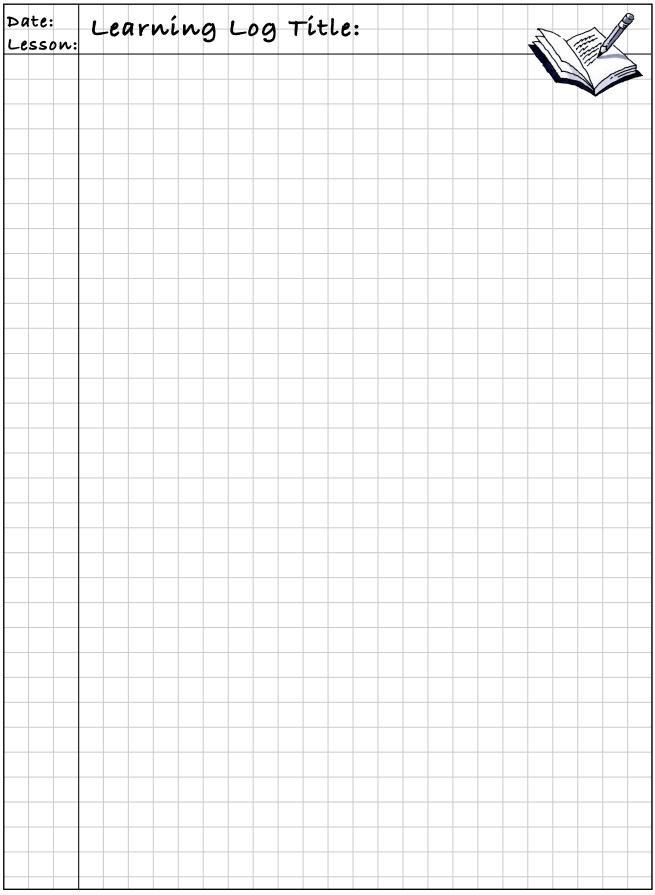
CHAPTER 8: STATISTICS AND ANGLE RELATIONSHIPS

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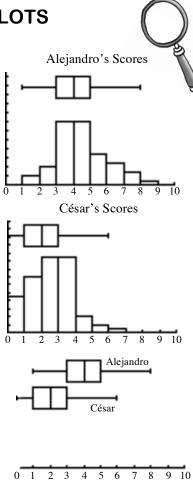
MATH NOTES

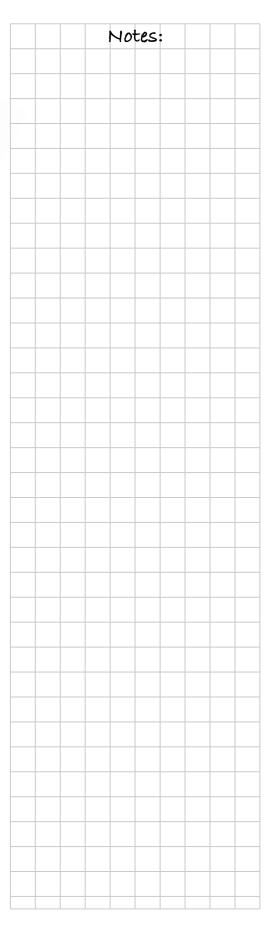
COMPARING BOX PLOTS

One way to visually represent a distribution of collected data is with a **combination histogram and box plot**. The box plot is graphed on the same *x*-axis as the histogram. See Alejandro's scores at right.

To compare two distributions, a second combination histogram and box plot is drawn with the same scale as the first histogram. The two combination plots can then be lined up exactly on top of each other so that differences are readily observable. Compare Alejandro's scores from above to César's scores at right.

Sometimes comparing only the two box plots is enough to be able to compare the distributions. When two box plots are drawn on the same axis, they are called **parallel box plots**. An example is shown at right.





Notes:	TYPES OF SAMPLES FROM A O
	When taking a survey, the population is the group of people about whom the information is to be gathered. For example, if you wanted to conduct a survey about what foods to serve in the cafeteria, the population would be the entire student body. Since it is not usually convenient to survey the total population, different kinds of samples may be used.
	A representative sample is a subgroup of the population that matches the general characteristics of the entire population. If you choose to sample 10% of the students, you would need to include an equivalent fraction of students from each grade and an equivalent ratio of male to female students as the larger population.
	A convenience sample is a subgroup of the population where it is easy to collect data. Only sampling the students in your homeroom, for example, would be convenient, but would not necessarily accurately represent the entire school.
	A cluster sample is a subgroup of the population that contains a common characteristic. Sampling only the eighth graders, in the above example, would be a cluster sample. Again, this sample would not necessarily represent the entire school.
	A voluntary response sample contains only the sample of the population that chose to respond. This also would not necessarily represent the entire population.
	RANDOM SAMPLES
	There are many techniques for taking samples from populations. You are familiar with convenience samples, voluntary response samples, and cluster samples. However, a random sample is the best way to get a sample that is most representative of the population.
	If you were conducting a survey, you might think it would be a good idea to pick some athletes, some band members, and some honor students to represent the school. The problem with intentionally sampling students is that it is too easy to miss an important group of students. By <i>randomly</i> picking students you would get some athletes, some band members, and some honor students. But most importantly, you would also get some students that you forgot about or did not know about, such as, the drama club students.
	A random sample is representative of the whole population. Therefore, you can use random samples to make inferences (predictions) about characteristics of the whole population, without having to measure every single item in the population.

