

The Mission Challenges provide tools to extend Learning Blade in the classroom using interactive, group and/or problem-based exercises. These challenges allow the student to provide open-ended responses that show how he or she would solve problems related to those posed in the corresponding online mission, or to construct small projects that feature science and technology concepts from the mission.

### Conduct Team Interviews

#### Objective:

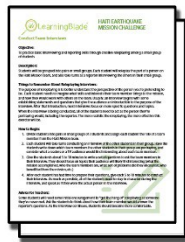
To practice basic interviewing and reporting skills through creative roleplaying among a small group of students.

#### Description:

Grouped into pairs or small groups, students will roleplay parts of a person on the Haiti Mission team, and also take turns as a reporter interviewing the others in their small group.

#### Outcomes:

Some students will need encouragement to “get the hang of” roleplaying as someone they’ve never met. Ask the students to think about how their team member would answer the reporter’s questions. As the interview continues, students should become more comfortable.



### Write Blog Postings

#### Objective:

To share the experience of building the orphanage in the post-earthquake conditions through entries in an imaginary blog

#### Description:

Students will create blog posts about the Haiti orphanage mission. Students will share personal stories about the mission that will help online readers connect with the project.

#### Outcomes:

A blog platform allows students to exercise their creativity and write stories about the mission from different points of view. Make sure students focus on how sharing their project with a wide audience, and educating readers, can build an online community that takes an interest in the mission.



### Construction Response Activity

#### Objective:

To build a structure and observe its response to the stresses of a simulated earthquake

#### Description:

Using toothpicks and marshmallows, students will build a structure and test it to see how well it responds to being shaken on a shake table.

#### Outcomes:

This experiment is designed to demonstrate how model structures assist in designing safe and practical buildings. Encourage students to experiment with different designs to explore the balance between creative and safe architecture.



### Mission-Related Experiment

#### Objective:

To understand the design challenges involved in planning for a building’s usage requirements

#### Description:

Students will create a custom floor plan for a new orphanage based on the required building features.

#### Outcomes:

While this experiment is designed to use the included graph paper and building features, it could also work with toy plastic building blocks (Lego®, MegaBlocs®, etc.). Students should be encouraged to be creative with this building layout project.



## Conduct Team Interviews

### **Objective:**

To practice basic interviewing and reporting skills through creative roleplaying among a small group of students

### **Description:**

Students will be grouped into pairs or small groups. Each student will roleplay the part of a person on the Haiti Mission team, and also take turns as a reporter interviewing the others in their small group.

### **Things to Remember About Roleplaying Interviews:**

The purpose of roleplaying is to better understand the perspective of the person you're pretending to be. Each student needs to imagine what skills and interests their team member brings to the mission, and how they would work with others on the team. Usually, an interview begins with some establishing statements and questions that give the audience an introduction to the purpose of the interview. After that introduction, most interviews focus on more specific questions and topics.

When the interview is being conducted, all of the students need to act as the person they're portraying would, including the reporter. The more realistic the roleplaying, the more effective this exercise will be.

### **How to Begin:**

1. Divide students into pairs or small groups of 3 students and assign each student the role of a team member from the Haiti Mission team.
2. Each student will take turns conducting an interview of the other students in their group. Have the students write down which team members the other students in their group are portraying, and consider what a readers or a TV audience would find interesting about each team member.
3. Give the students about 5 to 10 minutes to write a set of questions to ask the team members in their interview. They should focus on topics their audience will likely find interesting (what the mission accomplished, who the team members are, what sort of problems did they encounter, who benefitted from the mission, etc.)
4. After each student has had time to prepare their questions, give each 5 to 10 minutes to conduct their interview. As much as possible, all of the students need to stay in character during the interview, and speak as if they were the actual person in the interview.

### **Advice for Teachers:**

Some students will need some initial encouragement to "get the hang of" roleplaying as someone they've never met. Ask the students to think about how their team member would answer the reporter's questions. As the interview continues, students should become more comfortable.

**Objective:**

To share the experience of building the orphanage in the post-earthquake conditions through entries in an imaginary blog

**Description:**

In this exercise, you will create blog posts about the Haiti orphanage mission. Because the audience of the blog can be anyone on the internet, you should share not only technical information on the project, but personal stories about the workers on the project and the orphans the project will help.

