

**NORTH BRANFORD HIGH SCHOOL  
SCIENCE DEPARTMENT  
SCIENCE CAPT INFORMATION**

**Introduction:**

**The purpose of this packet is to familiarize you with the science portion of a test taken by all high school students at the end of their sophomore year.** The test is called the Connecticut Academic Performance Test (CAPT). The test is given during the month of March. Students take various parts of the test on different days. Students are now required to take the test in order to graduate from high school. Therefore, it is critical that you are familiar with the format of the test (types of questions) and the content of the test.

**Overview of the Science CAPT:**

There are two primary objectives tested on the science CAPT: first, students are tested on their understanding of scientific concepts ( i.e. content strands) ; and second; students are tested on their understanding of scientific processes (i.e. experimentation, data analysis, interpretation of data, etc). The content strands (Energy Transformations, Chemical Structures and Properties and Global Interdependence) are taught in grade 9 General Science. The content standards (Cell Chemistry and Biotechnology, and Genetics, Evolution & Biodiversity) are taught in grade 10 Biology. The experiments (performance tasks) are conducted during science classes in grades 9-10.

**The Structure of the Science CAPT:**

The table on the last page indicates the structure of the science CAPT. In order to do well on this test, it is critical that students learn the strategies for answering the two types of questions that will be on the test. The two types of questions are: first, **multiple-choice questions**; and second, **constructed response (also known as open-ended or short essay) questions**. The constructed response questions focus on scientific skills/processes that are specific to the performance tasks completed in grades 9-10. The multiple-choice questions are worth one point each and the constructed-response (short essay) questions are worth three points each. The constructed response questions are scored with a scoring rubric (0-3). The scoring rubric is as follows:

**Scoring Rubric for constructed response questions:**

**Score 3** = The response is an **excellent** answer to the question. It is correct, complete, and appropriate and contains elaboration, extension, and/or evidence of higher-order thinking and relevant prior knowledge. There is no evidence of misconceptions. Minor errors will not necessarily lower the score.

**Score 2** = The response is a **proficient** answer to the question. It is generally correct, complete, and appropriate although minor inaccuracies may appear. There may be limited evidence of elaboration, extension, higher-order thinking, and relevant prior knowledge, or there may be significant evidence of these traits but other flaws (e.g., inaccuracies, omissions, inappropriateness) may be more than minor.

**Score 1** = The response is a **marginal** answer to the question. While it may contain some elements of a proficient response, it is inaccurate, incomplete and/or inappropriate. There is little if any evidence of elaboration, extension, higher-order thinking or relevant prior knowledge. There may be evidence of significant misconceptions.

**Score 0** = The response, although on topic, is an **unsatisfactory** answer to the question. It may fail to address the question, or it may address the question in a very limited way. There may be no evidence of elaboration, extension, higher-order thinking, or relevant prior knowledge. There may be evidence of serious misconceptions.

**EXAMPLE of CONSTRUCTED RESPONSE QUESTION:**

Students in a science class conducted an investigation to determine how a specific factor affects yeast population growth measured by the amount of carbon dioxide gas produced. The table below shows the results of the students' experiment:

pH level	Height of CO <sub>2</sub> bubbles in mm
3	2
7	8
9	10

What conclusion can be drawn based upon the students' results?

**Multiple-Choice Questions:** The multiple choice questions are typically organized into clusters, usually 2-4 questions per cluster, about specific concepts. Each cluster starts with an introductory description of a particular situation. The introduction is followed by several questions. The introduction may provide specific information which may help you to answer the questions.

**Sample multiple-choice cluster:**

While sitting by a fireplace you are watching several logs burn. Answer the following questions.

**Question 1:** Which of the following statements best describes the energy transformation that occurs when a log burns?

- A. Mechanical energy changes to chemical energy
- B. Chemical energy changes to heat and light energy
- C. Heat and light energy changes to chemical energy
- D. Mechanical energy changes to heat and light energy.

**Question 2:** A log was burned in a fireplace. Which statement is true about the leftover ashes when they are compared to the original unburned log?

- A. The ashes have more mechanical energy than the unburned log.
- B. The ashes occupy the same amount of space as the unburned log.
- C. The ashes have less chemical energy than the unburned log.
- D. The ashes have the same molecular structure as the unburned log.

**Question 3:** Which of the following equations best represents the burning of a log?

- A.  $\text{Wood} + \text{CO}_2 \rightarrow \text{O}_2 + \text{H}_2\text{O} + \text{energy}$
- B.  $\text{Wood} + \text{O}_2 \rightarrow \text{CO}_2 + \text{H}_2\text{O} + \text{energy}$
- C.  $\text{Wood} + \text{H}_2\text{O} \rightarrow \text{O}_2 + \text{CO}_2 + \text{energy}$
- D.  $\text{Wood} \rightarrow \text{CO}_2 + \text{O}_2 + \text{H}_2\text{O} + \text{energy}$

## OVERVIEW of the CAPT SCIENCE TEST: Third generation

### Item Distribution (MC = multiple-choice, CR = constructed response)

	Content Knowledge	Scientific Inquiry, Literacy and Numeracy		Total
<b>Content Strand</b>	MC Items*	MC Items*	CR Items*	Points
I. Energy Transformations	8	4	1	15
II. Chemical Structures & Properties	8	4	1	15
III. Global Interdependence	8	4	1	15
IV. Cell Chemistry & Biotechnology	8	4	1	15
V. Genetics, Evolution & Biodiversity	8	4	1	15
<b>Totals</b>	<b>40 MC Items (40 points)</b>	<b>20 MC Items (20 points)</b>	<b>5 CR Items (15 points)</b>	<b>75 Points</b>

\* Each multiple-choice (MC) item is worth 1 point. Each constructed response (CR) item is worth 3 points.

#### General Test Format

There will be a total of 65 test questions: 60 multiple choice items and five constructed response items.

Each “**Content Strand**” (see left column in table above) will be assessed by 13 items: 12 multiple-choice and one constructed response item. Eight of the multiple-choice items will assess content knowledge and four will assess scientific inquiry, literacy and numeracy. Each of the constructed response questions will focus on scientific inquiry, literacy, and/or numeracy (i.e. asking about an experiment, graphing data, interpreting data, etc.).

#### Test Scoring

The multiple choice questions will be scored electronically as correct or incorrect. Constructed response questions will be hand-scored by trained readers using a 4-point scale (0-3).

Please contact your child’s science teacher if you would like more information regarding the Science CAPT.

PLEASE ENCOURAGE YOUR CHILD TO

***“DO THEIR BEST WHEN TAKING THE CAPT TEST”***