INVESTIGATIONS INTO ESTIMATIONS!

ITV SERIES

THE EDDIE FILES: #102 Going to the Dogs

GRADES 4-6

PREVIEWING ACTIVITIES

Activity One

For the first Previewing Activity students will learn to use Venn diagrams to sort and classify predicted information. Ask the students to predict or guesstimate how many students:

Have a pet dog.
Used a computer today.
Were born in another state.

Students should base their predictions and guesses on the number of students in the classroom. Record student answers on chart paper or the chalkboard. Then ask the students to predict or guesstimate how many students:

Have a pet dog and used a computer today.
Have a pet dog and were born in another state.
Used a computer today and were born in another state.
Have a pet dog, were born in another state, and used a computer today.

Record student answers on chart paper or the chalkboard. Tell the students that they will be using Venn diagrams to check their predictions.

Model the making of a Venn diagram, using the categories, on three separate charts around the classroom. Instruct students to sign their names in the categories which apply to them. Tell them that they should sign only in an intersection of two or three categories if both or all are true for them. Divide the class into thirds and have one-third sign at each Venn diagram.

When all students have completed signing their assigned Venn

OVERVIEW

Prediction and estimation are a constant part of the world of science and math as well as our everyday lives. The ability to predict and estimate accurately has many facets. Willingness to make as informed a guess as possible is one component. Rounding off to make quick mental computations is another. Averaging and the ability to estimate averages are important skills. Estimating and predicting are powerful tools in giving students control over more formal mathematics and science. In this lesson students will view the importance of these skills in daily living. They will make predictions and calculate estimations which they feel are reasonable. Students will compare predictions and estimations. The importance of estimating and predicting, in the fields of science and math, will be practiced and discussed. Students will demonstrate, compute, and graph estimating procedures. They will recognize that estimating in problem solving allows the problem to make more sense and become more manageable. Students will progress from predictions and "guesstimations" to actual estimating based on data.

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LEARNING OBJECTIVES

Students should be able to:

- Define estimation.
- Identify several methods of estimation.
- Explain importance of estimation.
- Use calculators to assist in estimating activities.
- Locate New York City on a map of the United States.
- Predict outcomes in estimation activities.
- Estimate outcomes.
- Name careers which use estimation.
- Use a Venn Diagram.
- Sort and classify information.
- Graph estimation predictions and results.
- Compare and contrast methods of estimation.

MATERIALS

Previewing Activities
Activity One

- 3 large pieces chart paper and a marker
- pencil for each student
- 9”x12”, 0.5 centimeter graph paper - one for each student

PREVIEWING ACTIVITIES (continued)

diagram, give each student a piece of graph paper. Tell students to place the graph paper in front of them so that the short sides, or 9 inch sides, are at the top and bottom. Have students title the top of their graph paper: CLASS DATA.

Then have the students list all seven categories from the Venn diagrams at the bottom of their graph paper. You may want to model the graph design on the chalkboard. Allow students to use abbreviations for categories, such as:

Dog
Comp.
Other state
Dog/Comp.
Dog/Other State
Comp./Other State
Dog/Comp./Other State

Place all Venn diagrams in the front of the classroom. As a class tally the numbers for each category. As each category is totalled students should graph the answers on their graph paper.

When all categories are tallied and graphed, have students compare their predictions with the actual answers in each category. Discuss with students the importance of making accurate predictions. Ask who might be interested in this data, i.e. pet store owners, computer salesmen, and city planners.

PREVIEWING ACTIVITIES (continued)

Activity Two

Tell students that they will now use a different method for measuring the outcomes of their predictions or guesstimations.

Divide students into pairs. Have one student from each pair collect the following materials from the teacher:

one penny
one eye dropper
one 3" x 5" card
cup of water

Ask students to predict how many drops of water will stay on the top of a penny without spilling over. Have each student write their name and prediction on the 3" x 5" card. Pairs of students should take turns dropping water onto the penny and counting the number of drops. The student counting the drops of water should tally the number on the opposite side of the 3" x 5" card. This activity should take approximately ten minutes.

When all students have completed the activity, because the water flowed over their penny, have each pair share their predictions and their answers.

Record all answers on the chalkboard. Discuss with students reasons for outcomes, i.e. heads or tails, care taken in dropping water, damaged penny, and/or unstable work area for experiment. Ask students if they could make a more accurate estimation, using a nickel, based on this experience. Encourage them to try other coins on their own.

MATERIALS (continued)

Activity Two

For each pair of students:

- one penny
- one eye dropper
- one 3" x 5" card
- cup or similar sized container of water
- a pencil

Post Viewing Activity

For each group of four students:

- one box of raisin bran-(All boxes should be the same size and brand. Do not use individual serving size boxes.)
- one measuring cup with ounce measurement
- four calculators

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ACTION PLAN

Have students interview school cafeteria personel to determine how they estimate the amount of food to order and prepare.

Invite a local meteorologist to your school to share how estimation is used to determine weather forecasts.

Invite a marine science expert to your classroom to share technology used to predict and estimate facts about the ocean floor and life within our world's oceans.

