



## Proposal for Teaching Materials for Preschool and Elementary School Based on Japanese and Tokyo Government's Disaster Safety Educational Programs

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### Abstract

After the Great Hanshin-Awaji Earthquake in 1995, the Japanese government and the Ministry of Education, Culture, Sports, Science and Technology (MEXT) began considering educational programs for disaster mitigation. Accordingly, MEXT prepared educational materials. Later, in 2011, the Great East Japan Earthquake struck Japan. Subsequently, the Japanese government and MEXT revised their educational material substantially. MEXT conducted programs in kindergarten, an elementary school, a junior high school, a high school, and a special support school.

The Tokyo Metropolitan Government also conducted programs for kindergartens, elementary schools, junior high schools, high schools, and special support schools, which were managed under the Tokyo prefecture. The Tokyo Metropolitan Government designed the framework for these programs, and they conformed to the national educational policy.

At present, an educational program is available; however, its teaching materials' quality is not enriched. Therefore, we decided to propose and develop teaching materials that conform to MEXT's and Tokyo Metropolitan Government's educational policy for disaster mitigation. Two types of teaching materials were proposed: picture book teaching material for preschoolers and teaching material for upper-grade students in elementary school. In addition, teaching guidelines were developed for each to aid teachers; as these educational programs were new, teaching guidelines were necessary for teachers.

The teaching materials were developed as follows.

First, we developed the first version of the teaching materials. Teachers were asked to judge the validity of these materials through a survey. Then, the materials were revised based on the survey results.

Second, we developed guidelines that explained the contents of the teaching materials. We also determined whether a teacher could teach a class using these guidelines. Finally, we considered the contents.

Through this process, we were able to develop teaching materials and corresponding teaching guidelines.

We plan to offer these materials on the Internet.

**Keywords:** earthquake disaster mitigation, teaching material, teaching guidelines



## 1. Introduction

After the Great Hanshin-Awaji Earthquake in 1995, the Japanese government and the Ministry of Education, Culture, Sports, Science and Technology (MEXT) started educational programs for disaster mitigation. These programs were revised after the 2011 Great East Japan Earthquake. This paper analyzes the disaster mitigation education policy of MEXT and safety educational program of the Tokyo Metropolitan Government, which followed MEXT's education policy. Furthermore, it proposes new disaster mitigation teaching materials for kindergarten and primary school students.

In Japan, MEXT is in charge of school education. Kindergarten lasts for 2–3 years; elementary school, for six years; junior high school, for three years; high school, for three years; university in graduate school, for four years; Master's degree course, for two years; and Doctoral degree course, for three years. Of these, elementary and junior high school are compulsory. Before elementary school, children go to a nursery school, which is under the jurisdiction of the Ministry of Health, Labour and Welfare. MEXT provides curriculum guidelines for kindergarten through 12th grade (high school), and school education must be based on these.

A Board of Education is organized in each prefecture to ensure compliance with MEXT's education policies and govern school education. A Board may sometimes develop educational programs and teaching materials that reflect a regional peculiarity in accordance with the curriculum guidelines.

## 2. New disaster mitigation program in schools after 1995 Great Hanshin-Awaji Earthquake

### 2.1 Changes

In 1998, the Japanese government and MEXT promoted reference documents of the disaster mitigation program for school education. After the 2011 Great East Japan Earthquake, they revised these programs, as shown in Table 1. [1] The revised documents were ready by 2013 for kindergarten to high school students. The disaster mitigation program is one of the safety programs in school education in the “Disaster security” field. The safety programs cover three fields: “Disaster security,” “Life security,” and “Traffic safety.”

Table 1 – Revisions in disaster mitigation program after Great Hanshin-Awaji Earthquake

Date	Events
January 15, 1995	The Great Hanshin-Awaji Earthquake
March 1998	"Reference documents of disaster mitigation educational program"
November 2001	"Reference documents of safety programs," first edition
March 2010	"Reference documents of safety programs," second edition
March 11, 2011	The Great East Japan Earthquake
March 2013	"Reference documents of safety programs," revised and extended version

According to the 2013 reference documents, the purposes of the program are “to understand systematically, and increase the ability to think and judge and make appropriate decisions” and “to increase the practical ability and attitude about security, and more importantly, make these a habit.” The purposes of the program differed from kindergarten to high school, with its scope increasing with the school year. [1] The 2013 reference documents show some concrete class examples, including six for kindergarten, seventeen for elementary school, ten for junior high school, seven for high school, and twelve for special support school.

### 2.2 Purpose and instruction contents of disaster mitigation program according to 2013 reference documents

We focused on the kindergarten and elementary school disaster mitigation program, as described in Table 2.



