

8



Lesson Plan

**Use Information in Line, Bar, Circle, and
Picture Graphs to Make Comparisons and
Predictions**

for

All Language Learners

in the

Eighth Grade

Lesson Overview

Grade Level:	Eighth
Language Level:	All
Content Category:	Math
Content Subcategory:	Data Analysis, Statistics, and Probability
Materials Needed:	Computer connected to the Internet
Technology Tool:	See the Lesson Tools section for this lesson in the Teacher Management Area of the K to 8 technology curriculum
Lesson Summary:	This lesson teaches students to use information in line, bar, circle, and picture graphs to make comparisons and predictions.
Lesson Objectives:	At the end of the lesson, the student will be able to: <ul style="list-style-type: none">• give the definitions for graph, bar graph, line graph, circle graph, and picture graph• make comparisons using graphs• make predictions using graphs
Academic Content:	This lesson covers: <ul style="list-style-type: none">• using information in line, bar, circle, and picture graphs to make comparisons and predictions
Technology Skills:	See the following sections of the lesson plan for a detailed list of skills covered in this lesson: <ul style="list-style-type: none">• Standards: NETS - Performance Indicators• Activity Instructions & Rubric

Lesson Plan

Lesson and Student Activity Details:

1. The lesson begins by giving students the definition of a graph. A graph is a drawing that shows information about numbers.
2. A picture graph is the first graph introduced. A picture graph uses pictures instead of numbers.
3. Students are given the definition of a bar graph. A bar graph is a special graph using rectangular bars to show data.
4. Next is the definition of a line graph. Line graphs compare two variables. Each variable is plotted along an axis.
5. The last graph introduced is a circle graph. Circle graphs are used to compare parts of a whole.
6. Students learn that they can use charts and graphs to compare information. They are given an example of how two students spend their allowance. Students must answer questions based on the information in the circle graphs.
7. Students look at bar graphs and answer questions based on the information in the bar graphs.
8. Next students look at a line graph showing temperature and answer questions based on the line graph.
9. In the next example students are asked to make predictions about population growth based in a graph.
10. Students are given one more example of a picture graph and asked to make predictions about that graph.
11. There is an activity at the end of the lesson.
12. There is an assessment at the end of the lesson.

Lesson Plan

Extension Activities:

1. Students can look through newspapers, advertisements, and magazines for examples of each type of graph.
2. Students can draw an example of each type of graph.

Multiple Intelligences

- Bodily/Kinesthetic
- Intrapersonal
- Logical/Mathematical
- Verbal/Linguistic
- Visual/Spatial

Questions & Answers

Lesson Assessment

What percent of Jake's spending is for clothes? Chart with data.

20%

30%

10%

40%

2

What percent of Sarah's spending is for lunches? Chart with data.

15%

20%

30%

12%

3

How much will Bart have saved by the end of week 4? Chart with data.

\$55

\$75

\$25

\$50

4

When will Jessica reach her goal of saving \$75? Chart with data.

Week 5

Week 4

Week 6

She doesn't reach her goal.

Questions & Answers

5
Which city has the highest temperature at 5:00 pm? Chart with data.

Johnson City
Kingston

6
What is the difference in temperature between the two cities at 11:00 am? Chart with data.

10 degrees
5 degrees
15 degrees
20 degrees

7
What is the difference in temperature between the two cities at 2:00 pm? Chart with data.

15 degrees
5 degrees
10 degrees
20 degrees

8
Based on last year's sales, which month do you predict will be the top sales month? Chart with data.

June
July
August
September

9
Which season needs the fewest salesmen? Chart with data.

Winter
Summer
Fall
Spring

Standards

NETS - Technology Foundation Standards for Students

(From the International Society for Technology in Education)

1. Basic operations and concepts

- Students demonstrate a sound understanding of the nature and operation of technology systems.
- Students are proficient in the use of technology.

2. Social, ethical, and human issues

- Students understand the ethical, cultural, and societal issues related to technology.
- Students practice responsible use of technology systems, information, and software.
- Students develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

3. Technology productivity tools

- Students use technology tools to enhance learning, increase productivity, and promote creativity.
- Students use productivity tools to collaborate in constructing technology-enhanced models, prepare publications, and produce other creative works.

