



Soak It Up

Instructional Decisions ***(Number Sense/Computation)***

Objective

Students will compare three products to determine the best value by using problem solving strategies, reasoning, communications, and making connections.

Students will determine the surface area of a region.

Overview of the Lesson

Students are engaged in a role playing activity where they assume the role of business executives who must decide which of three prototypes of paper towels would be the best buy for consumers. They use problem solving strategies to find the best value in terms of cost and then conduct experiments to test the absorbency of the three prototypes. In their testing procedures they find the surface area of the stain as they drop water into the center of a paper towel and then use a transparent grid to measure the area of the stain. Students then analyze the results of their absorbency test and the cost factors to determine which towel is the best value.

Materials

Teacher:

- Three rolls of paper towels (choose 3 brands that vary in price and sheets per roll)
- Large chart with 3 columns marked A, B, and C

Each Student:

- Copy of Activity Sheet: “Picking the Best Paper Towel”

Each Student Pair:

- Calculator
- Dropper
- Transparency pen
- Transparent grid (Activity Sheet: “Transparent Grid” template)
- One sheet of paper towel
- Water (adding color to the water will help the students to see it better)

Procedure

Begin the lesson with a discussion about television commercials. Have students discuss the purpose of commercials. Distribute a copy of Activity Sheet: “Picking the Best Paper Towel” to each student. Have the students read the problem presented on the Activity Sheet concerning the comparison of three paper towel prototypes. Show the class three rolls of paper towels clearly labeled with an A, B, or C on each one. Ask students how they could determine which brand was the best buy. Students will work with a partner to discuss which towel is the best buy and which roll is the most expensive and least expensive. Encourage students to examine the price and the number of sheets on each roll of towels.

Allow approximately five minutes and then have students share their ideas concerning the best buy with the entire class. Challenge students to find a way to determine the exact cost of each sheet of paper towel. If students experience difficulty with this concept, offer examples of a similar but simpler problem that utilizes the same problem solving strategy. Examples could include the following problems:

- * If you bought two lollipops for a total cost of \$4.00, how much would each one cost? (\$2.00)
- * If you bought a packet of five barrettes for \$10.00, how much would each one cost? (\$2.00)
- * If you bought a packet of two hairbrushes for \$14.00, how much would each brush cost? (\$7.00)

Ask students to explain how they solved each problem and explain that they can use the same strategy to determine the cost of each sheet of paper towels. Find the cost per sheet for Prototype C with the class. Allow students to use a calculator for this activity. Students may need to round the answer to the nearest penny.

Have the students work with a partner to find the same information for Prototypes A and B. Students will record their answers on their Activity Sheets.

After sufficient time, have students share their information with the entire class. Ask students if the price per sheet is the only consideration when determining the best buy for paper towels. Lead students to the notion that amount of absorbency could also be a consideration.

Divide the class into three groups. Each group will test one of the three prototypes. Have partners test the absorbency of a prototype by dropping 15 ml of water from a dropper onto the center of a sheet of paper towel. Students place a transparent grid over the top of the paper towel and use a transparency pen to trace around the stain on the paper towel. Students then count the squares covered by the stain to determine the surface area. Record data from the experiment on a large class chart.

Students then compare the results of the absorbency test to determine which paper towel is the most absorbent. Discuss the idea that the prototype with the least surface area would be the most absorbent. Have students discuss which paper towel they would purchase and the reasons for choosing that particular prototype.

Mathematically Speaking...

Many students exhibit difficulty when making monetary computations on the calculator often because they lack a true understanding of decimal values. When working with "messy" numbers as in this video lesson, students may either round or truncate the answer depending on the nature of the data. When trying to determine the price per sheet of paper towels, students rounded the answers on their calculator displays to the nearest penny or hundredth. In working with other data that may be "messy," truncating may be an option. Truncating is simply specifying a particular place value and discarding all other numbers. For example, if you were working with money and using only dollars and cents, 3.5666 would truncate to 3.56.

