names on each card so that each of them can be responsible for making them.
- Writing down what they learned on the cards. Making sure that each card contains information on one location.
- Selecting photos and attaching them to corresponding cards.
- Attaching color code stickers and marking them with numbers.



Making interview cards

- Using one question card per question and attaching it to an interview card prepared for each interviewee, to improve work efficiency.
- There is also the idea to let children write their names on each card so that each of them can be responsible for making them.
- Organizing remarks for each interview.
- Finishing up by attaching all the cards made by each member to one interview card.

インタビューカード		名 義 姓
住所	氏名	質問) この1年間で変わったことはありましたか?
ご住所からのお名前	写真	
さん		住所
質問) 最近でどのくらい被害がありましたか?		氏名
住所		質問) OO(地域名)をより良くするため、ほかに、わたしたちにしてほしいことはありますか?
質問) お道はいつ再開しましたか?		
住所		住所

WS-10

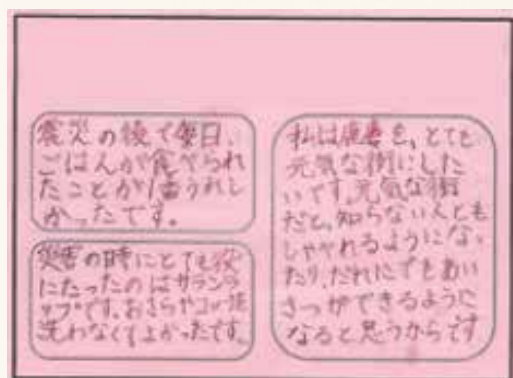
Attaching color code stickers to the area map

- Attaching color code stickers correctly to the area map for each group while confirming the route they walked and the places they researched in chronological order.
- Marking numbers on the stickers attached to the area map.
- In case a discovered point doesn't fit into a single category, let them attach multiple stickers.



Making personal comment cards

- Letting children write about what they learned in the interview with their family members regarding the situations at the time of the Great East Japan Earthquake and Tsunami and what they themselves thought about that.
- Letting children write about things they felt and found during the town watching and their thoughts and hopes for the future of their hometown.



Deciding on a map title

- The title represents what they thought about their hometown and what kind of town they want it to be in the future.
- Alloting sufficient time as it is an important part relating to the unit objectives.
- Letting children be reminded of what they researched in the town watching, what they found through communicating with local people and what they thought was delightful, and think about what they can do themselves.
- Letting children discuss with each other in each group what kind of town they want to make their hometown to be.
- Filling out the title card with the title decided on by each group.

WS-12

復興マップのタイトルを考えよう！

～ 組 ～ 名

復興マップのタイトルは、みんなの意見を参考にしたいので、考えてください。または、一人ひとりで考えたことを発表してみよう。

1. 正解はありません。〇〇(地名) 〇〇(希望) 〇〇(希望)を参考に考えてください。

2. 地図の上でマーカーをつけて、〇〇をより詳しくするところ、自分で行きたいところを教えてください。

3. 〇〇をより詳しくしたいところを教えてください。

4. 思いついた「〇〇をより詳しくしたいところ」について話し合い、決めた復興マップのタイトルを以下の欄に書き込んでください。

※例：『復興、それ以外の場所をついでに復興させる』など。

(Ex.)
 “Green Town Surrounded by Nature” “Cheerful, Joyful, Beautiful Town” “Happy, Bustling and Joyful _____” “Safe, Livable Town Full of Smiles”

Finishing up

- Letting children put out all the cards they created (information cards, personal comment cards and a title card), area maps, categorization tables, etc., on a large piece of paper (“mozoushi”), check the positions and attach.

6 Map presentation

- Letting children think of persons who supported them in the town watching and write letters (invitations) to them with sincere thanks. Organizing information obtained in the learning activity and making a presentation on it, help them clarify their own thoughts, make issues clearer and find new challenges.
- Letting children consider the ways of expression according to the listeners, so that they can deliver their messages appropriately.



Worksheet for presentation preparation

WS - 13

復興マップについて発表してみよう!

