2004

FCAT

Florida Comprehensive Assessment Test

Student Name

_____

SCIENCE
Sample Test & Answer Book

GRADE 8

FC00000156

FCAT Sample Test Materials

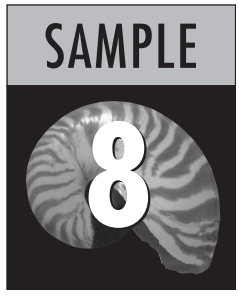
These sample test materials are designed to help you prepare to answer FCAT questions. These materials introduce you to the kinds of questions you will answer when you take FCAT and include hints for responding to the different kinds of FCAT questions. The FCAT Science sample test materials for Grade 8 are composed of the books described below:

☑ **Sample Test and Answer Book**
Includes a science sample test, a sample answer book, and instructions for completing the sample test. (Copies are available for all students in the tested grade.)

❑ **Sample Answer Key**
Includes answers and explanations for the questions in the sample test. (Copies are available for classroom teachers only.)

☑ = This book

FCAT Science Sample Test Book



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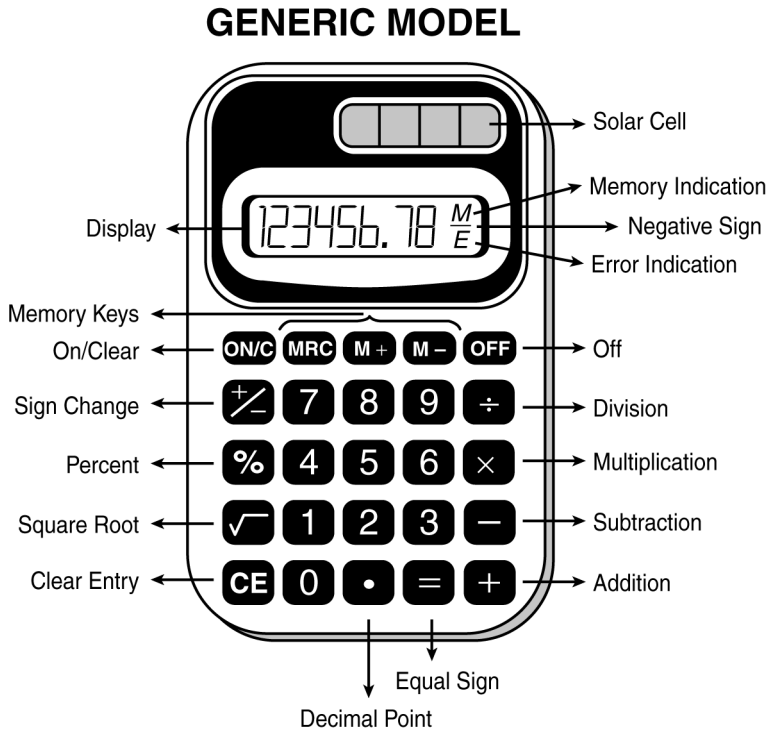
This is a picture of a generic calculator and its parts.



Helpful Hints for Taking the FCAT Science Test

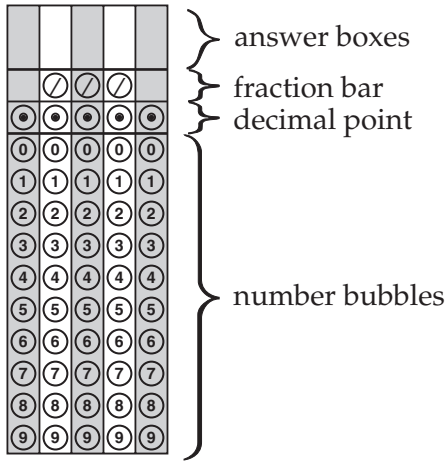
1. Read the problem very carefully. Then decide whether or not you need the calculator to help you solve the problem.
2. When starting a new problem, always clear your calculator by pressing the clear key.
3. If you see an **E** in the display, clear the error before you begin.
4. If you see an **M** in the display, clear the memory and the calculator before you begin.
5. If the number in the display is not one of the answer choices, check your work. Remember that when computing with certain types of fractions, you may have to round the number in the display.
6. Remember, your calculator will NOT automatically perform the algebraic order of operations.
7. Calculators might display an incorrect answer if you press the keys too quickly. When working with calculators, use careful and deliberate keystrokes, and always remember to check your answer to make sure that it is reasonable.
8. Always check your answer to make sure that you have completed all of the necessary steps.

How to Complete the Response Grids

Science test questions with this symbol  require that you fill in a grid in your answer book. There may be more than one correct way to fill in a response grid. This section shows you different ways the response grid may be completed.