Predict and then estimate the number of books in your school by taking a sampling from several classrooms and the library.

Have students' parents come and share how they use estimation in their daily lives, i.e. work, home, extra-curricular activities.

FOCUS FOR VIEWING

The focus for viewing is a specific responsibility or task(s) that the students are responsible for during or after watching the video to focus and engage students' viewing attention.

Give students these specific responsibilities while viewing the video segment:

Ask the students to raise their hands when they can identify where Eddie, the main character in the video, lives.

Have students raise their hands when they hear the definition for estimation.

Tell students to listen and watch for people who use estimation as part of their job.

Ask students to watch for different types of estimating methods.

VIEWING ACTIVITIES

START THE VIDEO at the very beginning. **TURN THE SOUND OFF** and allow the students to guess in which city the story is taking place. Have students share their reasons for guessing a particular city. After the students have made their predictions, **REWIND THE VIDEO** back to the beginning. **TURN ON THE SOUND** and **START THE VIDEO** and have the students raise their hands when they hear in which city the story is taking place.

PAUSE THE VIDEO after Eddie says, "East Harlem to be exact." Have the students locate New York City on a map of the United States. **RESUME THE VIDEO**.

PAUSE THE VIDEO after Ms. Toliver says, "How do you think you can use your bin and this bin to make a better estimate?" Ask the students what they might do to estimate the number of cat biscuits in the large bin. **RESUME THE VIDEO**.

PAUSE THE VIDEO after Vincent says, "They take what they know and they make a smart guess." Ask students how the mayor's office, astronomers, and raisin bran manufacturers estimate. **RESUME THE VIDEO**.

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VIEWING ACTIVITIES (continued)

PAUSE THE VIDEO after Eddie says, "I've got a whole file on people who work with animals, and Dr. Detler, she's right at the top." Ask the students how veterinarians use estimation. **RESUME THE VIDEO**.

PAUSE THE VIDEO after Eddie says, "File note: Don't study bug file before dinner." Ask the students how they think Jan Dietrick uses estimation in her job as bug grower. **RESUME THE VIDEO**.

PAUSE THE VIDEO after Eddie says, "I'm not sure what I want to do when I grow up. That's why I keep my files." Ask the students how Bert Grantges estimates the number of bats in a cave. Also ask, why he estimates the number of bats. **RESUME THE VIDEO**.

PAUSE THE VIDEO after Ms. Toliver says, "Good for you Brandon. Okay, that was a nice job." Ask the students how they feel about Brandon's method of estimating the number of sneakers in New York City. Do the students think his estimate was accurate? **RESUME THE VIDEO**.

PAUSE THE VIDEO after Eddie says, "Talk about pressure. But after all that I had been through, it really was pretty easy." Have the students predict how Eddie estimated the number of dogs in New York City. **RESUME THE VIDEO**.

PAUSE THE VIDEO after Ms. Toliver says, "Great Eddie, three hundred fifty thousand. That's a wonderful estimate." Ask the students if they feel Eddie's method of estimating the number of dogs in New York City was accurate. **RESUME THE VIDEO**.

STOP THE VIDEO after Eddie says, "I have a feeling tomorrow's going to be a big day."

POST VIEWING ACTIVITY

Tell students that for this activity they may use any of the estimation methods they saw on today's video to solve the problem. Their task is to determine how many raisins are in a box of raisin bran cereal. Ask students to predict how many raisins might be in any given box

EXTENSIONS

Language Arts: Have students keep journals of ways they see estimation used at home, play, and in the classroom. Students can share their findings with the class.

Have students e-mail a variety of cereal companies to inquire about methods of estimation for raisin bran and other cereals.

Science: Make a saturated solution of sugar and water. Hang a string in the solution. Instruct students to predict the amount of time it will take for sugar crystals to form.

Estimate the number of paper clips a full glass of water can hold before overflowing. Carefully drop and count the paper clips until the water flows out of the glass.

Math: Have students estimate how many seconds there are in a day? week? year? Use calculators to compute the actual answers.

Estimate the number of names in the local phone book. Select randomly three full pages and count the number of names. Multiply the number of names by the total number of pages with names. Students can use calculators for this activity.

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EXTENSIONS (continued)

Social Studies: Use the Internet to identify the number of people in the United States in 1970, 1980, and 1990. Have students estimate the population of the United States in the year 2000.

Economics: Purchase several different brands of raisin bran. Instruct students to repeat the Post Viewing Activity for each brand. Compare and contrast brand ingredients and prices.

Health: Have students estimate the number of teeth they will lose during the school year. Keep track on a classrooom chart.

Have the students estimate how many inches/centimeters they will grow before the end of the school year. Keep track on a classroom growth chart.

VIDEO AVAILABLE FROM

ITV Overnight Blockfeed which may be taped off-air. Consult you local PBS station for schedule.

POST VIEWING ACTIVITY (continued)

of cereal. Write all predictions on the chalkboard. Divide the students into groups of four.