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ANGLES

To understand the meaning of an angle, picture two rays starting at a single point called the **vertex** of the angle, as shown in the diagram at right. (A **ray** is a part of a line that starts at a point and goes on without end in one direction.)



An **angle** is formed by two rays (or line segments) that have the same starting point (or **endpoint**). The **measure** of an angle is how many degrees you rotate your starting ray to get to the ray on the opposite side of an angle. One way to visualize an angle is as a measure of how "open" the gap is between the two rays.

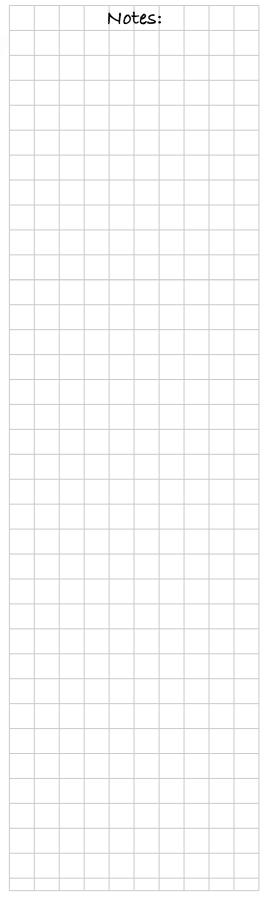
Angles are named by their size in comparison to a right angle. That is, they are named according to whether they are less than, greater than, or equal to a right angle. An **acute angle** measures less than 90°. An **obtuse angle** measures more than 90° and less than 180°. The little box in an angle indicates that it is a **right angle**, which measures 90°). A **straight angle** measures 180° and forms a straight line.

acute angle

right angle

obtuse angle

straight angle



Notes:	ANGLE RELATIONSHIPS
	It is common to identify angles using three letters. For example, $\angle ABC$ means the angle you would find by going from point A, to point B, to point C in the diagram at right. Point B is the vertex of the angle (where the endpoints of the two sides meet) and BA and BC are the rays that define it. A ray is a part of a line that has an endpoint (starting point) and extends infinitely in one direction.
	If two angles have measures that add up to 90°, they are called complementary angles. For example, in the diagram above right, $\angle ABC$ and $\angle CBD$ are complementary because together they form a right angle. G E F
	If two angles have measures that add up to 180°, they are called supplementary angles . For example, in the diagram at right, $\angle EFG$ and $\angle GFH$ are supplementary because together they form a straight angle.
	Two angles do not have to share a vertex to be complementary or supplementary. The first pair of angles at right are supplementary; the second pair of angles are complementary.
	Adjacent angles are angles that have a common vertex, share a common side, and have no interior points in common. So $\angle c$ and $\angle d$ in the diagram at right are adjacent angles, as are $\angle c$ and $\angle f$, $\angle f$ and $\angle g$, and $\angle g$ and $\angle d$. $\int d$
	Vertical angles are the two opposite (that is, non-adjacent) angles formedby two intersecting lines, such as angles $\angle c$ and $\angle g$ in the diagramabove right. $\angle c$ by itself is not a vertical angle, nor is $\angle g$, although $\angle c$ and $\angle g$ together are a pair of vertical angles. Vertical angles always haveequal measure.

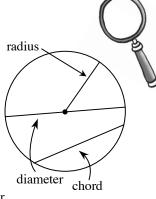
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CIRCLE VOCABULARY

The **radius** of a circle is a line segment from its center to any point on the circle. The term is also used for the length of these segments. More than one radius are called **radii**.

A **chord** of a circle is a line segment joining any two points on a circle.

A **diameter** of a circle is a chord that goes through its center. The term is also used for the length of these chords. The length of a diameter is twice the length of a radius.

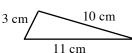


TRIANGLE INEQUALITY

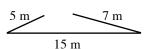
For any three lengths to form a triangle, the sum of the lengths of any two sides must be greater than the length of the third side.

For example, the lengths 3 cm, 10 cm, and 11 cm will form a triangle because

3 + 10 > 11	
3+11>10	
10 + 11 > 3	



The lengths 5 m, 7 m, and 15 m will not form a triangle because 5 + 7 = 12, and $12 \ge 15$.



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