Parts of a Response Grid

For Grade 8, response grids have the following parts:



Directions

1. Work the problem and find an answer.

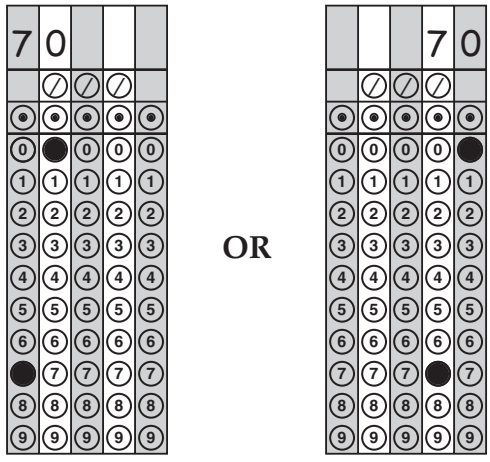
2. Write your answer in the answer boxes at the top of the grid.
   - Print your answer with the first digit in the left answer box, OR with the last digit in the right answer box.
   - Print only one digit or symbol in each answer box. Do NOT leave a blank answer box in the middle of an answer.
   - Be sure to write a decimal point or fraction bar in the answer box if it is a part of the answer.

3. Fill in a bubble under each box in which you wrote your answer.
   - Fill in one and ONLY one bubble for each answer box. Do NOT fill in a bubble under an unused answer box.
   - Fill in each bubble by making a solid black mark that completely fills the circle.
   - You MUST fill in the bubbles accurately to receive credit for your answer.

Examples

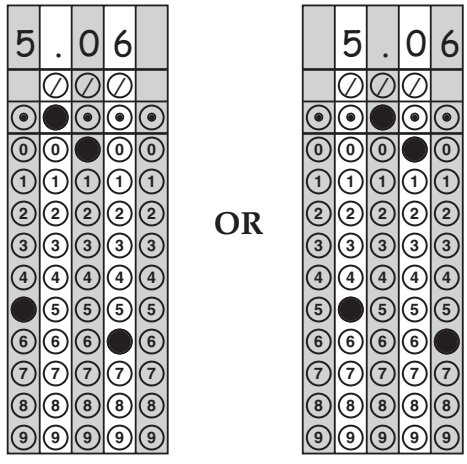
Whole Number

60 + 10 =



Decimal

Show the decimal equivalent of $5\frac{6}{100}$.

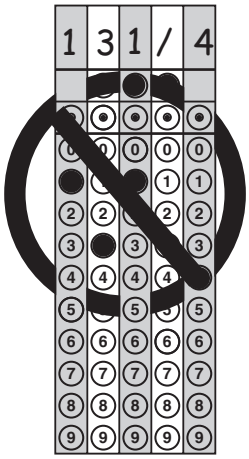


Fraction

NOTE: You may NOT write a **mixed number** such as $13\frac{1}{4}$ in the answer grid. If your answer is a mixed number, you must convert the answer to an improper fraction, such as $\frac{53}{4}$, or to a decimal number, such as 13.25. If you tried to fill in $13\frac{1}{4}$, it would be read as $\frac{131}{4}$ and would be counted wrong.

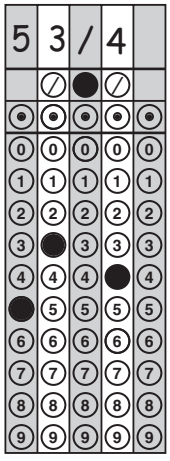
INCORRECT

$12\ \frac{3}{4} + \frac{1}{2} =$

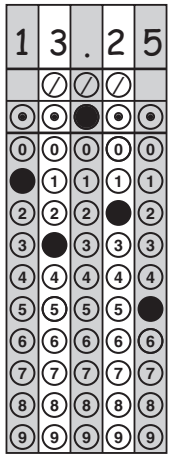


CORRECT

$12\ \frac{3}{4} + \frac{1}{2} =$

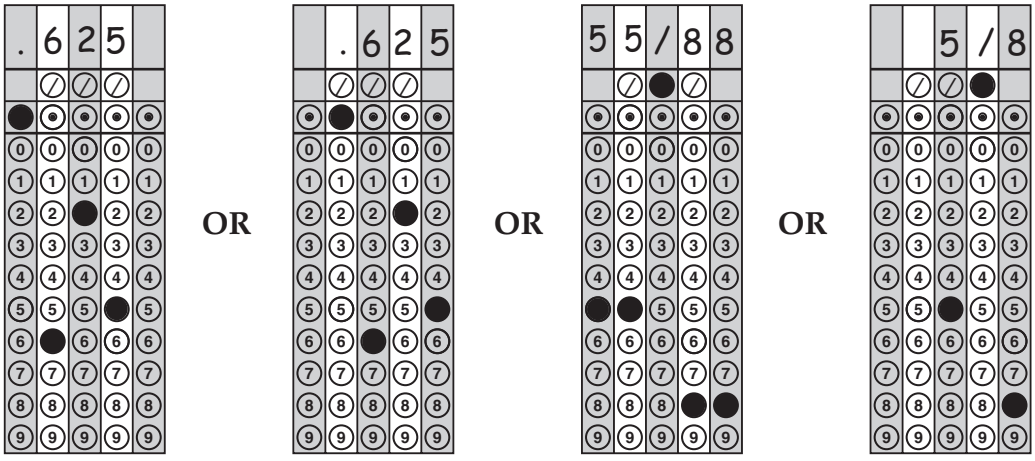


OR



Decimal or Fraction

Many answers may be shown as either a decimal or a fraction.

