Tecumseh	Grade 10	Science

Name _____ Date _____ Period _____

"Biology Blizzard Bag #2"

Directions:

Complete the following OGT review test from the concepts we covered this year in the spaces provided on the following pages. You may print out this test and write on it, or write your answers on a separate answer sheet.

10TH Grade Scientific Processes OGT Assessment

Directions: For multiple-choice questions, choose the correct answer and then mark the corresponding circle in the Answer Document. If you change an answer, be sure to erase the first mark completely.

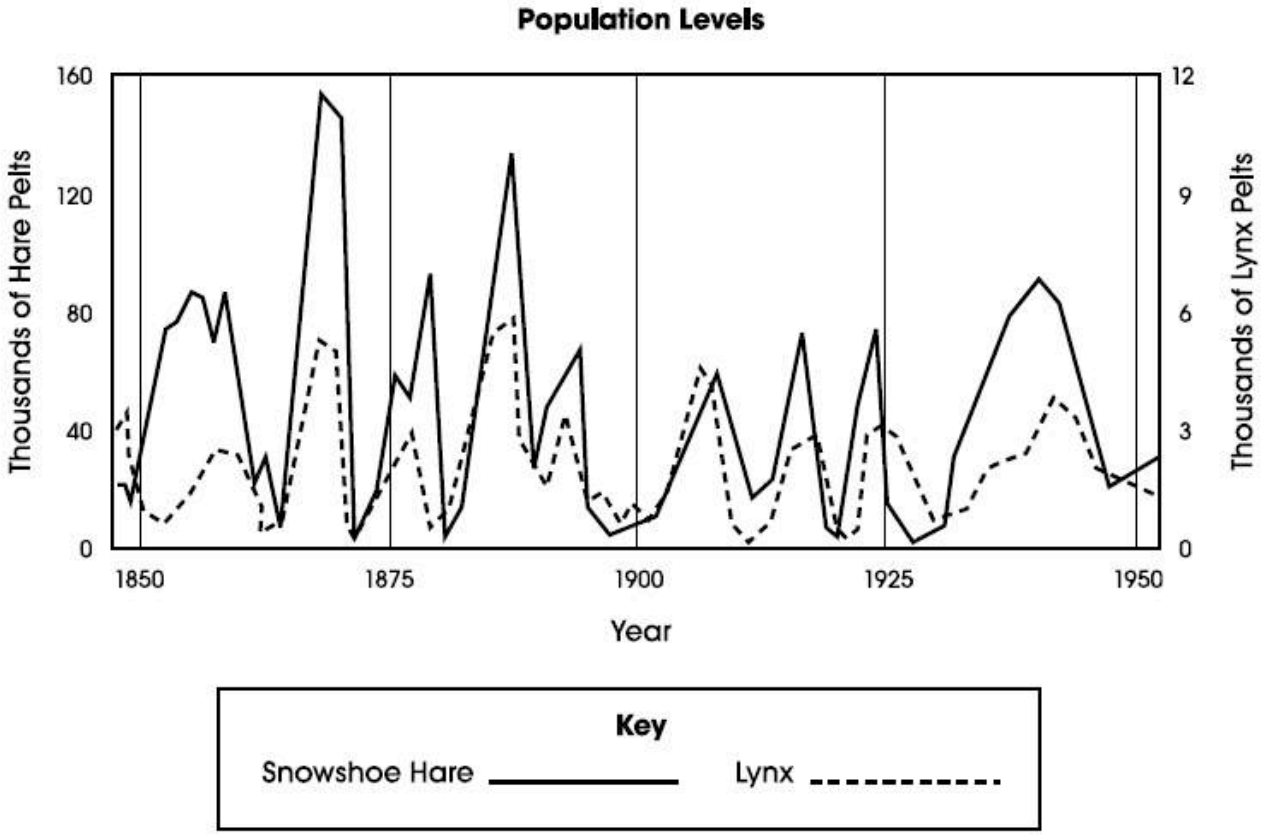
Short-answer questions are worth two points. Extended-response questions are worth four points. Point values are printed near each question in your Test Booklet. The amount of gridded space provided for your answer is the same for all two- and four-point questions. Using the gridded space may or may not be necessary to answer the question; however, your response should be written in the gridded space.

