

Admission Test for Dental Hygiene (ATDH)

Practice Questions

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The following questions are offered to help candidates understand the types of questions appearing on the Admission Test for Dental Hygiene (ATDH). It should be noted that practice questions are not subjected to the same intense scrutiny—and do not undergo the same level of review—as questions appearing on the actual examination. When developing examination content, the best questions are always reserved for placement on the actual examination itself (as opposed to placement on distributed lists of practice questions). The American Dental Association (ADA) recommends that you use textbooks and lecture notes as primary sources for study. The intent of the practice questions is to help candidates understand the types of questions that will be asked on the ATDH. These practice questions feature the types of questions and question formats used in the actual test. These questions may not be used for commercial purposes.

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ATDH Overview

- The ATDH is an admission test designed to provide dental hygiene education programs with a means to assess an applicant's readiness and potential for success in these programs.
- The ATDH is intended for candidates who are interested in pursuing a career in dental hygiene and are currently seeking admission into a dental hygiene education program in the United States.
- The ATDH assesses critical thinking, focusing on candidate skills in the following areas:
 - Reading Comprehension
 - Language Usage
 - Quantitative Reasoning
 - Perceptual Ability
 - Biology
 - General Chemistry
- The ATDH is composed of multiple-choice, single-response test questions presented in the English language. The questions have only one correct answer and candidates are only allowed to choose one response.
- The ATDH Administration Schedule and number of questions per section are shown below.

Section	Questions	Minutes
Introduction and Tutorial		15
Reading Comprehension	40	50
Language Usage	40	30
Break		15
Quantitative Reasoning	40	45
Perceptual Ability	60	45
Break		15
Biology	30	30
General Chemistry	30	30
Post Examination Survey		15
Total	240	290

Reading Comprehension

Reading Comprehension

The reading comprehension section of the ATDH assesses the candidate's ability to read, understand, and analyze basic scientific information. The section consists of questions pertaining to reading passages on various scientific topics. Prior familiarity with the specific science topics covered in the passages is not a prerequisite to answering the questions. Reading passages are approximately 450–500 words in length, and there are typically eight questions associated with each passage. Questions are written in standard American English. Questions are written to evaluate whether the candidate possesses reading comprehension skills at a high school graduate or first-year college student proficiency level and includes questions covering the following topics:

Topic	Description
Main Ideas	Determine the main ideas and supporting details presented in an informational text (e.g., identify the main idea, identify details that support the main idea, summarize the important points of the text).
Inferences and Conclusions	Make inferences and draw conclusions about ideas presented in an informational text (e.g., make inferences about the author's point of view and purpose, determine whether a given statement is or is not supported by the text, use evidence from the text to support inferences and conclusions).
Relationships Among Ideas	Analyze relationships among ideas presented in informational text and how that text is organized (e.g., how connections are made between ideas, including compare/contrast structure, use of categories, and use of analogies; how one part of the text fits in with the whole; the structure of a particular paragraph; the purpose of transition words).
Meaning of Words and Phrases	Determine the meaning of words and phrases used in the context of informational text, including figurative, connotative, and technical meanings.

Sample Reading Comprehension Passage

Below is a sample Reading Comprehension passage. Sample questions pertaining to this passage are on the following pages.

The Lowest Place on Earth

1. Photographs of planet Earth taken from satellites show an exquisite spherical body, with an apparently smooth, clearly defined surface. However, we who dwell on the Earth's surface have a different perspective: we know that the surface includes both miles-high peaks and miles-deep valleys.
2. Even the loftiest and most rugged peaks are accessible to those with sufficient skill, funds, and determination. Thousands of climbers have gazed down from the summit of Mt. Everest, the world's tallest peak. The valleys, on the other hand, present daunting challenges—submerged under oceans, many of these valleys remain elusive to all but a tiny number of daring, highly motivated explorers.
3. The deepest of these aquatic valleys is the Mariana Trench, a gash in the Earth's crust that lies on the floor of the Pacific Ocean between the Philippines and the Hawaiian Islands. The Mariana Trench is the result of an ancient geological confrontation—a collision between two massive plates in the planet's crust, called a subduction. When the plates collided, one plate pushed below the other, gouging a V-shaped slash 1,500 miles long with an average width of 43 miles, and plunging the ocean floor to a depth 36,000 feet below sea level. At this depth, the pressure is about eight tons per square inch—the equivalent of more than a ton of weight on a person's fingernail! No light penetrates the depths, and the environment does not support forms of aquatic life that populate the higher levels of the oceans.
4. The first human mission to the bottom of the trench was in 1960, when engineer Jacques Piccard and submariner Don Walsh descended in a deep-sea submersible called the *Trieste*. It was 52 years before the second descent, by *Titanic* filmmaker James Cameron. In 2019 and 2020, explorer Victor Vescovo and various companions braved the gloomy depths five times. Having previously climbed to the summit of Mt. Everest, Vescovo and his companion Vanessa O'Brien have achieved the remarkable distinction of reaching both the highest and the lowest points on the planet. Another companion has accomplished a different singular feat. Kathy Sullivan is a former astronaut who walked in space in 1984. As an explorer of both oceanic depths and extraterrestrial heights, she has contemplated the earthly sphere from afar and probed its deepest inner recess.
5. As remote as the Mariana Trench is, and as exotic and unattainable as it may seem, Vescovo did find something familiar: at the bottom of the trench, he discovered an object that was clearly human made. Looking closer, Vescovo concluded that it was that ubiquitous artifact of 21st-century life—a plastic bag! Everything that goes into the water ultimately ends up in the ocean, and even the deepest and most out-of-the-way part of the planet's largest ocean could not escape humanity's propensity for littering.
6. Exploring the Mariana Trench is costly, arduous, and dangerous. Yet our fascination with superlatives (It is the deepest!) and the relentless tug of scientific curiosity will likely continue to spark investigation into its dark secrets.

