The Soccer Club holds a flavored-popcorn fundraiser each fall. The 23 club members from four teams. The most successful team receives a prize. For Exercises 1-5, use the data in the table below.

Money Collected During Fundraiser (dollars)

<table>
<thead>
<tr>
<th>Team 1</th>
<th>Team 2</th>
<th>Team 3</th>
<th>Team 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>55</td>
<td>56</td>
<td>100</td>
<td>80</td>
</tr>
<tr>
<td>53</td>
<td>53</td>
<td>50</td>
<td>73</td>
</tr>
<tr>
<td>44</td>
<td>50</td>
<td>40</td>
<td>44</td>
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<tr>
<td>44</td>
<td>38</td>
<td>40</td>
<td>38</td>
</tr>
<tr>
<td>39</td>
<td>37</td>
<td>25</td>
<td>35</td>
</tr>
<tr>
<td>35</td>
<td>36</td>
<td>15</td>
<td></td>
</tr>
</tbody>
</table>

1. Find the total amount of money collected by each team. Do the totals help you determine the most successful team? Explain.

2. What is the mean amount of money collected by each team? The median?

3. Do either of these measures of center help you determine the most successful team? Explain.

4. For each team, find the range.

5. Does this measure of spread help you determine the most successful team? Explain.

For Exercises 6 and 7, use the dot plot below. The dot plot shows the amount of sugar per serving in 47 cereals.

6. Describe the shape of the distribution above.
7. Estimate the locations of the mean and the median. How does the shape of the distribution influence your estimates?

Questions 8–11, describe the population, the sampling plan, and sample.

8. A magazine for teenagers asks its readers to write in with information about how they solve personal problems.

   Population: ______________________________________________________________________

   Sampling plan: __________________________________________________________________

   Sample: _______________________________________________________________________

9. An 8th-grade class wants to find out how much time middle-school students spend on the telephone each day. Students in the class keep a record of the amount of time they spend on the phone each day for a week.

   Population: ______________________________________________________________________

   Sampling plan: __________________________________________________________________

   Sample: _______________________________________________________________________

10. Ms. Darnell’s class wants to estimate the number of soft drinks middle-school students drink each day. They obtain a list of students in the school and write each name on a card. They put the cards in a box and select the names of 40 students to survey.

    Population: ______________________________________________________________________

    Sampling plan: __________________________________________________________________

    Sample: _______________________________________________________________________

11. The newspaper below gives information about how adults feel about global warming. The editors of the school paper want to find out how students feel about this issue. They select 26 students for their survey – one whose name begins with A, one whose name begins with B, one whose name begins with C, and so on.

    Population: ______________________________________________________________________

    Sampling plan: __________________________________________________________________

    Sample: _______________________________________________________________________


A middle school has 350 students. One math class decides to investigate how many hours a typical student in the school spent doing homework last week. Several students suggest sampling plans. For Questions 12-15, name the type of sampling plan. Then tell whether you think the sampling plan would give a representative sample.

12. Zak suggests surveying every third student on each homeroom class list.

13. Kwang-Hee suggests putting 320 white beans and 30 red beans in a bag. Each student would draw a bean as he or she enters the auditorium for an assembly. The 30 students who draw red beans will be surveyed.

14. Ushio suggests that each student in the class survey everyone in his or her English class.

15. Kirby suggests putting surveys on a table at lunch and asking students to return completed questionnaires at the end of the day.

16. A radio host asked her listeners to call in to express their opinion about a local election. What kind of sampling plan is she using? Do you think the results of this survey could be used to describe the opinions of all the show’s listeners? Explain.

Between ages 5 and 18, the average student eats 1,500 peanut butter and jelly sandwiches. You can make about 15 sandwiches from an 18-ounce jar of peanut butter.

17. How many 19-ounce jars of peanut butter would you need to make 1,500 sandwiches? Explain.

18. From age 5 to age 18, about how many 18-ounce jars of peanut butter does an average student eat each year?

19. How many peanut butter sandwiches does a student need to eat each week to consume the number of jars per year from part (b)?
Unit Review for *Samples and Populations*

Name ___________________________________ Date __________________ Period _____

For Questions 20-23, use the two dot plots below.

The dot plots show the number of hours student spent doing homework on Monday.

