MoSH

EARTHQUAKES:
Suitcase Program [3-4]

TEACHER'S MANUAL

This Suitcase Program provides the materials and lesson plans for teachers of grades 3-4 with content and activities increasing in difficulty by grade level. Activities in this Suitcase Exhibit may assist in meeting the Tennessee State Standards.

ACTIVITIES

TENNESSEE STATE STANDARDS FOR 3-4

3.PS3.1	Recognize that energy is present when objects move; describe the effects of energy transfer from one object to another.
3.ESS3.1	Explain how natural hazards (fires, landslides, earthquakes, volcanic eruptions, floods) impact humans and the environment.
3.ESS3.2	Design solutions to reduce the impact of natural hazards (fires, landslides, earthquakes, volcanic eruptions, floods) on the environment.
3.ETS2.1	Identify and demonstrate how technology can be used for different purposes.
4.PS3.2	Observe and explain the relationship between potential energy and kinetic energy.
4.ESS2.2	Interpret maps to determine that the location of mountain ranges, deep ocean trenches, volcanoes, and earthquakes occur in patterns.
4.ESS2.4	Analyze and interpret data on the four layers of Earth, including thickness, composition, and physical states of these layers.

For the entire activity and materials and to reserve a Suitcase Exhibit, please call 901.636.2362.

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EARTHQUAKES:
Suitcase Program [3-4]

UNIT I: Defining an Earthquake

LEVEL 2: People Explain Earthquakes

ACTIVITY I: Earthquake Experiences

DURATION OF ACTIVITY: 30 minutes

LESSON OBJECTIVES

Students will describe personal experiences with earthquakes, write and illustrate a paragraph about what they think causes earthquakes, and read and illustrate earthquake legends.

GUIDING QUESTIONS

What is an earthquake? What do you think causes earthquakes?

TENNESSEE STATE STANDARDS

3.ESS3.1	Explain how natural hazards (fires, landslides, earthquakes, volcanic eruptions, floods) impact humans and the environment.
3.ESS3.2	Design solutions to reduce the impact of natural hazards (fires, landslides, earthquakes, volcanic eruptions, floods) on the environment.
4.ESS2.2	Interpret maps to determine that the location of mountain ranges, deep ocean trenches, volcanoes, and earthquakes occur in patterns.

MATERIALS INCLUDED

None

MATERIALS PROVIDED BY TEACHER

Magazine or newspaper accounts of earthquakes, or books, slides, movies and other media dealing with the subject
Drawing paper
Crayons or colored pencils
Tape

For the entire activity and materials and to reserve a Suitcase Exhibit, please call 901.636.2362.

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EARTHQUAKES:
Suitcase Program [3-4]

UNIT I: Defining an Earthquake

LEVEL 2: People Explain Earthquakes

ACTIVITY II: Earthquake Legends

DURATION OF ACTIVITY: 30 minutes

LESSON OBJECTIVES
Students will locate the cultures that developed the various legends on a world map, and compare those locations to the major areas of earthquake activity around the world. Students will discuss what scientists now believe is the cause of earthquakes.

GUIDING QUESTIONS
How did legends about earthquakes develop?

TENNESSEE STATE STANDARDS
3.ESS3.1 Explain how natural hazards (fires, landslides, earthquakes, volcanic eruptions, floods) impact humans and the environment.

4.ESS2.2 Interpret maps to determine that the location of mountain ranges, deep ocean trenches, volcanoes, and earthquakes occur in patterns.

MATERIALS INCLUDED
Master 5, World Map
Master 6, World Map with Legend Sites
Master 7, World Map with Epicenters

MATERIALS PROVIDED BY TEACHER
Overhead projector
Large wall map of the world, or transparency made from Master 5, World Map
Transparency made from Master 6, World Map with Legend Sites
Transparency made from Master 7, World Map with Epicenters
Tape or pins
Colored yarn
Booklet of earthquake legends
Large sheets of drawing paper
Crayons or markers

For the entire activity and materials and to reserve a Suitcase Exhibit, please call 901.636.2362.

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EARTHQUAKES:
Suitcase Program [3-4]

UNIT I: Defining an Earthquake

LEVEL 2: People Explain Earthquakes

ACTIVITY III: Tasty Quake

DURATION OF ACTIVITY: 30 minutes

LESSON OBJECTIVES

Students will observe the effects of a simulated earthquake.

GUIDING QUESTION

What do scientists think is the cause of earthquakes?

TENNESSEE STATE STANDARDS

3.PS3.1	Recognize that energy is present when objects move; describe the effects of energy transfer from one object to another.
3.ESS3.1	Explain how natural hazards (fires, landslides, earthquakes, volcanic eruptions, floods) impact humans and the environment.
4.PS3.2	Observe and explain the relationship between potential energy and kinetic energy.
4.ESS2.4	Analyze and interpret data on the four layers of Earth, including thickness, composition, and physical states of these layers.

