Day Three Lesson Plan

Objectives

• Students learn to calculate the cost of a hovercraft model
• Students calculate the cost of their personal hovercraft model
• Students compile a materials list

Materials Needed

• Hovercraft “Materials and Cost Worksheet” (2 per student – one for the in-class hovercraft design and one for their own hovercraft design)
• Transparency of Warm Up
• Transparency of Hovercraft “Materials and Cost Worksheet”
  [Option: you may choose to make paper copies to pass out to the students]
• 14” inch graph paper
  [Note: this is just for if a student needs to start over]
• PVC connector stick-on labels (one section per student)
• Transparency of a hovercraft design
• Handout of the hovercraft design

Warm Up

Display the following:
Complete the table below. Remember 14” on graph paper = 2” of PVC.

<table>
<thead>
<tr>
<th>Inches on hovercraft plan (on graph paper)</th>
<th>Actual length of PVC pipe</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 12”</td>
<td></td>
</tr>
<tr>
<td>414”</td>
<td></td>
</tr>
<tr>
<td>34”</td>
<td></td>
</tr>
<tr>
<td>138”</td>
<td></td>
</tr>
</tbody>
</table>

Yesterday’s Homework
Collect the final copy of the student’s own Hovercraft Design. Again, this is a complete or incomplete grade. At this point, the student just should be demonstrating a conceptual understanding, not perfect drawing skills.

**Materials Cost for Hovercraft**

*Today you will first work as a class in order to make a materials and cost list for a given hovercraft design (transparency.) Afterwards, students will begin to do this with their own hovercraft design/drawing. A completed Materials and Cost Worksheet is the homework assignment. The focus of today is gathering all the measurements and determining the appropriate amount of materials needed. The focus of today is NOT the cost.*

_This activity should be performed as a class:_

1. Pass out the “Materials and Costs” worksheet. This will be used after the students scale the graph paper drawing to actual PVC pipe length in order to learn to calculate cost.
2. Display the Hovercraft Design so that all students can see it. You may use the transparency provided or another method of your choice.  
   [Note: It might be helpful to give a paper copy of this design to all the students. This is up to you as the teacher.]
3. The first step is converting the drawing to the appropriate scale for PVC pipe. To do this, direct the students in measuring the length of each PVC pipe in the drawing.  
   [Note: An easy way to organize this is in a chart form similar to the way that the warm up was portrayed]
4. Using the scale 14” : 2”, record the true lengths of each PVC pipe on a separate overhead or the chalkboard. You can have the students do the same on a separate sheet of paper.
5. Remember when you make your organized list of PVC measurements that there are two sides to the hovercraft. The top view is only used for the 34 12” pieces that connect the two sides together. Remind students not to use the top view to count connectors unless they have used a connector in the middle of their top view plans.
6. Once you have all of your measurements; organize your PVC lengths on the “Materials and Cost” Worksheet.
7. Decide as a class how to best use the PVC pipe and not waste materials. Performing this activity as a class helps the students understand the process. _Remind the students that they have four 10 foot PVC pipes to work with._ Show the final work on the “Materials and Cost” Worksheet. Record the amount of leftover PVC next to each 10 foot section.  
   [Note: the answer key is provided]
8. As a class, figure out how many connectors are needed. The students may need to be reminded to double the number of connectors from the side view in order to account for both sides. Fill these amounts in on the “Materials and Cost” worksheet.
9. Finish filling out the Hovercraft “Materials and Cost Worksheet” on the overhead, and have students fill out their own worksheet, also. Make sure to fill out the cost portions of the worksheet.

This activity should be completed individually:

1. Students should now be ready to calculate the cost of their own hovercraft design.
2. Have them list the length of PVC pipe needed, mark and label the PVC pipe on “Materials and Cost Worksheet”, count connectors needed and fill out their sheets.
3. If time permits, let students start their work in class.
4. This worksheet should be finished for homework as this must be done before they can continue. Remind students that their total budget is $16.

Wrap Up Question

What will happen if you come to class unprepared tomorrow?

Answer: You are telling your group that you don’t want them to select your design for the actual hovercraft that your group will be making, or that you are willing to take a zero for the assignment.

Homework

Complete Hovercraft “Materials and Cost Worksheet” for your model.
[Note: This worksheet will also be a complete or incomplete grade, but the students should not know this until after the work is complete]