

Choose, Create, and Check Graphs

Turn survey data into useful, honest displays.

GRADE 7 • MA.7.DP.1.5

MA.7.DP.1.5 "Excerpt: Given a real-world numerical or categorical data set, choose and create an appropriate graphical representation."

NAME _____

DATE _____

Start with the data and the question

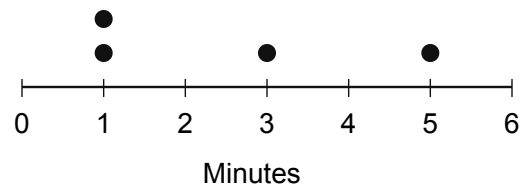
Bar graphs compare category counts. Dot plots preserve individual numerical observations. Histograms group numerical values into equal-width intervals. Choose a display that makes the question answerable.

Worked example

Plot the waits 1, 1, 3, 5 minutes.

Stack two dots at 1. Place one each at 3 and 5. Four separate dots preserve all four observations.

Practice waits



Key: one dot = one wait

Simulated school-fair data. Use a pencil and ruler. Choose a display, build it, then check what it communicates.

1. Choose displays for two questions

The activity survey below asks which named option each student prefers. A separate survey records game wait times in minutes. Choose a bar graph or a dot plot for each survey and explain how its data type supports your choice.

One activity choice per student

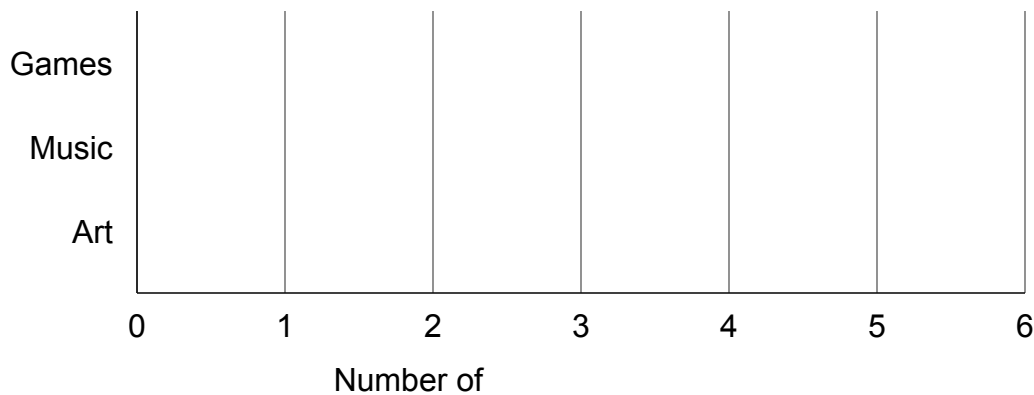
Activity	Students
Games	5
Music	4
Art	3

2. Build the categorical display

Use the activity counts to create your bar graph. Add a title and finish the number-axis label. Start every bar at zero; keep space between the named categories.

Graph title: _____

Choice

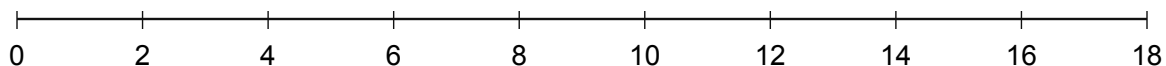
**3. Build the numerical display**

Use all 12 game waits below to create your dot plot. Add a title, axis label and dot key. Stack repeated observations rather than putting them on top of each other.

Recorded waits in minutes

Waits 1-4	Waits 5-8	Waits 9-12
2	6	10
4	6	10
4	8	12
6	8	16

Plot title: _____



Horizontal axis: _____

Key: one dot = _____

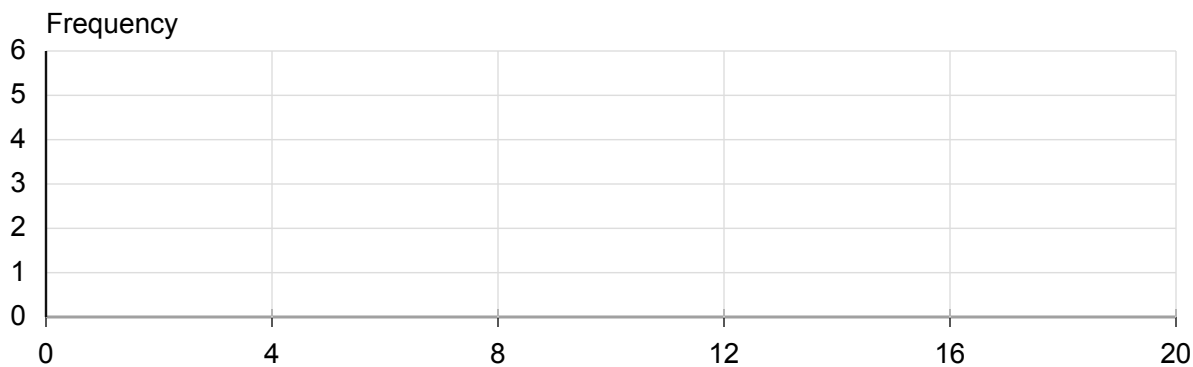
4. Use the displays to answer questions

How many students answered the activity survey? How many more chose Games than Art? Use your dot plot to find the most frequent wait and how many observations have that wait. Explain how each graph makes its comparison visible.

