DraftKids
Learn through sports

PRINTABLE · GRADES 6-8 · AGES 11–14

Box Score Box Plots

A box score lists every player's stats from one game. Add up a season of box scores and you get a data set, and a box plot shows that whole set in one picture. Use the made-up Harbor City Herons' points in 11 high school games for problems 1–8.

Name _____

Date _____

BOX PLOT TOOLKIT

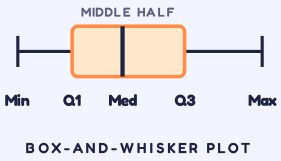
Min & Max
smallest and largest value

Median
middle value of the ordered data

Q1 & Q3
medians of the lower and upper halves

IQR
Q3 − Q1
spread of middle half

Outlier
below Q1 − 1.5 × IQR
or above Q3 + 1.5 × IQR



BOX-AND-WHISKER PLOT

Harbor City Herons · POINTS SCORED · 11 GAMES	GAME 1	GAME 2	GAME 3	GAME 4	GAME 5	GAME 6	GAME 7	GAME 8	GAME 9	GAME 10	GAME 11
	63	48	70	57	91	61	52	66	55	64	58

ROOKIE

1 Write the **11** scores in order from least to greatest. What are the **minimum** and the **maximum**?

WORK SPACE

min _____ max _____

ROOKIE

2 What is the **range** of the Herons' scores?

WORK SPACE

_____ points

STARTER

3 What is the **median** score? Circle it in your ordered list.

WORK SPACE

_____ points

STARTER

4 Find **Q1**, the median of the **lower half**. Leave the median out of both halves.

WORK SPACE

Q1 = _____

PRO

5 Find **Q3**, the median of the **upper half**.

WORK SPACE

Q3 = _____

PRO

6 What is the **interquartile range** (IQR)? It tells how spread out the middle half of the games is.

WORK SPACE

IQR = _____

ALL-STAR

7 Use the outlier rule from the toolkit. Find both fences. Which score, if any, is an **outlier**?

WORK SPACE

_____

CHALLENGE ★

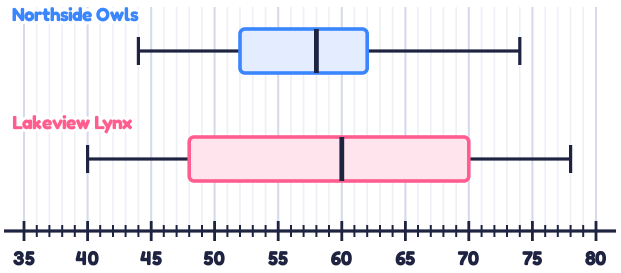
8 Challenge: In game 12 the Herons score **59** points. Now there are 12 scores. What is the **new median**?

WORK SPACE

_____ points

A Compare Two Box Plots

Two made-up teams each played 15 games. Each box plot shows points scored. Read the five numbers from the plot.



Each gridline is 1 point. Thick line inside the box = median.

1. Which team has the **greater median**? By how many points?

   _____ **by** _____ **points**

2. Find the **IQR** of each team.

   Owls _____ **Lynx** _____

3. Which team scores more **consistently** from game to game? Use the IQR to explain.

   _____

4. About what **fraction** of their games did the Lynx score **70 or more** points?

   _____

B Build a Box Plot

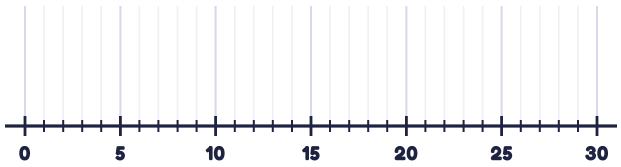
Guard Tess Okafor (made up) scored these points in 10 games. With 10 scores, the median is the mean of the 5th and 6th values.

Tess Okafor · POINTS · 10 GAMES	GAME 1	GAME 2	GAME 3	GAME 4	GAME 5	GAME 6	GAME 7	GAME 8	GAME 9	GAME 10
	15	9	20	6	13	24	10	18	12	16

1. Find the five-number summary.

MIN	Q1	MEDIAN	Q3	MAX

2. Draw Tess's box plot above the number line.



3. IQR = _____

4. Find the fences. Are there any outliers? _____

C One Huge Night

Bench player Ray Lin (made up) usually scores a few points. Then one night he scored 30. See what one outlier does.