MATERIALS INCLUDED

Recipes for Gelatin Dessert and Flubber

MATERIALS PROVIDED BY TEACHER

One pan for prepared Gelatin Dessert (see recipe)
A fist-sized rock
Silicone putty or “Flubber”(see recipe)
25 plastic coffee stirrers – 5” (13 cm)
Scissors
Ruler

For the entire activity and materials and to reserve a Suitcase Exhibit, please call 901.636.2362.

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EARTHQUAKES:
Suitcase Program [3-4]

UNIT II: Why and Where Earthquakes Occur

LEVEL 2: Plates Going Places

ACTIVITY I: What's Inside

DURATION OF ACTIVITY: 30 minutes

LESSON OBJECTIVES
Students will describe the structure of the interior of the Earth, name and identify the layers of the Earth, and interpret a graph of the approximate thickness of the Earth's layers.

GUIDING QUESTIONS
What do you think the center of the Earth looks like? How would you describe the layers, the inner core, the outer core, mantle, lithosphere, and crust?

TENNESSEE STATE STANDARDS
4.ESS2.4 Analyze and interpret data on the four layers of Earth, including thickness, composition, and physical states of these layers.

MATERIALS INCLUDED
Master 15, A Pizza of the Earth
Master 16, Graph of the Earth's Layers

MATERIALS PROVIDED BY TEACHER
Overhead projector
Globe of the Earth
Transparency of Master 15, A Pizza of the Earth
Transparency of Master 16, Graph of the Earth's Layers
For each student:
Worksheet of Master 15, A Pizza of the Earth
Worksheet of Master 16, Graph of the Earth's Layers
Crayons of colored pencils
Metric ruler

For the entire activity and materials and to reserve a Suitcase Exhibit, please call 901.636.2362.

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EARTHQUAKES:
Suitcase Program [3-4]

UNIT II: Why and Where Earthquakes Occur

LEVEL 2: Plates Going Places

ACTIVITY II: We're All Cracked Up

DURATION OF ACTIVITY: 30 minutes

LESSON OBJECTIVES
Students will observe a model demonstrating the layers of the Earth and its plates.

GUIDING QUESTIONS
In the model of an egg, which layers of the Earth do the shell, white and yolk represent? What do the cracks represent?

TENNESSEE STATE STANDARDS
4.ESS2.4 Analyze and interpret data on the four layers of Earth, including thickness, composition, and physical states of these layers.

MATERIALS INCLUDED
None

MATERIALS PROVIDED BY TEACHER
Several hard-boiled eggs
Small kitchen knife
Narrow permanent marker
Free-flowing broad permanent marker

For the entire activity and materials and to reserve a Suitcase Exhibit, please call 901.636.2362.

MoSH EARTHQUAKES: Suitcase Program [3-4]

UNIT II: Why and Where Earthquakes Occur

LEVEL 1: Plates Going Places

ACTIVITY III: Plates of the Earth

DURATION OF ACTIVITY: 30 minutes

LESSON OBJECTIVES
Students will identify the 12 major plates of the Earth and relate earthquake epicenters to plate boundaries. Students will demonstrate the motions of the plates.

GUIDING QUESTIONS
Where can you find plates on the map of the Earth? What happens when the plates move?

TENNESSEE STATE STANDARDS

3.PS3.1	Recognize that energy is present when objects move; describe the effects of energy transfer from one object to another.
3.ESS3.1	Explain how natural hazards (fires, landslides, earthquakes, volcanic eruptions, floods) impact humans and the environment.
4.PS3.2	Observe and explain the relationship between potential energy and kinetic energy.
4.ESS2.2	Interpret maps to determine that the location of mountain ranges, deep ocean trenches, volcanoes, and earthquakes occur in patterns.

MATERIALS INCLUDED
Master 7, World Map with Epicenters
Master 17, Plate Boundaries Map

MATERIALS PROVIDED BY TEACHER
Overhead projector
Transparency and handouts of Master 7, World Map with Epicenters
Transparency and handouts of Master 17, Plate Boundaries Map
Crayons or colored markers

For the entire activity and materials and to reserve a Suitcase Exhibit, please call 901.636.2362.

UNIT II: Why and Where Earthquakes Occur

LEVEL 2: Plates Going Places

ACTIVITY IV: Hot Stuff Rises and Cold Stuff Sinks

DURATION OF ACTIVITY: 30 minutes

LESSON OBJECTIVES
Students will observe a convection current, and witness how hot materials rise, and cold materials sink.

GUIDING QUESTIONS
What happens when food coloring is added near heat source? What happens when food coloring is added near cold source? What does this tell you about heat exchange?