**Things to Remember About Blog Posts:**

Blogs entries are usually placed in chronological order, which is the order events occurred. Blog entries present events as they happened, using descriptions of the events to tell an overall story of why the events are important. Blogs are helpful because they can give the reader more insight into the perspectives of the people actually involved in the events.

Blogs are also often used to build an online community, drawn together by common interests. The power of internet-based communication, like blogs is their ability to reach people in locations all over the world. A blog about the efforts to rebuild an orphanage in Haiti could reach and interests people all around the world. Make sure your blog posts are written to facilitate building an online community.

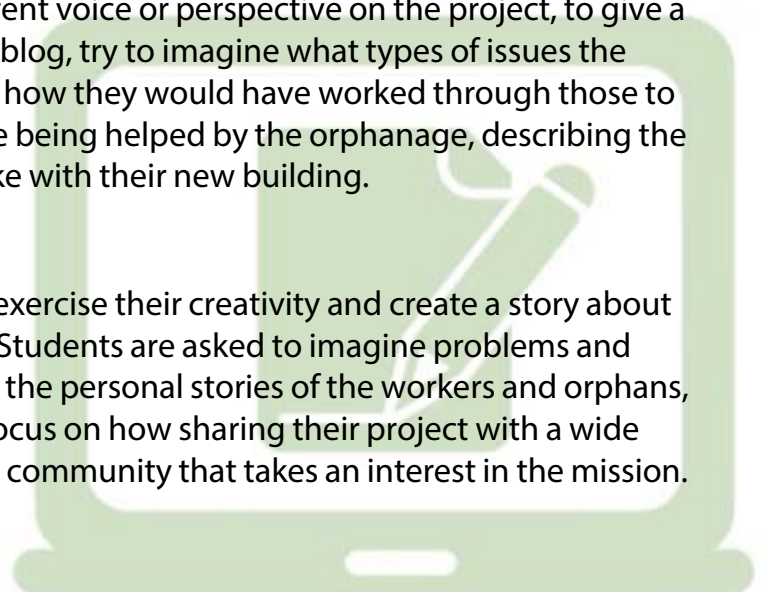
**How to Begin:**

Start with the history of the why the building is needed. Continue with the fundraising and plans created to begin building the orphanage. Begin telling the story of the project, highlighting the features of the building and any problems you encounter. There might be issues with shipping the materials, weather delays, and problems with electricity. Final entries might include stories about the children moving in and a ribbon cutting ceremony.

Create different “authors” on the blog, giving a different voice or perspective on the project, to give a full picture of how the project is progressing. In your blog, try to imagine what types of issues the writer is working on in the Haiti building project, and how they would have worked through those to reach the best solutions. Tell stories about the people being helped by the orphanage, describing the previous conditions and what their new life will be like with their new building.

**Advice for Teachers:**

The use of a blog platform will allow the students to exercise their creativity and create a story about the orphanage project from different points of view. Students are asked to imagine problems and solutions for the duration of the project, while telling the personal stories of the workers and orphans, sharing it in an imaginary blog. Make sure students focus on how sharing their project with a wide audience, and educating readers, can build an online community that takes an interest in the mission.



## Construction Response Activity

### Objective:

To build a structure and observe its response to the stresses of a simulated earthquake

### Description:

Using toothpicks and marshmallows, students will build a structure and test it to see how well it responds to being shaken on a shake table.

### Construction:

(A single shake table can be used to test many structures.)

Cut two 5 inch by 8 inch rectangles of cardboard. Place the pieces of cardboard on top of each other and stretch the rubber bands over them, about 1 inch from each end. Gently spread apart the pieces of cardboard and slide a superball into each corner as shown in Figure 2.

Using the toothpicks, marshmallows, and/ or gumdrops, build a 3-level structure. Experiment with different shapes, widths, and heights. Once the structure is built, tape the base of the structure to the top piece of cardboard on the shake table as shown in Figure 3.

### Simulated Earthquake Testing:

Place the ruler alongside the bottom piece of cardboard on the shake table with the edge of the cardboard lined up to the 1 inch mark as shown in Figure 4. Place one hand in between the two pieces of cardboard in the shake table, firmly holding the bottom piece of cardboard against the desk to prevent it from moving. Gently pull the top piece of cardboard in the shake table to the one-half inch mark on the ruler as shown in Figure 5.

