

Choose and Defend Your Graph

GRADE 5

MATHEMATICS

D1.3

B2.4

Choosing a graph is an argument, not a preference: the right one makes the story in the data easy to see, and the wrong one hides it. A graph can also mislead without a single wrong number, which is what Part B question 3 is about.

Three Weeks of Class Earnings

Week	Earned	Spent
Week 1	\$2,450	\$1,180
Week 2	\$3,120	\$2,640
Week 3	\$2,875	\$1,905

Source: the classroom transaction history

PART A: DATA TO GRAPH

Match each set of data to the graph that shows it best.

1. Spending and saving as the two parts of each week's earnings

2. One student's balance measured every Friday for a term

3. How many students hold each classroom job

4. One week's spending split across four categories

5. The exact amounts behind every bar, kept for the record

- A Stacked-bar graph
- B Bar graph
- C Broken-line graph
- D Data table
- E Circle graph

PART B: CHECK THE NUMBERS

6. In a stacked-bar graph of the Three Weeks table, each bar is one week's earnings split into spending and savings. How tall is each bar, and how big is each savings part?

SHOW YOUR WORK

Answer: _____

7. Which week saved the most, and how much more did it save than the week that saved least?

SHOW YOUR WORK

Answer: _____

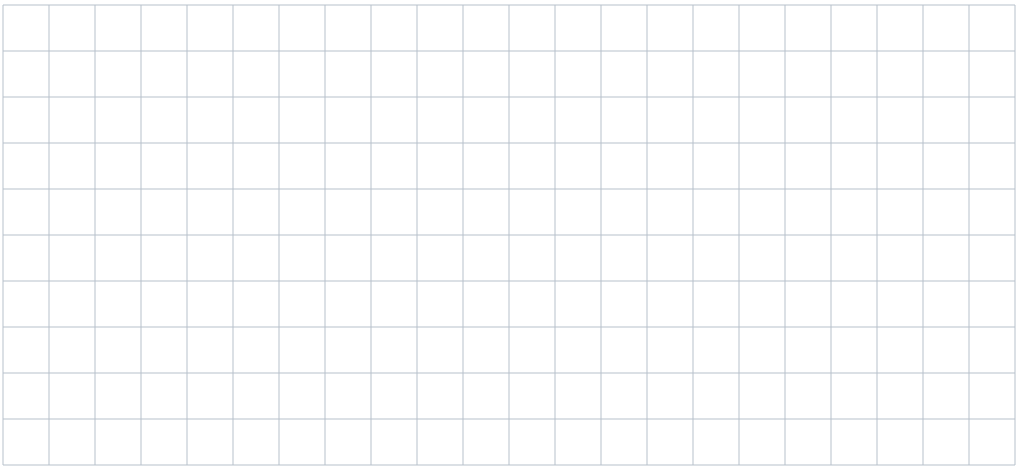
PART C: WHEN NOT TO STACK

8. A stacked-bar graph is the wrong choice when:
- (A) the two amounts are not parts of one whole
 - (B) the numbers are large
 - (C) there are more than three bars
9. A graph names its source because:
- (A) a reader needs to know where the numbers came from before trusting them
 - (B) it makes the graph look longer
 - (C) every graph is required by law to have one

PART D: DESIGN ONE COMPLETELY

10. Choose one dataset from Part A and design its graph in full: the type, the title, every label a reader needs (both axes if it has axes), the scale if it uses one, the legend if it needs one, and the source. Then say in one sentence why another graph type would tell the story less well.

11. Sketch the graph you designed on this grid, with every part you named. A circle graph can be sketched freehand over the squares.



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ANSWER KEY

1. A) Stacked-bar graph
2. C) Broken-line graph
3. B) Bar graph
4. E) Circle graph
5. D) Data table
6. The bars are \$2,450, \$3,120 and \$2,875 tall, and the savings parts are \$1,270, \$480 and \$970.
7. Week 1 saved the most at \$1,270, which is \$790 more than Week 2's \$480.
8. A) the two amounts are not parts of one whole
9. A) a reader needs to know where the numbers came from before trusting them
10. Answers will vary and must name the type, the title, the labels and the source, plus a scale for any graph that has axes and a legend for any graph with more than one kind of bar or slice. A circle graph or a table is a legitimate choice for the datasets that suit one, and then the labels are the category names and shares rather than axis labels and no scale is needed, which the student should say rather than leave blank. Example, for spending and saving by week: a stacked-bar graph titled "Where Each Week's Earnings Went", weeks along the bottom, dollars up the side in steps of \$500 to \$3,500, a legend naming spending and savings, sourced from the classroom transaction history. A multiple-bar graph of spending and savings would show both parts but hide the earnings they add up to, which is exactly what stacking makes visible.
11. The sketch should match the design above: the type named, the title, the labels, the scale and legend where they apply, and the source.

TEACHER NOTES

Extension beyond the grade-level expectation: Part B question 3 asks students to reason about a truncated axis, a graph that misleads with entirely correct numbers, and Part D requires every display element at once rather than one at a time. The Part A pairs are deliberately close together, so a student must think about parts-versus-whole and change-over-time rather than pattern-match. A stacked bar's parts must make a whole, which is why Part B stacks spending and savings to make earnings rather than piling spending on top of earnings.