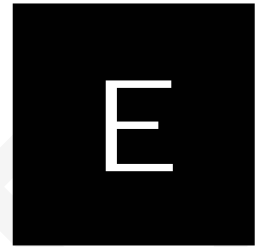


Name

RELEASED FORM

Grade 8

Form E



# North Carolina Test of Science—Grade 8

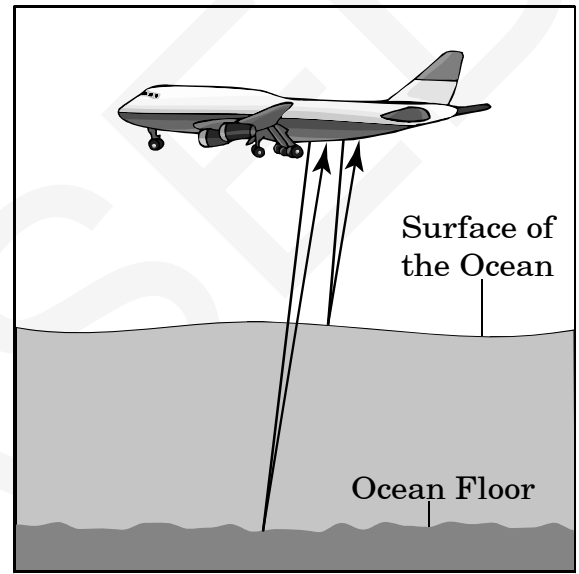
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Public Schools of North Carolina  
[www.ncpublicschools.org](http://www.ncpublicschools.org)  
State Board of Education  
Department of Public Instruction  
Division of Accountability Services/North Carolina Testing Program  
Raleigh, North Carolina 27699-6314



1. Which source of water pollution includes oil and gasoline discharge from automobiles and storm sewer drainage?
- A agriculture
  - B bacteria
  - C sedimentation
  - D urban runoff

2. This drawing represents an airplane flying over the ocean, carrying equipment that measures characteristics of the ocean. The equipment produces two kinds of laser beams that react differently when they come into contact with the ocean's surface and the ocean floor.



What does this form of technology measure?

- A water depth
- B water temperature
- C pH levels of water
- D dissolved oxygen in water

3. This chart describes an experiment using a sample of water and three solids made of different substances.

- Three different solids are dropped into a wide beaker of water.
- Solid 1 sinks halfway down the water and remains suspended.  
Solid 2 sinks to the bottom.  
Solid 3 floats to the top of the water.

Which property of water is being tested?

- A solubility
  - B cohesion
  - C polarity
  - D buoyancy
4. Which **best** explains the importance of dissolved gases in the ocean?
- A They help control pollution.
  - B They help provide oxygen for aquatic animals.
  - C They help maintain a constant water temperature.
  - D They help maintain constant levels of salinity.

5. Which **best** describes a bioindicator?

- A a species that has a short life span
- B a species that depends on specific conditions to survive
- C a species that can adapt to a variety of conditions
- D a species that has been introduced to an ecosystem

6. How can the atmosphere be considered part of the hydrosphere?

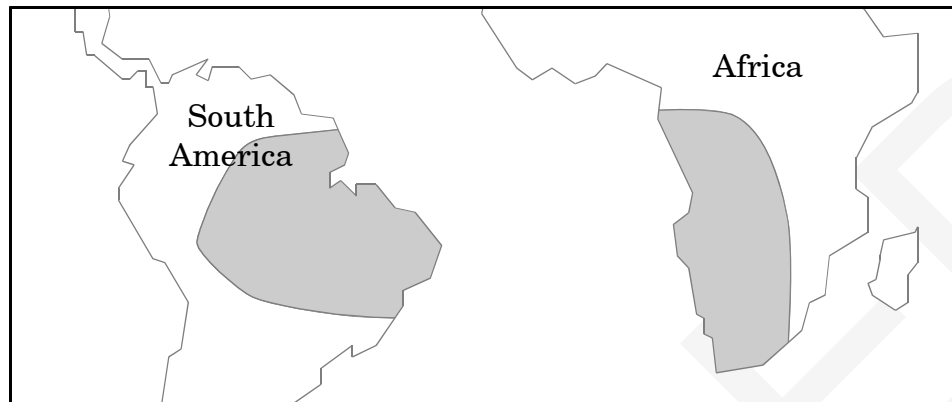
- A It is a source of water.
- B It blocks ultraviolet rays from the sun.
- C It contains the oxygen necessary for life on Earth.
- D It traps pollutants that would otherwise harm the earth.