5. Create a grouped view

Explain why a histogram is more direct than a dot plot for reporting counts in four-minute wait intervals. Construct that histogram below, with a title and axis label. Intervals include their left endpoint and exclude their right endpoint.

Plot title: _____



Intervals include the left endpoint and exclude the right endpoint.

6. Match the graph to the question

A teacher asks exactly how many waits were 6 minutes. Another asks how many waits were less than 8 minutes. Which of your numerical graphs directly answers each question? Give both answers and explain what the grouped display cannot recover.

7. Check a misleading claim

An organizer says, "There are only seven waits because the dot plot has seven occupied positions." Correct the claim using your graph. Then explain why a bar graph whose bars start at 2 students would distort the activity-count comparison.

TEACHER NOTES

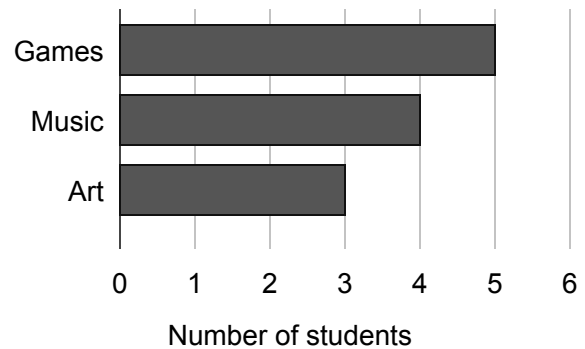
These are guided constructions after an initial graph-choice explanation. Accept equivalent clear titles and units. Every repeated observation needs its own dot; histogram bars touch and category bars have gaps. Other appropriate displays can be discussed, but each requested construction must be complete.

TASK 1

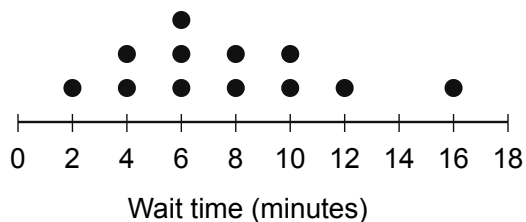
Activity preferences are named categories, so choose a bar graph to compare their counts. Wait times are numerical, so a dot plot shows their ordered values and repeated observations.

TASK 2

Bars extend from zero to Games 5, Music 4 and Art 3. Title: Preferred fair activities. Number axis: Number of students. Leave gaps between categories.

Preferred fair activities**TASK 3**

Dot frequencies: 2(1), 4(2), 6(3), 8(2), 10(2), 12(1), 16(1). All 12 observations are shown. Title: School-fair game waits; axis: Wait time (minutes); one dot = one wait.

School-fair game waits

Key: one dot = one wait

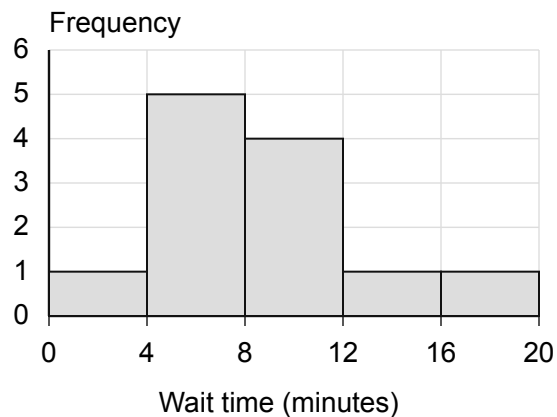
TASK 4

12 students: $5 + 4 + 3$. Games exceeds Art by $5 - 3 = 2$ students. The most frequent wait is 6 minutes, with three observations. Bar lengths compare category counts; stacked dots show how often a numerical value occurs.

TASK 5

Choose a histogram because equal-width intervals group numerical waits and show interval frequencies. For $[0,4)$, $[4,8)$, $[8,12)$, $[12,16)$, $[16,20)$, frequencies are 1, 5, 4, 1, 1. Bars meet at interval boundaries. Use equal-width intervals and count all observations.

Grouped school-fair waits



Intervals include the left endpoint and exclude the right endpoint.

TASK 6

The dot plot directly shows three waits at 6 minutes. The histogram directly groups $1 + 5 = 6$ waits below 8 minutes; counting dots also gives 6. The histogram alone cannot recover the exact count at 6 because its $[4,8)$ interval combines several possible values. State the numerical answer and what each display preserves.

TASK 7

There are 12 waits, not seven. Seven occupied values can contain repeated observations, so count every stacked dot. Starting category bars at 2 would display lengths 3, 2, 1 instead of counts 5, 4, 3, exaggerating relative differences; count bars should start at zero.