Graphing our Way to School
Early Elementary Math

LESSON 1 | How We Get To School — 35–45 minutes

Students create bar graphs physically and on paper and compare data regarding their methods of transportation to school.

Objectives

- Students will be able to translate a concrete activity into a bar graph.
- Students will be able to compare numbers using words while interpreting data.

LESSON 2 | Active vs. Passive Transportation — 30–35 minutes

Students combine data from Lesson 1 to create a table and discuss definitions of active and passive transportation.

Objectives

- Students will be able to explain the difference between active transportation and passive transportation.
- Students will be able to name at least one benefit of active transportation.
- Students will be able to explain changes that would make it easier to use active transportation to get to and from school.
- Students will be able to predict how their travel choices might change based on certain variables, such as weather.

LESSON 3 | Transportation Survey* — 20–30 minutes

Students create a survey to gain data about their family members' transportation choices.

Objectives

- Students will be able to formulate questions regarding their families' transportation choices.
- Students will be able to design a survey to gather data.
- Students will be able to make predictions about the outcomes of new data collection based on previously collected data.

LESSON 4 | Comparing Transportation Data 30–40 minutes

Students compile data from family member surveys to make comparisons and inferences.

Objectives

- Students will be able to combine their individual survey results to produce class data.
- Students will be able to organize data using tally marks.
- Students will be able to describe data in a bar graph.

LESSON 5 | Transportation Pie Chart Posters 30–40 minutes

Students use manipulatives to create pie charts to represent student and family member data.

Objectives

- Students will be able to communicate data through pie charts.
- Students will be able to create posters to display their findings and present positive messages about using active transportation.

**NOTE: Lesson 3 may be omitted if desired, but the teacher will need to create a survey for use before Lesson 4. See Lesson 3 and Lesson 4 descriptions for details*.

LEARNING OBJECTIVES

- Students will be able to explain the difference between active transportation and passive transportation.
- Students will be able to name at least one benefit of active transportation.
- Students will be able to explain changes that would make it easier to use active transportation to get to and from school.
- Students will be able to predict how their travel choices might change based on certain variables, such as weather.

ILLINOIS STATE LEARNING STANDARDS

- 6.B.1–Solve one- and two-step problems with whole numbers using addition, subtraction, multiplication and division.
- 10.A.1b–Answer questions and make predictions based on given data.

REQUIRED MATERIALS

- Chart paper with bar graph from Lesson 1
- Prepared chart paper with bar graph template
- Marker
- "Look Again: How We Get To School" reproducible

SET-UP

- Prepare empty two-column bar graph on chart paper. Label one empty space "active transportation" and the other "passive transportation."
- Affix bar graph from Lesson 1

LESSON ACTIVITY

Defining Active Transportation (10 minutes)

Distribute the reproducible handout to students. Point to the empty bar graph and its labels. Explain that "active transportation" means actively using your own body's energy to go from one place to another. Explain that "passive transportation" means using another type of power to move from one place to another. Brainstorm different forms of active and passive transportation. (In addition to the four categories previously used, make sure students include such options as trains, planes, boats, roller skates, and scooters.) Have students list or draw pictures of the many different types of transportation under the corresponding labels at the bottom of their reproducibles.

Revisit the data from Lesson 1. Ask students to identify which two forms of transportation are active and which two forms are passive. Look at the list of active transportation choices. Ask students to name some of the direct benefits of active transportation. (Exercise, no pollution, avoid traffic, fun.)

Ask students to dig deeper into some larger benefits as well:

- "How would the environment around our school change if everyone traveled here using active transportation?" (Fewer cars, more people talking/connecting, less traffic)
- "How would using more active transportation affect your safety around the school building?" (Reducing the number of cars could make walking and bike riding safer. You could note that parents driving students to school account for an estimated 15% to 30% of morning traffic.)

- "What are some benefits of active transportation?" (Save money, exercise, see more of the community, no/low environmental impact.)

Tabulating Results (5 minutes)

Ask students to identify which numbers to add together from the original data to find the number of students using active transportation. Add the numbers together on the board and fill in the Active Transportation bar on the display graph and student graphs.

Instruct students to add the whole numbers of the passive transportation data together and then to compare their answer with a partner; display the equation on the board and fill in the graphs.

A Table, Too! (5–10 minutes)

Explain to students that they can use a chart or table to display the data from both graphs and show the addition they did. On the board or a piece of chart paper, create the chart at right, leaving data spaces empty. Ask students what numbers go in each space. Point out how the chart simplifies the addition process in each category.

Active Transportation		Passive Transportation	
Walk	#	Ride in a Car	#
Ride a Bike	#	Take a Bus	#
Total	#	Total	#

Analyze and Interpret (5 minutes)

Ask students "What factors might affect this data?" Discuss some of the factors that determine their transportation choices (e.g., time, weather, distance, parents' schedules, etc.) Ask students to predict how the data might be affected by changing seasons and other factors. Write down their predictions.

Discuss what would make it easier/more appealing/safer for more students to use active transportation to go to and from school.

EXTENDING THE LESSON

Designate other dates later in the school year, in different seasons, to collect new data from the class and create bar graphs together to check the accuracy of the class's predictions. As the school year continues, display the graphs side-by-side in the room to help track changes in transportation choices.

HOME CONNECTION

Distribute a weekly or monthly calendar that students can use to keep track of how they travel to and from school each day (or for all of the trips they make). Have students use symbols or abbreviations to indicate their modes of travel. At the end of each week or month, have students bring them back to class and discuss and/or tabulate the results.

ADDITIONAL RESOURCES

Use materials from Oregon's "Walk + Bike" program to help track students' daily commuting choices. www.portlandonline.com/transportation/index.cfm?a=239483&c=48999; www.walknbike.org