Measures help us describe people, places, objects, and events with numbers.

Length describes how long something is. ***Distance*** describes how far things are apart. Length and distance can be measured using a ruler or a tape measure.

Weight describes how heavy something is. Weight can be measured using a scale.

Volume describes how much space something takes up. Volume can be measured using a measuring cup or a graduated cylinder.

Temperature describes how hot something is. Temperature can be measured using a thermometer.

Price tells us how much something costs.

Time describes how long something takes to happen. Time can be measured using a clock or a stopwatch.

PRACTICE | Connect each item on the left with ***all*** of the measures on the right that are useful for describing the item.

1. A kite string
2. A refrigerator
3. A footrace
4. A swimming pool
5. A movie

Length

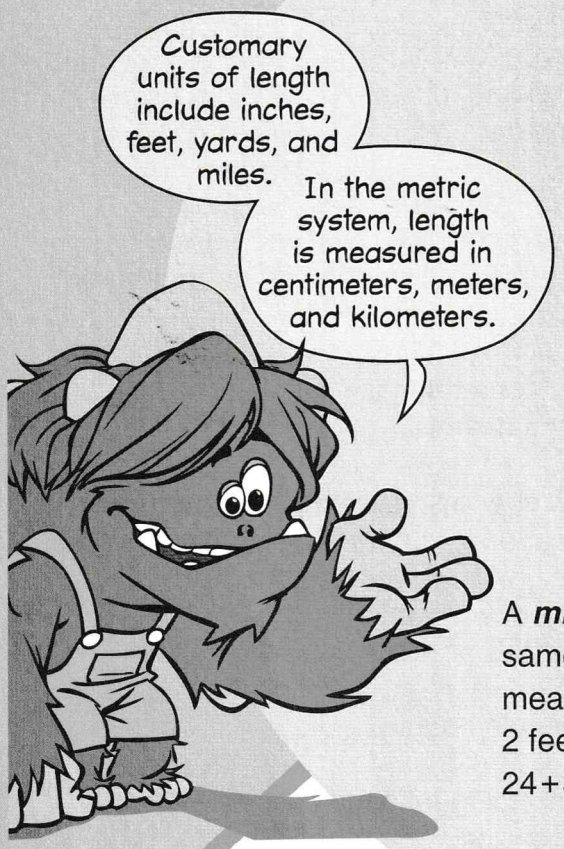
Weight

Volume

Temperature

Price

Time



Units of Length and Distance

Abbreviations for each unit are in parentheses.

Customary Unit	**Conversion**
inch (in)	
foot (ft)	1 ft = 12 in
yard (yd)	1 yd = 3 ft
mile (mi)	1 mi = 1,760 yd = 5,280 ft

Metric Unit	**Conversion**
centimeter (cm)	
meter (m)	1 m = 100 cm
kilometer (km)	1 km = 1,000 m

A ***mixed measure*** includes two different units from the same system. For example, 2 feet 3 inches is a mixed measure. Since 2 feet equals $2 \times 12 = 24$ inches, 2 feet 3 inches means the same thing as $24 + 3 = 27$ inches.

PRACTICE Use the information above to help you solve each problem below.

6. Barry is 7 feet 3 inches tall. What is Barry's height in inches? **6.** _____

7. How many centimeters are there in three and a half meters? **7.** _____

8. Lizzie cuts a five-foot rope into three equal pieces. How many inches long is each piece of rope? **8.** _____

9. The perimeter of a square is one meter. What is the length in centimeters of one side of the square? **9.** _____

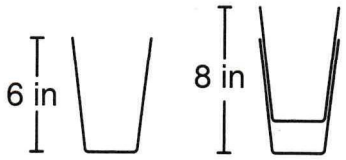
PRACTICE Use the information on the previous page to help you solve each problem below.

10. Three laps around a fitness track equals a length of one mile. What is the length in feet of one lap around the fitness track? **10.** _____

11. ★ If seven blocks can be stacked to a height of 40 centimeters, how many blocks will it take to make a stack that is 2 meters tall? **11.** _____

12. ★ The width of a rectangle is double its height. Its perimeter is 54 inches. What is its height? **12.** _____

13. ★ Lizzie is stacking cups. Each cup is 6 inches tall. Two stacked cups reach a height of 8 inches. How many cups must Lizzie stack to make a tower that is 3 feet tall? **13.** _____



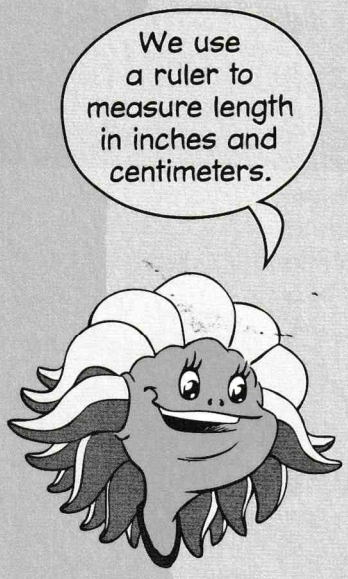
14. ★ Order the following distances from longest to shortest: **14.** _____