Make sure the number of the question in this Test Booklet corresponds to the number on the Answer Document. Be sure to answer the question completely and show all your work in the Answer Document.

Use the information to answer question 1.

Hare and Lynx Populations

In a classic study of predator-prey interactions, the numbers of snowshoe hare pelts and lynx pelts sold to a trading company by trappers were recorded over a period of 100 years. Both lynx and hare populations appear to oscillate in a regular pattern over a period of about ten years. One explanation for this pattern is that heavy predation reduces the snowshoe hare population, which in turn reduces the lynx population. More recently, scientists have proposed that the hare population oscillates due to diseases caused by overcrowding or by the effects of its own feeding activities on vegetation.



1. One assumption about the data used in this study is that OGT2007-Q.43

A. oscillations in population size occur every ten years.

B. the number of pelts reflects the size of the populations.

C. snowshoe hares have an impact on their food supply.

D. hares and lynx were trapped over a period of 100 years.

2. When submitting research proposals to funding agencies, investigators must follow ethical guidelines.

What information in a research proposal would be considered bogus and lead to rejection of the proposal? OGT2008-Q.2

A. plan for monitoring safety

B. estimates of the number of participants required for the study

C. data from experiments that have not been performed

D. projected budget for equipment

3. The pesticide DDT was at one time referred to as a "miracle" pesticide. Its widespread use in the United States peaked in 1959, but then usage steadily declined until its ban in late 1972. Reasons for declining usage included increased insect resistance and public concern over potentially harmful environmental effects. How did this concern affect the field of agricultural science?

OGT2008-Q.8

A. It led to the development of equally harmful herbicides.

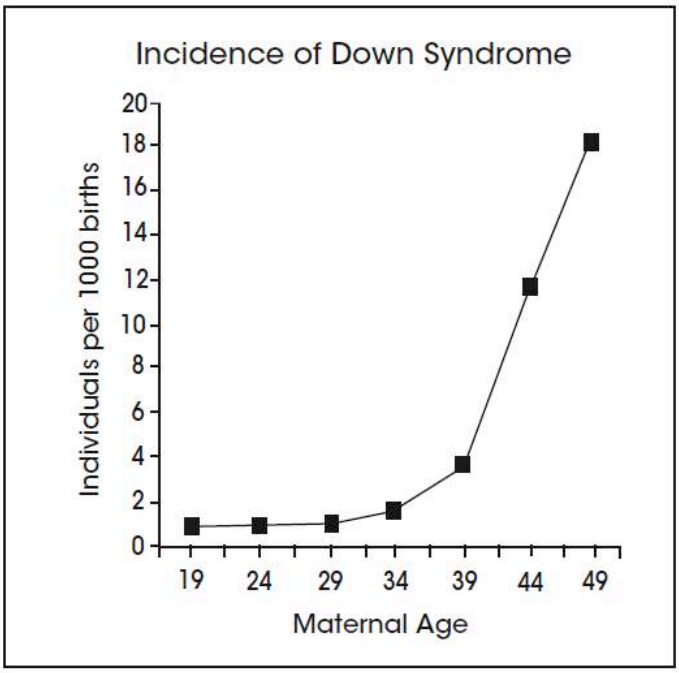
B. It encouraged farmers to violate the ban and increase the use of DDT.

C. It led to the development of more effective, alternative pesticides.

D. It encouraged farmers to reduce the number of crops grown in their fields.

4. Individuals suffering from debilitating and sometimes terminal diseases often advocate a more rapid development cycle for approving new drug treatments. If the development cycle is accelerated, describe one potential benefit and one potential hazard of treating a disease. Respond in the space provided in your **Answer Document**.
(2 points) OGT2008-Q.18

5. The graph below shows the relationship between maternal age and the incidence of children born with Down syndrome (a condition that results in an individual having an extra chromosome 21).