氏名 姓 名前 学年

① 目的、内容(題)で簡単に説明しよう。
 ○○地区(うち町)は、そのおかげで元々こんなことを考えています。

② 復興マップの目的(どこですか?)

③ その目的は「どこをどうするの?」

④ 調べてみて復興のイメージが湧いたら
 ⑤ 復興マップの目的がわかって、復興のイメージが湧いたら

⑥ その目的の中で特に重要なポイントはどこか、その目的は
 ⑦ ⑧ ⑨ ⑩ ⑪ ⑫ ⑬ ⑭ ⑮ ⑯ ⑰ ⑱ ⑲ ⑳ ㉑ ㉒ ㉓ ㉔ ㉕ ㉖ ㉗ ㉘ ㉙ ㉚ ㉛ ㉜ ㉝ ㉞ ㉟ ㊱ ㊲ ㊳ ㊴ ㊵ ㊶ ㊷ ㊸ ㊹ ㊺ ㊻ ㊼ ㊽ ㊾ ㊿

⑧ 復興マップの目的は (○○をどうするつもりか)

⑨ その目的に達成するための

Worksheet for listeners

WS - 14

WS - 15

WS - 16

復興マップ学年発表会

氏名 姓 名前 学年

① 復興マップの目的(どこですか?)

② その目的は「どこをどうするの?」

③ 調べてみて復興のイメージが湧いたら
 ④ 復興マップの目的がわかって、復興のイメージが湧いたら

⑤ その目的の中で特に重要なポイントはどこか、その目的は
 ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫ ⑬ ⑭ ⑮ ⑯ ⑰ ⑱ ⑲ ⑳ ㉑ ㉒ ㉓ ㉔ ㉕ ㉖ ㉗ ㉘ ㉙ ㉚ ㉛ ㉜ ㉝ ㉞ ㉟ ㊱ ㊲ ㊳ ㊴ ㊵ ㊶ ㊷ ㊸ ㊹ ㊺ ㊻ ㊼ ㊽ ㊾ ㊿

⑦ 復興マップの目的は (○○をどうするつもりか)

⑧ その目的に達成するための

Worksheet for parents/guardians and the community

WS - 17

WS - 18

復興会に参加された地域の皆様へ

本日は、○○小学校の子どもによる復興マップの発表会にご参加いただき、ありがとうございました。また、まだまだ思いも届かない復興のイメージを、重ねてお礼申し上げます。

これからの復興のイメージをさらに広げるために、復興を聞いて感じたことなど皆様のご意見を伺いたしたいと思います。

お名前 _____

学校・お住まい _____

① 「復興マップ作り」を通じて、○○(地域名)の子ども達が被災した地域に向き合うことについて、どのようにお考えになりますか? (あてはまるもの全てに○をつけてください。)

② 子どもには、震災の経験が伝わらないでほしい
 ③ ○○地域に対して、子どもたちにはもっと愛着をもってほしい
 ④ 震災の経験を前向きにとらえて、子どもには地域の未来に役立ててもらいたい
 ⑤ この機会に子ども達と、地域の復興や防災について話したい
 ⑥ 未来も継続してほしい
 ⑦ 他の学年も含め、学校全体の取り組みとしてほしい
 ⑧ 他の児童や親友や復興について話してほしい
 ⑨ 子どもには震災のことまで考えは思いがけない
 ⑩ 震災、言葉が通じないから、安全には気を付けてほしい
 ⑪ こうした取り組みではなく、他の復興目的にもっと時間を割いてほしい
 ⑫ わからない
 ⑬ その他 (_____)

画に貼ります

3.3 Utilizing the “map” in class

The “map” made by children is an accumulation of records of recovery and disaster risk reduction in the school district. And above all it is an item of material that allows them to trace all their learning activities in the unit. Utilization of the “map” they created as a learning material will encourage them to have a sense of accomplishment in their activities and foster their self-confidence and motivation toward further activities in the future.