TENNESSEE STATE STANDARDS
4.ESS2.4 Analyze and interpret data on the four layers of Earth, including thickness, composition, and physical states of these layers.

MATERIALS INCLUDED
Master 18, Convection Currents and Plate Cross Section
2 eye droppers
Red food coloring
Blue food coloring
Hole puncher

MATERIALS PROVIDED BY TEACHER
Overhead projector
Clear heatproof glass baking dish (23 cm x 13 cm x 7 cm)
Handful of solid paper circles from hole puncher
Replace with appropriate text.
Ice cubes
Cold water
Transparency from Master 18, Convection Currents and Plate Cross Section

For the entire activity and materials and to reserve a Suitcase Exhibit, please call 901.636.2362.

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EARTHQUAKES:
Suitcase Program [3-4]

UNIT III: Physical Results of Earthquakes

LEVEL 2: Landscape on the Loose

ACTIVITY I: Up, Down, and Sideways

DURATION OF ACTIVITY: 30 minutes

LESSON OBJECTIVES
Students will understand that many landscape features are a result of earthquake activity. Students will construct models of three types of faults and be able to name and identify them. They will also demonstrate the formation of folded rock.

GUIDING QUESTIONS
How does the Earth's surface change after a fault line, thrust fault, or lateral fault occurs? How does it affect rivers when rock layers move?

TENNESSEE STATE STANDARDS

3.PS3.1	Recognize that energy is present when objects move; describe the effects of energy transfer from one object to another.
3.ESS3.1	Explain how natural hazards (fires, landslides, earthquakes, volcanic eruptions, floods) impact humans and the environment.

MATERIALS INCLUDED
Master 23, Fault Model

MATERIALS PROVIDED BY TEACHER
Map of the U.S.
Worksheets made from Master 23, Fault Model
Scissors
Crayons or colored pencils
Tape
Paper strip 5/8-inch wide from standard-sized paper

For the entire activity and materials and to reserve a Suitcase Exhibit, please call 901.636.2362.

UNIT III: Physical Results of Earthquakes

LEVEL 2: Landscape on the Loose

ACTIVITY II: Liquification Lab

DURATION OF ACTIVITY: 30 minutes

LESSON OBJECTIVES
Students will demonstrate liquification, and describe how it happens.

GUIDING QUESTIONS
What happens during liquification? What would happen to buildings on top of soil that was liquefied?

TENNESSEE STATE STANDARDS

3.PS3.1	Recognize that energy is present when objects move; describe the effects of energy transfer from one object to another.
3.ESS3.1	Explain how natural hazards (fires, landslides, earthquakes, volcanic eruptions, floods) impact humans and the environment.

MATERIALS INCLUDED
None

MATERIALS PROVIDED BY TEACHER
Newspapers to cover work surfaces for each small group
About 300 mL (1 1/4 cup) medium- fine-grain sand in a container (e.g. plastic margarine tub)
About 100 mL (1/3 to 1/2 cup) water
Measuring cup or breaker marked in metric units

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EARTHQUAKES:
Suitcase Program [3-4]

UNIT III: Physical Results of Earthquakes

LEVEL 2: Landscape on the Loose

ACTIVITY III: A Slippery Slope

DURATION OF ACTIVITY: 30 minutes

LESSON OBJECTIVES
Students will demonstrate a landslide and describe some factors that influence the results of landslides triggered by earthquakes.

GUIDING QUESTIONS
How does the shape of a hill affect a landslide? What would happen if more or less water is present? How should the potential of a site for landslides caused by earthquakes affect decisions on locating homes and other structures on or under it? What are some events other than earthquakes that can cause landslides?

TENNESSEE STATE STANDARDS
3.ESS3.1 Explain how natural hazards (fires, landslides, earthquakes, volcanic eruptions, floods) impact humans and the environment.

MATERIALS INCLUDED
Aluminum foil

MATERIALS PROVIDED BY TEACHER
Newspapers to cover work surface
Large tray (ask your grocer for a supply of large plastic foam meat trays
Local soils of various textures, or potting soil
Builders sand
Fine gravel
Water

For the entire activity and materials and to reserve a Suitcase Exhibit, please call 901.636.2362.

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EARTHQUAKES:
Suitcase Program [3-4]

UNIT III: Physical Results of Earthquakes

LEVEL 2: Landscape on the Loose

ACTIVITY IV: Tsunami!

DURATION OF ACTIVITY: 30 minutes

LESSON OBJECTIVES
Students will identify tsunamis as an earthquake event, and demonstrate their mechanism and effects on shore faults.

GUIDING QUESTIONS
Do tsunamis occur under the ocean? How do earthquakes under the ocean affect people? Where do damaging tsunamis occur? What kind of damage is caused by tsunamis? Where do earthquakes originate that cause tsunamis?