What conclusion is best supported by the data? OGT2008-Q.19

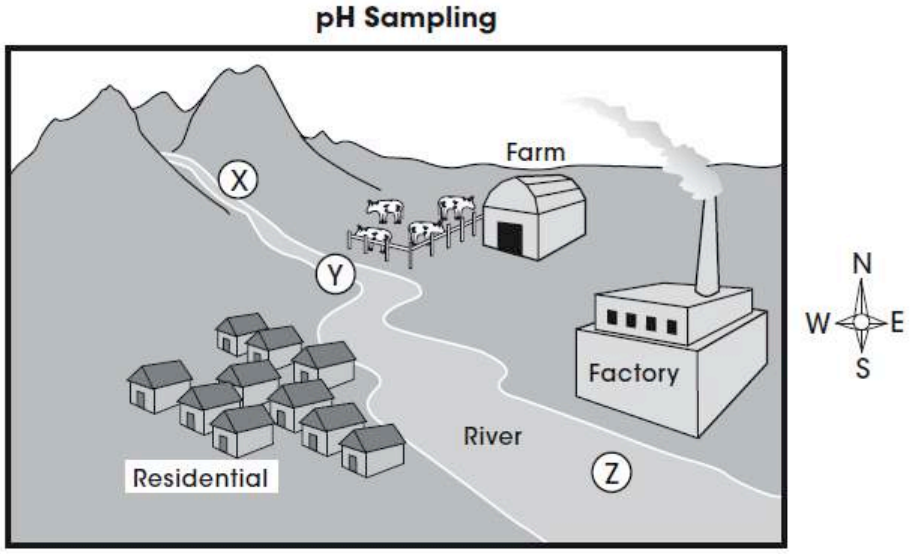
A. There is no risk of Down syndrome in children born to mothers under age 34.

B. The risk of Down syndrome increases dramatically in children born to mothers after age 34.

C. The risk of Down syndrome doubles in children born to mothers for each year over the age of 34.

D. There is no correlation between the number of Down syndrome births and age.

6. Environmental monitoring of a lake located to the southeast of a factory has shown a consistent decrease in pH over the period of a year. A researcher investigating the pH change hypothesizes that either a factory or a farm along the river is responsible for the pH change. The river flows into the lake.



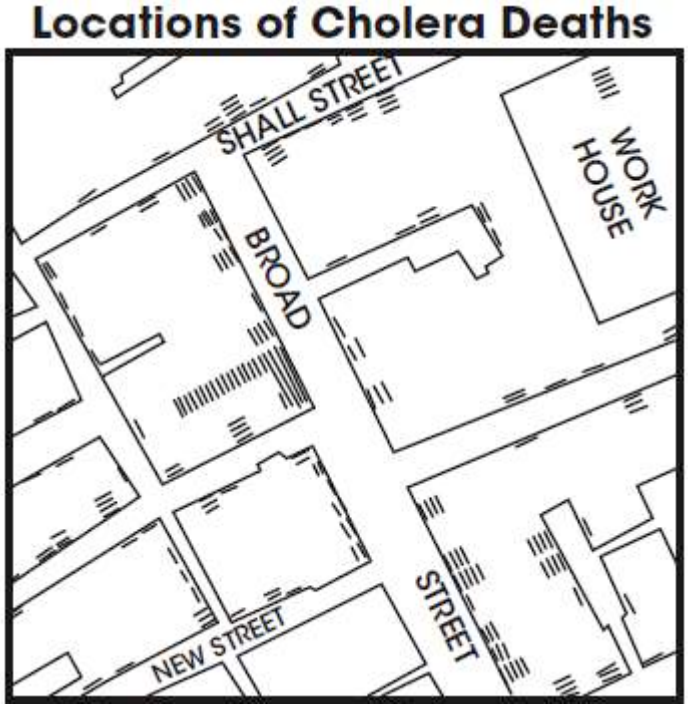
ph Sampling

The researcher collects a water sample from locations Y and Z in the diagram and runs pH analyses on each sample. He finds that the pH in sample Z is lower than the pH in sample Y and concludes that the factory is responsible for the low pH values in the lake.

Based on the diagram and the researcher's investigation, provide two reasons why this may not be a valid conclusion. Describe how each reason could invalidate the conclusion.