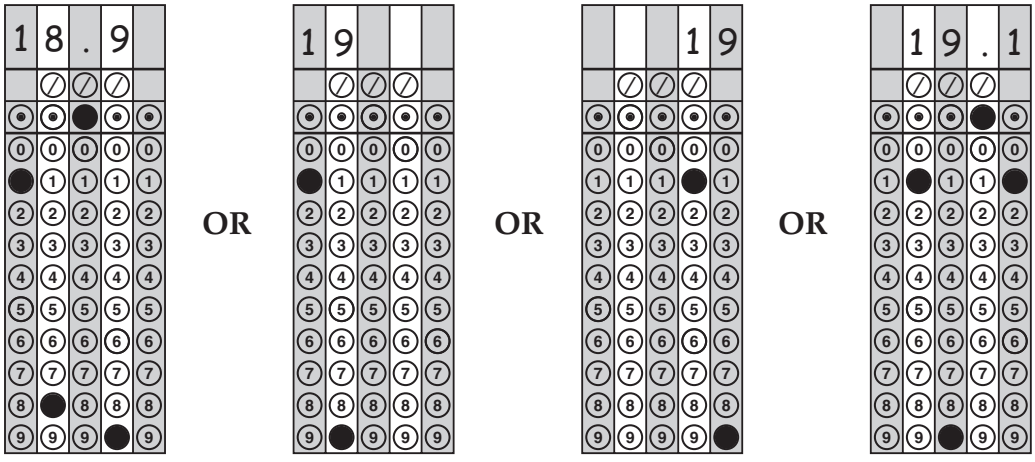


Ranges

A correct answer within a range of values may be represented in various ways. For example, for the inequality

$$18.8 < n < 19.2$$

values of n could be written as shown below.



There are also other correct answers.

Taking the FCAT Science Sample Test

Hints for Taking the FCAT Science Test

Here are some hints to help you do your best when you take the FCAT Science test. Keep these hints in mind when you answer the sample questions.

- ✔ **Learn how to answer each kind of question. FCAT Science tests have four types of questions: multiple-choice, gridded-response, short-response, and extended-response.**
- ✔ **Read each question carefully.**
- ✔ **Check each answer to make sure it is the best answer for the question asked.**
- ✔ **Answer the questions you are sure about first. If a question seems too difficult, skip it and go back to it later.**
- ✔ **Be sure to fill in the answer bubbles correctly. Do not make any stray marks around answer spaces.**
- ✔ **Think positively. Some questions may seem hard to you, but you may be able to figure out what to do if you reread the question carefully.**
- ✔ **When you have finished each question, reread it to make sure your answer is reasonable.**
- ✔ **Relax. Some people get nervous about tests. It's natural. Just do your best.**

How to Answer the "Read, Inquire, Explain" Questions

Answers to the short- and extended-response problems can receive full or partial credit. You should try to answer these questions even if you are not sure of the correct answer. If a portion of the answer is correct, you may get a portion of the points.

- ✔ **Allow about 5 minutes to answer the short "Read, Inquire, Explain" questions and about 10 to 15 minutes to answer the long ones.**
- ✔ **Read each question carefully.**
- ✔ **If you do not understand the question, read it again and try to answer one part at a time.**
- ✔ **Be sure to answer every part of the question.**
- ✔ **Use the information provided to answer the question.**
- ✔ **Write your explanations in clear, concise language. Use only the space provided in the Sample Answer Book.**
- ✔ **Reread your explanation to make sure it says what you want it to say.**

Directions for Taking the Science Sample Test

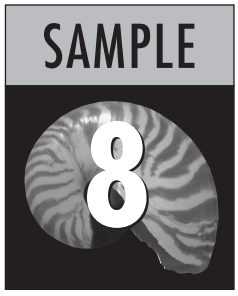
The Sample Test contains the Reference Sheet, the Periodic Table, and 16 science questions. It should take about 30 to 45 minutes to answer all the questions. Mark your answers in the Science Sample Answer Book, which begins on page 23. If you don't know how to answer a question, just ask your teacher to explain it to you. Your teacher has the answers to the sample test questions.

You may need formulas or the Periodic Table to help you answer some of the questions. You may refer to the Reference Sheet (page 11) or the Periodic Table (page 12) as often as you like.

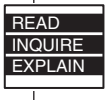
Use the space in your Science Sample Test Book to do your work on the multiple-choice and gridded-response questions, but be sure to put your answers in the Sample Answer Book. For the "Read, Inquire, Explain" questions, write your answers in the Sample Answer Book.

Before you begin, remove the Sample Answer Book by tearing along the dotted line.

FCAT *Science* *Sample* Test



FCAT Question Symbols



This symbol appears next to questions that require short written answers. Use about 5 minutes to answer each of these questions.