Table 2 – Purpose and instruction contents of disaster mitigation program for kindergarten and elementary school period [1]

		Aim of study	Instruction contents
Kindergarten	3-year-old child	<ul style="list-style-type: none"> <li>• Be aware of safety and dangers in daily life in kindergarten</li> <li>• Perform evacuation with teachers and staff</li> </ul>	<ul style="list-style-type: none"> <li>• Know rules for emergency evacuation</li> <li>• Act as instructed by teachers and staff</li> <li>• Evacuate with teachers and staff</li> </ul>
	4-year-old child	<ul style="list-style-type: none"> <li>• Understand safety rules, be able to act carefully</li> <li>• Move to a safer area as instructed by teachers and staff quickly during a disaster</li> </ul>	<ul style="list-style-type: none"> <li>• Know rules for emergency evacuation</li> <li>• Understand safe areas, guard oneself, and take necessary actions</li> <li>• Pay attention to others and take actions</li> <li>• Understand dangers during a disaster</li> <li>• Take care of infants and elderly persons</li> </ul>
	5-year-old child	<ul style="list-style-type: none"> <li>• Understand the safety/danger place and action, be able to act out of own head</li> <li>• Move to a safer area as instructed by teacher and staff in charge quickly and calmly, when disaster happens</li> </ul>	<ul style="list-style-type: none"> <li>• Guard oneself and act quickly to move to a safe area</li> <li>• Understand dangers during a disaster</li> <li>• Take care of infants and elderly persons</li> </ul>
Elementary school	6- & 7-year-old children (1st & 2nd grades)	<ul style="list-style-type: none"> <li>• Show interest in disasters, and this will enable thinking about safe behaviors during a disaster.</li> <li>• Know dangers during a disaster, take appropriate actions, and act as instructed by teachers and staff</li> <li>• Avoid dangerous situations and act according to an adult's instructions during a disaster</li> </ul>	<ul style="list-style-type: none"> <li>• How to behave during a disaster</li> <li>• Appropriate behaviors during a disaster</li> <li>• System to ensure safety in a region</li> </ul>
	8- & 9-year-old children (3rd & 4th grades)	<ul style="list-style-type: none"> <li>• Understand basics about a disaster and think of good ideas to mitigate problems</li> <li>• Be aware of dangers during a disaster and of ways to avoid dangerous situations by oneself</li> <li>• Be able to avoid dangerous situations in cooperation with family, friends, and neighbors during a disaster</li> </ul>	<ul style="list-style-type: none"> <li>• Safety during daily life and prepare for emergency</li> <li>• Appropriate behaviors during a disaster</li> <li>• Show consideration for others and show some social responsibility</li> </ul>
	10- & 11-year-old children (5th & 6th grades)	<ul style="list-style-type: none"> <li>• Be able to understand regional characteristics of a disaster and be prepared for a disaster</li> <li>• Be able to expect dangers during a disaster and act to avoid dangerous situations by oneself</li> <li>• Be able to consider the safety of family, friends, and neighbors and perform actions useful to others during a disaster</li> </ul>	<ul style="list-style-type: none"> <li>• Understand disasters that are likely to occur in a region</li> <li>• Appropriate behaviors during a disaster</li> <li>• How to be prepared for a disaster in the near future</li> </ul>

During kindergarten, it is important for pupils to understand safety in daily life and to get into the habit of thinking carefully before they do something during a disaster. Toward this end, practical drills that become increasingly difficult with time are conducted every month. The purpose of these drills is that a pupil can sense or avoid danger and cultivate a habit of doing something with a quiet attitude.

During elementary school, it is important to teach children to think deliberately and continually. It is considered that schoolchildren can make appropriate decisions during disasters and cultivate their practical ability, attitude and habits toward safety. Teachers have to set the program's aims according to their school district and local characteristics.

### 3. Tokyo Metropolitan Government's safety training program

The Tokyo Metropolitan Government developed a safety training programs [2] for kindergarten, elementary school, junior high school, high school, and special support school students; these were managed under Tokyo prefecture. The Tokyo Metropolitan Government designed the framework, including teaching contents and methods, for these programs, [2] and they conformed to the national educational policy. [1]

The educational policy aims to cultivate two abilities: quality and the ability to contribute to others and social safety, and the ability to predict and avoid danger. To realize this educational policy, two goals are set during kindergarten to behave under the directions of the teaching staff and a guardian: to inform a nearby adult during a dangerous situation, and to engage in safe customs and attitudes during daily life. During elementary school, the goals are to cultivate children's crisis avoidance ability and behavior choice ability. Children should be able to keep an open mind and consider themselves as well as regional conditions.



