

INTEGRATED PROCESS SKILLS TEST II

Instructions:

Please use a #2 pencil to complete this test. On your **answer sheet** mark the box below the letter of the best answer. Be careful that the answer number is the same as the question number you are answering. Darken each box completely, being careful not to color in any other boxes. Be sure to completely erase any stray marks.

1. A football coach thinks his team loses because his players lack strength. He decides to study factors that influence strength. Which of the following variables might the coach study to see if it affects the strength of the players?
 - A) Amount of vitamins taken each day.
 - B) Amount of lifting exercises done each day.
 - C) Amount of time spent doing exercises.
 - D) All of the above.

2. A study of auto efficiency is done. The hypothesis tested is that a gasoline additive will increase auto efficiency. Five identical cars each receive the same amount of gasoline but different amounts of Additive A. They travel the same track until they run out of gasoline. The research team records the number of miles each car travels. How is auto efficiency measured in this study?
 - A) The time each car runs out of gasoline.
 - B) The distance each car travels.
 - C) The amount of gasoline used.
 - D) The amount of Additive A used.

3. An auto manufacturer wants to make cars cheaper to operate. They are studying variables that may affect the number of miles per gallon that autos get. Which variable is likely to affect the number of miles per gallon?
 - A) Weight of the car.
 - B) Size of the motor.
 - C) Color of the car.
 - D) Both A and B.

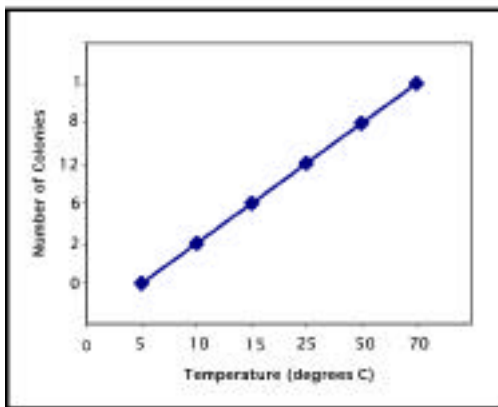
4. A class is studying the speed of objects as they fall to the earth. They design an investigation where bags of gravel weighing different amounts will be dropped from the same height. In their investigation which of the following is the hypothesis they would test about the speed of objects falling to earth?
 - A) An object will fall faster when it is dropped further.
 - B) The higher an object is in the air the faster it will fall.
 - C) The larger the pieces of gravel in a bag the faster it will fall.
 - D) The heavier an object the faster it will fall to the ground.

5. A student in a science class studied the effect of temperature on the growth of bacteria. The student obtained the following data:

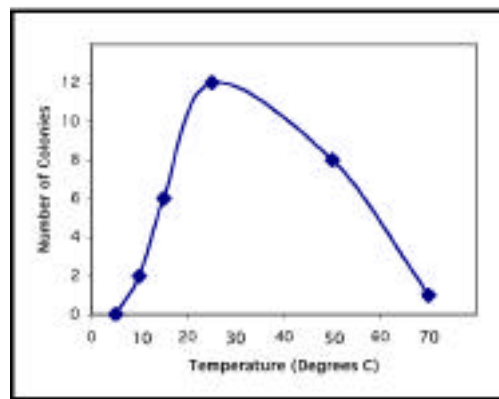
Temperature of the growth chamber (°C)	Number of bacterial colonies
5	0
10	2
15	6
25	12
50	8
70	1

Which graph correctly represents the data from the experiment?

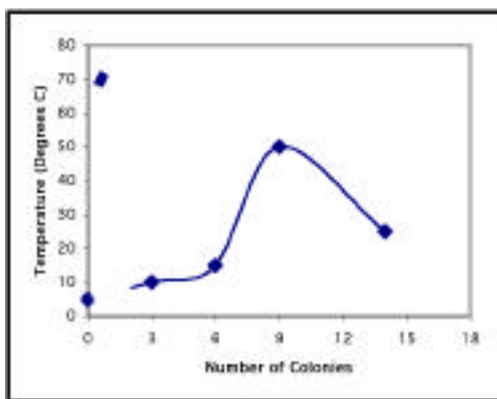
A)