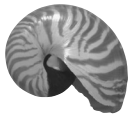
A complete and correct answer to each of these questions is worth 2 points. A partially correct answer is worth 1 point.

This symbol appears next to questions that require longer written answers. Use about 10 to 15 minutes to answer these questions.

A complete and correct answer to each of these questions is worth 4 points. A partially correct answer is worth 1, 2, or 3 points.

This symbol appears next to questions that require you to fill in your answer on a grid. There may be more than one correct way to fill in a response grid. You MUST fill in the bubbles accurately to receive credit for your answer.

A correct answer to each of these questions is worth 1 point.

Grade  **FCAT Science Reference Sheet**

Equations

Acceleration ($\bar{a}$)	=	$\frac{\text{change in velocity (m/s)}}{\text{time taken for this change (s)}}$	$\bar{a}$	=	$\frac{v_f - v_i}{t_f - t_i}$
Average speed ($\bar{v}$)	=	$\frac{\text{distance}}{\text{time}}$	$\bar{v}$	=	$\frac{d}{t}$
Density (D)	=	$\frac{\text{mass (g)}}{\text{Volume (cm}^3\text{)}}$	D	=	$\frac{m}{V}$
Percent Efficiency (e)	=	$\frac{\text{Work out (J)}}{\text{Work in (J)}} \times 100$	%e	=	$\frac{W_{out}}{W_{in}} \times 100$
Force in newtons (F)	=	mass (kg) × acceleration (m/s^2)	F	=	ma
Frequency in hertz (f)	=	$\frac{\text{number of events (waves)}}{\text{time (s)}}$	f	=	$\frac{n \text{ of events}}{t}$
Momentum (ρ)	=	mass (kg) × velocity (m/s)	ρ	=	mv
Wavelength (λ)	=	$\frac{\text{velocity (m/s)}}{\text{frequency (Hz)}}$	λ	=	$\frac{v}{f}$
Work (W)	=	Force (N) × distance (m)	W	=	Fd