TENNESSEE STATE STANDARDS

3.ESS3.1	Explain how natural hazards (fires, landslides, earthquakes, volcanic eruptions, floods) impact humans and the environment.
3.ESS3.2	Design solutions to reduce the impact of natural hazards (fires, landslides, earthquakes, volcanic eruptions, floods) on the environment.
4.ESS2.2	Interpret maps to determine that the location of mountain ranges, deep ocean trenches, volcanoes, and earthquakes occur in patterns.

MATERIALS INCLUDED
Master 24a, Tsunami Facts
Master 24b, Notable Tsunamis
Punching tool (or drawing compass)
Toothpicks
String
Metal baking pan

MATERIALS PROVIDED BY TEACHER
Overhead projector
Transparencies of Master 24a and b
About 1 liter of water
Scissors
Sand
Erasers, popsicle sticks, and other small objects to represent shore features
Book or block of wood to serve as a wedge
Metric ruler

For the entire activity and materials and to reserve a Suitcase Exhibit, please call 901.636.2362.

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EARTHQUAKES:
Suitcase Program [3-4]

UNIT IV: Measuring Earthquakes

LEVEL 2: Different Shakes for Different Quakes

ACTIVITY I: Measuring with Mercalli

DURATION OF ACTIVITY: 30 minutes

LESSON OBJECTIVES
Students will construct drawings to illustrate the Mercalli scale as a measure of earthquake effects on people, structures, and the Earth's surface.

GUIDING QUESTION
What are the social impacts of each step of the Mercalli Scale?

TENNESSEE STATE STANDARDS
3.ETS2.1 Identify and demonstrate how technology can be used for different purposes.

MATERIALS INCLUDED
Master 28, Modified Mercalli Scale

MATERIALS PROVIDED BY TEACHER
Overhead projector
Large Roman Numerals I through XII
Copies of Master 28, Modified Mercalli Scale
Large sheet of drawing paper
Art supplies: colored pencils, crayons, felt markers
Scissors
Tape

For the entire activity and materials and to reserve a Suitcase Exhibit, please call 901.636.2362.

UNIT IV: Measuring Earthquakes

LEVEL 2: Earthquakes Great and Small

ACTIVITY II: Movin' with Magnitude

DURATION OF ACTIVITY: 30 minutes

LESSON OBJECTIVES

Students will identify the magnitude scale as a measure of energy released by earthquakes. Students will construct and use a seismograph to demonstrate the measurement of earthquakes. Students will chart the number of earthquakes that occur each year in different damage categories, mild to severe.

GUIDING QUESTIONS

How does the amplitude of an earthquake reflect the amount of Earth's movement? How does it reflect the magnitude of the earthquake?

TENNESSEE STATE STANDARDS

3.PS3.1	Recognize that energy is present when objects move; describe the effects of energy transfer from one object to another.
3.ESS3.1	Explain how natural hazards (fires, landslides, earthquakes, volcanic eruptions, floods) impact humans and the environment.
4.PS3.2	Observe and explain the relationship between potential energy and kinetic energy.

MATERIALS INCLUDED

Master 29, Several Seismographs
Master 30, Seismogram Worksheet
Master 31, Earthquake Magnitudes
Master 32, Seismogram Showing Amplitude

MATERIALS PROVIDED BY TEACHER

Overhead projector
Transparencies from Masters 29, 30, 31, and 32
Free-flowing overhead marker with fine tip for marking transparency for each small group
Blank transparency for each small group
A lightweight table or desk
Worksheet of seismogram tracings made from Master 39 for each student

For the entire activity and materials and to reserve a Suitcase Exhibit, please call 901.636.2362.

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EARTHQUAKES:
Suitcase Program [3-4]

UNIT IV: Measuring Earthquakes

LEVEL 2: Earthquakes Great and Small

ACTIVITY III: Little Shakes and Big Quakes

DURATION OF ACTIVITY: 30 minutes

LESSON OBJECTIVES
Students will chart the number of earthquakes that occur each year in different damage categories, from mild to severe.

GUIDING QUESTIONS
How many earthquakes are there each year, by magnitudes?

TENNESSEE STATE STANDARDS

3.PS3.1	Recognize that energy is present when objects move; describe the effects of energy transfer from one object to another.
3.ESS3.1	Explain how natural hazards (fires, landslides, earthquakes, volcanic eruptions, floods) impact humans and the environment.
4.PS3.2	Observe and explain the relationship between potential energy and kinetic energy.

MATERIALS INCLUDED
Master 33, Earthquake Severity Worksheet

MATERIALS PROVIDED BY TEACHER
Overhead projector
Transparency of Master 33
Worksheet of Master 33 for each student
Pencils for each student

For the entire activity and materials and to reserve a Suitcase Exhibit, please call 901.636.2362.

