Answer Sheet

Elementary Science Content Test

PART I

There are 45 questions in Part I of the test. Each question is followed by four choices, numbered 1 – 4. Decide which choice is the best answer. Indicate the best answer in the box provided.

1. 4	8. 4	15. 3	22. 1	29. 3	36. 1	43. 4
2. 2	9. 2	16. 4	23. 3	30. 4	37. 2	44. 4
3. 2	10. 4	17. 2	24. 3	31. 4	38. 1	45. 1
4. 4	11. 2	18. 1	25. 3	32. 3	39. 3	x
5. 3	12. 3	19. 3	26. 4	33. 4	40. 1	x
6. 1	13. 1	20. 1	27. 1	34. 4	41. 3	x
7. 2	14. 2	21. 2	28. 2	35. 2	42. 2	X

Directions (46 – 84) Record your answers in the space provided below. Refer to the charts, graphics, diagrams on the test prior to recording your answer.

46. Determine the mass of the cart, using the equation below.

Force (newton) + mass (kg) x acceleration (M/S2)

Mass of cart = 2 kg

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47. OMIT

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48. OMIT

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49. The diagram on # 49 represents part of a science classroom. Several items are labeled.

Choose TWO labeled items from the diagram and explain how each is used to keep students safe.

Item 1: goggles

Explanation: Goggles keep things like chemicals from splashing into the students eyes

Item 2: Sink

Explanation: The sink provides the students with a place to wash chemicals off of their skin if need be

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50 -52

Base your answers to questions 50 through 52 on the information on the bar graph below and on your knowledge of science.

A group of science students have been learning how the human circulatory system reacts during exercise. The students measured their heart rates both before and after they ran five laps around the school gym. This was repeated two more times, with a 5-minute rest period between each trial. The average heart rates of the students are shown on the bar graph.

50. Use the data from the bar graph to complete the data table below:

TRIAL	Heart Rate Before Exercise (Beats per minute)	Heart Rate After Exercise (beats per minute)
1	72	124
2	76	134
3	82	146

51. State the general relationship between exercise and heart rate in humans: The general relationship that exists between exercise and heart rate in humans is that with an increase in exercise, an increase in a humans heart rate will follow. This is because exercise triggers our fight or flight mode, so heart rate goes up. A decrease in exercise will exhibit a decrease in human heart rate.

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52. Identify ONE way the students could have measured their heart rates: One way students could have increased their heart rate would have been by doing burpess.

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Base your answers to questions 53 and 54 (p. 17 of the test) on the information below and on your knowledge of science.

53. Identify the dependent variable in the investigation.

The pitch of sound depends on the length of the air column. So, the pitch is the dependent variable.

54. Identify one course of error that might have influenced the results of this investigation:

One source of error that may have influenced the results of the investigation is incorrect measurements of air in the tube.

55. The graph in # 55 (p. 18 on the test) shows the solubility of three substances in 100 grams of water at various temperatures.

How many grams of KBr will dissolve in 100 grams of water at 60 degrees C?

85 grams

Base your answers to questions 56 – 58 on the diagram on the test (p. 19) and on your knowledge of science. The diagram represents some processes that are part of the water cycle. Arrow X represents a water cycle process.

56. What is the source of energy for the water cycle?

The sun

57. Which process changes the water vapor into water droplets that form the cloud?

Evaporation and condensation

58. Which process in the water cycle is represented by arrow X, where water flows over land to the ocean?

Runoff

Base your answer to questions 59 – 60 (p. 20) on the Punnett square below and on your knowledge of science. The Punnett square represents a cross between two parent pea plants. The gene for round shape R is dominant over the gene for wrinkled shape (r).

59. What percentage of the offspring will have a round shape?: 75%

60. Complete the Punnett square below to show the probability of the results of crossing two Rr parents.

	R	r
R	**RR**	**Rr**
r	Rr	rr

61. The diagrams on p. 21 represent different types of metamorphosis (complete and incomplete) occurring in the life cycles of two insects. The stages of development are labeled in both life cycles.

Based on the diagrams, describe one-way complete metamorphosis is different from incomplete metamorphosis:

One way complete metamorphosis is different from incomplete metamorphosis is that in complete metamorphosis, there is a larva and pupa involved before the adult emerges.

62. The diagram on p. 22 represents a plant. Three plant structures are labeled A, B, C.

Complete the chart below by describing the structures and describing one function of each. The structure and function for A is show.

LABEL	STRUCTURE	One FUNCTION OF THE STRUCTURE
A.	Stem	Supports the plant
B	Leaf	Absorb water and minerals from soil
C	Roots	Carry nutrients and water from the earth to the stem/leafs

63. The diagram on p. 23 represents a simple animal cell. To the right of the cell, two cell structures have been enlarged and labeled A and B. A portion of structure B has been enlarged and labeled C.

A description of each cell structure is provided in the chart below. Complete the chart by identifying EACH cell structure. The name for structure A is shown.

LETTER	Description of Cell Structure	Name of Cell Structure
A	Thread-like structure found in the nucleus that contains many units of hereditary information	chromosome
B	A single unit of hereditary information	Gene
C	A double stranded molecule composed of genetic material	DNA (deoxyribonucleic acid)

64. The diagram on p. 23 represents a bird, fertilized eggs, and a nest.

Do birds exhibit mainly internal development or external development? Circle the correct answer and give ONE piece of evidence to support your answer.

Circle one: internal external

Evidence: Birds are oviparous- meaning they reproduce by joining one anothers cloacas together and then laying eggs that are fertilized by the yolk.

Base your answers to questions 65 – 66 (p. 24) on the diagram and on your knowledge of science. The diagram represents the production of new offspring in four different types of organisms.

65. Which evidence from the diagram indicates that all of the four organisms shown are reproducing asexually?

There is no mate present. Each organism is reproducing via a process called re-generation. Worms can also re-generate.

66. If the parent hydra has 32 chromosomes, how many chromosomes does the hydra offspring have?

32 chromosomes

Evidence: in asexual reproduction, a descendant of a parent is identical to the parent cell and bears same genetic make up

Base your answers to questions 67 and 68 on the diagram on p 25 and on your knowledge of science. The diagram represents a cross section of rock layers containing some fossils of organisms that have become extinct. The rock layers have NOT been overturned.

67. Explain how the diagram indicates that the trilobites are older than the other fossils shown.

The trilobites are listed at the bottom of the diagram, indicating that they are the oldest creatures amongst the ones listed.

68. Identify one factor that caused some species to become extinct: One factor that has caused some species to become extinct was the Ordovician Mass Extinction. This was due to climate fluctuations, changes in sea levels, and volcanism which led to the emission of harmful gases into the atmosphere and removal of oxygen, which killed off many species.

Base your answers to questions 69 and 70 on the food web on p 26 and your knowledge of science.

69. Identify ONE producer labeled on this food web: One producer is the tree. This is producer because it uses photosynthesis to produce its own food and produces oxygen

70. Explain why the frog population would most like DECREASE if there were a decrease in the cricket population: Frogs eat crickets to survive. If there are not crickets, the frogs could starve.