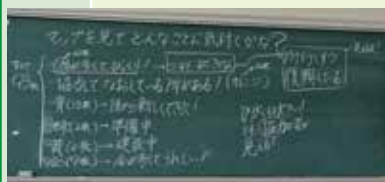
At the same time, it is important to lead them to find changes in themselves before and after the series of learning activities in the unit. Furthermore, it is advised to lead them to consider the reconstruction of and disaster risk reduction in their hometown as familiar issues relevant to themselves and to start thinking about these topics.

(Ex.)

- “Minato: Our Town 10 Years Later”—leads children to think of making the town disaster-resilient 10 years from now by utilizing the “map,” compile it and become motivated to take part in reconstruction.
- “Kazuma Reconstruction Map”—utilizes the completed “Making the Reconstruction Map—A Summary of the Activities” to encourage children to deepen their love for their hometown, find their own growth and think about what they can do for their hometown.

(Ex.) Making a Reconstruction Map by 5th Graders Watanoha Elementary School in SY 2015

Stage	Main learning activities	Teacher’s instructions and support	Viewpoint Evaluation criteria (Evaluation method)
	1. Putting maps of all the groups together	<ul style="list-style-type: none"> ● Letting children look at the whole picture of the “map” of the Watanoha Elementary School district to recognize the current status of reconstruction. 	
	2. Taking a note on the worksheet of what they noticed by looking at the “map.”	<ul style="list-style-type: none"> ● Encouraging children to freely write about things such as “which colors were easy to notice” and “how much the reconstruction has made progress.” Also, securing sufficient time to let them find as many viewpoints as possible. 	Capable of verifying the reconstruction status and finding good parts of the area. (Attitude to proactively and creatively solve problems)
	3. Making a presentation on what they wrote on the worksheet and exchanging it with each other and with friends.	<ul style="list-style-type: none"> ● Advising children to acknowledge and praise each other about what the presenters found. 	
	4. Writing about the future image of the Watanoha district on the worksheet.	<ul style="list-style-type: none"> ● Letting as many pupils as possible make a presentation. Securing time not only to raise hands and make presentations but also take a closer look at the “map” and exchange with each other what they noticed with nearby friends. Relating all that to their next learning activities. 	
		<ul style="list-style-type: none"> ● Giving viewpoints on what they can do in cooperation with adults or by themselves to help them write. 	<ul style="list-style-type: none"> ● Advising which colors are easy to notice on the whole picture of the “map.” ● Letting them think about what kind of town they want their hometown to be when writing about its future image.
	5. Checking the learning content during the next time.	<ul style="list-style-type: none"> ● Making an announcement to prepare for presentations on what each group researched. 	



3.4 Developing an information platform and utilizing it

■ It is important to continuously implement the town watching and map making as a learning activity of the R-DRR education.

- Continuous implementation lets children feel and experience themselves the changes in R-DRR information on their town.

■ The paper-based information recorded with the children's own hands can also be recorded and stored as digital data.

- Digitalized information provides easy-access.
- In later years it allows children of new generations to learn about the reconstruction status of the town based on the information created by their predecessors.

Information sharing platform

(EX.) Digitalization of Kazuma Elementary School's "Reconstruction Map"

An information-sharing platform for disaster reconstruction was developed at Kazuma Elementary School based on the information of the reconstruction maps of SY 2012, 2013 and 2014.

Below is the top page image of the information-sharing platform "Making the Kazuma Reconstruction Map."

Digitalization of the information of the paper-based Kazuma Reconstruction Maps for three years makes the accumulated data easy to search.

鹿妻復興マップづくり

ホームページ 調べる 復興マップ 鹿妻復興マップについて

フリーワードで調べる

さがす

キーワードから調べる

作成年度	エリア	分類 (ぶるい)
H24	①	インタビュー
H25	②	定点のうつりかわり
H26	③	(ア) 新しくできたもの
	④	(イ) 修理 (しゅうり) されたもの
	⑤	(ウ) 工事中のもの
	⑥	(エ) 復興準備 (じゅんび) 中 (さら地)
	⑦	(オ) 危険 (きけん) と思 (おも) うもの
	⑧	(カ) 自衛 (じまん) できるもの
	⑨	(キ) 新しくできたもの、修理 (しゅうり) されたもの
	⑩	
	⑪	
	⑫	

さがす

■ For example, the following is an idea for a teaching plan utilizing the information sharing platform in the orientation.