## 4. Proposed teaching materials

An educational program currently exists; however, the teaching materials' quality is not enriched. It is important to start the school programs from an early stage. Therefore, we decided to propose and develop teaching materials that conform to MEXT's and the Tokyo Metropolitan Government's educational policy for disaster mitigation. Two types of teaching materials are proposed: a picture book teaching material for preschoolers, and teaching material for upper grade (5th and 6th grades) in elementary school students. In addition, teaching guidelines were developed for each to aid teachers, as these materials were new and would therefore be unknown to teachers.

### 4.1 Developing teaching materials

#### 4.1.1 Teaching materials for preschoolers

Before developing the teaching materials, we conducted interviews with two former nurture persons and one kindergarten teacher about the current conditions of disaster mitigation education at kindergarten and preschool in September and October 2014. The main interview results are as follows.

- It is difficult to be conscious about disaster mitigation until the age of five.
- A five-year-old child cannot easily judge by him/herself what he/she should do.
- A five-year-old child does not understand why furniture shakes and falls down.
- When teaching a three-year-old child how to get under a desk repeatedly, we expect that he/she will understand this topic by using a picture book.
- It is necessary for a three-year-old child to read repeatedly to learn. A topic should be adopted in which he/she is calm in picture book material.
- A three-year-old child likes stories that include similar developments repeatedly, so such stories should be adopted in the teaching materials.

We also interviewed a disaster mitigation expert, who advised us that the teaching content must be narrowed down.

In our teaching material, we decided to adopt topics related to protecting oneself in a room or a visited place during an earthquake. Table 3 shows an outline of these topics. The stories in our teaching material show similar developments repeatedly. Our book's teaching guidelines conformed to MEXT's educational policy [1, 3] for disaster mitigation. The teaching guidelines were necessary for teachers and parents because these were new educational programs.

Table 3 – Topics and stories in our teaching materials

Large classification	Small classification	Topics
Earthquake	The beginning	Earthquake occurs during a dream, search for my friend.
	Evacuation route	At his friend Rabbit's house, the door cannot be opened.
Fire	Coping with a fire	His friend Pig's house is on fire.
Earthquake	Confirm the route to a refuge area	They cannot go through a road.
	Damage in a room	At his friend Squirrel's house, furniture has fallen down, and her treasure is crushed under the furniture.
	New developments Dangers	On the way to the house of a knowledgeable uncle, they fell down. They told him about their earthquake experience and learned about the earthquake.
Earthquake and Fire	Coping with a disaster	They learned how to cope with a disaster.
Earthquake	Preparation	After studying emergency foods, they ate them at their tea party.



#### 4.1.2 Teaching materials for upper grade students in elementary school

We developed teaching materials for upper grade students in elementary school (5th and 6th grades) because these students can provide instructions in their school. We expect that they can inform their family and local people about the contents that they learn, and these activities lead to an improvement in local disaster mitigation ability. The main aim of this teaching material is to prepare (mitigate) near-future damage such as damage estimates of an earthquake with an epicenter in the Tokyo Metropolitan Area.

Table 4 shows the contents of the teaching material. They consist of two parts: students learn from past large-scale earthquakes (especially school situations) like the 1995 Great Hanshin-Awaji Earthquake and the 2011 Great East Japan Earthquake [4–6] and a workbook part with investigative learning. The students think and discuss issues with their classmates using these materials. We also proposed and developed this book's teaching guidelines for teachers, and these conformed to MEXT's educational policy for disaster mitigation.

Table 4 – Contents of our teaching material for upper grade students in elementary school