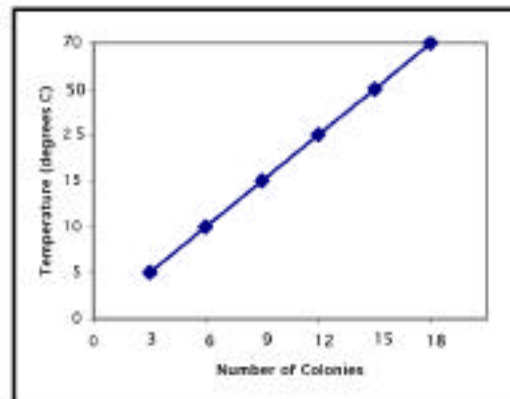
B)



C)



D)



6. A police chief is concerned about reducing the speed of autos. He thinks several factors may affect the automobile speed. Which of the following is a hypothesis he could test about how fast people drive?

- A) The younger the drivers, the faster they are likely to drive.
- B) The larger the autos involved in an accident, the less likely people are to get hurt.
- C) The more policemen on patrol, the fewer the number of auto accidents.
- D) The older the autos the more accidents they are likely to be in.

7. A science class is studying the effect of wheel width on ease of rolling. The class puts wide wheels onto a small cart and lets it roll down an inclined ramp and then across the floor. The investigation is repeated using the same cart but this time fitted with narrow wheels.

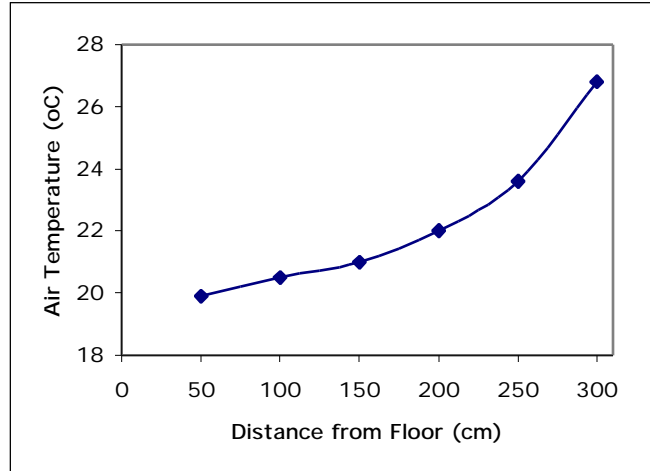
How could the class measure ease of rolling?

- A) Measure the total distance the cart travels.
 - B) Measure the angle of the inclined ramp.
 - C) Measure the width of each of the two sets of wheels.
 - D) Measure the weight of each of the carts.
8. A farmer wonders how he can increase the amount of corn he grows. He plans to study factors that affect the amount of corn produced. Which of these hypotheses could he test?

- A) The greater the amount of fertilizer the larger the amount of corn produced.
- B) The greater the amount of corn, the larger the profits for the year.
- C) As the amount of rainfall increases, the more effective the fertilizer.
- D) As the amount of corn produced increases, the cost of production increases.

9. A study is done of the temperature in a room at different distances from the floor. The graph of the data is shown below.

How are the variables related?



- A) As distance from the floor increases, air temperature decreases.
- B) As distance from the floor increases, air temperature increases.
- C) An increase in air temperature means a decrease in distance from the floor.
- D) The distance from the floor is not related to air temperature increases.

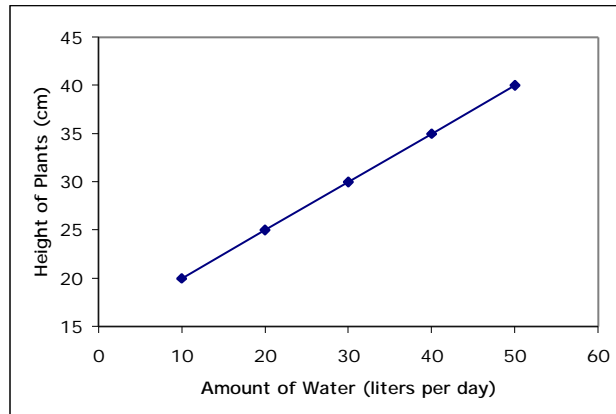
10. Jim thinks that the more air pressure in a basketball, the higher it will bounce. To investigate this hypothesis he collects several basketballs and an air pump with a pressure gauge.

