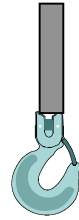


## GETTING READY TO LIFT THE LOADS



Here are some suggestions on how to get started on the crane unit.

### One to two weeks before you begin:

1. Gather the following materials for this activity.
  - alligator clips
  - bobbins
  - coated wire (22 gauge)
  - connectors (disconnect terminals – male and female)
  - coffee stirrers
  - construction paper (5 \_" x 11")
  - fishing line
  - glue sticks
  - paper clips
  - pipe cleaners
  - pulley sets
  - rubber bands (large postal size and various other sizes)
  - steel rods
  - straws
  - string
  - tape (masking and transparent)
  - thread
  - wooden dowels (10 to 15 – two different sizes)
  - yarn

The above materials are recommended for use during this engineering challenge. Please feel free to add to or delete from this list.

2. Gather the following items:
  - AC Adapter (3 volt) (2)
  - bolt cutters (small)
  - glue guns (one per team)
  - hammer
  - motors (one per team)
  - safety goggles
  - saw (mini size)
  - scale
  - stopwatch
  - rulers
  - vises (2)
  - weights (washers or fishing weights without lead)
  - wooden pieces (\_" x 4" x 12")
  - yardsticks

3. Each team will need a container to store supplies and money. You may want to send a note to parents asking them to send in large plastic containers or shoe boxes.
4. The students will be using “money” during this unit. It takes about a week to duplicate, laminate, and cut out all the coins and dollar bills. (Please look in the *Store* section.) You will want to buy or make containers to hold change in the store.
5. There are price tags in the store section you may want to cut apart, mount on construction paper, and laminate.
6. Prepare a store window.
7. There are word cards provided in the unit. It is suggested they be mounted on construction paper and laminated.
8. Have parent volunteers help you prepare the center ideas.
9. Ask a local hardware store if they will donate painters’ hats for the children to wear during the building process. (This really makes them feel like engineers!) Some companies do sell plastic construction hats for a reasonable amount.
10. Run off the Engineering Portfolio for each student. Place in a folder with prongs. (See *Engineering Portfolio* section.)

**One to two days before you begin the unit:**

1. Set up your classroom store.
2. Decide which students will be working together. (It is suggested students work in teams of two.)
3. Organize materials for the bulletin boards.

**To begin the unit:**

1. Have students read materials on cranes.
2. Have students do research projects on the many types of cranes and then have them report their findings to the class.
3. Familiarize the students with the parts of a crane.
  - Use pictures and the word cards.
  - Define each part with the students.

4. Before the students actually start building, the engineering portfolio needs to be reviewed with them. They need to do the Engineering Team Information and Engineering Worksheet One first. (See *Engineering Portfolio* section.)
5. You may want to have the students read some of the selections in the *Resource Booklet* section and complete some of the worksheets that are related to the readings.

This unit is designed to last approximately two to three weeks. The ideal amount of building time is 30 to 45 minutes each day. Take time to pick and choose the activities you feel will work best for your students and...

**ENJOY WATCHING YOUR STUDENT LIFT THEIR LOADS!**