	Content	At school	At home	In other places	Aim of study	Curriculum			
						1	2	3	4
1 Lessons from the 1995 Great Hanshin-Awaji Earthquake and the 2011 Great East Japan Earthquake	1-1 Damage resulting from an earthquake	<ul style="list-style-type: none"> <li>• 13 schools collapsed</li> <li>• Broadcasts could not be aired in schools</li> <li>• Teachers could not communicate easily with students because students were noisy</li> <li>• Objects fell in the classroom</li> </ul>	<ul style="list-style-type: none"> <li>• Furniture fell down or was overturned</li> <li>• Buildings collapsed while people were asleep, causing much damage</li> </ul>	<ul style="list-style-type: none"> <li>• Disaster message services could not be used because cellular phones went out of communication range</li> <li>• Tsunami caused damage</li> </ul>	<ul style="list-style-type: none"> <li>• Know that Japan is susceptible to earthquakes</li> <li>• Understand features of previous earthquakes</li> <li>• Be able to use a disaster message service</li> </ul>		○	○	○
	1-2 Relation between children and region	<b>Preparation</b> <ul style="list-style-type: none"> <li>• A tsunami drill had already been conducted before the Tohoku earthquake</li> </ul>	<b>Occurred</b> <ul style="list-style-type: none"> <li>• Some students evacuated with elderly persons who lived in the neighborhood</li> </ul>	<b>Emergency response</b> <ul style="list-style-type: none"> <li>• Some students helped to distribute supplies and control traffic at the shelter</li> </ul>	<ul style="list-style-type: none"> <li>• Know importance of mutual help</li> <li>• Understand how people can help each other in a group</li> <li>• Think of the role that you can play</li> </ul>		○	○	○
	1-3 School situation during a major earthquake	<b>Building</b> <ul style="list-style-type: none"> <li>• There were no emergency stockpiles, because non-designated schools were used as shelters</li> <li>• Before instructions arrived, a gymnasium was opened as a shelter</li> </ul>		<b>People</b> <ul style="list-style-type: none"> <li>• 4 years had passed since an earthquake drill was conducted in the community</li> <li>• Fire drills were conducted, but an earthquake drill was not conducted</li> </ul>	<ul style="list-style-type: none"> <li>• Know disaster prevention activities in school</li> <li>• Understand role of the shelter</li> <li>• Think of behaviors that people should show in a refuge</li> </ul>		○	○	○
2 Preparation for damage estimates of an earthquake with an epicenter in the Tokyo Metropolitan Area	2-1 What happens when a major earthquake occurs?	<ul style="list-style-type: none"> <li>• In a class room?</li> <li>• In a gymnasium?</li> </ul>	<ul style="list-style-type: none"> <li>• In my own room?</li> </ul>	<ul style="list-style-type: none"> <li>• In an alley?</li> <li>• In a school route?</li> <li>• Downtown?</li> <li>• Where to go after school?</li> </ul>	<ul style="list-style-type: none"> <li>• Know the dangers of a disaster in a familiar region</li> <li>• Understand features of Tokyo inland earthquake</li> <li>• Be able to identify dangerous places and think of countermeasures</li> <li>• Find disaster facilities in a familiar region</li> </ul>		○	○	○
	2-2 What should we do?	<ul style="list-style-type: none"> <li>• In a reading room?</li> <li>• During cleaning of a classroom?</li> </ul>	<ul style="list-style-type: none"> <li>• In a living room?</li> <li>• In the kitchen?</li> </ul>	<ul style="list-style-type: none"> <li>• In a shopping center?</li> <li>• Inside an elevator?</li> </ul>	<ul style="list-style-type: none"> <li>• Learn characteristics of and problems in Tokyo</li> <li>• Understand regional dangers and safety behaviors during a disaster</li> <li>• Be able to anticipate one's own behavior in various types of disaster scenarios</li> <li>• Find and communicate with friends</li> </ul>		○	○	○
	2-3 Relation between citizens and our region	<b>Building</b> <ul style="list-style-type: none"> <li>• Make an evacuation map</li> </ul>		<b>People</b> <ul style="list-style-type: none"> <li>• Check for people requiring special help (for example, elderly people, infants, etc.) in the neighborhood</li> <li>• Learn about voluntary disaster prevention organizations</li> </ul>	<ul style="list-style-type: none"> <li>• Check the evacuation route and refuge from my house</li> <li>• Know other evacuation routes and refuges in my region in case of emergencies</li> <li>• Try to work with familiar groups from daily life</li> </ul>		○	○	○
	2-4 What shall we keep prepared in case of an earthquake in the near future?	<ul style="list-style-type: none"> <li>• Know the location of an emergency warehouse and the goods stockpiled in it</li> </ul>	<ul style="list-style-type: none"> <li>• What goods should be carried in an emergency carry bag?</li> <li>• Check meeting place for family</li> <li>• Prevent furniture from overturning</li> </ul>		<ul style="list-style-type: none"> <li>• Know importance of being prepared</li> <li>• Learn how to prevent furniture from overturning</li> <li>• Think of goods to be stockpiled to deal with an earthquake</li> <li>• Decide a meeting place for the family during a disaster</li> </ul>		○	○	○

## 4. 2 Inspection of developed teaching materials

### 4.2.1 Teaching materials for preschoolers

We surveyed a K-kindergarten in December 2014 to inspect the developed picture book and its teaching guidelines. We also interviewed two former nurture persons and the disaster prevention expert who was interviewed before development.

For the survey, each kindergarten teacher read the picture book to pupils in her/his class. Readings were performed in all classes in all grades. Then, the teachers answered the questionnaire. We asked teachers seven questions: (1) Whether this picture book contains appropriate content for school children, (2) Whether the teaching guideline is easy to understand from the viewpoint of teachers, (3) Whether these materials can be used

in the classroom, (4) Whether there are any pictures or content that teachers and pupils cannot understand, (5) Whether there are any other improvements, (6) About the teacher's career and the suffering experienced by the respondent, and (7) Whether you have an interest in disaster prevention education. We also requested teachers to note the parts that are difficult to understand or which needed revision.

