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

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:
  o Empty shirt box
  o Marbles
  o 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:
    o Empty shirt box
    o 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