An example of teaching plan for “Period of Integrated Study” for the fourth grade

Unit name : “Town Watching and Reconstruction Map Making”

Session number: 2/17

Objectives : Finding out the reconstruction status so far in the town by utilizing the information sharing platform “Kazuma Reconstruction Map,” becoming interested in the situations of their hometown and willingly trying to do research on it.

● Teaching procedure

Learning activities	Teacher’s instructions and support	Evaluation
<p>1. Understanding the learning content in this session. Let’s think about making your own map by utilizing the platform “Kazuma Reconstruction Map.”</p> <p>Let’s think about making your own map by utilizing the platform “Kazuma Reconstruction Map.”</p> <ul style="list-style-type: none"> ● Searching for the past “Kazuma Reconstruction Maps.” 	<ul style="list-style-type: none"> ● Letting children understand the learning tasks ● Letting children study the “Kazuma Reconstruction Maps” for the 3 years of 2012-2014 and become interested in what they are. <p>Click on the “Reconstruction Map” tab on the top page.</p>	
<p>2. Actually doing research with a PC in each group.</p> <ul style="list-style-type: none"> ● Checking the information cards of the area each of them is going to do town watching in. <p>Search for the areas ① - ⑫ from “Area” under “Keyword Search” on the top page.</p> <ul style="list-style-type: none"> ● Checking the interview cards of each area. <p>Similarly, search in “Area” under “Keyword Search” and “Category → Interview”</p> <ul style="list-style-type: none"> ● Checking the transitions at each fixed point. <p>Similarly, search in “Area” under “Keyword Search” and “Category → Transitions at fixed points”</p>	<ul style="list-style-type: none"> ● Letting children search for the cards of places or shops they are familiar with and generate interest. ● Letting children find good parts of the area they haven’t noticed before by checking the remarks and messages from community people. ● Letting children get some ideas from them for their own interviews ● Letting children recognize specifically with the descriptions and photos on the cards how reconstruction has progressed in the area. ● Letting children become interested in the current situations of fixed points and “town watchings” in the future. 	<ul style="list-style-type: none"> ● Researching with interest how reconstruction has progressed in the area.
<p>3. Thinking about their own “map making.”</p> <ul style="list-style-type: none"> ● Viewing the platform and thinking of places they want to research in their town watching 	<ol style="list-style-type: none"> ① Changes at the fixed points since last year ② What has become of the places that had remained dangerous. ③ Changes in the places that had remained vacant. ④ Letting children freely think of places they want to research, such as those they want to newly research. <ul style="list-style-type: none"> ● Leading them to start thinking about their own map making based in this session. 	<p>Similarly, search in “Area” under “Keyword Search” and “Category → Categories of discovered points (a)-(g)”</p>

In Learning Activity 2, forty-six parts of information cards can be found as the result of searching for “Year Created (SY 2012, 2013, 2014)” × “Area ①.” The image below shows some of the interview cards found.



In Learning Activity 2, sixty one pieces of interview card can be found as the result of searching for “Year Created (SY 2013, 2014)” × “Category (Interview).” The image below shows a part of the cards found.



In Learning Activity 2, five spots are indicated on the map as the result of searching for “Year Created (SY 2014)” × “Area ③” × “Category ((e) Thing that seems dangerous)” and checking “View Map.”



4 Closing

Message from the City of Ishinomaki Board of Education

Six years have passed since the Great East Japan Earthquake and Tsunami occurred on March 11, 2011. Our city of Ishinomaki received the greatest damage among the areas hit by the enormous earthquake with a magnitude of 9.0 followed by the massive tsunami. In such a situation, children's positive attitudes and sparkling eyes have been lights of hope for those engaged in education.

Starting with Kazuma Elementary School in school year (SY) 2012, the "reconstruction mapping" was implemented for two years with the aim of "rediscovering the attractive parts of the hometown from children's viewpoints even though it was damaged by the disaster."