The questionnaire results indicated that the picture book contents were suitable for four- and five-year-old children; however, they were slightly difficult for three-year-old children, as shown in Fig.1. The picture book teaching material and its teaching guidelines were complete.

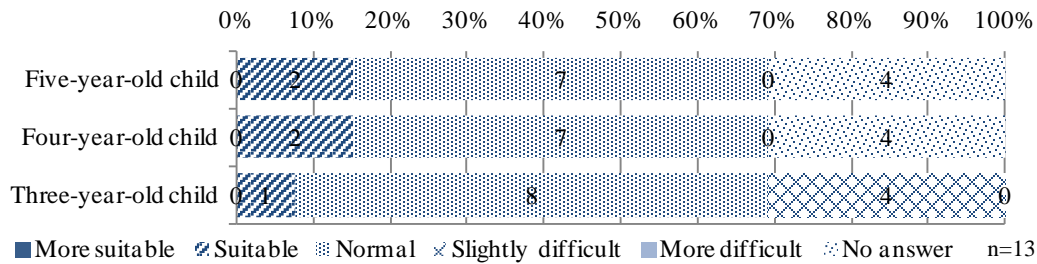


Fig. 1– Understanding level of picture book teaching material by school age

#### 4.2.2 Teaching materials for upper grade students in elementary school

The developed teaching material and guidelines were inspected in two steps: we developed and inspected the teaching material, and we revised the teaching material and developed its guidelines. We interviewed teachers about both materials. The teaching material and its guidelines were complete.

First, we interviewed an elementary school teacher and a disaster prevention expert in November 2014 for inspecting the teaching material. The interview results indicate the following: (1) with regard to the map simulation drill, a teacher should use the school districts map that each school has; (2) with regard to how to protect oneself in a dangerous situation, it is best for students to think about the best choice repeatedly; and (3) supplementary explanation about “Plates,” “Giving out supplies,” and so on are provided. A disaster prevention expert advised that the order of the strengths of furniture that could be overturned for protection should be shown to explain their effective use. Then, we revised the teaching materials and developed their guidelines.

Second, we interviewed two elementary school teachers in December 2014 about the revised teaching material and the guidelines. The interview results regarding the guidelines indicate that (1) the time required by each subject should be noted and (2) it is useful for teachers to show a blackboard demonstration of each subject. For the teaching material contents, we need to determine a good way to teach the topic of the simulation experience for a disaster message service and the topic of seeing what is stored in an emergency stockpile warehouse.

### 4.3 Completed teaching materials

#### 4.3.1 Preschoolers’ teaching material and guidelines for “Are you all right?”

Our picture book is titled “Are you all right?,” and its teaching guidelines are complete, as shown in Fig.2. Table 3 shows the story contents. Examples of the pages are shown below. Fig.3 shows the topic of “Damage in a room” in the picture book material. Fig.4 shows the same topic in the teaching guidelines. A detail explanation of the teaching points by school age and advanced learning contents are added in the guidelines.



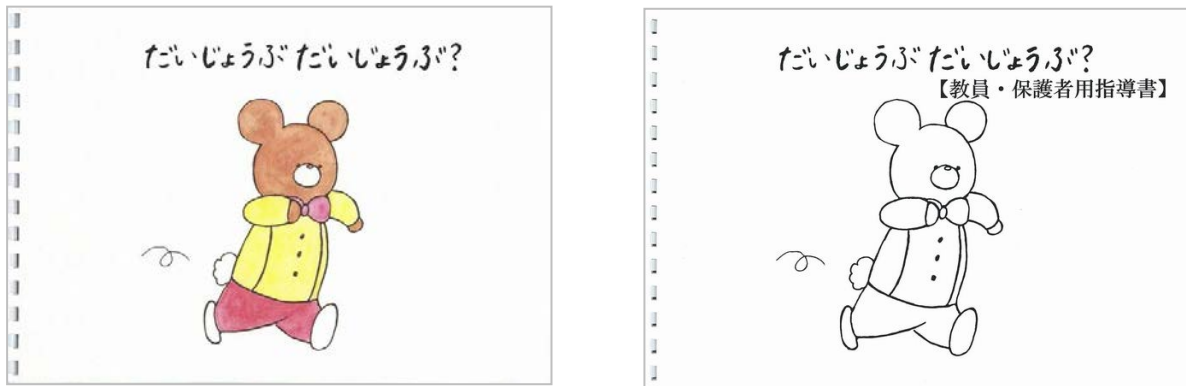


Fig. 2 – Covers of “Are you all right?” (on the left) and its teaching material (on the right)