Ray Lin · POINTS · 8 GAMES	GAME 1	GAME 2	GAME 3	GAME 4	GAME 5	GAME 6	GAME 7	GAME 8
	5	9	4	6	30	7	5	6

1. Find the **mean** of all 8 games.

   WORK SPACE

   _____ **points**

2. Find the mean **without** the 30-point game.

   WORK SPACE

   _____ **points**

3. Find the **median** with and without the 30-point game.

   WORK SPACE

   with _____ **without** _____

4. Which measure better describes a typical game for Ray: mean or median? Why?

   WORK SPACE

   _____

Answer Key (for teachers & parents)

Answers for **Box Score Box Plots**, with the work shown. Print pages 1 and 2 for students and keep this page for checking. Quartiles use the method on the sheet: Q1 and Q3 are the medians of the lower and upper halves, leaving the median out when the count is odd. Some calculators use other methods and may give slightly different quartiles. Teams and players are made up.

Page 1 Problems

1. **Answer: min 48, max 91**
   Ordered: 48, 52, 55, 57, 58, 61, 63, 64, 66, 70, 91
2. **Answer: 43 points**
   91 – 48 = 43
3. **Answer: 61 points**
   the 6th of 11 ordered scores
4. **Answer: Q1 = 55**
   lower half 48, 52, 55, 57, 58; middle is 55
5. **Answer: Q3 = 66**
   upper half 63, 64, 66, 70, 91; middle is 66
6. **Answer: IQR = 11**
   66 – 55 = 11
7. **Answer: 91**
   1.5 × 11 = 16.5; fences 55 – 16.5 = 38.5 and 66 + 16.5 = 82.5; only 91 is past a fence
8. **Answer: 60 points**
   12 scores: the 6th and 7th are 59 and 61; (59 + 61) ÷ 2 = 60

A · Compare Two Box Plots

1. **Answer: Lynx, by 2 points**
   Lynx median 60, Owls median 58; 60 – 58 = 2
2. **Answer: Owls 10, Lynx 22**
   Owls 62 – 52 = 10; Lynx 70 – 48 = 22
3. **Answer: Owls**
   their middle half spans only 10 points, so their scores are closer together
4. **Answer: about 1/4 (25%)**
   70 is the Lynx Q3; about one-fourth of the data is at or above Q3

B · Build a Box Plot

1. **Answer: 6, 10, 14, 18, 24**
   Ordered: 6, 9, 10, 12, 13, 15, 16, 18, 20, 24; median (13 + 15) ÷ 2 = 14; Q1 is the middle of 6, 9, 10, 12, 13; Q3 is the middle of 15, 16, 18, 20, 24
2. **Answer: box from 10 to 18**
   median line at 14, whiskers out to 6 and 24 (2 points)
3. **Answer: IQR = 8**
   18 – 10 = 8
4. **Answer: No outliers**
   1.5 × 8 = 12; fences 10 – 12 = –2 and 18 + 12 = 30; every score is between them

Quick score

Page 1 problems	_____ / 8
A · Compare (A2 = 2)	_____ / 5
B · Build (5 boxes + plot 2 + 2)	_____ / 9
C · One Huge Night	_____ / 4
Total	**_____ / 26**

Skills practiced

Five-number summary · Quartiles & IQR · Box plots · Outliers (1.5 × IQR) · Comparing data sets · Mean vs. median

Teaching tip: Have students line up by a number (like birthday day of the month), then split the line in half and in half again. The people standing at the splits are Q1, the median and Q3. Statistician John Tukey introduced the box plot in the 1970s.

C · One Huge Night

1. **Answer: 9 points**
   5 + 9 + 4 + 6 + 30 + 7 + 5 + 6 = 72; 72 ÷ 8 = 9
2. **Answer: 6 points**
   72 – 30 = 42; 42 ÷ 7 = 6
3. **Answer: 6 and 6**
   with: 4, 5, 5, 6, 6, 7, 9, 30, middle two are 6 and 6; without: 4, 5, 5, 6, 6, 7, 9, middle is 6
4. **Answer: Median**
   the 30 pulls the mean up by 3 points, but the median does not move; Ray scores about 6 in a typical game

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