Extensions & Connections

Have students complete a project comparing two or three brands of a commercial product. Challenge them to design a "fair test" that will compare the products. Have students write a letter to a company or consumer group sharing the results of their research. Students could test the strength of different brands of facial tissues as they wet the tissue and stretch it across the mouth of a glass. The tissue would be secured with a rubber band. Pennies could be counted and placed in the middle of the tissue until it breaks and the pennies fall into the glass. A comparison could

then be made concerning the number of pennies each brand could hold before breaking.

Have students find the surface area of their left foot. Students may make a scatter plot of the area of their feet and their height to see if there is a correlation. Have students write a paragraph describing their data set.

Resources

Teaching Integrated Mathematics and Science (TIMS) Elementary Math Curriculum Grade 3, Unit 5, Lesson 3: *The Better “Picker Upper”*
University of Illinois, Chicago. Published by Kendall/Hunt Publishing Company, Dubuque, Iowa.

Addenda Series, Fourth Grade Book
National Council of Teachers of Mathematics, 1992.

Ideas for Online Discussion

(Some ideas may apply to more than one standard of the NCTM Professional Standards for Teaching Mathematics.)

Standard 1: Worthwhile Mathematical Tasks

- The video teacher states that she tries to use real life problems when planning her mathematics lessons. What types of real life situations do you use when planning your lessons?

Standard 2: Teacher's Role in Discourse

- What special challenges or advantages does the bilingual classroom impose on promoting discourse among students?

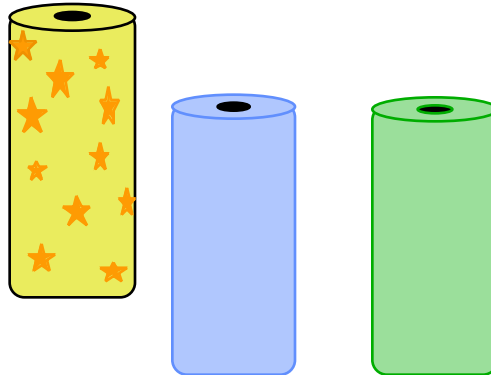
Standard 4: Tools for Enhancing Discourse

- How was the calculator effectively used in this lesson? The video teacher discussed the problems the students had with “messy” numbers and the calculator. What advice would you give on the use of the calculator in the mathematics setting?

Standard 6: Analysis of Teaching and Learning

- The video teacher states that teachers are second only to air traffic controllers in the amount of decisions that they make in a day. What factors do you consider when making decisions about curriculum issues? Do you involve students in making decisions about their learning? How do you accomplish this?

Picking The Best Paper Towel



You work for a company that makes paper towels. Your company would like to sell a new paper towel. The company has developed 3 different prototypes and also submitted the cost of each prototype.

Trabajas para una compañía que hace toallas de de papel. La compañía quiere hacer una toalla nueva para vender. La compañía ha hecho 3 prototipos de las toallas y fijado el precio de cada una.

Paper towel A Toalla A	\$.50 a roll \$.50 cada rollo	60 sheets per roll 60 hojas en cada rollo
Paper towel B Toalla B	\$1.12 a roll \$1.12 cada rollo	78 sheets per roll 78 hojas en cada rollo
Paper towel C Toalla C	\$1.52 a roll \$1.52 cada rollo	50 sheets per roll 50 hojas en cada rollo

You and your team's job is to test each paper towel and determine which one is the best. You need to offer evidence to support your decision. Take notes in your math journal. You will be asked to turn in all results of the tests with your recommendation to the boss of the company.

El trabajo de tú equipo es probar cada toalla y recomendar la mejor. Tienes que presentar evidencia que apoye tú recomendación. Tomas notas de todas las pruebas en tú diario de matematicas. Tienes que entregar los resultados de las pruebas con la recomendación a la administradora de la compañía.

Transparent Grid

