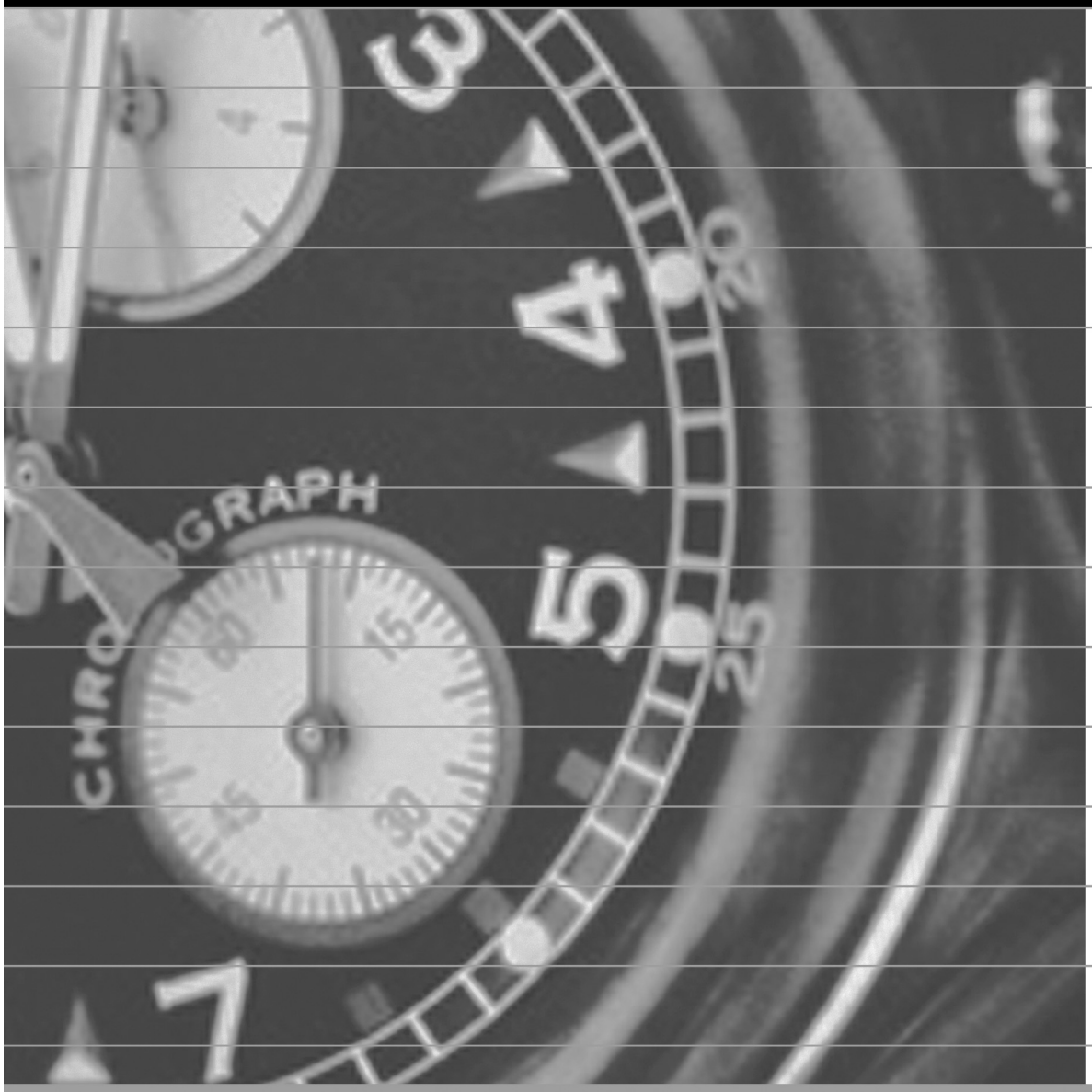
GRADES 7-8

test time!

Earth & Space Science

PRACTICE BOOKS THAT MEET THE STANDARDS



WALCH PUBLISHING

Gina Hamilton

table of contents

to the student

Test Your Best!

Long ago, a musician lost in New York City approached a New York musician and asked him how to get to Carnegie Hall. The New Yorker replied with a grin, "Practice! Practice!"

Test Time! is a series of practice books that will help you prepare for standardized testing of all sorts. We all have to take tests, and whether we like it or not, our abilities are often measured by them. Not only does your test reflect on your own abilities, it also reflects on the abilities of your school and the teachers who prepare you for them. A lot, including funding that might affect your school, is riding on these standardized tests. You and your school have to work together to make everyone successful. As you prepare for college, your test-taking skill becomes even more important.