4. Technology communications tools

- Students use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences.
- Students use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

5. Technology research tools

- Students use technology to locate, evaluate, and collect information from a variety of sources.
- Students use technology tools to process data and report results.
- Students evaluate and select new information resources and technological innovations based on the appropriateness for specific tasks.

Standards

6. Technology problem-solving and decision-making tools

- Students use technology resources for solving problems and making informed decisions.
- Students employ technology in the development of strategies for solving problems in the real world.

Standards

NETS - Performance Indicators

(From the International Society for Technology in Education)

Grade 6 to Grade 8

3. Exhibit legal and ethical behaviors when using information and technology, and discuss consequences of misuse. (2)
4. Use content-specific tools, software, and simulations (e.g., environmental probes, graphing calculators, exploratory environments, Web tools) to support learning and research. (3, 5)
5. Apply productivity/multimedia tools and peripherals to support personal productivity, group collaboration, and learning throughout the curriculum. (3, 6)
6. Design, develop, publish, and present products (e.g., Web pages, videotapes) using technology resources that demonstrate and communicate curriculum concepts to audiences inside and outside the classroom. (4, 5, 6)
7. Collaborate with peers, experts, and others using telecommunications and collaborative tools to investigate curriculum-related problems, issues, and information, and to develop solutions or products for audiences inside and outside the classroom. (4, 5)
8. Select and use appropriate tools and technology resources to accomplish a variety of tasks and solve problems. (5, 6)
9. Demonstrate an understanding of concepts underlying hardware, software, and connectivity, and of practical applications to learning and problem solving. (1, 6)
10. Research and evaluate the accuracy, relevance, appropriateness, comprehensiveness, and bias of electronic information sources concerning real-world problems. (2, 5, 6)

Standards

Mathematics Standards

(From the National Council of Teachers of Mathematics)

1. Number and Operation

Mathematics instructional programs should foster the development of number and operation sense so that all students-

- Understand numbers, ways of representing numbers, relationships among numbers, and number systems;
- Understand the meaning of operations and how they relate to each other;
- Use computational tools and strategies fluently and estimate appropriately.

2. Patterns, Functions, and Algebra

Mathematics instructional programs should include attention to patterns, functions, symbols, and models so that all students-

- Understand various types of patterns and functional relationships;
- Use symbolic forms to represent and analyze mathematical situations and structures;
- Use mathematical models and analyze change in both real and abstract contexts.

5. Data Analysis, Statistics, and Probability

Mathematics instructional programs should include attention to data analysis, statistics, and probability so that all students-

- Pose questions and collect, organize, and represent data to answer those questions;
- Interpret data using methods of exploratory data analysis;
- Develop and evaluate inferences, predictions, and arguments that are based on data;
- Understand and apply basic notions of chance and probability.

Standards

6. Problem Solving

Mathematics instructional programs should focus on solving problems as part of understanding mathematics so that all students-

- Build new mathematical knowledge through their work with problems;
- Develop a disposition to formulate, represent, abstract, and generalize in situations within and outside mathematics;
- Apply a wide variety of strategies to solve problems and adapt the strategies to new situations;
- Monitor and reflect on their mathematical thinking in solving problems.

8. Communication

Mathematics instructional programs should use communication to foster understanding of mathematics so that all students-

- Organize and consolidate their mathematical thinking to communicate with others;
- Express mathematical ideas coherently and clearly to peers, teacher, and others;
- Extend their mathematical knowledge by considering the thinking and strategies of others;
- Use the language of mathematics as a precise means of mathematical expression.

9. Connections

Mathematics instructional programs should emphasize connections to foster understanding of mathematics so that all students-

- Recognize and use connections among different mathematical ideas;
- Understand how mathematical ideas build on one another to produce a coherent whole;
- Recognize, use, and learn about mathematics in contexts outside of mathematics.

Standards

10. Representation

Mathematics instructional programs should emphasize mathematical representations to foster understanding of mathematics so that all students-

- Create and use representations to organize, record, and communicate mathematical ideas;
- Develop a repertoire of mathematical representations that can be used purposefully, flexibly, and appropriately;
- Use representations to model and interpret physical, social, and mathematical phenomena.