Respond in the space provided in your **Answer Document**. (4 points) OGT2008-Q.3

7. In 1854, a cholera epidemic spread throughout parts of London causing hundreds of deaths. Physician John Snow, in investigating the epidemic, plotted the locations of cholera-related deaths on a map of the city. Numbers of deaths are indicated by parallel lines in front of buildings where deaths occurred.



How did the data obtained from Snow's map most likely assist city officials in stopping the cholera epidemic? OGT2008-Q.39

A. It allowed them to verify the exact number of cholera-related deaths.

B. It allowed them to determine the average age of the individuals infected.

C. It allowed them to predict the rate at which the epidemic would continue to spread.

D. It allowed them to pinpoint the area most affected and determine the source of infection.

8. Significant progress has been made in the development of oxygen-carrying solutions that may replace whole blood. Describe two reasons why researchers are so interested in developing artificial blood to replace the use of whole blood.

Respond in the space provided in your **Answer Document** (2 points).

OGT2008-Q.40

9. If you were working for the Center for Disease Control and discovered a new, highly dangerous pathogen, what information should be presented to the public that may prevent a widespread epidemic of the disease?

A. the fatality rate caused by the pathogen

B. a report on how the pathogen is transmitted from one organism to another

C. pictures showing microscopic images of the pathogen so they will be familiar with it

D. a description of the surface receptors found on the pathogen and the immune response

(10-6-1) OGT2009-Q.3

10. Companies seeking new drug approval are required to conduct clinical trials involving human volunteers. During these trials, people with the disease are separated into different groups. One group receives a placebo (an inert or harmless substance used in controlled experiments). Each of the remaining groups receives a different dose of the drug (i.e., Group A receives a 30 mg dose once a day, Group B receives a 50 mg dose once a day, etc.).
Describe two reasons for testing new drugs at varying doses.

Respond in the space provided in your **Answer Document**. (2 points)

(10-6-3) OGT2009-Q.18

11. Some coal-burning power plants install "chemical scrubbers". These scrubbers reduce the amount of sulfur dioxide (SO_2) that is released when coal is burned.

How does installation of these scrubbers benefit the environment?

A. reduce the amount of acid rain

B. reduce the amount of coal mined

C. increase the amount of atmospheric CO_2

D. increase the amount of ground level ozone

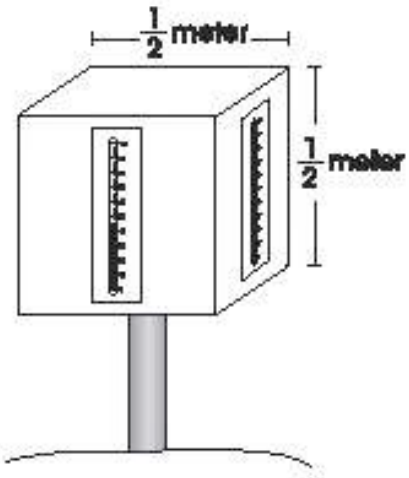
(10-4-2) OGT2009-Q.19

Use the information and illustration to answer question 12.

Solar Warming

A group of students in Ohio conducted an investigation during the month of January to study the effects of solar warming. The students used a wooden box painted white. The box was mounted on a post in an open area and a thermometer was fastened on each of the four sides. The box was oriented so that each thermometer faced squarely in a different direction: north, south, east or west. The temperature on each thermometer was recorded in degrees Fahrenheit at 12:00 noon during five consecutive days of clear skies.

The picture shows the apparatus used by the students.



The table shows the data collected by

Effects of Solar Warming (Temperature in ºF)

	North	South	East	West
Day 1	29	36	32	32
Day 2	29	36	32	31
Day 3	30	37	34	33
Day 4	27	34	32	30
Day 5	30	37	35	33

12. Based on the data, which statement best summarizes the effects of solar warming in January?

A. Solar warming at noon is greatest on south-facing surfaces.
B. Solar warming is greatest in January when the weather is clear.
C. Solar warming in Ohio is greatest in the northern part of the state.
D. Solar warming increases from the west side of Ohio to the east side of Ohio.