However, test taking does not have to be stressful. Using strategies to test well and practicing beforehand will minimize your stress level. Just knowing what is likely to be on your test will help!

This series includes strategy books, as well as practice problems in each subject area.

Practice! Practice! Then approach your tests with confidence.

PART 1 introduction

Earth and Space Science Strategies

As you take your test, some strategies are likely to help you. Although the Assessment Strategy book for Science goes over the strategies in detail, here are a few that may be of use in an Earth and Space Science test:

Know what to expect. Your test will include four different types of questions.

- Multiple choice—you will have to choose the best answer out of four or five.
- Constructed response—you will write a short answer in response to a question.
- Essay—you will write a paragraph or two in response to a question.
- Short lab—you will perform a laboratory experiment and respond to questions about it.

Organize your test the way you want. Within each section, group the questions the way it makes sense to you. There is no rule that you have to do the problems in the order they appear.

Eliminate obviously incorrect answers first. Especially in multiple choice, one or perhaps two of the questions might be obviously wrong. Eliminate them mentally, and concentrate on the more logical answers.

Think mathematically. You will be expected to be able to solve science problems using mathematical modeling. Remember everything you ever learned about graphing, estimating, logic, using probability and statistics, and projecting. Use old mathematical friends, such as the times table, to save time during the test.

Use experience and observation to make accurate generalizations. This is called inductive reasoning, and you will see it everywhere on the test. Think about how one experience or observation can be related to a new experience.

Use known physical and natural laws to make predictions. This is called deductive reasoning, and you will be expected to know how to use it. Think about how a particular law, for instance the law of gravity, predicts the behavior of an object.

Use the scientific method to design and recognize quality experiments. Keep in mind the steps of the scientific method, and use them when choosing the best design for an experiment or determining whether an experiment is a good one.

Consider the best scientific tools for the job. Part of the test will be on technology, especially scientific technology. Think about how a tool will be used and what qualities make it important for its task.

Consider all the natural laws to which a technology responds when choosing the best design. In order for something to perform well, it must withstand all the laws of nature to which it will be subjected.

Use graphic ideas to remember some content information. You will be asked questions that relate to how some processes cycle. Think about the cycle in a visual way.

In a question with a long reading, read the questions themselves first. Often, you are given far too much information in a long reading, and you can skim for needed information by knowing the questions.

Visualize the big picture. In Earth and Space Science, you are often addressing global or even universal ideas. Try to think about them as a whole, rather than small parts.

Don't be afraid to use common sense. Science is a pretty straightforward subject. If none of the scientific mental toolbox strategies—inductive and deductive reasoning, the scientific method, visual thinking, global thinking—fit, go with what seems as though the most logical idea from a common sense point of view.

Use your knowledge of vocabulary. Very often, scientific words can be broken down into recognizable word parts, which will help you figure out the answer.

Use mnemonics. Scientific study is filled with phrases and words that help you remember an order or how something is classified. If you know them, use them.

PART 3 earth science

SET 1

Rocks, Minerals, and the Rock Cycle

Read each question, then circle the best answer.

1. Which of the following properties is not an identifying property of minerals?

   A. cleavage
   B. streak
   C. size
   D. luster

2. A crystal in a pentagon shape with a tapered point at one end suggests the mineral belongs to which family of minerals?

   A. sulfates
   B. carbonates
   C. oxides
   D. quartzes

3. Which of the following is not an igneous rock?

   A. marble
   B. obsidian
   C. pumice
   D. basalt

4. Which of the following is a type of sedimentary rock?

   A. granite
   B. shale
   C. slate
   D. obsidian

GO ON

5. Which best describes how metamorphic rock is formed?

   A. The rock is ejected from a volcano.
   B. The rock is weathered away by wind and becomes tiny particles.
   C. The rock is compressed under high pressure or heated to high temperatures, which causes a change.
   D. None of the above describes how metamorphic rock is formed.

Read the following short essay, and answer the questions that follow.

The Life of a Rock

Most rocks in Earth's crust are igneous rocks. Igneous means "born of fire," and all igneous rocks begin life as magma, which is either extruded onto the surface or intruded below the ground. At the surface, the magma flows from a volcano and becomes lava. Depending on its gas content, the lava may be very dense and heavy or very light. If the rock is intruded below the surface, it is called a pluton and can only be seen when erosion of overlying materials and uplift through tectonic forces bring the pluton to the surface. Many mountain ranges have large plutons, called batholiths, which form their cores.