1 mi 30 yd 100 ft 1,000 in

_____

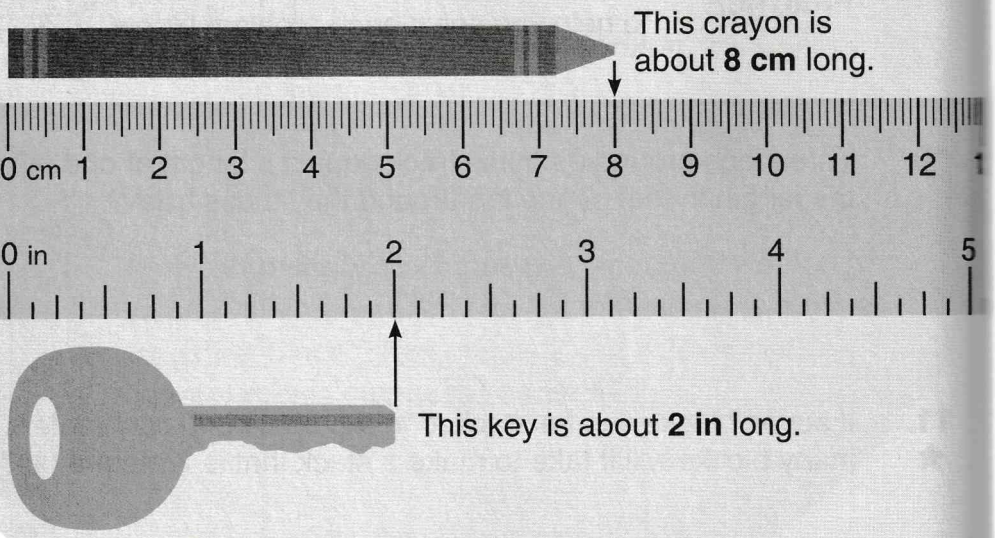
_____

_____



Small objects can be measured with a ***ruler***. Most rulers have measurements on both sides. One side is used for measuring length in ***inches***, and the other is used for measuring length in ***centimeters***.

To measure an object, place the end of the ruler marked with a zero at one end of the object. The length of the object is indicated by the number reached by the other end of the object.



The marks between the numbers on the ruler represent fractions of inches and centimeters. We will discuss these marks in Beast Academy 3D.

PRACTICE | Use the four points below to answer the questions that follow.

15. What is the distance in inches between points B and C? **15.** _____

16. Which two points are 4 inches apart? **16.** _____ and _____

17. Which two points are 5 inches apart? **17.** _____ and _____

18. Which two points are 6 inches apart? **18.** _____ and _____

PRACTICE

Bobby the bacterium has friends **E**d, **F**ran, **G**il, **H**ank, **J**o, and **K**iki. Each lives in a tiny house marked by the first letter of his or her name. Use the six labeled houses below to answer the questions that follow.

19. What is the distance in centimeters from Fran's house to Jo's house? **19.** _____

20. Bobby begins at Ed's house and visits Gil, then Fran, then Hank, then Kiki, then Jo. How many centimeters does Bobby travel? **20.** _____

21. For each distance below, find two houses that are separated by that distance. The first answer is given.

1 cm: J and K 2 cm: ____ and ____ 3 cm: ____ and ____

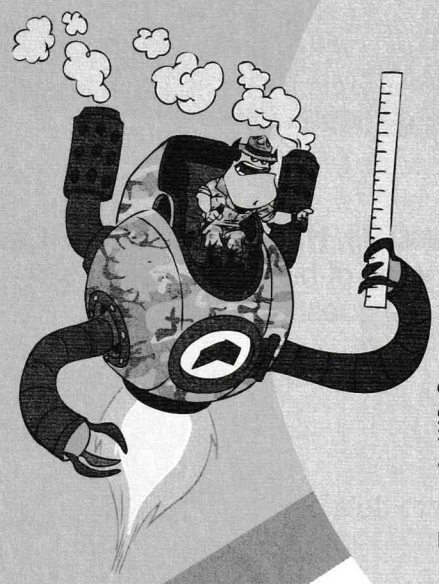
4 cm: ____ and ____ 5 cm: ____ and ____ 6 cm: ____ and ____

7 cm: ____ and ____ 8 cm: ____ and ____ 9 cm: ____ and ____

22. ★ In Problem 21, you found two houses that are separated by each distance from 1 cm to 9 cm. What is the smallest whole number of centimeters for which no two houses are separated by that distance (not including 0 cm)? **22.** _____

23. ★★ If Bobby the bacterium visits Ed, then Fran, then Gil, then Hank, then Jo, then Kiki, he will need to travel 17 cm. List the friends in an order that will require Bobby to travel 62 cm to visit all six friends in that order.