How should Jim test his hypothesis?

- A) Bounce basketballs with different amounts of force from the same height.
- B) Bounce basketballs having different air pressures from the same height.
- C) Bounce basketballs having the same air pressure at different angles from the floor.
- D) Bounce basketballs having the same amount of air pressure from different heights.

11. A study is being done on the amount of water needed to grow plants. Five small garden plots are given different amounts of water. After two months the height of the plants is measured. The data are shown on the graph.

What is the relationship between the variables?



- A) Increasing the amount of water increases the height of the plants.
- B) Increasing the height of the plants increases the amount of water.
- C) Decreasing the amount of water increases the height of the plants.
- D) Decreasing the height of the plants decreases the amount of water.

Marie wondered if the earth and oceans are heated equally by sunlight. She decided to conduct an investigation. She filled a bucket with dirt and another bucket of the same size with water. She placed them so each bucket received the same amount of sunlight. The temperature in each was measured every hour from 8:00 a.m. to 6:00 p.m.

12. Which hypothesis was being tested?

- A) The greater the amount of sunlight, the warmer the soil and water become.
- B) The longer the soil and water are in the sun, the warmer they become.
- C) Different types of materials are warmed differently by the sun.
- D) Different amounts of sunlight are received at different times of the day.

13. Which of these variables is controlled in Marie's study?

- A) Kind of water placed in the bucket.
- B) Temperature of the water and soil.
- C) Type of material placed in the buckets.
- D) Amount of time each bucket is in the sun.

14. What was the dependent or responding variable in Marie's study?

- A) Kind of water placed in the bucket.
- B) Temperature of the water and soil.
- C) Type of material placed in the buckets.
- D) Amount of time each bucket is in the sun.

15. What was the independent or manipulated variable in Marie's study?

- A) Kind of water placed in the bucket.
- B) Temperature of the water and soil.
- C) Type of material placed in the buckets.
- D) Amount of time each bucket is in the sun.

16. Susan is studying food production in bean plants. She measures food production by the amount of starch produced. She notes that she can change the amount of light, the amount of carbon dioxide, and the amount of water that plants receive. What is a testable hypothesis that Susan could study in this investigation?

- A) The more carbon dioxide a bean plant gets the more starch it produces.
- B) The more starch a bean plant produces the more light it needs.
- C) The more water a bean plant gets the more carbon dioxide it needs.
- D) The more light a bean plant receives the more carbon dioxide it will produce.

Joe wanted to find out if the temperature of water affected the amount of sugar that would dissolve in it. He put 50 mL of water into each of four identical jars. He changed the temperatures of the jars of water until he had one at 0°C, one at 50°C, one at 75°C, and one at 95°C. He then dissolved as much sugar as he could in each jar by stirring.

17. What is the hypothesis being tested?

- A) The greater the amount of stirring, the greater the amount of sugar dissolved.
- B) The greater the amount of sugar dissolved, the sweeter the liquid.
- C) The higher the temperature, the greater the amount of sugar dissolved.
- D) The greater the amount of water used, the higher the temperature.

18. What is a controlled variable in Joe's study?

- A) Amount of sugar dissolved in each jar.
- B) Amount of water placed in each jar.
- C) Number of jars used to hold water.
- D) The temperature of the water.

19. What is the dependent or responding variable in Joe's study?

- A) Amount of sugar dissolved in each jar.
- B) Amount of water placed in each jar.
- C) Number of jars used to hold water.
- D) The temperature of the water.

20. What is the independent or manipulated variable in Joe's study?

- A) Amount of sugar dissolved in each jar.
- B) Amount of water placed in each jar.
- C) Number of jars used to hold water.
- D) The temperature of the water.

21. A greenhouse manager wants to speed up the production of tomato plants to meet the demands of anxious gardeners. She plants tomato seeds in several trays. Her hypothesis is that the more moisture seeds receive the faster they sprout. How can she test her hypothesis?

