

Discipline: Mathematics

Standard Category: Numbers, Number Systems and Number Relationships & Statistics and Data Analysis

Lesson Focus: Sorting, graphing, and interpreting data

PA Standard(s):	Related TESOL Standard(s):
2.1.3G: Use concrete objects to count, order and group. 2.6.3A: Gather, organize and display data using pictures, tallies, charts, bar graphs and pictographs.	Goal 2: To use English to achieve academically in all content areas. Standard 2: Students will use English to obtain, process, construct, and provide subject matter information in spoken and written form.

Key Objectives in Accordance with TESOL Level:

Pre-Conversational/ Beginning	Intermediate	Advanced
Students will be able to: <ul style="list-style-type: none">Sort up to twenty items by color and represent data on a bar graph.	Students will be able to: <ul style="list-style-type: none">Sort up to twenty items by color and develop a bar graph based on the items.Verbally report the information shown on a bar graph.	Students will be able to: <ul style="list-style-type: none">Sort up to twenty items by color and develop a bar graph based on the items.Analyze and discuss the information shown on a bar graph.

Materials:

- Multi-colored unifex cubes
- Any multi-colored cereal or candy such as M&M's (enough for each student to get twenty each)
- Small paper cups
- Napkins
- One-inch graph paper
- Crayons

Procedures: (ELL suggestions are in italics.)

- Display twenty unifex cubes in assorted colors. Count the cubes in unison.
- Call for volunteers to sort the cubes by color. Name each color in unison.
Beginning ELL students may be hesitant to complete the oral tasks throughout the lesson. During this warm-up, the beginning ELL students may listen as the other students count in English.
Beginning students may feel more comfortable when counting in unison and attempt to join the group. They cannot be singled out.
- Refer to the cubes that were sorted during the warm-up and tell

Suggested Level:
Primary

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Teaching Strategies:
Whole group instruction

Use of manipulatives

Assessment Strategies:
Interview

Checklist

students that you can make a special picture called a graph to show how many cubes you have of each color.

4. Demonstrate to students how to count the cubes in each color group and color in squares on the graph paper using corresponding colors of crayon. For instance, five red blocks would be represented by coloring five squares red.

Modeling the activity is essential. ELL students usually have a difficult time following oral directions. ELL students can benefit from seeing an example before actually completing the task.

5. Upon completion of the graph, discuss the data presented:
 - How many blue cubes do we have?
 - Which color has the least?
 - How many colors are on the graph?
6. Explain to students that they will make their own graphs using candy/cereal.
7. Give each student a small paper cup filled with twenty pieces of multi-colored candy/cereal. Spill the candy/cereal onto a napkin. Sort and count by color. Graph the results.

If the ELL student doesn't work well independently, do not hesitate to provide a buddy to act as a model throughout the lesson. Beginning students should be allowed to use their native language to count items, if necessary.
8. After students have completed their graphs, conduct a show-and-tell session for them to share the information on their graphs.

The students should be allowed to share on a voluntary basis. Do not force an ELL student to speak in front of the group if he/she is not ready.

Assessment:

While students are working on the independent activity, the teacher can visit each student to assess understanding. Checklists may be developed for each proficiency level as follows:

Beginning

- Student sorted items by color.
- Student correctly counted the items in each group.
- Student developed a bar graph that accurately represented the number of items of each color.
- Additional Comments:

Intermediate

- Student sorted items by color.
- Student correctly counted the items in each group.
- Student developed a bar graph that accurately represented the number of items of each color.
- Student answered the following questions accurately:
 - How many colors do you have on your graph?
 - How many (items) do you have in all?
 - How many (color) items do you have?
- Additional Comments:

Advanced

- Student sorted items by color.
- Student correctly counted the items in each group.

- Student developed a bar graph that accurately represented the number of items of each color.
- Student answered the following questions accurately:
 - Which color has the most?
 - Which color has the least?
 - How many colors do you have on your graph?
 - How many items do you have in all?
- Additional Comments:
During the assessment interview, the teacher should allow the student to use gestures, pointing, and brief oral responses to answer the questions.

