



Day 1 – Urban Infrastructure and You

STEM Camp Notebook

Setting the Stage:

- sticky notes (one pack per team)

Activity 1: Engineering Project: Crossing the Wendella River (per team)

- 18 blue toothpicks (or another color) – for the bridge deck
- 40 white toothpicks (or another color) – for the bridge support system
- two sticks of modeling clay or putty
- ruler
- 6 books of equal thickness
- 50 pennies or other standard weights
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Recess Activity: Cup Game

- 1 cup per student

Day 2 – Urban Infrastructure and Earthquakes

STEM Camp Notebook

Activity: Building for an Earthquake (per student)

- Safety goggles

Per Group:

- 3 rigid craft foam blocks of varying sizes
- 3 cardboard blocks of varying sizes
- 3 wood blocks of varying sizes
- Stopwatch
- Shake table:
 - Empty shirt box
 - Marbles
 - Flat, circular piece of cardboard
- Video camera (optional)



Dream School Engineering Challenge (per team, some materials will be shared across teams)

- Lab paper (multiple sheets per team)
- World map
- USA map
- 1 or 2 sheets of large poster board
- large, shallow cardboard box (or large cardboard box cut in half to make it shallow)
- large, shallow plastic tray or container
- markers/crayons/colored pencils/paint and brushes
- construction paper
- scissors
- gluestick
- yarn/string
- fishing line
- newspaper/magazines
- adhesive tape
- duct tape
- rubber bands
- small milk cartons, cardboard boxes, or other containers (for buildings)
- aluminum foil
- plastic cling wrap (for windows in buildings)
- sand
- pebbles
- modeling clay
- wooden dowels or toothpicks
- pipe cleaners
- small pitchers of water
- rulers
- other craft supplies at the facilitator's discretion

Day 3 – Urban Infrastructure and Erosion

STEM Camp Notebook

Activity 1: Go with the Flow (per group)

- 24 sugar cubes (in 2 pre-formed bricks of 12 cubes each)
- eye dropper
- cup
- water
- plastic tray or foam plate with a flat bottom
- rulers
- paper towels
- graph paper
- 1 overhead transparency sheet, pre-printed with a graph grid (optional)
- writing paper or science notebook for recording ideas

Activity 2: The Trail That Would Fail (per group)

- foil baking pan, 12" X 18"
- second baking pan (or bucket, dish tub, etc. for catching water)
- 2 L of sand
- 50 mL water per test
- water to saturate sand
- beaker or graduated cylinder
- graduated cylinder or balance for measuring eroded sand
- 50 mL pea gravel or aquarium gravel
- spoon
- two rulers (to represent pavement – any thin impermeable material could work)
- three popsicle sticks to divert water
- 2-4 books of approximately the same thickness to create hill slope
- protractor
- trowel (optional)
- digital camera or video camera (optional)

Recess Activity: Water Balloon Bottle Race

- 4 water bottles the same size
- 200 filled water balloons
- large outdoor space

Dream School Engineering Challenge

- Same materials that were distributed on Day Two

Day 4 – Urban Infrastructure and Landslides

STEM Camp Notebook

Activity 1: What Lies Beneath? (per group)

- opaque plastic bin
- clay
- sand
- potting soil
- small pea gravel
- toothpicks
- rulers
- clear plastic straws
- two sheets of paper

Activity 2: Look Out Below! (per group)

- clear plastic bin
- sand (approximately 1-2 kg)
- container of water
- protractor
- measuring cups or spoons
- spray bottle (optional)

Recess Activity: Balloon Stomp

- 2 balloons for each player
- a roll of yarn
- trash bag

Dream School Engineering Challenge

- Same materials that were distributed on Day Two

Day 5 – Your Effect on Infrastructure

STEM Camp Notebook

Activity 1: Water Power!

- four plastic containers
- laboratory aprons
- chemical splash goggles
- sand (enough to half-fill the containers)
- a beaker
- a graduated cylinder
- tap water
- a meter stick or metric ruler
- a metric tape measure
- funnel
- science notebooks
- digital camera or video camera

Recess Activity: Sandcastle Building and Erosion (per group)

- a shallow, waterproof container
- several cups of sand
- small bucket/cup/can (for sandcastle mold)
- a small shovel, scoop, or spoon
- a small pitcher of water



If you are ordering the materials kit from our vendor, below is a list of resources NOT included in the kit.

Day 1 – Urban Infrastructure and You

STEM Camp Notebook

Activity 1: Engineering Project: Crossing the Wendella River (per team)

- ruler
- 6 books of equal thickness

If you are ordering the materials kit from our vendor, below is a list of resources NOT included in the kit.

Activity: Building for an Earthquake (per student)

- Safety goggles

Per Group:

- Shake table:
 - Empty shirt box
 - Flat, circular piece of cardboard
- Video camera (optional)

Dream School Engineering Challenge (per team, some materials will be shared across teams)

- Lab paper (multiple sheets per team)
- 1 or 2 sheets of large poster board
- large, shallow cardboard box (or large cardboard box cut in half to make it shallow)
- large, shallow plastic tray or container
- markers/crayons/colored pencils/paint and brushes
- construction paper
- scissors
- gluestick
- newspaper/magazines
- adhesive tape
- small milk cartons, cardboard boxes, or other containers (for buildings)

- sand
- small pitchers of water
- rulers
- other craft supplies at the facilitator's discretion

If you are ordering the materials kit from our vendor, below is a list of resources NOT included in the kit.

Day 3 – Urban Infrastructure and Erosion

STEM Camp Notebook

Activity 1: Go with the Flow (per group)

- water
- rulers
- paper towels
- 1 overhead transparency sheet, pre-printed with a graph grid (optional)
- writing paper or science notebook for recording ideas

Activity 2: The Trail That Would Fail (per group)

- 2 L of sand
- 50 mL water per test
- water to saturate sand
- 2-4 books of approximately the same thickness to create hill slope
- trowel (optional)
- digital camera or video camera (optional)

Recess Activity: Water Balloon Bottle Race

- 4 water bottles the same size
- large outdoor space

Dream School Engineering Challenge

- Same materials that were distributed on Day Two



If you are ordering the materials kit from our vendor, below is a list of resources NOT included in the kit.

Day 4 – Urban Infrastructure and Landslides

STEM Camp Notebook

Activity 1: What Lies Beneath? (per group)

- sand
- rulers
- two sheets of paper

Activity 2: Look Out Below! (per group)

- sand (approximately 1-2 kg)
- container of water
- spray bottle (optional)

Recess Activity: Balloon Stomp

- trash bag

Dream School Engineering Challenge

- Same materials that were distributed on Day Two

If you are ordering the materials kit from our vendor, below is a list of resources NOT included in the kit.

Day 5 – Your Effect on Infrastructure

STEM Camp Notebook

Activity 1: Water Power!

- laboratory aprons
- chemical splash goggles
- sand (enough to half-fill the containers)
- tap water
- a meter stick or metric ruler



- science notebooks
- digital camera or video camera

Recess Activity: Sandcastle Building and Erosion (per group)

- several cups of sand
- small bucket/cup/can (for sandcastle mold)
- a small pitcher of water