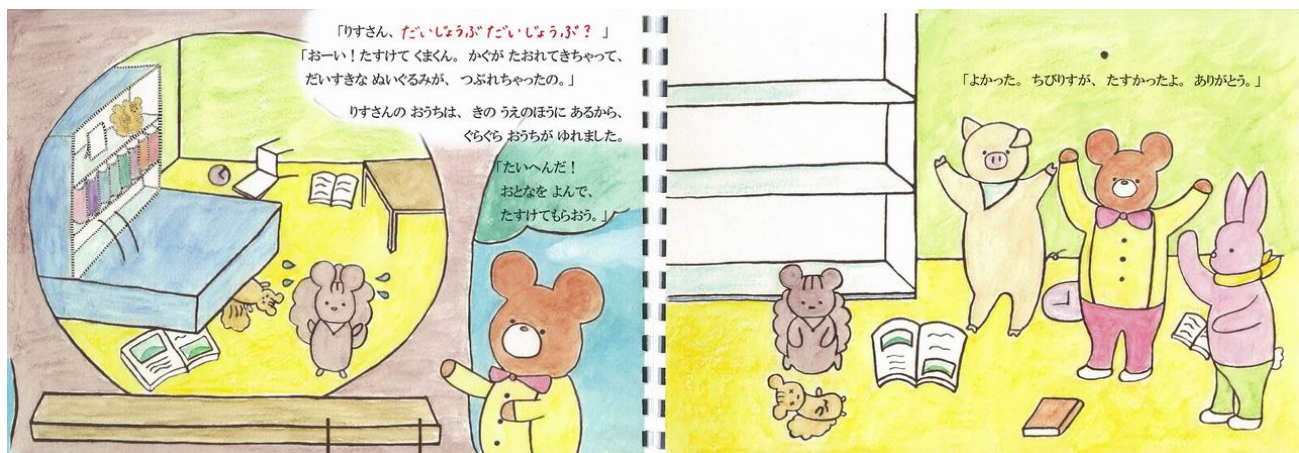


Fig. 3 – Scene of “Damage in a room” in the picture book material

◆室内安全の確認  
家具を固定していないと地震の時に下敷きになる可能性が高いです。そのために家具の固定器具を取り付けましょう。ここでは、りすくんの宝物のぬいぐるみが下敷きになってしまいます。子どもは理解が難しいかもしれないのですが、人間だったら怪をしようかもしれない、ということを伝えていただけたらと思います。

基本

- 地震があるか何が起こるのかを教える
- どうして家具倒れてしまったのかを考えさせる
- ぬいぐるみが下敷きになってしまったことがどう思ったかを問う

共通

みんなで協力すること、何かあったら大人を呼ぶことを教える

先生、または保護者の方  
震度4以上で電灯などのつり下げ物は大きく揺れます。また震度5弱以上で棚にある本や物が落ちることがあり、固定していない家具が移動し不安定なものも倒れることがあります。  
東日本大震災は学校がある時間帯に起こったため、子どもたちを守るためにも収容網や家具の転倒防止を行い、点検をしましょう。  
阪神・淡路大震災や新潟県中越地震、東日本大震災等の他、茨城県つくば市等で発生した地震では、ガラス破損が多発しました。ガラスは強化ガラスが確認していただく。

地震で、建物で物がぶつかることも、天井材・照明器具の落下、外装材の脱落、家具の転倒等が起こる可能性があります。天井材等を非構造部材といいます。建物の耐震化とあわせて非構造部材の耐震対策が必要です。

◆チェックしてください。

- 照明器具は、構造体等に適切に取り付けられているか
- 天井材の取付けは適切か
- 窓は、強化ガラスで、ひび割れ等が認められないか
- 収容網は、壁や床等に適切に固定しているか
- 遊戯室や屋内運動場
- 図書

発展

- 友達との関わり方、集団行動の仕方・約束
- 年下の幼弟を思いやる気持ち・周囲の人に関心を持つ
- 年下の幼弟やお年寄りや思いやる・友達と力を合わせ一緒に取り組む

共通

友達と協力して活動に取り組む  
高齢者や地域の人と関わり、自分のできることをする  
危険な状況を見つけた時、身近な大人にすぐ知らせる

Layout	Topic	Explanation for teachers and guardians
	Picturebook scene	Checklist for disaster
	Aim of study by school age (basis and advance)	

Fig. 4 – Scene of “Damage in a room” in the teaching guidelines

#### 4.3.2 Upper grade students’ teaching materials and guidelines for “Preparation for earthquake disaster”

The teaching material and guidelines for “Preparation for earthquake disaster” are complete, as shown in Fig.5. Table 4 shows the story contents.