7. What characteristic of aluminum allows it to be made into aluminum foil?

- A It is dense.
- B It is soluble.
- C It is magnetic.
- D It is malleable.

8. Which pure substance is composed of more than one element?
- A carbon
  - B gold
  - C water
  - D sodium
9. Which factor **best** explains why some people will develop cancer and others will not after being exposed to the same high levels of a harmful chemical?
- A concentration of the chemical
  - B potency of the chemical
  - C individual susceptibility to the chemical
  - D individual exposure to the chemical
10. After a chemical reaction occurs in an open test tube, measurements indicate that the mass of the reactants is greater than the mass of the products remaining in the test tube. What **most likely** explains the measurements?
- A A gas was produced.
  - B A solid was produced.
  - C The salinity of the reactants was high.
  - D The temperature of the reactants was low.
11. Which is the **best** way to determine if an object is made of pure silver?
- A determine the solubility of the object
  - B test to see if the object is chemically reactive
  - C determine the density of the object and compare the known density of pure silver
  - D compare the mass of the silver object to the mass of a piece of pure silver

12. The shaded areas of this diagram represent where fossils of a land-dwelling animal were found on the continents of South America and Africa.



What does this evidence suggest?

- A The animals swam from one continent to the other.
- B The two continents were once connected by a land bridge.
- C The animals developed on the two continents at the same time.
- D The two continents were once joined as part of a larger continent.
- 
13. A layer of marine fossils is discovered in a desert environment. Which hypothesis **best** explains the discovery?
- A The area was once covered by water.
- B Volcanic activity once occurred in the area.
- C A catastrophic event once occurred in the area.
- D Erosion turned most of the limestone in the area into sand.
14. Fossils of warm-weather plants were found on an island in the Arctic Ocean. What can **best** be concluded from this discovery?
- A Spores of plants drifted by air currents to the island.
- B Ocean currents carried the plants to the island.
- C The island drifted from a tropical region to its present location.
- D Seeds of plants have been carried to the island by migratory birds.

15. Which is **best** used to track the global movement of volcanic ash after an eruption?
- A ground truthing
  - B satellite photographs
  - C topographic maps
  - D weather balloons
16. Which theory **best** describes how an asteroid striking Earth may have caused the extinction of dinosaurs?
- A Heat from the asteroid caused massive fires that reduced the food supply.
  - B Dense clouds formed following the collision, causing a global drop in temperature.
  - C Land masses were altered by the collision, reducing the space where dinosaurs could roam for food.
  - D Glaciers melted rapidly from heat produced by the asteroid, causing floods that destroyed dinosaurs' habitats.
17. Which statement **best** explains the reason muscle cells have more mitochondria than skin cells?
- A Muscle cells use more energy than skin cells.
  - B Muscle cells have fewer proteins than skin cells.
  - C Muscle cells have a smaller nucleus than skin cells.
  - D Muscle cells have more excess water than skin cells.
18. What is the role of cytoplasm in a living cell?
- A fight infections
  - B digest proteins
  - C surround organelles
  - D pass on genetic information

19. This chart shows the worldwide number of measles cases over twenty years.

**Worldwide Cases of Measles**

Year	Measles Cases
1980	3,800,000
1985	2,800,000
1990	1,400,000
1995	800,000
2000	1,000,000

Which is *most likely* the cause of the decline in measles cases from 1980 to 1990?

- A antibiotics
- B chemotherapy
- C quarantines
- D vaccinations

20. How are parasites and viruses similar?

- A Both are contagious diseases.
- B Both infect host organisms.
- C Both reproduce using host cells.
- D Both break down food using oxygen.

