Sixth Grade Science Summer Homework

Dear rising sixth-grade,

I am so excited to meet you! Next year, sixth-grade science will be filled with inquiry, hands-on labs, projects and hopefully, a new way to see the natural world. This assignment is by no means something for you to worry about but it is an opportunity for you to begin to think like a scientist. There might be things here that you have no clue about and that's OK! You are welcome to ask your parents for help. My only request is that you give this your best effort and in the fall, we can dive deeper to learn and develop our scientific minds. Have fun and I'll see you in August!

Scientific Method Practice

Directions: Read the text below. Then match each statement with the number of the correct step in the scientific method

The scientific method is a set of steps that scientists use in order to learn more about something. By following the scientific method, scientists can gather information, perform experiments, and discover new things about our world. The scientific method follows this general pattern:

1. Identify a problem or question
2. Research information about the problem or question
3. Generate a hypothesis (a really good guess) about the problem or question
4. Design and perform an experiment
5. Gather and analyze observations about the experiment
6. Draw conclusions that are supported by your experiment

Put the following situations into the correct order based on the above scientific steps (1-6).

_____ Serena hypothesizes that crickets make more noise on hot nights than cool nights

_____Serena counts the number of chirps made by two groups of crickets. One group of crickets is in a cool cage and one group is in a warm cage. There are five crickets in each cage and she counts for 30 minutes.

_____Serena goes to the library to read information from an encyclopedia about the habits of crickets.

_____Serena wonders what makes crickets make more noise on some nights than others.

_____Serena makes a chart of the number of chirps made by the two groups of crickets and compares her findings.

_____Serena concludes that crickets chirp more on warm nights than on cool nights.

Name two ways Serena controlled her experiment. (What did she keep the same?)

What was Serena's variable? (What did she change?)

Part 2: Analyzing Data

1. An experiment studies the effects of an experimental drug on the number of offspring a mother mouse has. 10 female mice are given the drug and then impregnated. The number of mice in their litters is compared to the litters of mice that did not take the drug.

Number of Babies in a Litter									
Group A (drug)	5	6	4	8	5	2	7	12	12	8
Group B (control)	4	4	6	6	5	6	4	7	5	3

Based on the data, what would you conclude about the drug, did it work? Explain your thinking.

My conclusion is that Group A the ones with the drugs have more babies than the one without the medicine. Because the pattern shows that they have more babies from the medicine.

2. Cow growth rates:

A type of feed claims to boost the growth rate of cows. The feed is tested on two twin newborn cows. Bessie receives the experimental feed, and Bertha receives regular corn feed. Their weights are recorded below.

Month	April	May	June	July	August
Bessie	150 lbs	210 lbs	260 lbs	320 lbs	400 lbs
Bertha	150 lbs	250 lbs	290 lbs	340 lbs	400 lbs

Graph the data; use a dotted line for Bessie and a straight line for Bertha. Make sure to label your x and y axis (x is the horizontal line, y is the vertical line). (Optional)
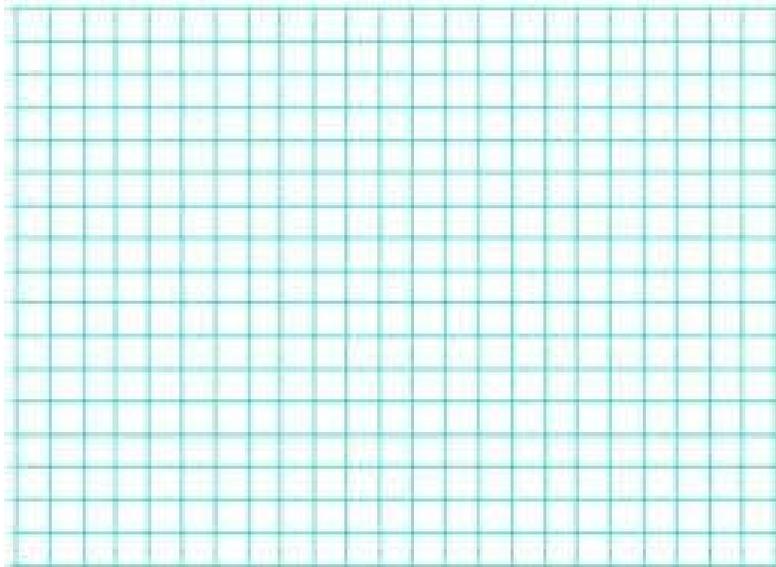
Both cows ended at the same weight, but did the experimental feed change the way they gained weight at all? Describe your conclusions about the experimental feed and explain why it is important that the experiment used twin cows?

