TITLE	Gardening Graphs
SUBJECTS	Math, Science
GRADES	2nd
DURATION	25-30 minutes
GROUP SIZE	One class (30 students or less)
SETTING	Indoor or Outdoors
KEY VOCABULARY	Bar Graph, Pictograph, Data
GEORGIA STANDARDS	**2.MDR.5 Estimate and measure the lengths of objects and distance to solve problems found in real-life using standard units of measurement, including inches, feet, and yards and analyze graphical displays of data to answer relevant questions.** • **2.MDR.5.4**: Ask questions and answer them based on gathered information, observations, and appropriate graphical displays to solve problems relevant to everyday life. **2.MPDisplay perseverance and patience in problem-solving. Demonstrate skills and strategies needed to succeed in mathematics, including critical thinking, reasoning, and effective collaboration and expression. Seek help and apply feedback. Set and monitor goals.** • **2.MP.4**: Model with mathematics. In early grades, mathematically proficient students experiment with representing problem situations in multiple ways with numbers and words (mathematical language), by drawing pictures, using objects, acting out, making a chart or list, and creating equations, etc.
SKILLS	IPS 7. interpret timelines, charts, and tables IPS 9. construct charts and tables IPS 11. draw conclusions and make generalizations IPS 12. analyze graphs and diagrams
OBJECTIVES	Students will be able to: - Observe and analyze patterns in data. - Sort data by categories. - Create a pictograph and bar graph using real life data. - Analzye data to draw conclusions. - Mathematically model data using an equation.
MATERIALS	Items needed for this activity are: - Garden crop photos - Student See-Think-Wonder Chart - Student Pictograph Data Sheet - Student Bar Graph Data Sheet
BACKGROUND	Jimmy Carter grew up on a farm and one of his farm chores was to help plant a garden. He would need to decide how many of each seed type to plant to grow food for the Carter family. In this activity, students will analyze a paper garden to collect data about the number of each crop type and create a graph displaying the data. Students will first create a pictograph and will then create a bar graph. Finally, students will create equations to model their data.

PROCEDURE	Part 1:
	  1. Lay out the garden crop photos in a grid, like a real garden would be planted. Photos should be placed at random. Each group of students should have their own set of photos.
	  2. Explain to students that Jimmy Carter grew up on a farm and one of his farm chores was planting a garden to grow food for the Carter family.
	  3. Have students complete a See-Think-Wonder activity for the paper garden. Students should write on their data tables what they see in the garden, what they think about the garden, and what they wonder about the garden. Discuss their findings using a think, pair, share activity or as a whole group.
	Part 2:
	  1. Have students sort their gardens into a pictograph by arranging the cards into columns based on type. For instance, if students have 3 carrot cards they should make a column of 3 carrot cards.
	  2. Students should make observations about their data. Teachers can use prompting questions to get them to think about their data. Questions can include but are not limited to:
	    a. Which crop do you have the most of?
	    b. Which crop do you have the least of?
	    c. How many more of one crop do you have than another?
	  3. Students should draw their pictograph on the Student Pictograph Data Sheet. On the Pictograph Data Sheet, students will draw pictures of their crops in columns.
	Part 3:
	  1. Students will use the Bar Graph Data Sheet to create a bar graph of their crops.
	  2. Graphs should include a title, labels, and accurate data.
	  3. Students should use their graph to answer the questions on the Bar Graph Data Sheet.
	  4. As a group, discuss the answers to the questions.

EVALUATION	A formative instruction can be done by observing students' graphs and answers to the questions at the end of the activity. Possible questions include: - How can a picture graph help you analyze and share data? - How can a bar graph help you analyze and share data? - What similarities do you see between a picture graph and a bar graph? - Why is it important to collect and organize data? - When you looked at your data and analyzed it, how did it help you answer your question?
DIFFERENTIATION/ EXTENSION	These are a few ways this activity can be adjusted for exceptional learners, gifted learners, or extended to fit a longer class period: - Have students collect their own data and create a graph using that data. - Provide students with sample graphs to help model graphing strategies. - Provide either graph paper to simplify or blank paper to extend student learning. - Use photo supports for English language learners.

Gardening Graphs: Student Data Sheet

See-Think-Wonder

What do you **SEE**?	
What do you **THINK**?	
What do you **WONDER**?	

Pictograph Data

Tomatoes	Carrots	Green Beans	Cabbage	Corn

Bar Graph Data

Title: _____

Tomatoes	Carrots	Green Beans	Cabbage	Corn

Discussion Questions

1. What plant do we have the most of in our garden? _____

2. What plant do we have the least of in our garden? _____

3. How many more carrots do you have than cabbages? _____

4. Write an equation to show how many more green beans there are than tomatoes.

   _____

5. How many total plants are in our garden? _____

6. What else do you wonder about the data? _____