21. Which describes a nonpoint source of pollution?
- A accumulation of oil in a stream next to a gasoline station
  - B chemical spill in a river next to a manufacturing complex
  - C runoff from a road into a nearby stream
  - D liquid fertilizer flowing from a barrel into a stream
22. Which statement *best* explains the reason some insects can walk across the surface of a lake?
- A Water is a polar molecule, and its adhesiveness causes good capillary action.
  - B Water is a non-polar molecule, and its cohesiveness causes good capillary action.
  - C Water is a polar molecule, and its cohesiveness causes high surface tension.
  - D Water is a non-polar molecule, and its high adhesiveness provides high surface tension.
23. Seasonal tourism can cause a shortage of the freshwater supply in some coastal areas. This can then cause coastal communities to purchase water from other sources. What does this situation describe?
- A economic trade-off
  - B excess nutrient input
  - C point source pollution
  - D environmental stewardship
24. Which interaction illustrates a terrestrial-aquatic food web relationship?
- A a bear eating fish in a river
  - B a turtle burying eggs in the sand
  - C a fish eating plankton in the ocean
  - D a bird laying eggs in a nest in a tree
25. What does the hardness of water indicate?
- A high levels of calcium and magnesium
  - B low levels of calcium and magnesium
  - C increased pressure in pipelines to faucets
  - D decreased pressure in pipelines to faucets



26. Water temperature and depth of water are factors that can determine the type of organisms that live in different areas of the ocean. Which other factor is **most** important?
- A currents
  - B tides
  - C sediments
  - D sunlight
27. How does exposure to cigarette smoke contribute to an asthma attack?
- A by decreasing blood pressure
  - B by causing mutations in cells
  - C by irritating the respiratory tract
  - D by reducing insulin levels
28. What makes fertilizers a benefit to the farming industry?
- A They increase the nutrients in soil.
  - B They increase the growth of helpful bacteria.
  - C They decrease the chance of bacteria growing in the soil.
  - D They decrease the chance of plants being eaten by insects.
29. Which is a naturally occurring chemical?
- A aspirin
  - B salt
  - C plastic
  - D nylon
30. Which element is a poor conductor of heat?
- A F
  - B K
  - C Fe
  - D Ag

31. This table shows the specific heat of four substances.

Substance	Specific Heat (J/kg•°C)
Lead	128
Iron	448
Glass	837
Ice	2,090

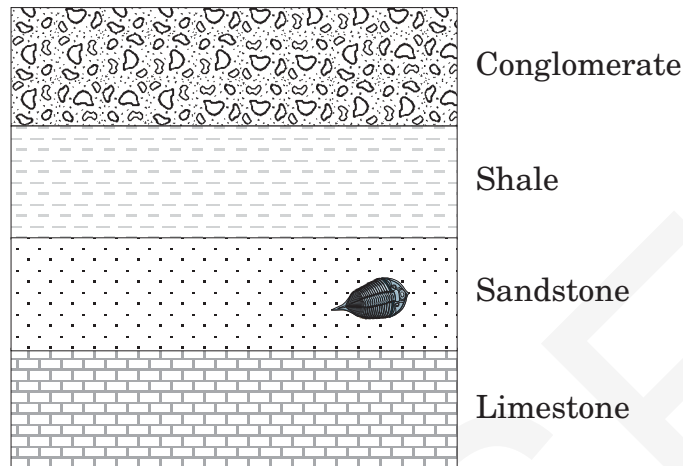
If each substance is exposed to the same amount of energy for one minute, which substance will get the hottest?

- A Lead
- B Iron
- C Glass
- D Ice

32. A beaker with 100 mL of water is placed on a hot plate and heated. The water boils at 100°C. At what temperature would 90 mL of water boil?

- A 10°C
- B 90°C
- C 100°C
- D 110°C

33. This diagram shows a cross section of land that has not been overturned and includes a fossil.



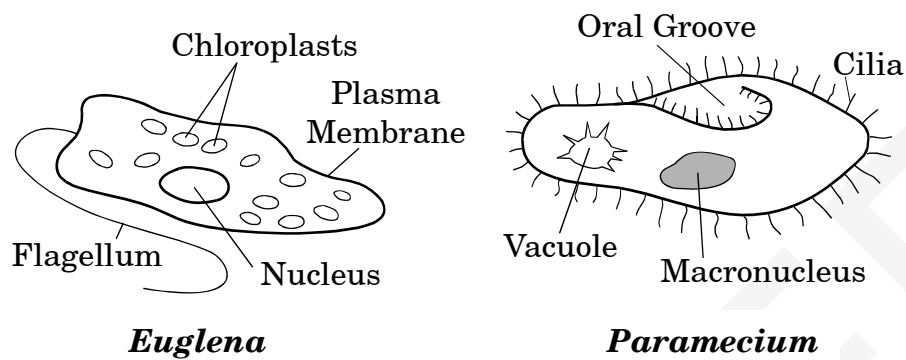
What can be concluded about the age of the fossil?