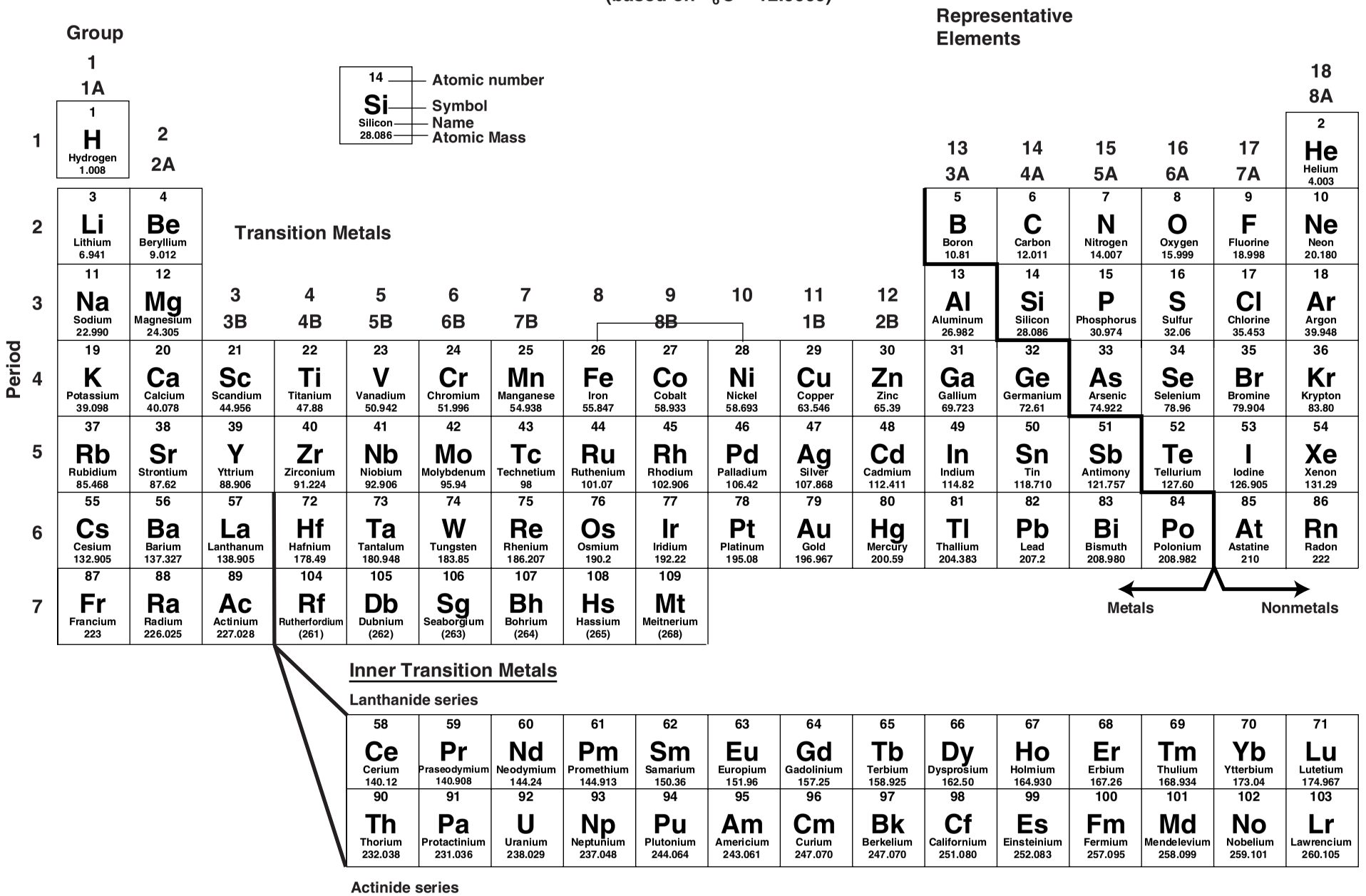
Units of Measure

cm = centimeter	Hz = hertz	kg = kilogram	N = newton
g = gram	J = joule (newton-meter)	m = meter	s = second

Fold and Tear Carefully Along Dotted Line

Periodic Table of the Elements

(based on $^{12}_{6}C = 12.0000$)



Period	Group 1 (1A)	Group 2 (2A)	3 (3B)	4 (4B)	5 (5B)	6 (6B)	7 (7B)	8	9 (8B)	10	11 (1B)	12 (2B)	13 (3A)	14 (4A)	15 (5A)	16 (6A)	17 (7A)	18 (8A)
1	1 H Hydrogen 1.008																	2 He Helium 4.003
2	3 Li Lithium 6.941	4 Be Beryllium 9.012											5 B Boron 10.81	6 C Carbon 12.011	7 N Nitrogen 14.007	8 O Oxygen 15.999	9 F Fluorine 18.998	10 Ne Neon 20.180
3	11 Na Sodium 22.990	12 Mg Magnesium 24.305											13 Al Aluminum 26.982	14 Si Silicon 28.086	15 P Phosphorus 30.974	16 S Sulfur 32.06	17 Cl Chlorine 35.453	18 Ar Argon 39.948
4	19 K Potassium 39.098	20 Ca Calcium 40.078	21 Sc Scandium 44.956	22 Ti Titanium 47.88	23 V Vanadium 50.942	24 Cr Chromium 51.996	25 Mn Manganese 54.938	26 Fe Iron 55.847	27 Co Cobalt 58.933	28 Ni Nickel 58.693	29 Cu Copper 63.546	30 Zn Zinc 65.39	31 Ga Gallium 69.723	32 Ge Germanium 72.61	33 As Arsenic 74.922	34 Se Selenium 78.96	35 Br Bromine 79.904	36 Kr Krypton 83.80
5	37 Rb Rubidium 85.468	38 Sr Strontium 87.62	39 Y Yttrium 88.906	40 Zr Zirconium 91.224	41 Nb Niobium 92.906	42 Mo Molybdenum 95.94	43 Tc Technetium 98	44 Ru Ruthenium 101.07	45 Rh Rhodium 102.906	46 Pd Palladium 106.42	47 Ag Silver 107.868	48 Cd Cadmium 112.411	49 In Indium 114.82	50 Sn Tin 118.710	51 Sb Antimony 121.757	52 Te Tellurium 127.60	53 I Iodine 126.905	54 Xe Xenon 131.29
6	55 Cs Cesium 132.905	56 Ba Barium 137.327	57 La Lanthanum 138.905	72 Hf Hafnium 178.49	73 Ta Tantalum 180.948	74 W Tungsten 183.85	75 Re Rhenium 186.207	76 Os Osmium 190.2	77 Ir Iridium 192.22	78 Pt Platinum 195.08	79 Au Gold 196.967	80 Hg Mercury 200.59	81 Tl Thallium 204.383	82 Pb Lead 207.2	83 Bi Bismuth 208.980	84 Po Polonium 208.982	85 At Astatine 210	86 Rn Radon 222
7	87 Fr Francium 223	88 Ra Radium 226.025	89 Ac Actinium 227.028	104 Rf Rutherfordium (261)	105 Db Dubnium (262)	106 Sg Seaborgium (263)	107 Bh Bohrium (264)	108 Hs Hassium (265)	109 Mt Meitnerium (268)									

Lanthanide series														
58 Ce Cerium 140.12	59 Pr Praseodymium 140.908	60 Nd Neodymium 144.24	61 Pm Promethium 144.913	62 Sm Samarium 150.36	63 Eu Europium 151.96	64 Gd Gadolinium 157.25	65 Tb Terbium 158.925	66 Dy Dysprosium 162.50	67 Ho Holmium 164.930	68 Er Erbium 167.26	69 Tm Thulium 168.934	70 Yb Ytterbium 173.04	71 Lu Lutetium 174.967
Actinide series														
90 Th Thorium 232.038	91 Pa Protactinium 231.036	92 U Uranium 238.029	93 Np Neptunium 237.048	94 Pu Plutonium 244.064	95 Am Americium 243.061	96 Cm Curium 247.070	97 Bk Berkelium 247.070	98 Cf Californium 251.080	99 Es Einsteinium 252.083	100 Fm Fermium 257.095	101 Md Mendelevium 258.099	102 No Nobelium 259.101	103 Lr Lawrencium 260.105