Fig. 5 – Covers of “Preparation for earthquake disaster” (on the left) and its teaching guidelines (on the right)

As shown in Table 4, this book consists of two parts: “Lessons from past earthquake disasters” and “Investigative learning: workbook.” Examples of the pages are shown below. Fig.6 shows the topics of “2 Preparation for damage estimates of an earthquake with an epicenter in the Tokyo Metropolitan Area” and of “2-1 What happens when a big earthquake occurs?” in the teaching material. Fig.7 shows the same topic in the teaching guidelines. The purpose of the topic, detailed explanation, flow in the class, evaluation, example of blackboard demonstration, teaching points, and advanced learning contents are added in the guidelines.

## 2 首都直下地震に備える

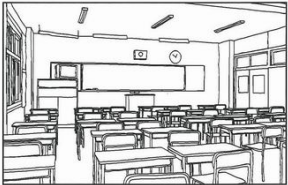
### 2-1 地震が起きたらどうなるの

近々、南関東でマグニチュード7クラスの直下地震が起こる確率が高まっています。地震はいつ起こるか分からないからこそ、学校でも家庭でもそれ以外の場所でも、いざというときに自分がとるべき行動を考えておくことが大切です。

まずはどんなことが起こるか考えてみよう！

**学校では・・・**

**教室**

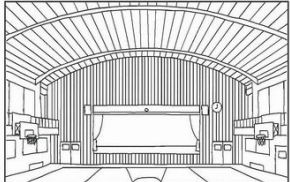


イラストからわかること・・・

- ・
- ・
- ・

自分の学校ではどうかな・・・

**体育館**




イラストからわかること・・・

- ・
- ・
- ・

自分の学校ではどうかな・・・


学校や地域でここで紹介する施設や設備を探してみよう！

**大きな公園**



広いスペースがある公園などは避難場所や防災活動拠点に指定されている場合があるよ。

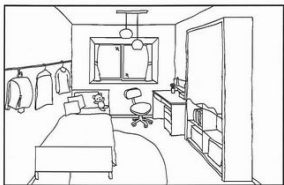
**防火水そう**



防火水そうは消火用の水槽です。災害時には飲み水を提供できるものもあるよ。

**家庭では・・・**

**部屋**



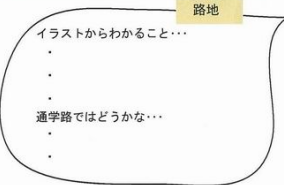
イラストからわかること・・・

- ・
- ・
- ・

自分の部屋ではどうかな・・・

**その他の場所では・・・**

**路地**

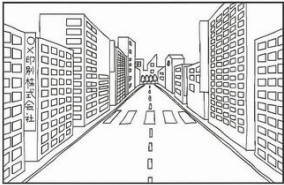


イラストからわかること・・・

- ・
- ・
- ・

通学路ではどうかな・・・

**街中**




イラストからわかること・・・

- ・
- ・
- ・


自分が習い事で行く建物の近くではどうかな・・・

**消火器**



学校やマンション、ビルなどには多くの消火器が置かれているよ。地域によっては道路の上にあるところもあるよ。

**コンビニエンスストア**



一時休憩所としてトイレの利用や水道水の提供をうけることができるよ。

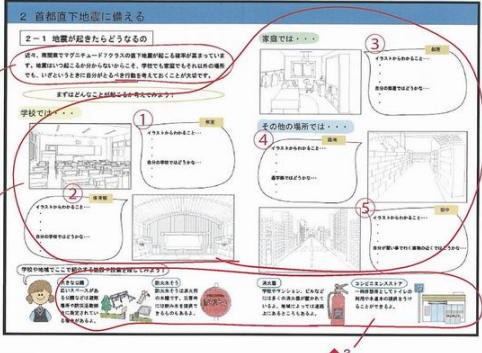
Fig. 6 – Scene of “2-1 What happens when a big earthquake occurs?” in teaching material



**単元名：2 首都直下地震に備える**

**2-1 地震が起きたらどうなるの**

**ねらい：**危険に対する心構えができるようになる。  
身近な場所の危険に気が付くことができるようになる。



**指導計画：**

	学習活動	支援・留意点
導入	首都直下地震が迫っていることを理解する。	首都直下地震がどういう地震なのかを知る。
展開	地震発生時の様々な場所の危険を予測する。 イラストを自分の身近な場所に置き換えて、考える。	イラストから分かることを考えさせ、書き込むよう指示する。(→解説・ポイント) 吹き出しの下項目についても考えさせ、書き込み、意見を出し合う。(→解説・ポイント) 「災害時に役立つものを通学路などでみつけておこう」と伝える。
まとめ	街で災害時に役立つ施設や設備を知る。	