_____

_____

_____

Part 3: Country Population Graphs
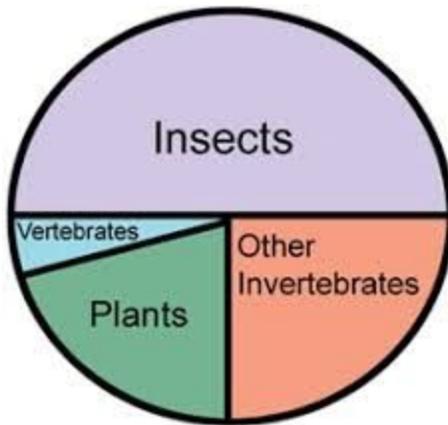

Population

1980 1990 2000
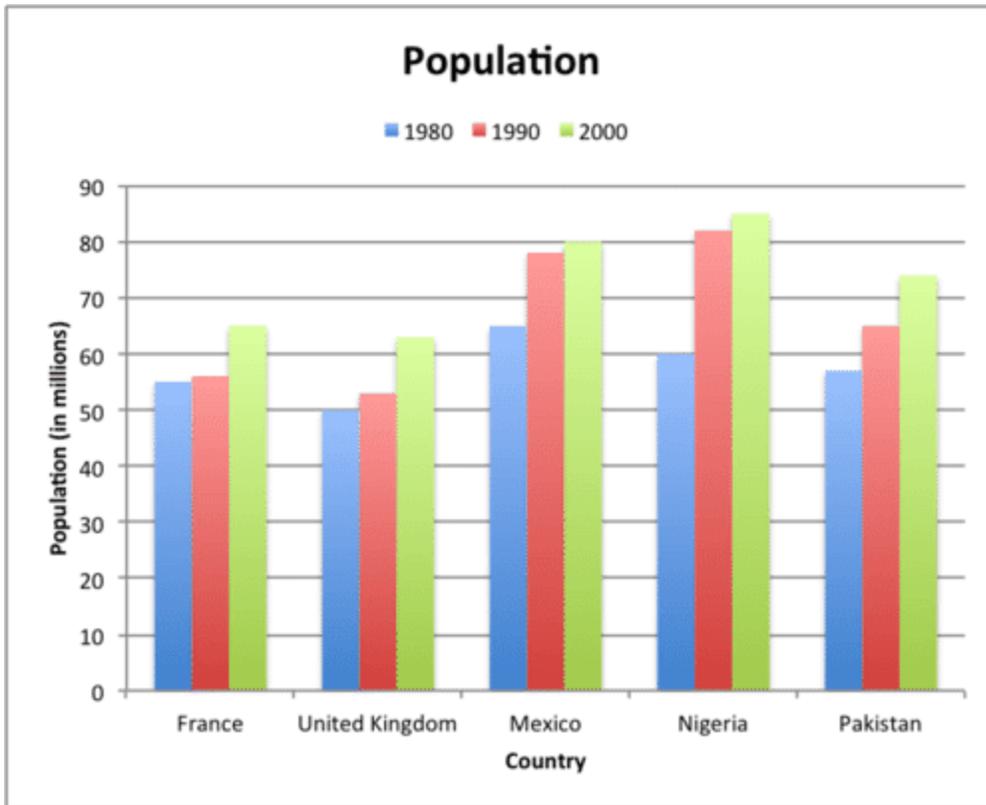
1. According to the graph which country grew the fastest over the three decades represented? How do you know?