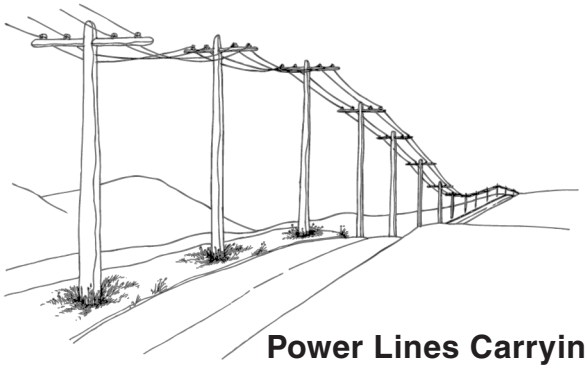
1 Mr. Molina's class studied the mass and volume of three liquids.

Liquid	Mass (grams)	Volume (cm^3)
Corn syrup	10.8	10.0
Salad oil	23.0	25.0
Vinegar	30.3	30.0

What is the difference in density between the least and the greatest density of the liquids listed in the table?

A. 0.09 g/cm^3
B. 0.10 g/cm^3
C. 0.16 g/cm^3
D. 1.08 g/cm^3

2 When electric power is carried over long distances through power lines, the electrical energy decreases as the distance increases. This energy decrease occurs because the current encounters resistance in the wires.



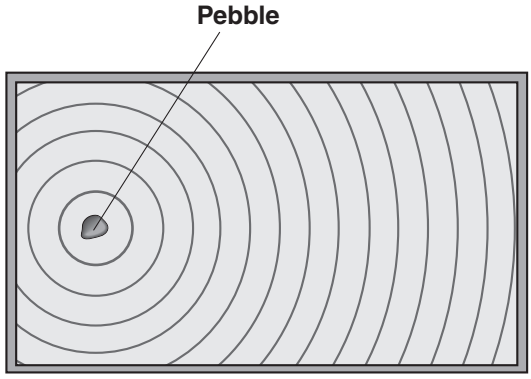
Power Lines Carrying Electricity

What happens to the electrical energy as it travels through the power lines?

F. The energy converts into thermal energy and is released into the atmosphere.
G. The energy converts into electromagnetic energy and is released as microwaves.
H. The energy is transferred to the current's electrons as the power lines are grounded.
I. The energy is transferred to the air as light energy as it travels along the power lines.

3

A ripple tank is a shallow container of water used to demonstrate the properties of a wave. Giselle tossed a pebble into the tank and counted the wave crests as they passed by a certain point. She counted 6 waves in 30 seconds.



Model of a Ripple Tank

Calculate the wave frequency in hertz (Hz).

4 Go to your Sample Answer Book to answer Number 4.

5 Lisa is seated at the front of a train. The train is traveling northbound at a steady speed of 40.2 kilometers/hour (km/hr). While the train is in motion, Lisa gets up from her seat and walks toward the back of the train at a steady rate of 2.4 km/hr.

Train

What is Lisa's actual rate of speed, relative to the ground, in km/hr in a northbound direction at the time that she is walking toward the back of the train?

6 A homeowner accidentally used a chemical treatment that eliminated the bacteria in the lawn. What would be the long term effect of such an action?

A. an increase in nests in the lawn area
B. a need to pull more weeds from the lawn area
C. a need to fertilize the lawn area with plant nutrients
D. an increase in the number of rodents in the lawn area

7 On flat open farmland, farmers often plant a row of trees as a method of soil conservation. Which statement **best** explains how a row of trees can help conserve soil?

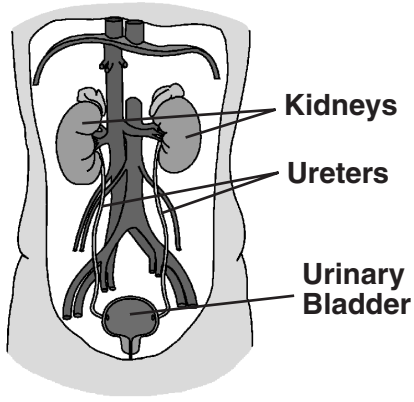
F. The trees provide shade, so the soil does not dry out.
G. The tree branches protect the soil from the force of acid rain.
H. The trees act as a windbreak, reducing soil erosion caused by blowing wind.
I. The trees attract animals whose wastes add fertilizer to help prevent soil erosion.

8 A small satellite orbits Pluto. Eight satellites orbit Neptune, the closest planet to Pluto. Pluto is much smaller than Neptune. Why isn't Pluto a satellite of Neptune?

A. The Sun's gravity is the primary influence on Pluto.
B. Neptune is not large enough to capture Pluto as a satellite.
C. Neptune's gravitational pull is neutralized by its eight satellites.
D. Pluto's satellite's gravitational pull keeps Pluto away from other planets.