- A) Count the number of days it takes seeds receiving different amounts of water to sprout.
- B) Measure the height of the tomato plants a day after each watering.
- C) Measure the amount of water used by plants in different trays.
- D) Count the number of tomato seeds placed in each of the trays.

22. A gardener notices that his squash plants are being attacked by aphids. He needs to get rid of the aphids. His brother tells him that "Aphid-Away" powder is the best insecticide to use. The county agent says "Squash-Saver" spray works the best. The gardener selects six squash plants and applies the powder to three and the spray to three. A week later he counts the number of live aphids on each of the plants.

How is the effectiveness of the insecticides measured in this study?

- A) Measuring the amount of spray or powder used.
- B) Determining the condition of the plants after spraying or dusting.
- C) Weighing the squash each plant produces.
- D) Counting the number of aphids remaining on the plants.

23. Lisa wants to measure the amount of heat energy a flame will produce in a certain amount of time. A burner will be used to heat a beaker containing a liter of cold water for ten minutes.

How will Lisa measure the amount of heat energy produced by the flame?

- A) Note the change in water temperature after ten minutes.
- B) Measure the volume of water after ten minutes.
- C) Measure the temperature of the flame after ten minutes.
- D) Calculate the time it takes for the liter of water to boil.

24. Mark is studying the effect of temperature on the rate that oil flows. His hypothesis is that as the temperature of the oil increases it flows faster.

How could he test this hypothesis?

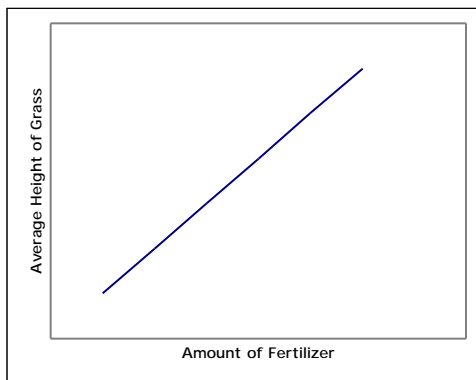
- A) Heat oil to different temperatures and weigh it after it flows out of the can.
- B) Observe the speed at which oil at different temperatures flows down a smooth surface.
- C) Let oil flow down smooth surfaces at different angles and observe its speed.
- D) Measure the time it takes for oil at different thicknesses to pour out of the can.

25. A researcher is testing a new fertilizer. Five small fields of the same size are used. Each field receives a different amount of fertilizer. One month later the average height of the grass in each plot is measured. The measurements are shown in the table below.

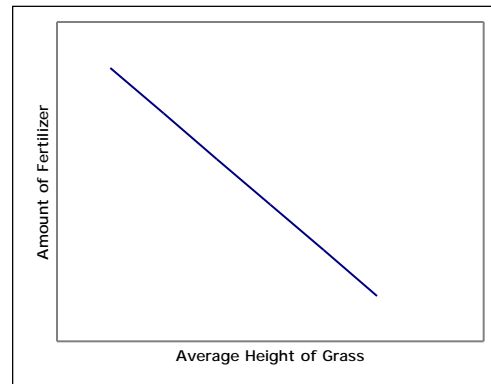
Amount of Fertilizer (kg)	Average Height of Grass (cm)
10	7
30	10
50	12
80	14
100	12

Which graph represents the data in the table?

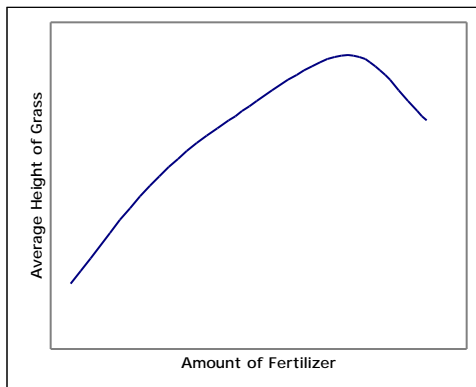
A)