While still holding the shake table's bottom piece of cardboard firmly against the desk, let go of the top piece of cardboard. The shake table should snap back, causing the structure to stress and shift. Observe how the different parts of the structure respond to the shifting movement. Try stressing the structure in different directions.

### Observation Questions:

Did the levels of the structure respond differently to the stresses?

Did different directions of the stress cause different effects on the structure? What design aspects added the most stability to the structure?

Measure the height of your structure and assume it represents a 30 foot-tall building. What is the scale of your structure compared to the 30 foot-tall building? Using this scale, how much earthquake shifting distance does one-half inch of movement on the shake table represent?

### Materials:

Mini marshmallows or Gum Drops  
tooth picks  
2 rubber bands  
4 superballs  
cardboard  
scotch tape  
ruler

Figure 1



Figure 2

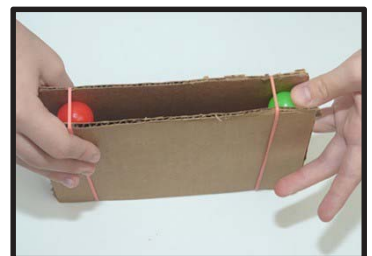


Figure 3

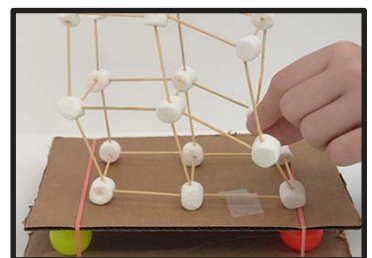


Figure 4

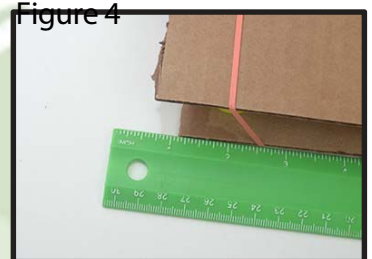
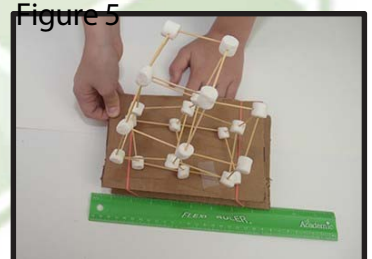


Figure 5



## Mission-Related Experiment

### Objective:

To understand the design challenges involved in planning for a building's usage requirements

### Description:

Students will create a custom floor plan for a new orphanage based on the required building features. A blank grid diagram and building feature icons are included on the following sheet. Students may draw their features on the grid, or cutout and glue (or tape) the included feature icons onto the grid.

### Required Building Features:

Neither floor of the orphanage can be larger than 150 feet long by 60 feet wide.

The orphanage must house 40 children.

Each bedroom must sleep either 2 or 4 children. A set of bunk beds sleeps 2 children and a dresser holds belongings for 2 children.

There must be 1 bathroom for every 8 children.

The orphanage must have a kitchen, and a dining hall to seat 48 people.

Each floor must have a common room with enough seating for half of the children sleeping on that floor.

Each floor must have 1 apartment for house parents.

Each floor must have 2 stairways connecting to a stairway on the other floor.

The orphanage must include hallways and space to move around furniture and enter any room.

The orphanage must include 2 entrances into the building.

### Getting Started:

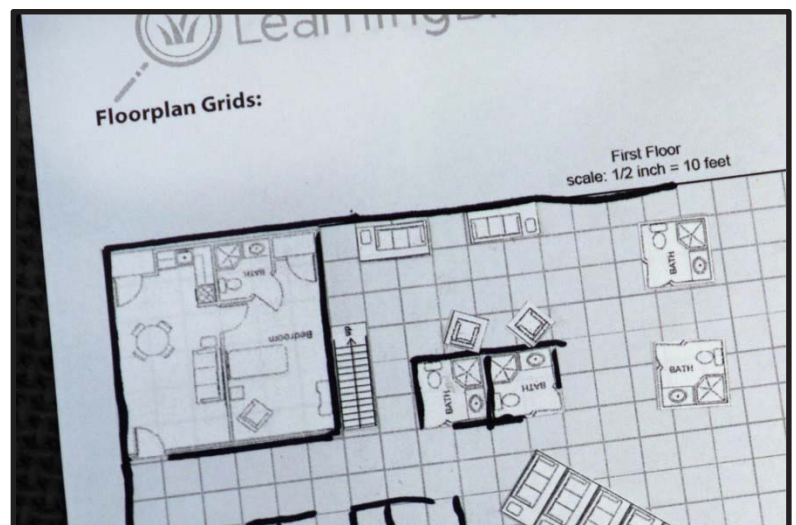
There are several ways to begin laying out the orphanage floorplan. Some planners choose where the largest features of a building will be located, then fill in smaller features around those large features. This method allows planners to focus on the areas that tend to be the least flexible in a floorplan before the space becomes cluttered. Other planners begin by crafting comfortable, but efficient bedroom arrangements, then use those to determine how the other pieces of the floorplan will work with the bedrooms.