9 Go to your Sample Answer Book to answer Number 9.

10 The excretory system in the human body has several components. Some of them are identified in the diagram below.



What is the relationship between the kidneys, ureters, and urinary bladder?

F. They work together to transport blood.
G. They work independently with specialized functions.
H. They work together to maintain the chemical balance of blood.
I. They work as storage organs for fluids to prevent dehydration.

11 In one species of guinea pig, the gene for black fur is dominant while the gene for brown fur is recessive. A male guinea pig with black fur and a female guinea pig with black fur produce a female offspring with brown fur. Which **most** likely describes the genes of the parent guinea pigs?

A. Both parent guinea pigs carry the recessive gene.

B. The male parent guinea pig carries the recessive gene, but the female parent does not.

C. The female parent guinea pig carries the recessive gene, but the male parent does not.

D. Neither parent guinea pig carries the recessive gene; the brown fur was a spontaneous mutation.

12 Soil organisms, such as fungi, worms, and bacteria, are all biotic parts of the woodland ecosystem. What is the role of these organisms in the woodland ecosystem?

F. to provide nitrogen for the animals

G. to obtain dissolved oxygen from moisture

H. to break down the remains of other living things

I. to store chlorophyll for the photosynthesis process

13 Earth's stratosphere contains ozone. The ozone layer protects Earth from ultraviolet radiation. If the ozone layer is damaged, how will Earth be **most** affected?

A. The ultraviolet radiation may result in damage to living organisms.

B. The ultraviolet radiation may cause air conditioning systems to overheat.

C. The ultraviolet radiation may rapidly increase the water temperature of the Pacific Ocean.

D. The ultraviolet radiation may permanently destroy some satellite communication systems.

14 When speaking about his accomplishments and contributions to the progress of science, Isaac Newton said, "If I have been able to see further, it is because I stood on the shoulders of giants." How does this statement apply to his scientific accomplishments?

F. His new theories were an outgrowth of Einstein's general theory of relativity.

G. He invented the telescope to see further into the universe than had others before him.

H. His law of universal gravitation was very much like the Ptolemaic system of epicycles.

I. His new theories increased scientific knowledge by looking at old observations in a new way.

15 A microbiologist working at a pharmaceutical company is conducting a research project on a new medicine used to treat the common cold. Why is it important for the scientist to keep accurate notes about the research?

A. Accurate notes are required to get the predicted results of the test.

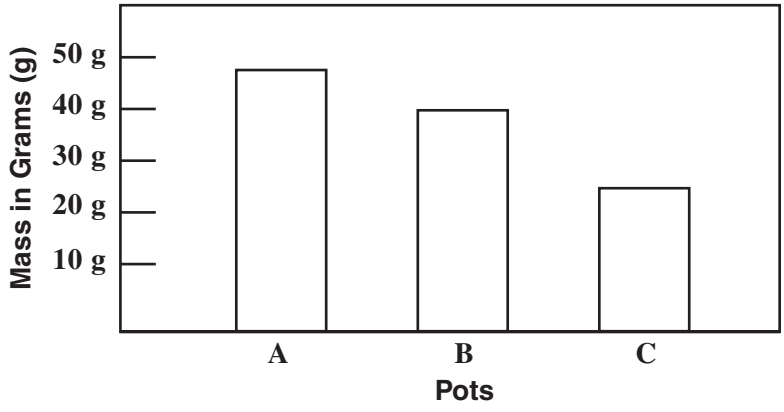
B. Accurate notes will help other scientists replicate and validate the results.

C. Accurate notes are necessary for experiments conducted on human subjects.

D. Accurate notes will help to ensure that no one uses the same experimental methods.

16 An equal amount of potting soil was placed in three identical pots. Twenty petunia seeds were used. Three seeds were planted in Pot A, seven seeds in Pot B, and ten seeds in Pot C. The pots were all placed on the same table, and after they grew to a height of about 10 centimeters (cm), the plants from each pot were cut off at soil level, dried overnight, and weighed. The chart below shows the average plant mass from each pot.

AVERAGE PLANT MASS



What is the variable in this investigation?

F. the soil
G. the temperature
H. the mass of each plant
I. the space available for each seed

This is the end of the Science Sample Test.

Until time is called, go back and check your work or answer questions you did not complete. When you have finished, close your Sample Test Book and Sample Answer Book.

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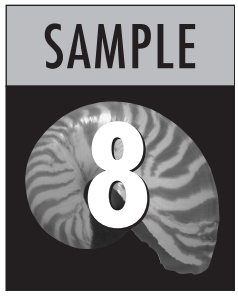
Name _____

FCAT Science Sample Answer Book



Answer all the questions that appear in the Sample Test in this Sample Answer Book. Answer multiple-choice questions by filling in the bubble for the answer you select. Answer gridded-response questions by filling in the correct bubbles. Write your answers to "Read, Inquire, Explain" questions on the lines provided.