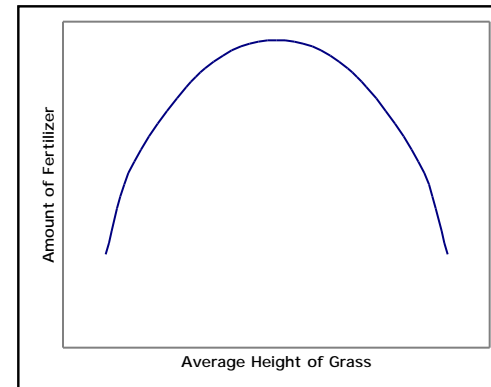
B)



C)



D)



- **Make sure that you have not skipped any questions so far.**
- **You should have filled in answers all the way to the bottom of your answer scan sheet (#1 to #25).**
- **Your next answer (#26) belongs at the top of the next column.**
- **Question #26 is on the next page.**

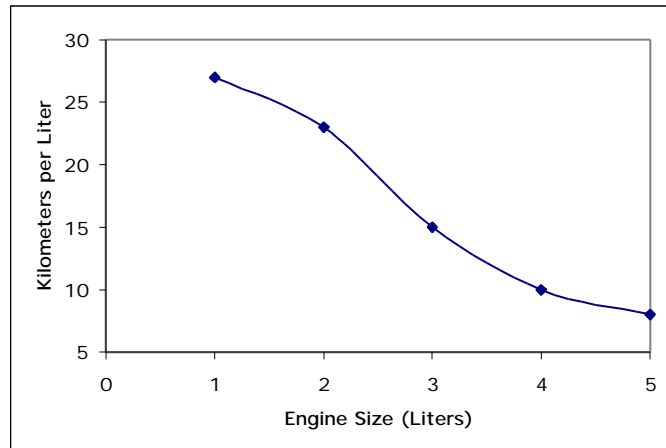
26. A biologist tests this hypothesis: the greater the amount of vitamins given to rats the faster they will grow. How can the biologist measure how fast rats will grow?

- A) Measure the speed of the rats.
- B) Measure the amount of exercise the rats receive.
- C) Weigh the rats every day.
- D) Weigh the amount of vitamins the rats will eat.

27. Some students are considering variables that might affect the time it takes sugar to dissolve in water. They identify the temperature of the water, the amount of sugar and the amount of water as variables to consider. What is a hypothesis the students could test about the time it takes for sugar to dissolve in water?

- A) The larger the amount of sugar the more water required to dissolve it.
- B) The colder the water the faster it has to be stirred to dissolve.
- C) The warmer the water the more sugar that will dissolve.
- D) The warmer the water the more time it takes the sugar to dissolve.

28. A consumer group measures the miles per gallon cars get with different size engines. The results are as follows:



Which of the following describes the relationship between the variables?

- A) The larger the engine the more miles per gallon the car gets.
- B) The fewer miles per gallon the car gets the smaller the engine.
- C) The smaller the engine the more miles per gallon a car gets.
- D) The more miles per gallon for a car the larger the engine.

A study was done to see if leaves added to soil has an effect on tomato production. Tomato plants were grown in four large tubs. Each tub had the same kind and amount of soil. One tub had 15 kg of rotted leaves mixed in the soil and a second had 10 kg. A third tub had 5 kg and the fourth had no leaves added. Each tub was kept in sun and watered the same amount. The number of kilograms of tomatoes produced in each tub was recorded.

29. What is the hypothesis being tested?

- A) The greater the amount of sunshine the greater the amount of tomatoes produced.
- B) The larger the tub, the greater the amount of leaves added.
- C) The greater the amount of water added, the faster the leaves rotted in the tubs.
- D) The greater the amount of leaves added, the greater the amount of tomatoes produced.

30. What is a controlled variable in this study?

- A) Amount of tomatoes produced in each tub.
- B) Amount of leaves added to the tubs.
- C) Amount of soil in each tub.
- D) Number of tubs receiving rotted leaves.

31. What is the dependent or responding variable?

- A) Amount of tomatoes produced in each tub.
- B) Amount of leaves added to the tubs.
- C) Amount of soil in each tub.
- D) Number of tubs receiving rotted leaves.

32. What is the independent or manipulated variable?

- A) Amount of tomatoes produced in each tub.
- B) Amount of leaves added to the tubs.
- C) Amount of soil in each tub.
- D) Number of tubs receiving rotted leaves.

