

Statistics and Probability

Tell the story of numerical data



Grade 6 • NC.6.SP.5

Teacher guide, models and student practice

Seven instructional sections • 30 multiple-choice items • 30 open/performance tasks •
Worked keys and evidence records

A reusable, multi-session resource bank. Select a few items for a lesson; do not assign all 60 in one sitting. All classroom-object data are synthetic unless learners collect their own safe object measurements.

Aligned to current NC standards for 2026-27 and 2027-28. The newly adopted 2026 standards begin in 2028-29 and are not substituted here.

Free sample | Contents

NC.6.SP.5 | Sixth Grade mathematics

This sample contains 12 complete selected pages from the 78-page resource, plus this sample contents page. Original printed page numbers are retained. Gaps are intentional.

Included original pages: 1-8, 10-11, 61, 68

Representative activities

M01: sample PDF page(s) 9; original page(s) 8

M02: sample PDF page(s) 9; original page(s) 8

O01: sample PDF page(s) 10; original page(s) 10

O02: sample PDF page(s) 11; original page(s) 11

Selected teacher prompts and keys: original page(s) 61, 68

Using this sample

Read the preparation and access guidance before using a selected activity.

Keep teacher keys and private preparation pages separate from student copies.

Use the original resource contents to see the scope of the complete packet.

Complete paid download

The complete resource includes the full PDF task bank and teaching materials.

TEACHER GUIDE

Standard and learning targets

NC.6.SP.5 Summarize numerical data sets in relation to their context.

a. Describe the collected data by:

Reporting the number of observations in dot plots and histograms

Communicating the nature of the attribute under investigation, how it was measured, and the units of measurement.

b. Analyze center and variability by:

Giving quantitative measures of center, describing variability, and any overall pattern, and noting any striking deviations.

Justifying the appropriate choice of measures of center using the shape of the data distribution.

A • I can report observation counts from dot plots and histograms.

B • I can identify the measured attribute, method, and units.

C • I can summarize center, variability, pattern, and striking deviations.

D • I can justify a measure of center using the distribution shape and context.

Essential question: How can our questions, displays and summaries preserve what varies in a collection of observations?

Evidence: individual explanations, accurate records or displays, and supported interpretations. Multiple-choice recognition alone cannot establish collection, construction or reasoning performance.

TEACHER GUIDE

Readiness, materials and access

Prerequisites: count repeated observations; order nonnegative whole numbers and simple decimals; add and divide; read equal-interval number lines. For box plots, establish median before finding medians of halves. Teach these prerequisites when needed; do not turn this packet into a speed test.

Materials: pencil, blank paper, ruler, optional calculator to check arithmetic, and safe classroom paper/cardboard objects. For physical collection, use object IDs rather than names. Adults handle any cutting. No child measurements, health information, identity data or other personal records are needed.

Access: neutral read-aloud, large print, tactile number lines/value cards, AAC, signed, oral, dictated or drawn explanations are valid when they preserve the target. A scribe records the learner's own reasoning. Do not name the correct statistic, sort the data for a median check, or point out a graph answer during independent evidence collection.

Support log: distinguish access tools from answer-supplying prompts. Record a modeled or jointly completed item as instruction, then seek a fresh individual response. If a representation is inaccessible or the learner is unobserved, use N/O rather than an incorrect score.

Vocabulary: observation, attribute, unit, variability, distribution, frequency, center, mean, median, range, cluster, gap, tail, dot plot, histogram, quartile and box plot. Introduce only the words needed for the current target. Home-language explanations are welcome.

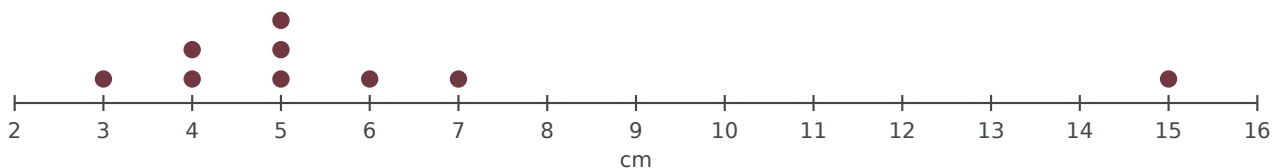
Differentiation: use a smaller new data set for reteaching, retain repetitions, and restore full task scope for a later check. Extend by asking how a changed observation changes a display or summary; do not infer unsupported facts about objects outside the collection.