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EARTHQUAKES:
Suitcase Program [3-4]

UNIT V: Earthquake Safety and Survival

PART 1: What Happens During an Earthquake?

ACTIVITY I: Size Up Your State

DURATION OF ACTIVITY: 30 minutes

LESSON OBJECTIVES
Students will identify the earthquake hazard for their state.

GUIDING QUESTIONS
What is the earthquake hazard for your state? How many states in the U.S. are free from earthquake hazards?

TENNESSEE STATE STANDARDS

K.ETS2.1	Use appropriate tools (magnifying glass, rain gauge, basic balance scale) to make observations and answer testable questions
1.ETS1.1	Solve scientific problems by asking testable questions, making short-term and long-term observations, and gathering information.
1.ETS2.1	Use appropriate tools (magnifying glass, basic balance scale) to make observations and answer testable questions.
2.ESS1.1	Recognize that some of Earth's natural processes are cyclical while others have a beginning and an end. Some events happen quickly, while others occur slowly over time.
2.ETS2.1	Use appropriate tools to make observations, record data, and refine design ideas.
2.ETS2.2	Predict and explain how human life and the natural world would be different without current technologies.
3.ESS3.1	Explain how natural hazards (fires, landslides, earthquakes, volcanic eruptions, floods) impact humans and the environment.
4.ESS2.2	Interpret maps to determine that the location of mountain ranges, deep ocean trenches, volcanoes, and earthquakes occur in patterns.
5.ETS2.2	Describe how human beings have made tools and machines (X-ray cameras, microscopes, satellites, computers) to observe and do things that they could not otherwise sense or do at all, or as quickly or efficiently.
6.LS2.6	Research the ways in which an ecosystem has changed over time in response to changes in physical conditions, population balances, human interactions, and natural catastrophes.

MATERIALS INCLUDED
Copy of Master 37, Earthquake Hazard Map

MATERIALS PROVIDED BY TEACHER
Overhead projector
Transparency of Master 37
Crayons or colored pencils

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EARTHQUAKES:
Suitcase Program [3-4]

UNIT V: Earthquake Safety and Survival

PART 1: What Happens During an Earthquake?

ACTIVITY II: Earthquake Simulation

DURATION OF ACTIVITY: 30 minutes

LESSON OBJECTIVES
Students will identify hazards caused by earthquakes and demonstrate safe behavior during an earthquake simulation.

GUIDING QUESTIONS
What does “drop and cover” mean? What are some things you can do to stay safe in case of an earthquake?

TENNESSEE STATE STANDARDS

K.ETS1.1	Ask and answer questions about the scientific world and gather information using the senses.
1.ETS1.1	Solve scientific problems by asking testable questions, making short-term and long-term observations, and gathering information.
2.PS2.3	Recognize the effect of multiple pushes and pulls on an object's movement or non-movement.
3.PS3.1	Recognize that energy is present when objects move; describe the effects of energy transfer from one object to another.
4.PS3.2	Observe and explain the relationship between potential energy and kinetic energy.
6.PS3.2	Construct a scientific explanation of the transformation between potential and kinetic energy.

MATERIALS INCLUDED
Master 38, Earthquake Simulator Script

MATERIALS PROVIDED BY TEACHER
Overhead Projector
Transparency of Master 38, Drop and Cover Master 40
Desks or tables to get under
Optional items for simulation activity (chairs to rattle; pencils, books, and other objects to drop)

For the entire activity and materials and to reserve a Suitcase Exhibit, please call 901.636.2362.

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EARTHQUAKES:
Suitcase Program [3-4]

UNIT V: Earthquake Safety and Survival

PART 1: What Happens During an Earthquake?

ACTIVITY III: Know What Might Happen

DURATION OF ACTIVITY: 30 minutes

LESSON OBJECTIVES
Explain to students that we can avoid or reduce our chances of being hurt if we know what to expect and what to do during an earthquake.

GUIDING QUESTIONS
What would you do if an earthquake struck? What are some of the warning signs in each room of your home?

TENNESSEE STATE STANDARDS

K.ETS1.1	Ask and answer questions about the scientific world and gather information using the senses.
2.PS2.3	Recognize the effect of multiple pushes and pulls on an object's movement or non-movement.
3.ESS3.2	Design solutions to reduce the impact of natural hazards (fires, landslides, earthquakes, volcanic eruptions, floods) on the environment.
3.ETS2.1	Identify and demonstrate how technology can be used for different purposes.
6.LS2.6	Research the ways in which an ecosystem has changed over time in response to changes in physical conditions, population balances, human interactions, and natural catastrophes.

MATERIALS INCLUDED
None

MATERIALS PROVIDED BY TEACHER
Pencil and paper for each student
Crayons or colored pencils

For the entire activity and materials and to reserve a Suitcase Exhibit, please call 901.636.2362.