Practice Question 1

Read these sentences from paragraph 1.

Photographs of planet Earth taken from satellites show an exquisite spherical body with an apparently smooth, clearly defined surface. However, we who dwell on the Earth's surface have a different perspective: we know that the surface includes both miles-high peaks and miles-deep valleys.

Which transition word could be substituted for the word however without changing the meaning of the sentence?

- A) Likewise
- B) Therefore
- C) Thus
- D) Yet

Correct Response: D
Content Classification: *Reading Comprehension: Relationships Among Ideas*

Practice Question 2

Read this sentence from paragraph 2.

The valleys, on the other hand, present daunting challenges—submerged under oceans, many of these valleys remain elusive to all but a tiny number of daring, highly motivated explorers.

Which is the meaning of the word daunting as it is used in this sentence?

- A) Foreseeable
- B) Formidable
- C) Mundane
- D) Mysterious

Correct Response: B
Content Classification: *Reading Comprehension: Meaning of Words and Phrases*

Practice Question 3

Read this sentence from paragraph 3.

The Mariana Trench is the result of an ancient geological confrontation—a collision between two massive plates in the planet's crust—called a subduction.

Which is the author's purpose for including the underlined clause?

- A) To communicate the meaning of a scientific term
- B) To convey the dangers of oceanic exploration
- C) To describe where the trench is located
- D) To explain how the trench became so deep

Correct Response: A
Content Classification: *Reading*
Comprehension: Inferences
and Conclusions

Practice Question 4

Which best describes the main idea of paragraph 4?

- A) Explorers of the Mariana Trench are a daring and accomplished group.
- B) Most people who explore the Mariana Trench are motivated by curiosity.
- C) The Mariana Trench is of interest to both geologists and oceanographers.
- D) Those who explore the Mariana Trench are honored internationally.

Correct Response: A
Content Classification: *Reading Comprehension: Main Ideas*

Practice Question 5

Which literary device does the author use to present ideas in both paragraph 1 and paragraph 5?

- A) Contrast
- B) Exaggeration
- C) Irony
- D) Repetition

Correct Response: A
Content Classification: *Reading Comprehension: Relationships Among ideas*

Practice Question 6

Read this sentence from paragraph 5.

Looking closer, Vescovo concluded that it was that ubiquitous artifact of twenty-first-century life—a plastic bag!

Which is the meaning of ubiquitous as it is used in this sentence?

- A) Controversial
- B) Conventional
- C) Universal
- D) Unusual

Correct Response: C
Content Classification: *Reading*
Comprehension: *Meaning of*
Words and Phrases

Practice Question 7

Refer to the passage, and determine whether the statement below is true or false or whether there is not enough information to make this determination.

The vast Mariana Trench hosts an abundance of marine species that thrive in its underwater ecosystem.

- A) True
- B) False
- C) Not enough information is given

Correct Response: B
Content Classification: *Reading Comprehension: Inferences and Conclusions*

Practice Question 8

Which paragraph contains details that most directly support the main idea of paragraph 6?

- A) Paragraph 1
- B) Paragraph 3
- C) Paragraph 4
- D) Paragraph 5

Correct Response: C
Content Classification: *Reading Comprehension: Main Ideas*

Language Usage

Language Usage

The language usage section of the ATDH assesses the candidate's ability to utilize English words, rules, structure, grammar, syntax, style, tone, spelling, and punctuation to facilitate effective written communication. Language usage items are written in standard American English. Items are written to evaluate whether the candidate possesses language skills at a high school graduate or first-year college student proficiency level and includes questions covering the following topics:

Topic	Description
Spelling, Punctuation, and Capitalization	Identify and correct errors in spelling, punctuation, and capitalization.
Word Usage	Identify and correct errors in word usage.
Grammar	Identify and correct errors in grammar (e.g., subject-verb agreement, pronoun-antecedent agreement, verb tense).
Syntax	Identify and correct errors in syntax (e.g., eliminating fragments and run-on sentences, eliminating dangling and misplaced modifiers, ensuring parallel structure).
Organization of Ideas	Organize written ideas to facilitate effective communication (e.g., combining sentences effectively, using effective transition words and phrases, clarifying the relationship between ideas, revising awkward sentence structure).
Style and Tone	Maintain a formal style and objective tone in written communication. Identify and replace non-standard English words and phrases.