**評価：**※授業内でワークブックに取り組み評価して下さい。

＜関心・意欲・態度＞ 身近な地域の災害による危険性に気が付くことができたか。

＜知識・理解＞ 首都直下地震の特徴を理解することができたか。

＜思考・判断＞ 危険箇所を発見し、対策を考えることができたか。

＜技能・表現＞ 身近な地域で防災設備を見つけることができたか。

**黒板使用例：**

**首都直下地震** 今後 30 年の間に約 70% の確率で起こる可能性がある！

＜特徴＞

- ・ 大規模な火災の発生
- ・ 鉄道などの交通手段に被害が及ぶことで、帰宅困難者が多く発生
- ・ 高層建物の被害
- ・ 人口が多く、警察や消防などがすぐには救助にこれない

	イラストでは？	身近なところでは？
教室	・	・
体育館	・	・
部屋	・	・
路地	・	・
街中	・	・

**解説・その他ポイント：**

◆1 首都直下地震  
首都直下地震とは、30 年以内に 70% の確率で起きるとされるマグニチュード 7 級の地震です。地震の揺れによる被害想定として、全壊家屋が約 175,000 棟、建物倒壊による死者が最大 11,000 人とされています。火災の被害想定として、焼失が建物倒壊等と合わせ最大約 610,000 棟、死者が建物倒壊等と合わせ最大約 23,000 人とされています。都市部では建物が密集しており、大規模な火災の発生や建物の倒壊、交通機関の乱れ、救助活動の遅れなどが予想されます。

◆2 どんなことが考えられるか  
① 教室：テレビが落ちる / ドアが開かなくなる / 窓が割れる / 時計が落ちる / 電気が落ちる / 掃除用具入れが倒れる  
② 体育館：天井が落ちる / バスケットゴールが落ちる / 窓が割れる / ボールが転がってくる  
③ 部屋：照明器具が落ちる / タンスが倒れる / 窓が割れる / 本棚が倒れる (本が落ちてくる)  
④ 路地：瓦が落ちる / 自動販売機が倒れる / ブロック塀が崩れる / 電柱が倒れる / 電線が切れる / 気が倒れる / 液状化がおきる  
⑤ 高い建物が  
ある 街中：割れたガラスが落ちる / 看板が落ちる / 人があふれる / 地割れが起きる  
などがあります。  
”自分の〇〇では”の欄には自分が実際に利用している空間から危険な箇所を探します。

◆3 災害時に便利な施設・設備  
一紹介した施設を身近なところできがしてみよう！と呼びかけ、身近な地域で災害時に役立つものがどこにあるのか確認させます。

## Layout

Aim of study	Example of blackboard demonstration
Material pages	
Teaching plan	Teaching points
Evaluation	

Fig. 7 – Scene of “2-1 What happens when a big earthquake occurs?” in the teaching guidelines

This educational program for disaster mitigation contains four main topics, because there is a difference in school class hours depending on the elementary school. A teacher who has many class hours can choose from Curriculum (1) and (2) that include all subjects; however, their number of class hours is different. Curriculum (1) is “Learning disaster then practice (six class hours)” and Curriculum (2) is “Learning repeatedly (five class hours).” A teacher who has less class hours can choose from Curriculum (3) and (4). Curriculum (3) is “Mainly learning self-help (five class hours)” and Curriculum (4) is “Mainly leaning mutual help (three class hours).”

## 5. Conclusions

This study aimed to examine the educational policy and purpose of MEXT and the Tokyo Metropolitan Government and to propose new education materials.

Our proposed teaching materials conform to MEXT’s and the Tokyo Metropolitan Government’s educational policy for disaster mitigation. We have completed teaching materials and teaching guidelines for preschoolers and for upper grade students in elementary school, as judged from the survey results.

We will provide these materials to educational sites for disaster mitigation.



## **6. Acknowledgements**

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## **7. References**

- [1] MEXT (2013): References documents of the safety programs, added and revised version.  
[http://www.mext.go.jp/a\\_menu/kenko/anzen/1289310.htm](http://www.mext.go.jp/a_menu/kenko/anzen/1289310.htm).
- [2] Tokyo Metropolitan Board of Education (2014): The safety educational program.  
[http://www.kyoiku.metro.tokyo.jp/pickup/p\\_gakko/anzenkuprogram/26anzenkyoikupro.pdf](http://www.kyoiku.metro.tokyo.jp/pickup/p_gakko/anzenkuprogram/26anzenkyoikupro.pdf).
- [3] MEXT (2010): Educational teaching guidelines for kindergarten, Volume 3.
- [4] The National Diet Library Survey and Analysis (2012): Reconstruction school buildings and facility after the 2011 Great East Japan Earthquake - Current status and issues.  
<http://www.ndl.go.jp/jp/diet/publication/issue/pdf/0736.pdf>.
- [5] Egawa T (1995): Teachers and the Kobe earthquake.
- [6] Hyogo Prefecture Union of Education Workers (1995): The 1995 Great Kobe earthquake and school circumstances - Report from the educational sites.