13. An aquatic ecologist collects data about the water quality of an Ohio lake throughout the year. In the summer, the ecologist shares data with a public health official from a nearby town.

Which data would a public health official use to determine whether the water was safe for swimming?

A. the temperature of the surface water

B. the amount of dissolved oxygen in the deep water

C. the number of water lilies, *N. odorata*, growing in the lake

D. the concentration of *E. coli* bacteria near the surface of the lake

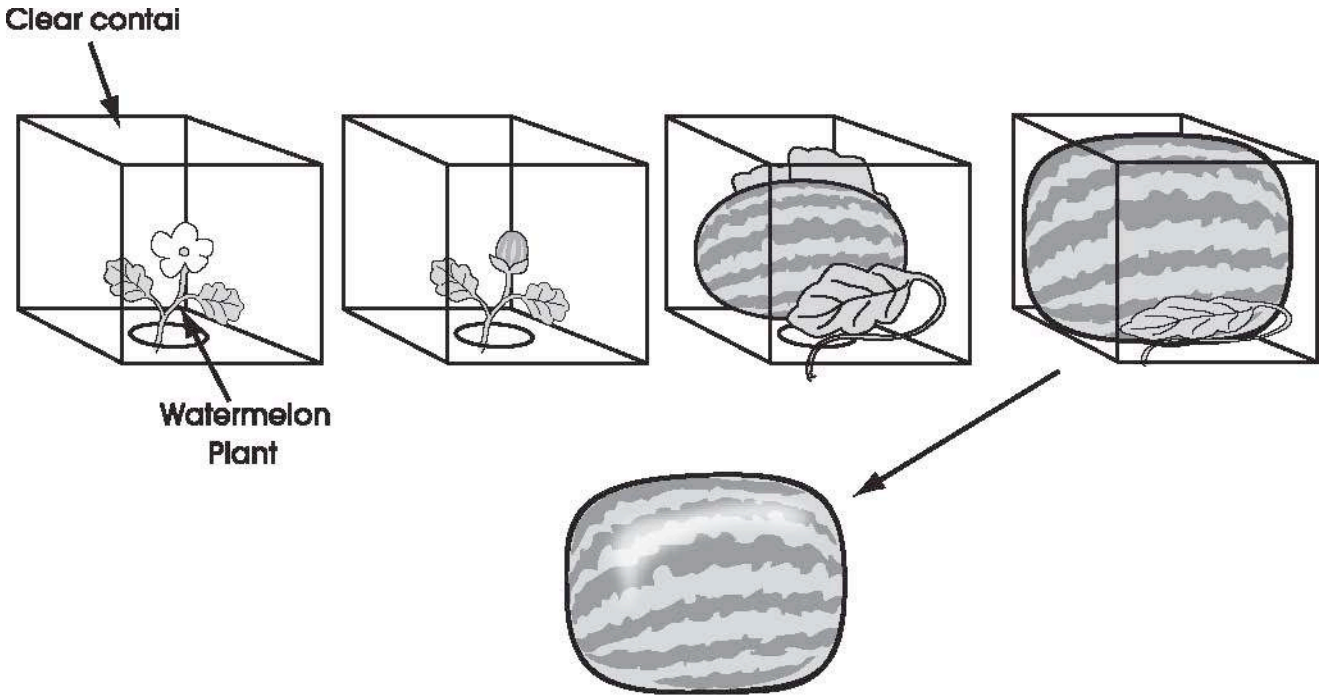
(10-6-3) OGT2009-Q.27

14. A teacher gives a student a nontoxic, odorless, white powder to identify. Generate four questions, each regarding a different property of the unknown powder, that could be safely tested and answered in the laboratory.

Respond in the space provided in your **Answer Document**. (4 points)

(10-5-1) OGT2009-Q.35

15. In a recent agricultural experiment, farmers in Japan inserted fertilized watermelon blooms into square containers, which resulted in the fruit taking the shape of its container as it grew.



Describe two benefits of farming practices that produce square watermelons.

Respond in the space provided in your **Answer Document**. (2 points)

(10-4-3) OGT2009-Q.