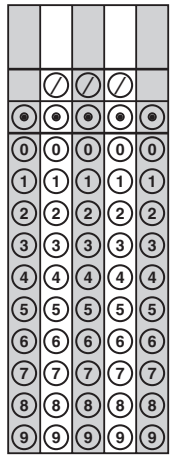
To remove your Sample Answer Book, carefully tear along the dotted line.

Fold and Tear Carefully Along Dotted Line

1 Ⓐ Ⓑ Ⓒ Ⓓ

2 Ⓕ Ⓖ Ⓗ Ⓘ

3

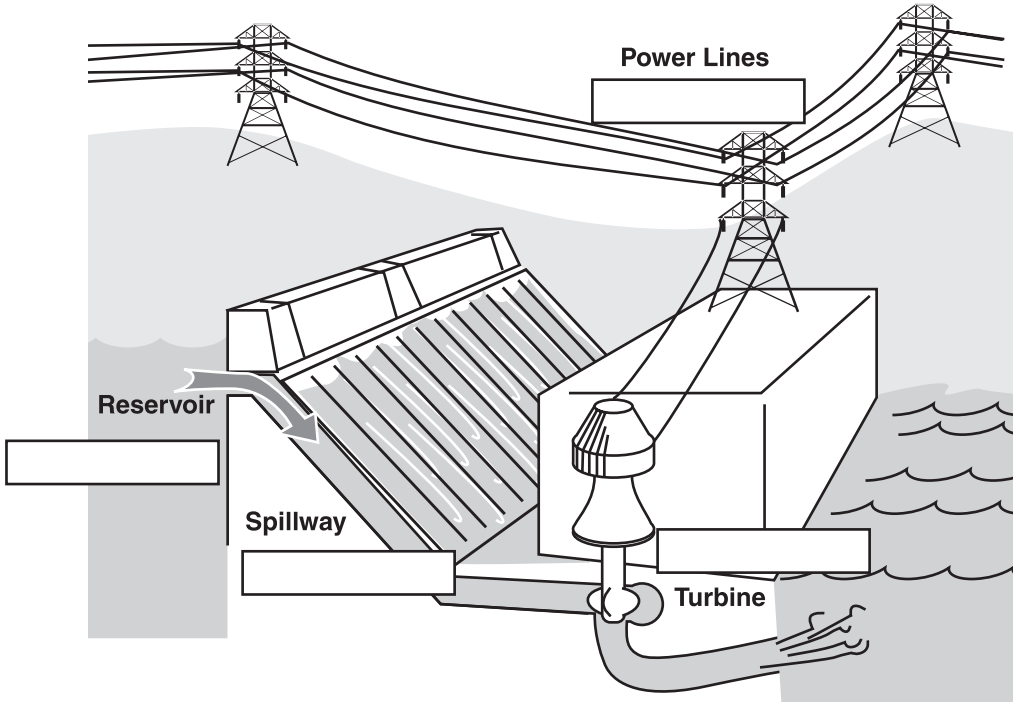


4 In 1920, the Florida Power Corporation built the Jackson Bluff Dam to serve as a hydroelectric power plant. The picture below shows a hydroelectric power plant changing energy from one form to another.

READ
INQUIRE
EXPLAIN

Part A Look at the diagram of the hydroelectric power plant below. Fill in the boxes with one of the energy terms given below that is most closely associated with the location indicated in the diagram. Each term can be used only once.

electrical kinetic mechanical potential



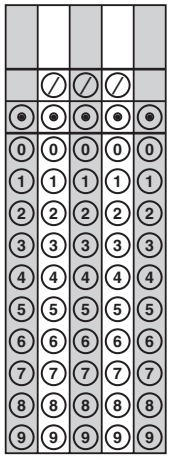
Part B Describe how electricity is produced in this hydroelectric power plant.

Be sure to include references to

- the power lines
- the reservoir
- the spillway
- the turbine

Go On

5



6 Ⓐ Ⓑ Ⓒ Ⓓ

7 Ⓕ Ⓖ Ⓗ Ⓘ

8 Ⓐ Ⓑ Ⓒ Ⓓ

9

READ
INQUIRE
EXPLAIN

If you look up on a clear night when the Moon is full, you will see dark spots, circles, and white patches on the Moon's surface. Observe the Moon on clear nights for one continuous month and you will see the same side of the Moon from any location.

Explain why you always observe the same side of the Moon while the Moon is revolving in its orbit about Earth. Be sure to include information about the rotations of the Moon and Earth.

10 Ⓕ Ⓖ Ⓗ Ⓘ

11 Ⓐ Ⓑ Ⓒ Ⓓ

12 Ⓕ Ⓖ Ⓗ Ⓘ

13 Ⓐ Ⓑ Ⓒ Ⓓ

14 Ⓕ Ⓖ Ⓗ Ⓘ

15 Ⓐ Ⓑ Ⓒ Ⓓ

16 Ⓕ Ⓖ Ⓗ Ⓘ

This is the end of the Science Sample Test.

Until time is called, go back and check your work or answer questions you did not complete. When you have finished, close your Sample Test Book and Sample Answer Book.

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