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EARTHQUAKES:
Suitcase Program [3-4]

UNIT V: Earthquake Safety and Survival

PART 2: Hunt for Hazards

ACTIVITY I: Classroom Hazard Hunt

DURATION OF ACTIVITY: 60-90 minutes

LESSON OBJECTIVES
Students will identify potential hazards in their classroom that may cause damage, injury or death during an earthquake. Students will also list, and if possible, make changes in their classroom to reduce potential hazards.

GUIDING QUESTIONS
What are some things that could move, fall or break during an earthquake? How can your classroom be made safer during an earthquake?

TENNESSEE STATE STANDARDS

K.LS1.3	Explain how humans use their five senses in making scientific findings.
2.ETS1.3	Recognize that to solve a problem, one may need to break the problem into parts, address each part, and then bring the parts back together.
3.ESS3.1	Explain how natural hazards (fires, landslides, earthquakes, volcanic eruptions, floods) impact humans and the environment.

MATERIALS INCLUDED
Master 41, Fourth Grade Classroom
Master 42, Classroom Hazard Hunt Grade Classroom

MATERIALS PROVIDED BY TEACHER
Overhead projector
Transparency made from Master 41, Fourth
Transparency marker
Handout of Master 41, Fourth Grade Classroom
Handout of Master 42, Classroom Hazard Hunt
Crayons or colored pencils
Drawing paper, optional

For the entire activity and materials and to reserve a Suitcase Exhibit, please call 901.636.2362.

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EARTHQUAKES:
Suitcase Program [3-4]

UNIT V: Earthquake Safety and Survival

PART 2: Hunt for Hazards

ACTIVITY II: Home Hazard Hunt

DURATION OF ACTIVITY: 30 minutes in classroom, 30 minutes at home; classroom follow up

LESSON OBJECTIVES
Students perform a Home Hazard Hunt to determine what hazards can be found in their own homes, and determine what actions they can take to reduce the danger.

GUIDING QUESTIONS
What are some of the hazards found in your home? What can you do to reduce the danger in your home?

TENNESSEE STATE STANDARDS

K.LS1.3	Explain how humans use their five senses in making scientific findings.
2.ETS1.3	Recognize that to solve a problem, one may need to break the problem into parts, address each part, and then bring the parts back together.
3.ESS3.1	Explain how natural hazards (fires, landslides, earthquakes, volcanic eruptions, floods) impact humans and the environment.

MATERIALS INCLUDED
Master 43a, b, and c, Home Hazard Hunt Worksheets
Master 44, Quake-Safe Home Checklist

MATERIALS PROVIDED BY TEACHER
Overhead projector
Transparencies of Master 43a, b, and c, Home Hazard Hunt Worksheets
Transparency of Master 44, Quake-Safe Home Checklist
Pencil or pen

For the entire activity and materials and to reserve a Suitcase Exhibit, please call 901.636.2362.

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EARTHQUAKES:
Suitcase Program [3-4]

UNIT V: Earthquake Safety and Survival

PART 2: Hunt for Hazards

ACTIVITY III: Community Hazard Hunt

DURATION OF ACTIVITY: 30 minutes

LESSON OBJECTIVES
Students perform a Community Hazard Hunt to determine what hazards can be found in their communities, including damage to buildings, power lines, bridges, highways and railroad tracks, ponds, spilled chemicals, and determine what actions they can take to reduce the danger.

GUIDING QUESTIONS
What are some of the hazards found in your community? What can you do to anticipate hazards to avoid danger and injury?

TENNESSEE STATE STANDARDS

K.LS1.3	Explain how humans use their five senses in making scientific findings.
2.ETS1.3	Recognize that to solve a problem, one may need to break the problem into parts, address each part, and then bring the parts back together.
3.ESS3.1	Explain how natural hazards (fires, landslides, earthquakes, volcanic eruptions, floods) impact humans and the environment.
6.LS2.6	Research the ways in which an ecosystem has changed over time in response to changes in physical conditions, population balances, human interactions, and natural catastrophes.

MATERIALS INCLUDED
Master 45, Neighborhood Hazard Hunt
Master 46, Safety Rules for Shoppers
Master 47a, b, and c, Community Hazard Hunt

MATERIALS PROVIDED BY TEACHER
Overhead projector
Transparency and handouts made from Master 45, Neighborhood Hazard Hunt
Transparency marker
Crayons or colored pencils
Handouts made from Master 46, Safety Rules for Shoppers
Older Students: Handouts made from Masters 47a, b, and c, Community Hazard Hunt

For the entire activity and materials and to reserve a Suitcase Exhibit, please call 901.636.2362.