Once you're ready to begin creating the floorplan, you can use the included floorplan grids and orphanage feature markers. Both the grid and the included markers are designed with a scale of 1/2 inch = 10 feet.

### Advice for Teachers:

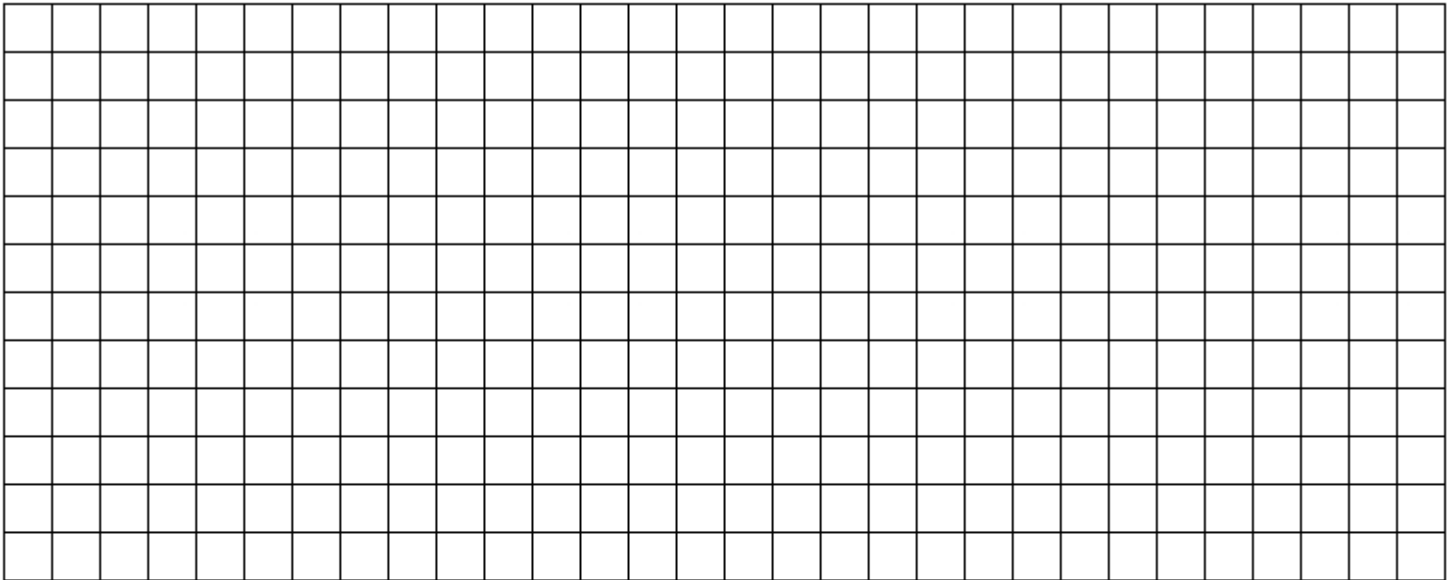
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### Mission Experiment Example:

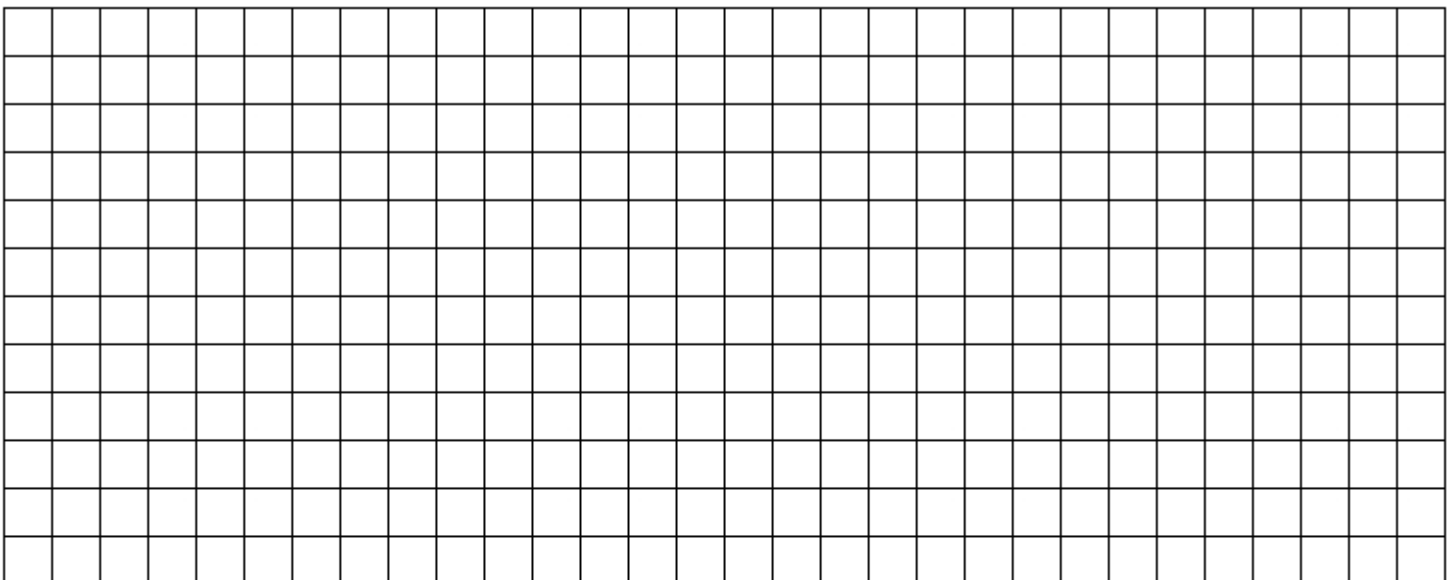


**Floorplan Grids:**

First Floor  
scale: 1/2 inch = 10 feet

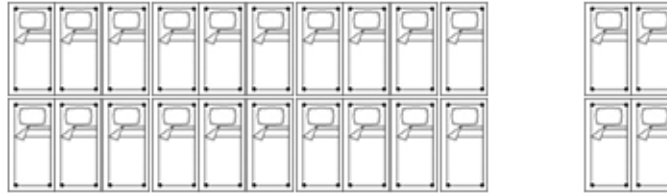


Second Floor  
scale: 1/2 inch = 10 feet



**Orphanage Feature Markers:**

**Bunk Beds**  
(Each bunk bed sleeps 2 children)



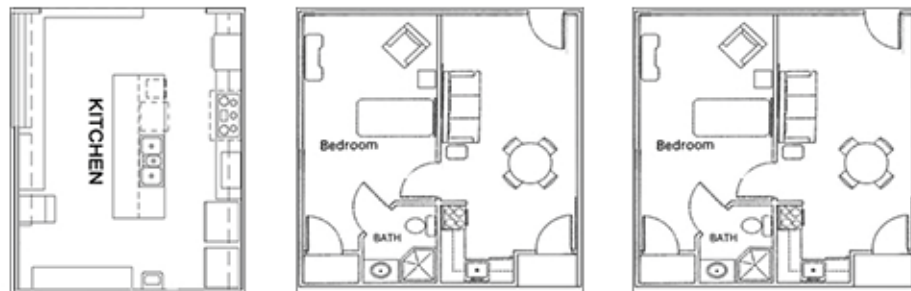
**Dressers**  
(Each dresser holds belongs for 2 children)



**Bathrooms**  
(Each bathroom serves 8 children)



**Orphanage Kitchen**



**Dining Tables**  
(Each table seats 8 people)



**Apartments**  
(One apartment per floor)

**Couches and Chairs**  
(For the common rooms)



**Stairways**  
(Two stairways for each floor)