However, the igneous rock is exposed at the surface. Once exposed, it begins the process of being weathered away. This can happen mechanically, when wind and water break the rock into tiny pieces, or it can happen chemically, when the rock reacts with acids and alkalines in the rain or in the soil, and breaks down. In either case, water and wind sweep the minute particles along. As they accumulate, for instance, at the bottom of a riverbed, the pressure of the water causes the particles to be forced together and become harder rock. In some cases, especially where there are certain chemicals in the water, they can also be cemented together by the chemicals. These are now sedimentary rocks. Although most rocks in the crust are igneous, most rock at the surface is sedimentary.

If the pressure and temperature increase, for instance, by tectonic activity forcing either sedimentary or igneous rock far underground, these rocks can transform into metamorphic rocks. Metamorphic rocks recrystalize or are deformed by stresses. Until they completely melt, they are neither the rock they once were, nor magma. Limestone, for instance, recrystallizes into marble.

Once the rocks do melt completely, however, they are destined to begin life anew as an igneous rock.

GO ON

6. The word *igneous* means

   A. born of water.

   B. changeable.

   C. born of fire.

   D. created by sediments.

7. What is the term for an igneous rock that is intruded below ground?

   _____

8. Briefly describe the role of weathering and erosion in the development of sedimentary rock.

   _____

   _____

   _____

9. What are the processes by which metamorphic rocks change form?

   _____

   _____

   _____

10. When the rocks melt, what do they become?

    A. lava

    B. magma

    C. sandstone

    D. marble

STOP

SET 2

Plate Tectonics

Read each question, then circle the best answer.

1. At one point in Earth's history, all of the continents were part of one large landmass. This landmass is called

   A. Atlantis.
   B. Terra superior.
   C. Pangaea.
   D. Terra incognito.

2. The modern theory of plate tectonics stems from an earlier theory called

   A. the Continental Drift Theory.
   B. the Atlantis Theory.
   C. the Magnetic Field Shift Theory.
   D. the Earthquake Theory.

3. The theory of plate tectonics holds that the lithosphere of Earth is divided into how many large plates?

   A. 30
   B. 17
   C. 8
   D. 2

4. How was the modern theory of plate tectonics verified?

   A. It is the only explanation for earthquakes.
   B. Scientists can see directly into fault zones.
   C. Stresses in Earth's crust were measured.
   D. A survey of the ocean floor found that the seafloor was spreading.

5. What causes the motion of the plates?

   A. convection in the mantle of Earth
   B. gravity
   C. the magnetic field of Earth
   D. the turning of Earth

GO ON

6. Which of the following is not evidence of a fault?

   A. a deep valley with steep mountains on either side
   B. a region subject to repeated earthquakes
   C. a volcanic mountain range
   D. one of the Great Lakes

7. Which is evidence of a fold?

   A. a gently rolling countryside
   B. a steep cliff face
   C. a geyser
   D. the Rocky Mountain range

8. There are three ways plates can interact at convergent boundaries. When two plates slide past one another, possibly causing earthquakes, it is known as

   A. a plate collision.
   B. a transform fault.
   C. subduction.
   D. seafloor spreading.

9. When two plates meet and push the rock at the border upward, it is known as

   A. a transform fault.
   B. subduction.
   C. a plate collision.
   D. seafloor spreading.

10. When two plates slide, one under the other, it is called

   A. a plate collision.
   B. subduction.
   C. a transform fault.
   D. seafloor spreading.

SET 3

Tectonic Expressions of Earth

Read each question, then circle the best answer.

1. The volcanic island chain of Hawaii was formed by which process?

   A. subduction
   B. transform faulting
   C. plate collision
   D. seafloor spreading

2. What is the best explanation for why Hawaii is a series of islands, rather than one large island?

   A. As the seafloor spreads, the hot spot is in different areas over time, causing the volcanic creation of several islands.
   B. One large island was torn apart by transform faulting.
   C. The islands drifted into that location.
   D. The collision of two plates causes each island to rise from the ocean floor.

Read the essay below, and answer the questions that follow.

The Himalayas

The Himalayas contain the highest mountains in the world, including Mt. Everest and K2. Every mountain in the majestic range, as well as the Tibetan plateau, was created by the convergence of two plates—the Eurasian plate in the north and the Indian subcontinent from the south.

The building of the Himalayas is comparatively recent, in our own geologic era, the Cenozoic. The mountain building continues today, with each mountain growing by about 5 cm per year.

The creation of the Himalayas is an example of plate collision. As the two plates collide, they force the side of the plates where they meet ever upward. Imagine taking two small stacks of paper and pushing them together at one end. Eventually, the two stacks begin to rise at the boundary. This is how the Himalayas were born, and continue to grow, even to this day.