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EARTHQUAKES:
Suitcase Program [3-4]

UNIT V: Earthquake Safety and Survival

PART 3: Prepare and Share

ACTIVITY I: Brainstorming

DURATION OF ACTIVITY: 30 minutes

LESSON OBJECTIVES
Students will demonstrate an awareness of responsibility for their own well-being and the well-being of others during an emergency.

GUIDING QUESTIONS
What are some things you cannot take with you if you had to leave your home in an emergency? What are things that you really need to live? Are they easy to carry and travel with?

TENNESSEE STATE STANDARDS

1.ETS1.1	Solve scientific problems by asking testable questions, making short-term and long-term observations, and gathering information.
2.ETS1.3	Recognize that to solve a problem, one may need to break the problem into parts, address each part, and then bring the parts back together.
3.ESS3.2	Design solutions to reduce the impact of natural hazards (fires, landslides, earthquakes, volcanic eruptions, floods) on the environment.
5.ETS1.1	Research, test, re-test, and communicate a design to solve a problem.

MATERIALS INCLUDED
None

MATERIALS PROVIDED BY TEACHER
Blackboard and chalk

For the entire activity and materials and to reserve a Suitcase Exhibit, please call 901.636.2362.

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EARTHQUAKES:
Suitcase Program [3-4]

UNIT V: Earthquake Safety and Survival

PART 3: Prepare and Share

ACTIVITY II: Create a Kit

DURATION OF ACTIVITY: 30 minutes

LESSON OBJECTIVES
Students will list items to include in classroom, home, and vehicle emergency kits, and brainstorm uses for the kits other than earthquakes. Students will prepare an emergency kit for the classroom.

GUIDING QUESTIONS
What items should be included in an earthquake emergency kit? Why?

TENNESSEE STATE STANDARDS

K.ETS2.1	Use appropriate tools (magnifying glass, rain gauge, basic balance scale) to make observations and answer testable questions.
1.ETS2.1	Use appropriate tools (magnifying glass, basic balance scale) to make observations and answer testable questions.
2.ETS2.1	Use appropriate tools to make observations, record data, and refine design ideas.
3.ESS3.2	Design solutions to reduce the impact of natural hazards (fires, landslides, earthquakes, volcanic eruptions, floods) on the environment.
3.ETS2.1	Identify and demonstrate how technology can be used for different purposes.
5.ETS2.1	Identify and demonstrate how technology can be used for different purposes.

MATERIALS INCLUDED
Earthquake Survival Kit., which includes:

Hard candy	Flashlight
Batteries (2D & 3AAA)	Water
Waterproof matches	First Aid Kit
Money	Radio
Scissors	Tape
Garbage bags	Playing cars
Paper & marker	Backpack

MATERIALS PROVIDED BY TEACHER
Art supplies
Writing paper and pencils

For the entire activity and materials and to reserve a Suitcase Exhibit, please call 901.636.2362.

UNIT V: Earthquake Safety and Survival

PART 3: Prepare and Share

ACTIVITY III: Poster Party

DURATION OF ACTIVITY: 30 minutes

LESSON OBJECTIVES
Students will memorize a safety chant. Students will make posters illustrating what they have learned, and distribute them around the school and community.

GUIDING QUESTION
How can you take what you've learned about earthquakes and use that information to inform others about earthquake safety and survival?

TENNESSEE STATE STANDARDS
2.S.10 Identify basic weather-related emergency guidelines. (Health standard)

MATERIALS INCLUDED
None

MATERIALS PROVIDED BY TEACHER
Poster board
Art supplies
Pencils and scarp paper for rough drafts

For the entire activity and materials and to reserve a Suitcase Exhibit, please call 901.636.2362.

MoSH

EARTHQUAKES:
Suitcase Program [3-4]

UNIT V: Earthquake Safety and Survival

PART 4: Evacuation Drill

ACTIVITY I: Get Ready, Get Set

DURATION OF ACTIVITY: 30 minutes

LESSON OBJECTIVES
Students will list items to include in classroom, home, and vehicle emergency kits, and brainstorm uses for the kits other than earthquakes. Students will prepare an emergency kit for the classroom.

GUIDING QUESTIONS
What actions should you take after an earthquake if you are inside? What actions should you take if you are outside?

TENNESSEE STATE STANDARDS
K.S.8 Distinguish between emergency and non-emergency situations.
2.S.8 Identify ways to reduce the risk of injuries and death from injury.
2.S.10 Identify basic weather-related emergency guidelines.
3.S.9 Describe appropriate actions for emergency and non-emergency situations.
3.S.10 Identify the importance of having a home safety plan for various emergency situations.
4.S.10 Demonstrate different methods of safe routes from emergency situations in home, school, and the community.
5.S.10 Compare and contrast the benefits and consequences of safety preparation when faced with an emergency situation.
6.SP.4 Identify appropriate resources available during emergency situations.