Have one student from each group obtain the following materials from the teacher:

one box of raisin bran
one measuring cup
four calculators

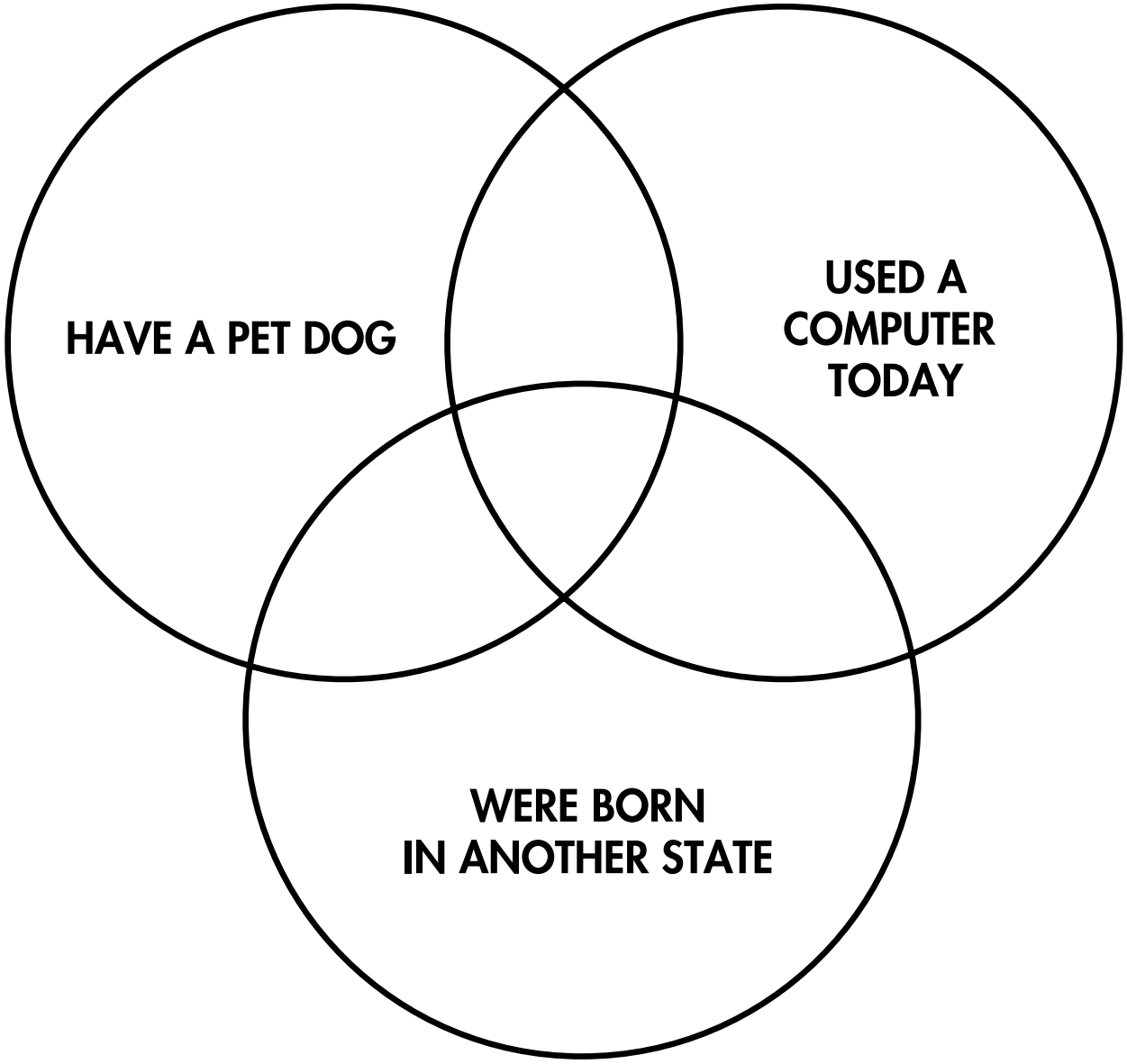
Tell the students that they are to arrive at a group consensus as to the amount of raisins in their box. They will not be allowed to count each raisin to determine their answer. Instruct the students that no more than four cups of cereal can actually be removed from the box. Encourage the class to use their calculators and any information found on the measuring cup and the box of cereal to determine an accurate estimate. Allow approximately fifteen minutes for this activity.

At the end of the fifteen minute period, have each group share their findings and how they calculated their answer. Discuss any difficulties in arriving at an answer. Note any similarities or differences in calculation methods with the previously viewed video. Write all answers on the chalkboard. Compare predicted answers to estimated answers. Ask for a volunteer from each group who will be responsible for counting all the raisins in their box for homework.

The following day have the volunteers share their findings. Compare actual amounts to predictions and estimations. Discuss reasons for any inaccuracy in answers, i.e. settling during shipping. Ask students to predict how the amount of raisins is determined for each box of cereal as it is packaged. Finally, ask students to list other food products which contain estimated amounts of ingredients.

Lesson Plan Created by Master Teacher Kris Pfaff, Pioneer Elementary, Meridian, Idaho.

Sample Venn Diagram



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