_____

_____

2. Which country had the smallest change in population over the three decades? How do you know?

_____

_____

3. What was the population of France in the year 2000?

_____

Insect Graph

4. According to the graph, which group of organisms has the most number of species? Why do you think that?
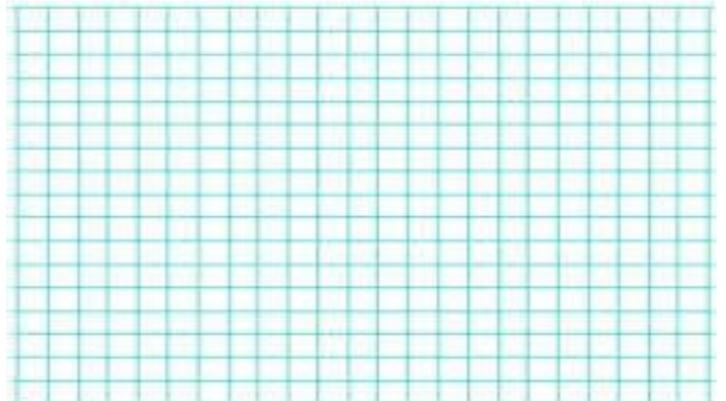
_____

_____

5. What is the percentage for all invertebrates?

_____

6. Approximately what percent do you think are vertebrates?

_____

Tiger Shark Populations

7. The population of tiger sharks off the coast of Florida was recorded over several months. Graph the tiger shark populations below.

Jan: 12	May: 34	Sep: 72
Feb 15	Jun: 44	Oct: 85
Mar: 25	Jul: 49	Nov: 98
Apr: 35	Aug: 55	Dec: 105

8. The number of nurse sharks was also recorded for this time period; though the person who recorded the number was not as reliable as the person recording tiger shark numbers. The following data was taken on nurse sharks. Use a different color to graph the nurse shark population on the graph above.

| Mar: 60 | Jul: 38 | Nov: 14 |
| Apr: 52 | Aug: 20 | Dec: 11 |

9. Looking at the graph and comparing the data, at what point would you expect the number of nurse sharks to equal the number of tiger sharks? Explain your thinking.

_____

_____

10. What does the graph tell you about the trends of both shark populations?

_____

_____

Understanding Metrics

In the United States, people usually use English units of measurement such as ounces, pounds, inches and feet. Most other countries in the world use metric units. Metric units include the gram, kilogram, meter, centimeter, liter, milliliter. **Scientists also use the metric system**. In science, you will use mostly metric units. The metric system is based upon units of ten. Each unit is ten times smaller or larger than the next unit. This means that a unit is made larger by multiplying it by 10 and made smaller by dividing by 10. Prefixes describe a unit's value. The prefixes and their meanings are listed below.

Prefix	Meaning	
kilo	One thousand (1,000)	Each larger by multiple of 10
hecto	One hundred (100)	
deca	Ten (10)	
deci	One tenth (1/10)	Each smaller by a multiple of 1/10
centi	One hundredth (1/100)	
milli	One thousandth (1/1000)	

Use the table above to answer the following questions:

1. To change from tens to hundreds, you multiply by _____

   1, 10, 100

2. To change from hundreds to thousands you multiply by _____

   1, 10, 100

3. In the metric system, to change from one unit to the next higher unit, what must you do?

_____

4. To change from one unit to the next lower, unit you must divide by _____

5. Which prefix stands for a greater value?
a. Deca- or kilo- _____
b. Kilo- or milli- _____

c. Centi- or milli- _____

d. Deca- or deci- _____

Metric Conversion

1. 3 cm = _____ mm

2. 2.84 hm = _____dam

3. 14d m = _____mm

4. 9 mm = _____km

5. 56 hm = _____cm

6. 107.6 km = _____dm

7. 0.919 m = _____ mm

8. 67 cg = _____mg

9. 2 mg = _____ cg

10. 7.4 dag = _____g

11. 0.210 kg = _____hg

12. 5 g = _____kg

13. 7 kL = _____ L

14. 15 L = _____mL

15. 740 dL = _____ kL