Same Data, New Look

Compare two bar graphs made from the same counts.

4.DS.A.1.c "Compare and contrast different data visualizations of the same data by varying attributes (e.g., reordering bars, changing the scale) and explain how changing the attributes affects the interpretation."

NAME _____ DATE _____

SCALE CHANGES

The numbered scale changes, but the data and bar order stay the same. If both graphs are the same size, the gaps between bars can look larger or smaller.

Sand castles: Mia 5, Leo 10. Graph A goes from 0 to 30; Graph B goes from 0 to 15. Both put Mia first.

ORDER CHANGES

The bars switch places, but the data and numbered scale stay the same. A different bar comes first, while the gaps keep the same size.

Toy cars: yellow 2, purple 7. Both graphs go from 0 to 14. Graph A puts yellow first; Graph B puts purple first.

1 SORT

8 items

Imagine each pair of graphs is the same size, circle SCALE or ORDER for each item, then choose two items and explain how you knew.

1. Apples: red 4, green 8. A: 0 to 16, red first. B: 0 to 8, red first. SCALE ORDER

2. Birds: sparrows 6, robins 9. A: 0 to 12, sparrows first. B: 0 to 18, sparrows first. SCALE ORDER

3. Stickers: stars 3, hearts 6. A: 0 to 9, stars first. B: 0 to 9, hearts first. SCALE ORDER

4. Lunches: pizza 10, soup 5. A: 0 to 20, pizza first. B: 0 to 20, soup first. SCALE ORDER

5. Plants: beans 7, peas 14. A: 0 to 28, beans first. B: 0 to 14, beans first. SCALE ORDER

6. Baskets: pears 2, plums 6. A: 0 to 12, pears first. B: 0 to 12, plums first. SCALE ORDER

7. Rainy days: Monday 4, Tuesday 6. A: 0 to 8, Monday first. B: 0 to 16, Monday first. SCALE ORDER

8. Games won: red team 3, blue team 9. A: 0 to 18, red first. B: 0 to 9, red first. SCALE ORDER

2 PROVE IT

Explain your thinking

Pick two items from Part 1. For each one, tell how you knew where it belonged.

ITEM # _____ **HOW I KNEW** _____

ITEM # _____ **HOW I KNEW** _____

3 MAKE YOUR OWN

One of each

Write one new pair of graph plans that belongs in SCALE and one that belongs in ORDER; give both graphs the same data.

SCALE _____

ORDER _____

CHALLENGE

Two same-size graphs show 5 muffins and 10 cookies. Graph A goes from 0 to 20 and puts muffins first. Graph B goes from 0 to 10 and puts cookies first. Which graph makes the gap look larger, and what does switching the order change?

ANSWER KEY # Same Data, New Look

GRADE 4 · 4.DS.A.1.c

PART 1 · SORT

#	ITEM	CATEGORY	WHY
1	Apples: red 4, green 8. A: 0 to 16, red first. B: 0 to 8, red first.	**SCALE**	The scale changes from 0 to 16 to 0 to 8; the order stays the same.
2	Birds: sparrows 6, robins 9. A: 0 to 12, sparrows first. B: 0 to 18, sparrows first.	**SCALE**	The scale changes from 0 to 12 to 0 to 18; the order stays the same.
3	Stickers: stars 3, hearts 6. A: 0 to 9, stars first. B: 0 to 9, hearts first.	**ORDER**	The bars switch places, while both scales go from 0 to 9.
4	Lunches: pizza 10, soup 5. A: 0 to 20, pizza first. B: 0 to 20, soup first.	**ORDER**	The bars switch places, while both scales go from 0 to 20.
5	Plants: beans 7, peas 14. A: 0 to 28, beans first. B: 0 to 14, beans first.	**SCALE**	The scale changes from 0 to 28 to 0 to 14; the order stays the same.
6	Baskets: pears 2, plums 6. A: 0 to 12, pears first. B: 0 to 12, plums first.	**ORDER**	The bars switch places, while both scales go from 0 to 12.
7	Rainy days: Monday 4, Tuesday 6. A: 0 to 8, Monday first. B: 0 to 16, Monday first.	**SCALE**	The scale changes from 0 to 8 to 0 to 16; the order stays the same.
8	Games won: red team 3, blue team 9. A: 0 to 18, red first. B: 0 to 9, red first.	**SCALE**	The scale changes from 0 to 18 to 0 to 9; the order stays the same.

PART 2 · PROVE IT

Accept any explanation that names the deciding feature from the rule box for the chosen item.

PART 3 · MAKE YOUR OWN (SAMPLE ANSWERS)

- **SCALE**: Shells: Uma 3, Kai 9. A: 0 to 18, Uma first. B: 0 to 9, Uma first.
- **ORDER**: Crayons: black 4, pink 11. A: 0 to 12, black first. B: 0 to 12, pink first.

Challenge: Graph B makes the gap look larger because its scale ends at 10. Switching the order changes which bar comes first, not the counts.

For Part 2, accept two explanations that name the changed feature and state what stayed the same. All paired graph plans use identical data and start their scales at zero.