

DESIGNING YOUR BACKPACK*

SCIENCE & TECH ACTIVITY 5A

WORKSHEET

1. Your backpack design must:

- ✓ Incorporate three objects or elements defined by your group.
- ✓ Contain sufficient space for textbooks.
- ✓ Feature a special place for pens and pencils.
- ✓ Be as inexpensive as possible. (If they have time, girls should go to stores or online to see how much a typical backpack costs.)

You should also consider whether to add design features that were not part of the original specifications to enhance the backpack for your market audience. But remember your costs!

2. For your backpack design, you need to know the dimensions of the items that will be placed in the backpack. Use your ruler to measure the sample items.

3. As you design your backpack, consider:

- ✓ What are the most important elements of the design?
- ✓ What kinds of materials are you going to use and where?
- ✓ Which parts of the backpack need to be closed off and how?
- ✓ What will distinguish your backpack from the competition?

4. After designing your backpack, determine how much of each material is needed to create your design. Make sure to follow the Materials Guidelines listed on your "What's It Cost?" handout (from Science and Tech Trek Activity 5B). Then use the costs listed on the "What's It Cost?" handout to calculate the cost of each material and the final cost to make your backpack.

5. Evaluate your initial design and cost. Redesign the backpack until you are satisfied with the results.

Ask yourself these questions:

- ✓ Which features of your backpack are the most desirable?
- ✓ What is the least desirable part of your design?
- ✓ What constraints prevented you from presenting a design that was better than your final design?
- ✓ Which design feature was the most challenging to incorporate and why?
- ✓ Is it possible to create a backpack that meets all needs without any compromises? Why or why not?

* adapted from "Battle of the X-Planes" a NOVA Teachers' Activity