TEACHER MODEL • NOT A STUDENT ASSESSMENT

Write a report with context

Say: "Our synthetic paper-strip lengths are 3, 4, 4, 5, 5, 5, 6, 7, 15 cm, measured end to end with a ruler to the nearest centimeter. There are nine observations. Total is 54 cm, so mean is 6 cm; the fifth ordered value gives median 5 cm. Range is $15 - 3 = 12$ cm. Most lengths lie from 3 to 7 cm, with one far larger value at 15 cm and a right tail. For a typical strip, I prefer median 5 cm because the high value pulls up the mean. I do not delete 15 merely because it is unusual. I report the deviation and check the measurement."

Worked teaching data



Pause and ask: What does one observation mean? Where can you see evidence for this claim? Invite an alternative explanation, then verify it against every observation.

REUSABLE ANCHOR

Keep the data story intact

Report n and name the objects/trials, attribute, measurement method and unit.

Connect quantitative center and variability to the context; range is one useful spread description.

Describe the overall pattern and striking deviations; do not invent formal outlier cutoffs.

Use shape and purpose to justify a center. Median resists an extreme tail; mean can summarize balanced data. With two clusters, one center can hide a gap.

Blank reasoning organizer

Question / objects / attribute / method / units

Evidence from the data or display

Claim, justification and one limitation

TEACHER GUIDE

Select a core across sessions

Suggested pacing: Session 1 (35 minutes): warm-up, model, guided work. Session 2 (30 minutes): collaborative and independent practice. Session 3 or conferences (15+ minutes): reteach, exit and unfinished performance evidence. Collection and two-display tasks may need an additional 15-25 minutes. Timing is instructional guidance, never a scoring cutoff.

Warm-up: M01-M04 and O01-O04. Begin with M01 and O01; use remaining items for later practice or conferences.

I Do: M05-M08 and O05-O08. Begin with M05 and O05; use remaining items for later practice or conferences.

We Do: M09-M13 and O09-O13. Begin with M09 and O09; use remaining items for later practice or conferences.

Collaborative practice: M14-M18 and O14-O18. Begin with M14 and O14; use remaining items for later practice or conferences.

Independent practice: M19-M23 and O19-O23. Begin with M19 and O19; use remaining items for later practice or conferences.

Small-group reteach: M24-M27 and O24-O27. Begin with M24 and O24; use remaining items for later practice or conferences.

Exit ticket: M28-M30 and O28-O30. Begin with M28 and O28; use remaining items for later practice or conferences.

Observe these dimensions separately

Question/plan or representation • computation and accuracy • contextual reasoning. Score each dimension: 3 = accurate and justified independently; 2 = mostly sound with a limited error or incomplete justification; 1 = partial relevant evidence with substantial gaps; 0 = observed, interpretable incorrect performance; N/O = not observed, inaccessible or insufficient evidence. These are instructional descriptions, not official mastery cutoffs.

Do not score handwriting, accent or spelling unless meaning is lost. Never combine an N/O with zero. Record which task and support produced the evidence.

TEACHER MOVES • WARM-UP

Warm-up: choose, observe, respond

Selected core: M01 and O01; bank M01-M04, O01-O04. Suggested 8 minutes.

Focus: Report observation counts from dot plots and histograms.

0-2: Ask learners to read the question and name what counts as one observation. 2-5: Use the selected M item as a low-stakes probe. 5-8: Ask for a brief individual start on the selected O item; collect the reasoning, not just the answer.

Say: "What would we need to observe? Which values or features matter to this question?"

Listen/look for: Frequencies [1, 6, 0, 1, 1] sum to 9. Observed values fall in occupied intervals from 12 to less than 27. Describe the visible frequencies, not invented within-bin positions. These bars show a concentration in lower intervals and a tail to higher intervals. Grouping hides exact values, so many raw data sets can produce these bars with different exact means/medians.

If evidence is missing: If a histogram is used to invent exact values, contrast grouped information with raw data. If an extreme value is dropped without evidence, preserve it and discuss its effect. Require units and a shape-based reason for a chosen center.

Neutral prompt: "Show where that comes from in your record." Access: read words without pointing to a correct value. Extension: alter one observation or one question condition and defend what changes. Record the learner's actual response, support and next step.

WARM-UP • STUDENT CHOICE PRACTICE

Read, choose, then justify

M01 • Target C

Synthetic mass data for empty supply boxes (g): 12, 13, 13, 13, 14, 14, 15, 19, 22. Which number describes the overall spread as a range?

- A. 9
- B. 11
- C. 12
- D. 10

Evidence / quick check: _____

M02 • Target C

Synthetic number of cards data for card stacks (cards): 15, 16, 17, 18, 19, 20, 21. What is the median?

- A. 19
- B. 17
- C. 20
- D. 18

Evidence / quick check: _____

Target A • Report observation counts from dot plots and histograms.