- A It is younger than the shale.
  - B It is older than the shale.
  - C It is older than the sandstone.
  - D It is younger than the sandstone.
- 
34. Which **best** explains how geologic time scales can help scientists study the evolution of life on Earth?
- A They describe the existence of rocks before there was life on Earth.
  - B They show that geological features have evolved at the same rate as organisms.
  - C They compare the life histories of species that have used rocks as habitats.
  - D They correlate the existence of life on Earth with geological events.

35. Which statement supports the theory of evolution?
- A All living cells come from previous cells.
  - B All plants and animals have DNA.
  - C Matter cannot be created or destroyed during chemical reactions.
  - D Fossils provide evidence that vertebrates share a common ancestor.
36. How can satellite imagery *best* be used after a hurricane hits the coast?
- A to check nearby lake depths
  - B to identify the amount of beach erosion
  - C to determine the location of sea turtles' nests
  - D to map topography inland of the coastal region

37. How are plant and animal cells similar?
- A They both have flagella.
  - B They both have a nucleus.
  - C They both have an eyespot.
  - D They both have chloroplasts.

38. This diagram shows a *Euglena* and a *Paramecium*.



*Euglena* and *Paramecium* are similar in which way?

- A Both are types of plants.
- B Both have a cell wall to maintain their structure.
- C Both have structures that aid them in movement.
- D Both must produce their own food in order to live.

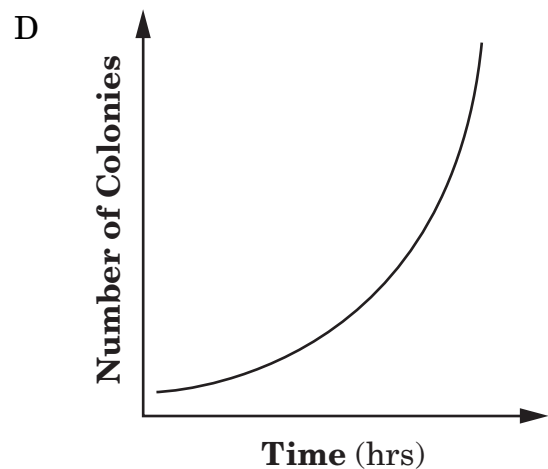
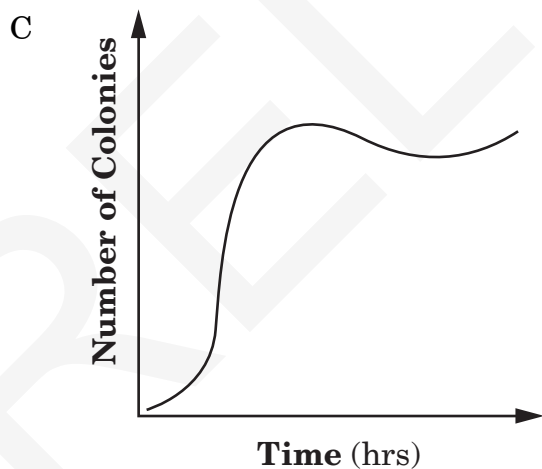
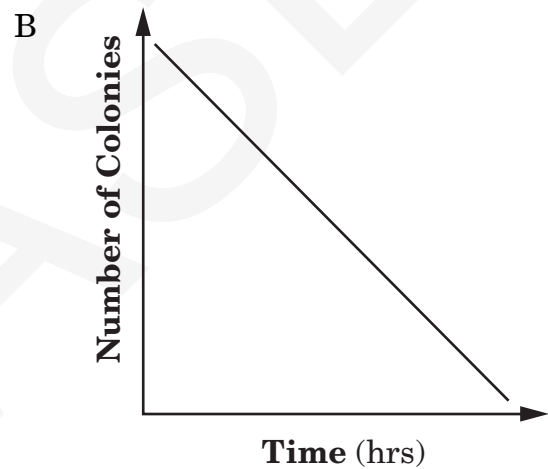
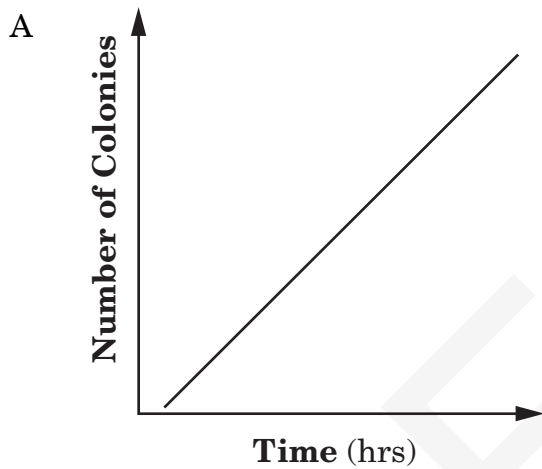
39. Some women who took the drug thalidomide in early pregnancy gave birth to children with severe birth defects. Which is thalidomide considered to be?