In SY 2014, three schools, namely Watanoha Elementary School, Minato Elementary School and Minato Junior High School, returned to their original school buildings from temporary relocation due to the tsunami damage and implemented the "R-DRR mapping" while reconstructing the school together with the community.

In SY 2015, the town watching and interviews became meaningful opportunities for children at Sumiyoshi Elementary School, Nakasato Elementary School and Sumiyoshi Junior High School to once again think about DRR, as they walked on their own feet and saw how reconstruction was going in each area. This school year (SY 2016), three schools in the inland areas where damage was limited, namely Wabuchi Elementary School, Kanomata Elementary School and Kanan Higashi Junior High School, implemented it with the aim of "reviewing the local area from the DRR point of view,"

This time, "The practical guide to Reconstruction and Disaster Risk Reduction (R-DRR) Mapping" was created under the supervision of the International Collaborating Center of Disaster Education Research and Implementation (ICCDERI), International Research Institute of Disaster Science (IRIDeS), Tohoku University. We are confident that this guidebook will be highly useful and important in widely implementing the "R-DRR mapping" at all the schools in our city hereafter.

Finally, we as the Board of Education, would like to extend our gratitude to all concerned, wishing to promote the "R-DRR mapping" at all the schools in our city by utilizing this guidebook.

Messages from universities



Dr. Takeshi Sato/Professor and Chief of ICCDERI, IRIDeS, Tohoku University

I believe that future local leaders will emerge from children who grow up seeing local adults collaborate with the school and hometown. As a community-based learning activity, I think “R-DRR mapping” holds plenty of hints for it.



Dr. Aiko Sakurai/Assistant Professor and Deputy Chief of ICCDERI, IRIDeS, Tohoku University

I would be pleased if teachers read this guide and think “Seems doable in our class.” Also I wish R-DRR mapping to be a good experience for all the children who grow up in Ishinomaki so that they can recall it in the future, regardless of wherever they are then.



Dr. Sanae Kitaura/Research Assistant, IRIDeS, Tohoku University

“R-DRR mapping” has been evolving in these five years in accordance with the given circumstances of each area. I hope this map making is continued upon the unchanged wish for children “knowing your hometown and loving it.”



Dr. Yoshiyuki Murayama/Professor, Professional School of Education, Yamagata University

I believe that “R-DRR mapping” not only brings children a big education effect but can contribute to foster future local leaders. Local areas will be invigorated if children are frequently seen carrying out such activities too.

The practical guide to “Reconstruction and Disaster Risk Reduction (R-DRR) Mapping” Understanding the natural environment and the lives of those in your hometown

First edition (March 2017)

【Editor】

The International Collaborating Center of Disaster Education Research and Implementation (ICCDERI),
International Research Institute of Disaster Science (IRIDeS), Tohoku University, Japan

【Authors】

Aiko Sakurai, Associate Professor, IRIDeS, Tohoku University
Sanae Kitaura, Research Assistant, IRIDeS, Tohoku University
Takeshi Sato, Professor, IRIDeS, Tohoku University
Yoshiyuki Murayama, Professional School of Education, Yamagata University

【Collaborators】

Ishinomaki City Board of Education
Ishinomaki City School Disaster Risk Reduction Promotion Conference
Pupils, students, teachers and the community people of pilot schools

This guide is translated and printed with support from Collaboration Research Funding of Disaster Prevention Research Institute, Kyoto University.

【Contacts】

The International Collaborating Center of Disaster Education Research and Implementation (ICCDERI)

▶ <http://drredu-collabo.sakura.ne.jp/en/>

International Research Institute of Disaster Science (IRIDeS), Tohoku University

▶ <http://irides.tohoku.ac.jp/eng>

468-1-304 Aoba-Aramaki, Aoba-ku, Sendai City, Miyagi Prefecture, Japan 980-0845

Tel. +81-22-752-2106 Fax. +81-22-752-2105

Email : drdm1@irides.tohoku.ac.jp

Homepage of the R-DRR Mapping Program

▶ <http://drredu-collabo.sakura.ne.jp/en/mapping>