Length (cm)	Count
12-15	1
15-18	6
21-24	1
24-27	1

[illegible]

WARM-UP • STUDENT PERFORMANCE

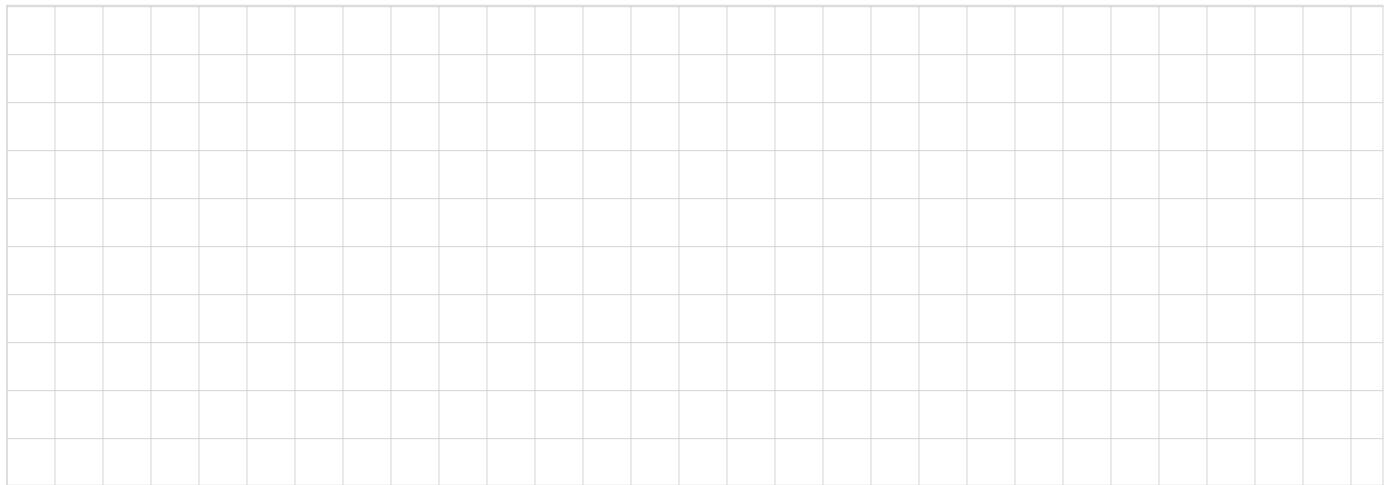
002 • Make your thinking visible

Target D • Justify a measure of center using the distribution shape and context.

Synthetic number of pencils data for supply trays (pencils): 8, 11, 12, 13, 13, 14, 14, 14, 15. The method was: count the pencils in each tray. Write a short statistical report with n, attribute, method, units, mean, median, range, shape and any striking deviation. Choose a useful center for a typical object and justify it from the shape. Do not automatically label an unusual value an error.

Data record / plan / calculations (use object IDs and units)

Plotting / model workspace: label your own axes, scale and units



Explanation / answer in context

TEACHER-ONLY WORKED KEY

Check reasoning, not just answers

M01 • Answer D: 10

Range = $22 - 12 = 10$ g.

M02 • Answer D: 18

$n = 7$; total = 126; mean = $126 \div 7 = 18$; median = 18; range = $21 - 15 = 6$. Median is based on ordered middle positions.

M03 • Answer D: 10

$n = 9$; total = 99; mean = $99 \div 9 = 11$; median = 10; range = $18 - 8 = 10$. Median is based on ordered middle positions.

M04 • Answer C: 13

$n = 9$; total = 117; mean = $117 \div 9 = 13$; median = 13; range = $15 - 11 = 4$. Median is based on ordered middle positions.

TEACHER-ONLY WORKED KEY

Check reasoning, not just answers

M29 • Answer B: Median, because the long tail pulls the mean toward the extreme values.

The asymmetrical tail affects the mean more than the median. $n = 9$; total = 117; mean = $117 \div 9 = 13$; median = 12; range = $20 - 10 = 10$.

M30 • Answer B: 6

Range = $13 - 7 = 6$ g.

O01 • Sample response / required evidence

Frequencies [1, 6, 0, 1, 1] sum to 9. Observed values fall in occupied intervals from 12 to less than 27. Describe the visible frequencies, not invented within-bin positions. These bars show a concentration in lower intervals and a tail to higher intervals. Grouping hides exact values, so many raw data sets can produce these bars with different exact means/medians.

O02 • Sample response / required evidence

$n = 9$; total = 114; mean = $114 \div 9 \approx 12.667$; median = 13; range = $15 - 8 = 7$.

Attribute/method/units: number of pencils; count the pencils in each tray; pencils. Shape: left-skewed, with a tail toward smaller values. The low endpoint 8 is separated from the next value 11; median is a useful typical center because the low tail pulls the mean down. An unusual observation can be genuine; verify before excluding it.