20. Find the median homework times. Complete the table below:

<table>
<thead>
<tr>
<th>Times Spent on Homework (minutes)</th>
<th>Grade</th>
<th>Mean</th>
<th>Median</th>
<th>MAD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6</td>
<td>25.8</td>
<td></td>
<td>18.56</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>36.13</td>
<td></td>
<td>14.53</td>
</tr>
</tbody>
</table>

21. For each grade, describe the variability in the distribution of homework times. Use what you know about the distribution's shape and the MAD.

22. Use statistics to compare the times 6<sup>th</sup> graders spent doing homework to the times 7<sup>th</sup> graders spent doing homework.

23. Could these data be used to describe the time spent on homework on a typical school night by a typical student in each grade? Explain.

Use the following information for Questions 24-29.

Annie’s teacher starts each class with the names of all the students in a container. There are 12 girls and 6 boys in the class.

The teacher pulls out names at random to choose students to present answers. After choosing a name, the teacher sets the name aside. At the end of class, the teacher replaces all the names in the container. So, each student’s name has a chance of being chosen the next day.

24. What is the probability Annie will be the first student chosen on Monday?
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25. What is the probability Annie will be the first student chosen on Tuesday?

26. What is the probability Annie will be the first student chosen on both Monday and Tuesday?

27. What is the probability the first student chosen on a given day will be a girl?

28. Suppose Annie is chosen first. What is the probability that the next student selected will be another girl?

29. Suppose the teacher plans to choose six students during one class. Would you be surprised if only two girls were chosen? Explain.

Keisha opens a bag containing 60 chocolate chip cookies. She selects a sample of 20 cookies and counts the chips in each cookie. For Questions 30 and 31, use Keisha’s data below.

<table>
<thead>
<tr>
<th>Cookie Number</th>
<th>Number of Chips</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>4</td>
<td>11</td>
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<td>5</td>
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<td>6</td>
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<tr>
<td>9</td>
<td>11</td>
</tr>
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<td>10</td>
<td>7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cookie Number</th>
<th>Number of Chips</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>8</td>
</tr>
<tr>
<td>12</td>
<td>7</td>
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<td>13</td>
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<tr>
<td>19</td>
<td>10</td>
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<tr>
<td>20</td>
<td>8</td>
</tr>
</tbody>
</table>

30. Estimate the number of total chips in the bag. Explain your answer.

31. Complete each statement with the most appropriate fraction: \( \frac{1}{4}, \frac{1}{6}, \frac{1}{2} \)

More than _____ of the cookies have at least 8 chips.

More than _____ of the cookies have at least 9 chips.

More than _____ of the cookies have at least 10 chips.
Unit Review for *Samples and Populations*

Name _______________________________ Date ___________________ Period _____

32. A baker makes raisin muffins in batches of four dozen muffins. She pours a box of raisins into each batch. How could you use a sample of muffins to estimate the number of raisins in a box?

33. Suppose there 1,000 raisins in each box. How many raisins would you expect to find in a typical muffin? Explain.

34. **Multiple Choice** After testing many samples, a milk shipper determines that approximately 3 in every 100 milk cartons leak. The company ships 200,000 cartons of milk every week. About how many of these cartons leak?

   A. 3  
   B. 600  
   C. 2,000  
   D. 6,000

For Questions 35-36, evaluate each survey described. Use the questions below to help you with your evaluation.

- What is the goal of the survey?  
- What population is being studied?  
- How is the sample chosen?  
- How are the data analyzed and reported?  
- Does the analysis support the conclusions?

35. A television manufacturer wants to design a remote control. Representatives for the company call 1,000 homes with televisions. They find that remote-control users sit an average of 3 meters from their televisions. Based on this finding, the company designs the remote control to work well at distances of 2.5 meters to 3.5 meters from a television.

36. A light bulb manufacturer wants to know the “defect rate” for its product. The manager takes 10 boxes of light bulbs from the assembly line and tests them. Each box contains 50 light bulbs. The manager finds that 5 bulbs are defective. He concludes that production quality is acceptable.

For Questions 37-41, use the box plot below. Tell whether each statement is true or false. Explain.

For Questions 37-41, use the box plot below. Tell whether each statement is true or false. Explain.

- The class median is less than 80.  
- Half the class scored between 60 and 80.  
- At least one student earned a score of 100.  
- The class mean is probably less than the median.  
- If there are 30 students in the class, at least 10 scored above 80.