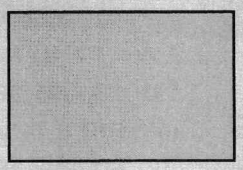
23. ____ ____ ____ ____ ____ ____

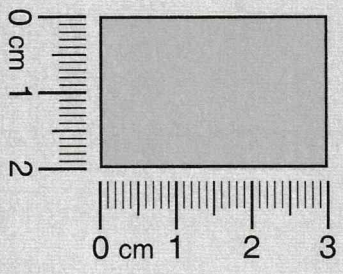


EXAMPLE

We can use a ruler to measure the perimeter of a polygon.

What is the perimeter, in ***centimeters***, of the rectangle below?

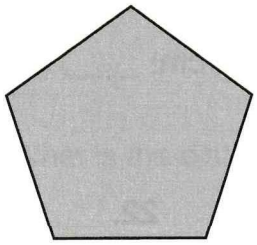




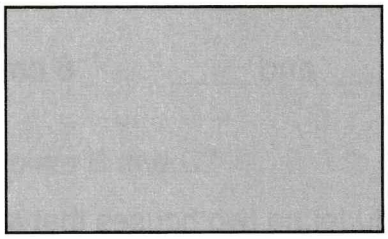
We can use a ruler to measure the height and width of the rectangle. The rectangle is 2 cm tall and 3 cm wide, so its perimeter is $2+3+2+3=$ **10 centimeters**.

PRACTICE | Find the perimeter in ***centimeters*** of each polygon below.

24. Regular Pentagon



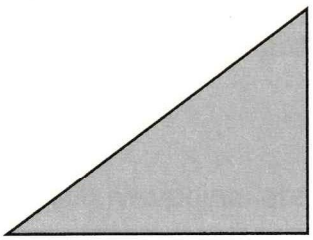
25. Rectangle



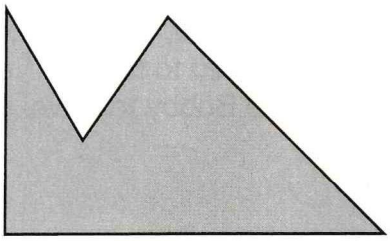
24. _____

25. _____

26. Right Triangle



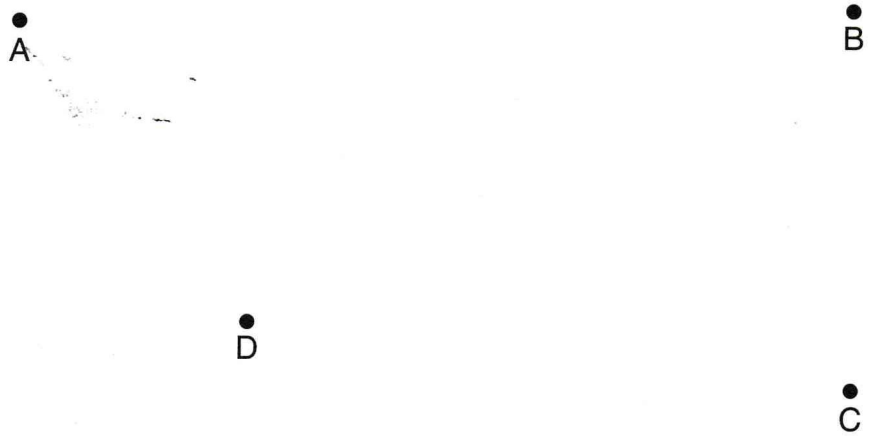
27. Pentagon



26. _____

27. _____

Use points A, B, C, and D below to answer the questions that follow.

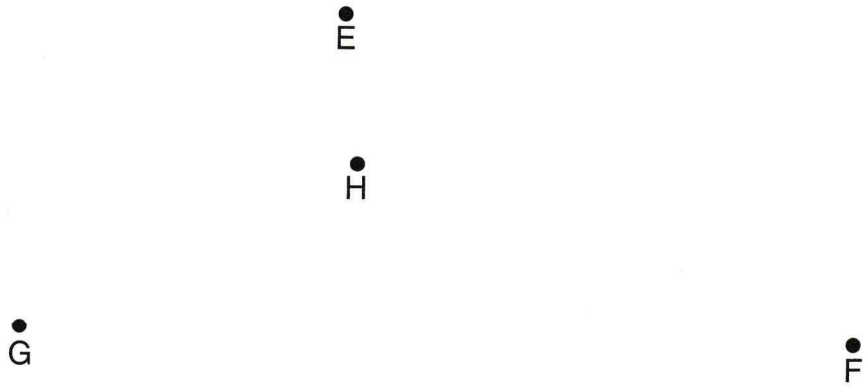


28. What is the perimeter in centimeters of quadrilateral ABCD? **28.** _____

29. What is the perimeter in centimeters of triangle ACD? **29.** _____

30. What is the greatest possible perimeter in centimeters of a triangle formed by connecting three of the points above? **30.** _____

Use points E, F, G, and H below to answer the questions that follow.



31. What is the perimeter in centimeters of quadrilateral EFGH? **31.** _____

32. Which three points can be connected to make a triangle with a perimeter of 13 centimeters? **32.** _____ _____ _____

33. What is the greatest possible perimeter in centimeters of a triangle formed by connecting three of the points above? **33.** _____