- A antibiotic
- B mutagen
- C vaccine
- D virus

40. This chart shows the growth of bacteria over a period of 10 hours.

Time (hrs)	Number of Colonies
0	0
1	5
3	25
5	125
8	250
10	500

Which graph *best* illustrates the growth of the bacteria?



41. What is one way scientists analyze the health of a river?
- A by measuring its depth
  - B by measuring the speed at which the river flows
  - C by measuring its dissolved oxygen content
  - D by measuring the distance the river travels to reach an ocean
42. Which example **best** represents an interconnection between an aquatic food web and a terrestrial food web?
- A Fish eat insects that land on the surface of a pond.
  - B Snakes eat bird eggs.
  - C Bats eat mosquitoes.
  - D Mountain lions catch and eat deer.
43. What is one way the government of the United States attempts to reduce pollution in the oceans?
- A create new desalination plants
  - B discontinue sewage treatment programs
  - C increase oil and gasoline production
  - D enforce laws limiting trash dumping
44. Where is the majority of Earth's freshwater located?
- A clouds
  - B Pacific Ocean
  - C polar ice caps
  - D rivers
45. The population density of marine life is greater along the shorelines of the ocean than farther out in the deep waters of the ocean. Which statement provides the **best** reason for this situation?
- A Ocean currents prevent many smaller marine organisms from living in deep water.
  - B The shallow waters have fewer predators.
  - C Coastal waters are less polluted than the deeper waters of the ocean.
  - D There are more nutrients in shallow waters.

46. Which technology **best** monitors temperature changes in Earth's oceans?
- A radar
  - B satellites
  - C sonar
  - D microwave
47. Chemical X has a mass of 5 grams, and chemical Y has a mass of 10 grams. If the two chemicals are mixed and a complete chemical reaction takes place, what is **most likely** the mass of the product?
- A 5 grams
  - B 10 grams
  - C 15 grams
  - D 50 grams
48. Which **best** describes a way to reduce a person's exposure to pesticides?
- A put leftovers in the refrigerator
  - B do not eat bread that has mold growing on it
  - C make sure meat is thoroughly cooked before eating it
  - D wash fruits and vegetables before eating them
49. How can a scientist, using the periodic table, find an element with properties similar to another element?
- A by comparing density
  - B by finding its periodic group
  - C by comparing malleability
  - D by comparing atomic weight
50. Why were some pesticides such as DDT removed from public use?
- A They can cause heart disease.
  - B They can cause diabetes.
  - C They can cause meningitis.
  - D They can cause cancer.
51. The element silicon is **best** used for which purpose?
- A as a container to keep coffee hot
  - B as a semiconductor in computer chips
  - C as a material to make airplane frames
  - D as a malleable material for coins and jewelry



52. Which is an example of a physical change?
- A boiling
  - B burning
  - C rotting
  - D rusting
53. The theory of global warming is based on an increase of what atmospheric gas?
- A carbon dioxide
  - B helium
  - C hydrogen
  - D oxygen
54. The Mid-Atlantic Ridge exists between the African and South American geologic plates. Which process **most often** occurs at the Mid-Atlantic Ridge?
- A destruction of underwater mountains
  - B creation of new continents
  - C subduction of geologic plates
  - D spreading of sea floor
55. A scientist has a hypothesis that a large volcanic eruption caused a change in global temperature. Which information gained from ice cores is **most** useful in supporting the scientist's hypothesis?
- A levels of dissolved oxygen
  - B identities of trace metals
  - C estimates of natural radioactivity
  - D amounts of atmospheric dust
56. Which is the **best** method for verifying data gathered by satellites?
- A ground truthing
  - B reflectance curves
  - C satellite imagery
  - D spectral analysis
57. Information about the heredity of a cell is stored in which organelle?
- A flagellum
  - B mitochondrion
  - C nucleus
  - D vacuole

