NOTICE

Fourth Edition of Earthquake Education Materials For Grades K-12

by

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ABSTRACT

Resources for teachers and administrators desiring to start an earthquake education program or teach a more detailed lesson on earthquakes, volcanoes, tsunamis, and plate tectonics are presented in this text. Curricula, software, and supplemental informational material lists are provided with bibliographies of related books and articles for grades K-9 and parents and teachers. Bibliographic citations include reading levels and length of books whenever possible.

On May 26, 1988, the National Center for Earthquake Engineering Research initiated an education project whose focus was on earthquake education in school programs for grades K-12. From the start of this project, copies of and information about earthquake education curricula, related software, and supplemental informational materials and books were collected and compiled. As this compilation progressed, it became clear that there was a great deal of interest in a publication listing such materials.

The result was the *NCEER Interim Bibliography of Earthquake Education Materials* which was printed in March, 1989. Interest in this type of publication has maintained, leading to this expanded, fourth edition.

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Section 1
Introduction

Earthquake education has an important role in both school and society. All 50 states are vulnerable to earthquakes and at least 39 of these are subject to moderate or major seismic risk, as are the most heavily populated parts of Canada. Millions of people are exposed to significant earthquake hazards. When the mobility of society is taken into consideration, the number of individuals who may one day experience a damaging earthquake is even greater. In this century, earthquakes in North America have resulted in more than a thousand deaths and billions in property damage. Earthquake education that provides an understanding of the causes of earthquakes, their impacts, and the necessary steps to reduce loss of life and property is essential to our physical and emotional well-being.

Children spend a significant portion of their day in schools. The school community needs to be well-prepared to meet school earthquake emergencies in order to protect the welfare of students and staff both during and after the ground shaking. The development of an effective disaster preparedness program requires an understanding of the natural processes involved and the type of dangers they pose to the school community. Psychological issues of anticipatory anxiety, emotional trauma, response and recovery must also be considered. Appropriate countermeasures to reduce earthquake damage and personal harm can then be included in school and home emergency response plans.

An on-going Earthquake Education program incorporated into all grade levels will provide a continually developing foundation of science and safety information for students and staff tailored to their learning and emotional needs. Students of all ages must be able to take self-protective actions during an earthquake. Factual information on the science of earthquakes will help place the need for learning safety actions within the context of naturally occurring phenomena like weather, will help dispel common misperceptions that could inadvertently result in physical and emotional harm, and will help build a future population of knowledgeable adults capable of making decisions concerning appropriate policies needed to reduce earthquake hazards.

Earthquake Education provides an opportunity to satisfy a number of goals in the areas of both science and safety:

1. Reducing loss of life and property damage in schools during earthquakes.

2. Reducing emotional damage through realistic, but not alarmist, presentations and providing coping strategies to students and staff.

3. Ensuring the inclusion of accurate scientific concepts about the causes of earthquakes in school programs and textbooks.

4. Building scientific literacy through a hazard education program.

5. Providing a model for the development of other science and safety programs using natural hazards to illustrate basic science principles and safety actions, i.e. hurricane education, tornado education, etc.

6. Providing examples of the application of science to daily life.

7. Empowering the school community to realize they can survive a major earthquake.

8. Transferring information on how to reduce earthquake damage and personal loss to the community through school children.

9. Building social responsibility.

10. Encouraging the selection of scientific and technical careers.

News accounts of damaging earthquakes occurring somewhere in the world are frequent. Scientific understanding of these earthquakes continues to grow. Earthquake education that incorporates these new lessons into the curriculum provides an exciting introduction to the dynamic role of science in society. These occurrences provide opportunities to strengthen the interaction between the classroom, the scientific community, and emergency managers through the discussion of the causes, effects, and impacts of recent events.

Education seeks to develop informed adults with the skills to address and find solutions to the problems that will face us. Earthquakes remain a potential hazard. Tomorrow's adults need to be aware of the dangers that earthquakes present to our communities and how to achieve a greater level of safety through 1) building codes to ensure more earthquake resistant structures, 2) training in earthquake safety actions to take during and after an earthquake, and 3) improved levels of preparedness in schools, homes and businesses. Earthquake education can provide insight into solving problems in science as well as making our environment a safer place to be.

In order to meet the needs of our children in this important area, it is imperative that those who are interested be provided with information about background support materials and curricula so that valuable time and resources are not spent redesigning what is already available. Time can then be devoted to regionalizing existing materials, deciding what concepts are most crucial to teach at each age, and designing materials for those groups of students that are currently not being reached. It is hoped that this document continues to fulfill this purpose.