33. A student is investigating the lifting ability of magnets. He has several magnets of different sizes and shapes. For each magnet, the student weighs the amount of iron filings it picks up. How is the lifting ability of magnet defined in the experiment?

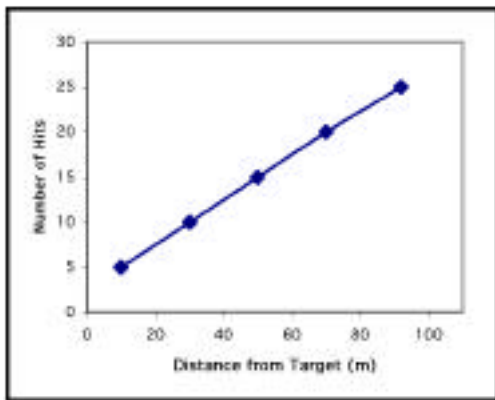
- A) The size of the magnet in use.
- B) The weight of the magnet picking up things.
- C) The shape of the magnet in use.
- D) The weight of the iron filings picked up.

34. Twenty-five shots are fired at a target from several distances. The table below shows the number of "hits" in 25 shots at each distance.

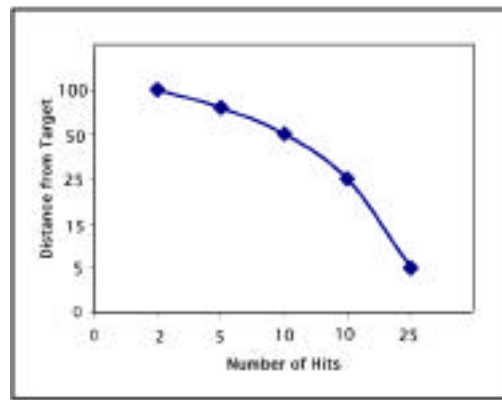
Distance from Target (m)	Number of Hits
5	25
15	10
25	10
50	5
100	2

Which graph represents the data?

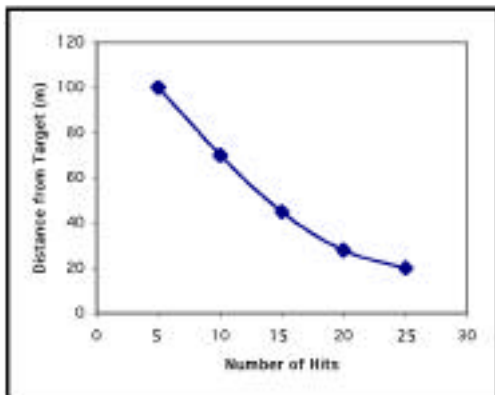
A)



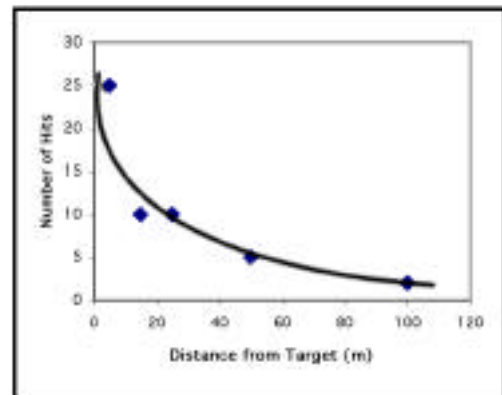
B)



C)



D)



35. Ann has an aquarium in which she keeps goldfish. She notices that the fish are very active sometimes but not at others. She wonders what affects the activity of the fish. What is a hypothesis she could test about factors that affect the activity of the fish?
- A) The more you feed fish, the larger the fish become.
 - B) The more active the fish, the more food they need.
 - C) The more oxygen in the water, the larger the fish become.
 - D) The more light on the aquarium, the more active the fish.
36. Mr. Bixby has an all electric house and is concerned about his electric bill. He decides to study factors that affect how much electrical energy he uses. Which variable might influence the amount of electrical energy used?
- A) The amount of television the family watches.
 - B) The location of the electric meter.
 - C) The number of baths taken by family members.
 - D) A and C

YOU'RE DONE!