MATERIALS INCLUDED
Materials and procedure for earthquake drill
Master 39, Drop and Cover

MATERIALS PROVIDED BY TEACHER
Overhead projector
Transparency of Master 39, Drop and Cover
Index cards

For the entire activity and materials and to reserve a Suitcase Exhibit, please call 901.636.2362.

MoSH

EARTHQUAKES:
Suitcase Program [3-4]

UNIT V: Earthquake Safety and Survival

PART 4: Evacuation Drill

ACTIVITY II: Put It All Together

DURATION OF ACTIVITY: 30 minutes

LESSON OBJECTIVES
Students will describe ways of helping others who are injured during earthquakes. Students will describe feelings they might have and dangers they might face after an earthquake.

GUIDING QUESTIONS
What are some things we can do to help care for each other and keep busy after an earthquake? How can you help with the clean-up and repair work? What items would help keep you safer when helping?

TENNESSEE STATE STANDARDS
K.S.8 Distinguish between emergency and non-emergency situations.
2.S.8 Identify ways to reduce the risk of injuries and death from injury.
2.S.10 Identify basic weather-related emergency guidelines.
3.S.9 Describe appropriate actions for emergency and non-emergency situations.
3.S.10 Identify the importance of having a home safety plan for various emergency situations.
4.S.10 Demonstrate different methods of safe routes from emergency situations in home, school, and the community.
5.S.10 Compare and contrast the benefits and consequences of safety preparation when faced with an emergency situation.
6.SP.4 Identify appropriate resources available during emergency situations.

MATERIALS INCLUDED
Master 48, Drill and Evacuation Checklist

MATERIALS PROVIDED BY TEACHER
Chairs and other objects needed to simulate earthquake obstacles
Classroom emergency kit
Paper and pencils

For the entire activity and materials and to reserve a Suitcase Exhibit, please call 901.636.2362.

MoSH

EARTHQUAKES:
Suitcase Program [3-4]

SUITCASE EXHIBIT INVENTORY CHECKLIST

School: _____
Check Out: _____
Return Date: _____

MoSH Check In:	Teacher Check In:	Item	Books/Videos/Posters	Teacher Return:
		A	Teacher's Manual	
		B	Binder: Paper copies of transparencies	
		C	Binder: Transparencies	
		D	DVD: Yogi Bear Earthquake Preparedness	
		E	DVD: Faulting and Folding	
		F	DVD: Plate Tectonics	
		G	Audio CD: Elmo- Beatin' the Quake	
		H	Poster: The Earth's Fractured Surface	
		I	Poster: Earthquakes	
		J	Booklet: Yogi Bear Earthquake Preparedness	
		K	Seismograph Activity Model Investigation	
		L	Poster: Central United States. Earthquakes	

MoSH

EARTHQUAKES:
Suitcase Program [3-4]

SUITCASE EXHIBIT INVENTORY CHECKLIST

MoSH Check In:	Teacher Check In:	Item	Materials	Teacher Return:
		1	Seismograph	
		2	6 Foam Blocks	
		3	Geology Demonstration Set: Tray 4 3 ½-inch Foam Rectangles 3 Strata Blocks 3 20-inch Foam Strips 1 Volcano Model	
		4	Rock	
		5	Earthquake Survival Kit Hard Candy Flashlight Batteries (2D & 3AA) Waterproof Matches Water First Aid Kit Money Radio Tape Garbage Bags Scissors Playing Cards Paper & Marker	
		6	Aluminum Foil	
		7	Large Mixing Bowl	
		8	Bucket	
		9	Coffee Can	
		10	Metal Baking Pan	
		11	3 Foam Trays	
		12	Plastic Bags	
		13	15 Droppers	
		14	4 Paper Punches	
		15	16 Small Paper Plates	
		16	String	
		17	Yarn	
		18	Timer	
		19	Straight Pins	
		20	2 Containers of Play-Doh	
		21	Toothpicks	
		22	2 bottles of Food Coloring	
		23	Measuring Cup	
		24	15 Metric Rulers	
		25	Dental Floss	
		26	Paper Clips	
		27	Measuring Tape	
		28	4 Goggles	
		29	5 Containers of Silly Putty	
		30	Clay	
		31	Washers	
		32	Straws	
		33	Stirring Sticks	
		34	Fabric Scraps	
		35	Quake Game (4 tokens, 1 die, 18 Go Cards, 18 Question Cards, 25 Quake Cards, Game board, Directions Card)	
		36	50 Cups	
		37	5 Slinkies	
		38	Lincoln Logs (3 large, 2 medium, 10 small, 45 tiny, 1 rooftop)	
		39	Building Blocks (10 red, 10 green, 10 blue, 10 yellow)	
		40	Bag - Penne Pasta	
		41	Lattice Wood	