58. How is the cell membrane important to the process of osmosis?
- A It allows water to move into the cell.
  - B It allows all materials from the outside environment to move into the cell.
  - C It traps water and nutrients that would otherwise be unable to move into the cell.
  - D It collects nutrients from water in the outside environment and moves them into the cell.
59. Which is *most likely* responsible for the formation of cancer cells?
- A an antibiotic
  - B a mutagen
  - C a bacterium
  - D a parasite

60. Which project is *most likely* to interest a scientist working at a biotechnology company?
- A study and reconstruction of fossilized bones
  - B conservation of key species within ecosystems
  - C development of genetically modified corn plants
  - D prevention of sewage leaking into water supplies



**End of Science Test**

**North Carolina Test of Science  
Grade 8 Form E RELEASED Fall 2009  
Answer Key**

Item Number	Correct Answer	Goal
1	D	3 — Hydrosphere
2	A	3 — Hydrosphere
3	D	3 — Hydrosphere
4	B	3 — Hydrosphere
5	B	3 — Hydrosphere
6	A	3 — Hydrosphere
7	D	4 — Chemistry
8	C	4 — Chemistry
9	C	4 — Chemistry
10	A	4 — Chemistry
11	C	4 — Chemistry
12	D	5 — Evolution of Organisms and Landforms
13	A	5 — Evolution of Organisms and Landforms
14	C	5 — Evolution of Organisms and Landforms
15	B	5 — Evolution of Organisms and Landforms
16	B	5 — Evolution of Organisms and Landforms
17	A	6 — Cell Theory
18	C	6 — Cell Theory
19	D	7 — Microbiology
20	B	7 — Microbiology
21	C	3 — Hydrosphere
22	C	3 — Hydrosphere
23	A	3 — Hydrosphere
24	A	3 — Hydrosphere
25	A	3 — Hydrosphere
26	D	3 — Hydrosphere
27	C	4 — Chemistry
28	A	4 — Chemistry
29	B	4 — Chemistry
30	A	4 — Chemistry
31	A	4 — Chemistry
32	C	4 — Chemistry
33	B	5 — Evolution of Organisms and Landforms
34	D	5 — Evolution of Organisms and Landforms
35	D	5 — Evolution of Organisms and Landforms
36	B	5 — Evolution of Organisms and Landforms
37	B	6 — Cell Theory
38	C	6 — Cell Theory
39	B	7 — Microbiology
40	D	7 — Microbiology
41	C	3 — Hydrosphere
42	A	3 — Hydrosphere

**North Carolina Test of Science  
Grade 8 Form E RELEASED Fall 2009  
Answer Key**

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43	D	3 — Hydrosphere
44	C	3 — Hydrosphere
45	D	3 — Hydrosphere
46	B	3 — Hydrosphere
47	C	4 — Chemistry
48	D	4 — Chemistry
49	B	4 — Chemistry
50	D	4 — Chemistry
51	B	4 — Chemistry
52	A	4 — Chemistry
53	A	5 — Evolution of Organisms and Landforms
54	D	5 — Evolution of Organisms and Landforms
55	D	5 — Evolution of Organisms and Landforms
56	A	5 — Evolution of Organisms and Landforms
57	C	6 — Cell Theory
58	A	6 — Cell Theory
59	B	7 — Microbiology
60	C	7 — Microbiology

**North Carolina Test of Science  
Grade 8 Form E RELEASED Fall 2009  
Raw to Scale Score Conversion**

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<b>Raw Score</b>	<b>Scale Score</b>
0	124
1	124
2	125
3	125
4	126
5	126
6	127
7	128
8	128
9	129
10	130
11	131
12	132
13	132
14	133
15	134
16	136
17	137
18	138
19	139
20	140
21	141
22	142
23	143
24	144
25	145
26	146
27	146
28	147
29	148
30	149
31	150
32	150
33	151
34	152
35	153
36	153
37	154
38	155
39	156
40	156
41	157

**North Carolina Test of Science  
Grade 8 Form E RELEASED Fall 2009  
Raw to Scale Score Conversion**

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42	158
43	159
44	160
45	160
46	161
47	162
48	163
49	164
50	165
51	166
52	167
53	168
54	169
55	170
56	171
57	173
58	175
59	177
60	180