GO ON

3. What is the process by which the Himalayas are formed?

_____

_____

4. During which geologic era were the Himalayas formed? What does this mean about the age of the mountains?

_____

_____

5. The Himalayas contain the highest mountains in the world. What does this suggest about the speed of the Indian plate as it collides with the Eurasian plate? Why?

_____

_____

6. Which best describes the formation of a tectonically created volcano?

   A. Two plates slide past one another, heating up the rock and causing it to melt.
   B. One plate is subducted beneath the other, causing the rock to melt.
   C. One plate pushes against the other, causing the volcano to rise.
   D. A fissure in the rock directly from the mantle causes a volcano.

7. Why are earthquakes in California so devastating?

   A. Although the average movement of the Pacific and North American plates at the San Andreas Fault is about 5 cm per year, the plates do not usually move that much. The energy is stored up for many years until they release with catastrophic results.
   B. Some earthquakes occur much deeper in the ground than others. When the earthquake occurs near surface level, the quake is usually stronger.
   C. Unlike in some other locations where earthquakes occur, there is a large population that is affected.
   D. All of the above are true.

8. Earthquakes are more damaging to structures closest to the

   A. seismic edge.
   B. most porous rock.
   C. epicenter.
   D. longitudinal wave.

GO ON

Read the following paragraph, and answer the questions.

Types of Volcanoes

Volcanoes come in all shapes and sizes, depending on how they are built. If the volcano issues fluid lava, and the mountain is built slowly and steadily, such as Mauna Loa in Hawaii, the resulting volcano is called a shield volcano. These types are not very dangerous. A human can easily out walk the lava flow, even if he or she is unfortunate enough to be caught near the volcano during an eruption. Another type of volcano is called a cinder cone. These are built rapidly, sometimes over just a few days, by spewing ash and small rock. Paricutín, a cinder cone in Mexico, rose 300 m out of a cornfield overnight. The most dangerous type of volcano is the composite cone, or stratovolcano. These volcanoes erupt both lava and ash, as well as poisonous gases. Because the lava is less fluid than that of the shield volcano, the volcano erupts with deadly force, often killing many people and livestock. Mt. Pinatubo, in the Philippines, is an example of a stratovolcano.

9. Why are shield volcanoes relatively harmless?

_____

_____

_____

10. Explain how a cinder cone volcano is built.

_____

_____

_____

11. Why is a stratovolcano so dangerous?

_____

_____

_____

PART 4 space science

SET 1

Gravitation

Read each question, then circle the best answer.

1. Which of the following is not a fundamental force of nature?

   A. gravitation

   B. strong nuclear force

   C. inertia

   D. electromagnetism

2. Which is the best explanation for why most early people believed Earth was stationary at the center of the universe?

   A. They were egocentric.

   B. Things appear to move around Earth.

   C. Nobody had given it a lot of thought.

   D. The Bible claims Earth is at the center of the universe.

3. Which is the best description of Newton's theory of gravitation?

   A. Every mass attracts every other mass with a force that is directly proportional to the product of the two masses, and inversely proportional to the square of the distance between them.

   B. An object of greater mass always pulls on an object of lesser mass.

   C. An object of greater mass attracts an object of lesser mass with a force that is proportional to the object of greater mass.

   D. An object of lesser mass is attracted to an object of greater mass, and the force is inversely proportional to the square of the distance between them.

GO ON

4. Which best explains why gravitation is such a weak force?

   A. The gravitational constant is a very small number.

   B. Because of the inverse square law, most bodies are not greatly affected by gravitation from distant objects.

   C. It is very difficult to deflect bodies from straight line paths.

   D. Gravity is dependent upon the mass of the two bodies.

5. Which model of the solar system places the Sun at the center?

   A. geocentric model

   B. heliotropic model

   C. heliocentric model

   D. hydrotropic model

6. Which scientist created the model of the solar system we use today?

   A. Einstein

   B. Newton

   C. Maxwell

   D. Copernicus

7. Which scientist correctly described the motion of the planets as ellipses, rather than circles?

   A. Einstein

   B. Kepler

   C. Galileo

   D. Newton

8. Which of the formulas below describes the acceleration of a body in Earth's gravitational field?

   A. $A = \Delta v/t$

   B. $V = gt$

   C. $g = 9.8\ m/s^2$

   D. $d = \frac{1}{2}gt^2$

GO ON

Write a short essay to answer the question.

9. Using what you know about gravitation, explain why lunar high tides are larger than solar high tides.

_____

_____

_____

_____

Read the question, then circle the best answer.

10. When a body is moving under the influence of gravitational pull only, we say that body is in

    A. gravitational alignment.
    B. free fall.
    C. angular momentum.
    D. negative acceleration.

STOP