About the Math and Science Test

As part of the selection process for many positions at Bruce Power, you will be given a math and science test. Due to the technical nature of the position and our industry, we provide extensive training programs for new staff and it is important to ensure that people joining our organization can be successful in these programs.

A basic knowledge of math and science is considered to be an entry requirement for Nuclear Power School, which provides the fundamental training for new employees.

What topics are covered?

- Basic Mathematical Concepts
- Scientific Notation
- Dimensional Analysis
- Algebra
- Trigonometry
- Graphs and Basic Statistics
- Physics Terms and Units
- Mechanical Principles
- Simple Machines
- Basic Concepts of Physics
- Basic Electrical Concepts
- Basic AC and DC Circuits
- Atomic Structure
- Nuclear Interactions and Reactions
- Heat Transfer
- Fluid Flow
- Chemistry Fundamentals
- Water Chemistry
- Material Science
- Radiation

What are the questions based on?

While applicants may have taken post-secondary courses in some of the topics, the questions on the test are based on the Ontario Grade 7 to 12 curriculums. It is recognized that people will not necessarily have taken all of the topics depending on the specific courses they took in school, but the level of the questions is based on what someone who had taken that topic at the high school could reasonably be expected to answer.

What format is the test?

The test has 100 multiple choice questions, five in each of the topics above.
An equation sheet and a scientific calculator are provided for your use.
You will have up to three hours to write it.

What are some samples of questions?

BASIC MATH CONCEPTS – Questions in this area test your ability to perform basic arithmetic and numerical operations.

Solve: $\sqrt{49} \times 3^2$

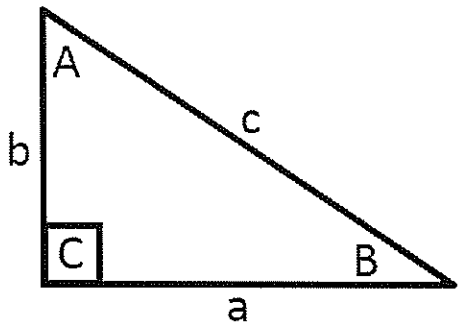
a. 21
b. 63
c. 441
d. 3969

Answer: b

TRIGONOMETRY – Questions in this area test your ability to solve problems involving trigonometric functions. A table of trigonometric functions is attached to the test.

Typical Questions:

What is angle A when a = 4 and b = 3?



a. 36.9
b. 38.7
c. 51.3
d. 53.1

Answer: d

ALGEBRA – Questions in this area test your ability to perform algebraic operations. In addition, it includes questions in important related areas, such as graphical representations.

Typical Question:

Solve the following simultaneous equations for x.

$$4x - 3y = 11$$
$$5x + 4y = 6$$

a. x = 2
b. x = 3
c. x = 4
d. x = -3

Answer: a

CHEMISTRY FUNDAMENTALS – Questions in this area test your knowledge of basic concepts in chemistry and biology, which are important to the operation of a power plant.

Typical Question:

In chemistry the term "valence" is a measure of the ability of an element to _____ with other elements.

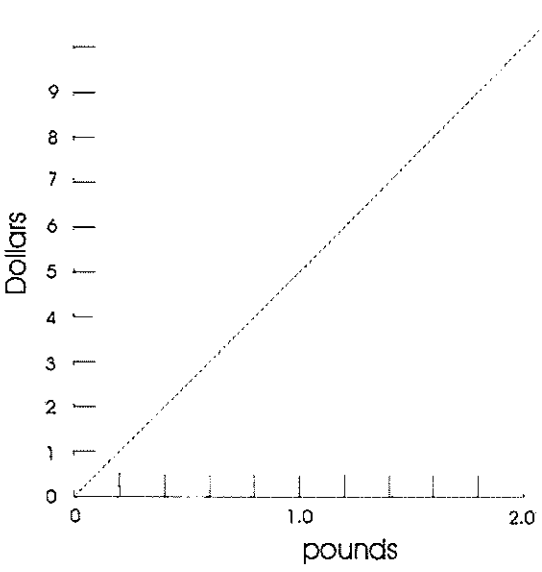
a. decompose
b. dissociate
c. combine
d. diffuse

Answer: c

GRAPHS AND BASIC STATISTICS – Questions in this area test your ability to read graphical information and interpret statistics.

Typical Question:

The relationship between the Hong Kong dollars and the British pound (at one period of time) is represented by the graph below. How many pounds were equivalent to $4.00 at that time?



a. 0.75
b. 0.80
c. 0.90
d. 1.00

Answer: b

DIMENSIONAL ANALYSIS – Questions in this area test your ability to apply basic geometric relationships with respect to three dimensional objects.

Typical Question:

What is the entire surface area of a cube if the surface area of one face is equal to e^2?

a. e^6
b. $6e^2$
c. $3e^2$
d. $6e^6$

Answer: b

ATOMIC STRUCTURE - Questions in this area test your knowledge of the structure of atoms.

Typical Question:

In atomic notation the elements are shown by symbols using the conventional notation ${}^{A}_{Z}N$.

How is the number of neutrons in the nucleus determined?

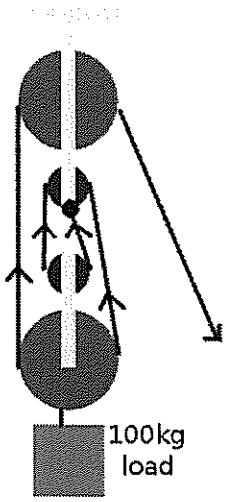
a. Z
b. A
c. A - Z
d. A + Z

Answer: c

SIMPLE MACHINES – Questions in this area test your knowledge of application of basic physics in levers, pulleys, and ramps, which are important to understanding the operation of equipment in a power plant.

Typical Question:

In the pulley system shown below, how much force is required to lift a 100kg load?



a. 25
b. 50
c. 100
d. 200

Answer: a

BASIC CONCEPTS OF PHYSICS - Questions in this area test your knowledge of basic concepts in physical and mechanical science, which are important to the operation of a power plant. Emphasis is placed on application of these concepts to actual physical and mechanical problems.

Typical Question:

A heavy ball is tied to the end of a string and is swung around in a circular orbit at a constant rotational rate. If the string is cut while the ball is in motion, the ball will …

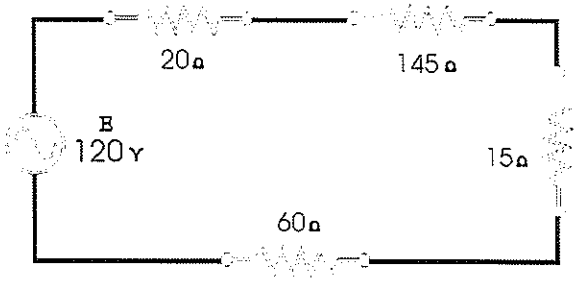
a. Travel in a straight line perpendicular to the radius of the orbit.
b. Travel in a straight line path parallel to the radius of the orbit.
c. Continue to remain in a circular path.
d. Move toward the center of the circular orbit.

Answer: a

BASIC AC & DC CIRCUITS - Questions in this area test your knowledge of basic electricity and electronics. Emphasis is placed on application of basic relationships to simple circuits and components.

Typical question:

Determine the current (amperes) in the circuit below:



a. 5.0 amps
b. 0.5 amps
c. 50.0 amps
d. 100.0 amps

Answer: b