Practice Question 9

Read this sentence.

I like biology, but I'm taking cell biology 301 next semester, which looks difficult.

Which option uses correct capitalization?

- A. Biology, but I'm taking Cell Biology 301
- B. Biology, but I'm taking cell biology 301
- C. biology, but I'm taking Cell biology 301
- D. biology, but I'm taking Cell Biology 301

Correct Response: D

Content Classification: *Language Usage: Spelling, Punctuation, and Capitalization*

Practice Question 10

Which word completes this sentence?

I hope that you will _____ my congratulations.

- A. accent
- B. accept
- C. except
- D. excerpt

Correct Response: B
Content Classification: *Language Usage:*
Word Usage

Practice Question 11

Read this sentence.

I know the funny story about my sister is true because she told me themselves.

How should the underlined word be changed?

- A. herself
- B. herself
- C. himself
- D. yourself

Correct Response: B
Content Classification: *Language Usage:*
Grammar

Practice Question 12

Read these sentences.

When she was younger. She went to the museum and saw the exhibit of reconstructed blue whale skeletons.

Which option best combines these sentences?

- A. She went to the museum and saw the exhibit of reconstructed blue whale skeletons, when she was younger.
- B. She went to the museum and saw the exhibit when she was younger of reconstructed blue whale skeletons.
- C. When she was younger, she went to the museum and saw the exhibit of reconstructed blue whale skeletons.
- D. She went to the museum and saw the exhibit of reconstructed blue whale skeletons. When she was younger.

Correct Response: C

Content Classification: *Language Usage: Syntax*

Practice Question 13

Read this sentence.

The bird watcher saw three cardinals, one male and two females, observing the bird feeder.

Which option best clarifies the relationship between ideas?

- A. While observing the bird feeder, the bird watcher saw one male and two female cardinals.
- B. Three cardinals one male and two females saw the bird watcher observing the birdfeeder.
- C. Observing the bird feeder the bird watcher saw three male and female cardinals.
- D. The bird watcher saw three cardinals observing the bird feeder; one male and two females.

Correct Response: A
Content Classification: *Language Usage:*
Organization of Ideas

Practice Question 14

Read this excerpt from a letter to a patient.

Your improved cholesterol test results are _____, and we encourage you to maintain a healthy diet and daily exercise regimen to help you sustain those results!

Which option completes the sentence while maintaining the style?

- A. commendable
- B. nifty
- C. wicked awesome
- D. pretty terrific

Correct Response: A
Content Classification: *Language Usage:
Style and Tone*

Quantitative Reasoning

Quantitative Reasoning

Quantitative reasoning questions require candidates to solve problems by applying critical thinking skills, along with knowledge of core principles in quantitative disciplines such as algebra, probability, and statistics. Questions are targeted at the level of the college-ready high school graduate who has successfully completed courses in algebra I and algebra II. The following topics are included:

Topic	Description
Algebra	Solve algebraic problems involving equations and expressions, inequalities, exponential notation, absolute values, ratios and proportions.
Probability and Statistics	Apply probabilistic reasoning skills; calculate and interpret probabilities; calculate and interpret basic statistics such as means, medians, or ranges.
Interpretation of Quantitative Information	Understand and interpret quantitative data presented in graphs or tables.
Word Problems	Solve word problems by applying principles from algebra, probability, and statistics.

Practice Question 15

Which must be correct if $2x - 4 > 2$?

A) $x < \frac{1}{3}$

B) $x > \frac{1}{3}$

C) $x < 3$

D) $x > 3$

Correct Response: D

Content Classification: *Quantitative Reasoning:*
Algebra

Practice Question 16

A person can have one of the following blood types: A, B, AB, or O. In a group of 250 people, 60 people have blood type A; 75 people have blood type B; 90 people have blood type O; 25 people have blood type AB. If a person from this group is selected at random, which is the probability that this person has blood type A?

- A) 0.24
- B) 0.30
- C) 0.34
- D) 0.40

Correct Response: A
Content Classification: *Quantitative Reasoning:
Probability and Statistics*

Practice Question 17

This table shows the number of individuals responding to a survey about favorite styles of music. Please answer the question to the nearest whole percentage.

	AGE			
	15-20	21-25	26-30	>30
Classical	4	6	7	15
Pop	7	9	6	5
Rock	6	7	5	3
Jazz	1	2	2	10
Blues	2	3	5	15
Hip-Hop	10	9	9	2
Total	30	36	34	50

Which is the approximate percentage of respondents aged 21-25 that selected Hip-Hop or Blues as their favorite style of music?

- A) 12
- B) 24
- C) 33
- D) 36

Correct Response: C
Content Classification: *Quantitative Reasoning: Interpretation of Quantitative Information*

Practice Question 18

A person receives \$6 for each patient record transcribed from paper file to computer file. How many records must be transcribed in a given eight hour day to earn the equivalent of \$24 per hour?

- A) 24
- B) 28
- C) 32
- D) 36

Correct Response: C
Content Classification: *Quantitative Reasoning:
Word Problems*

Perceptual Ability

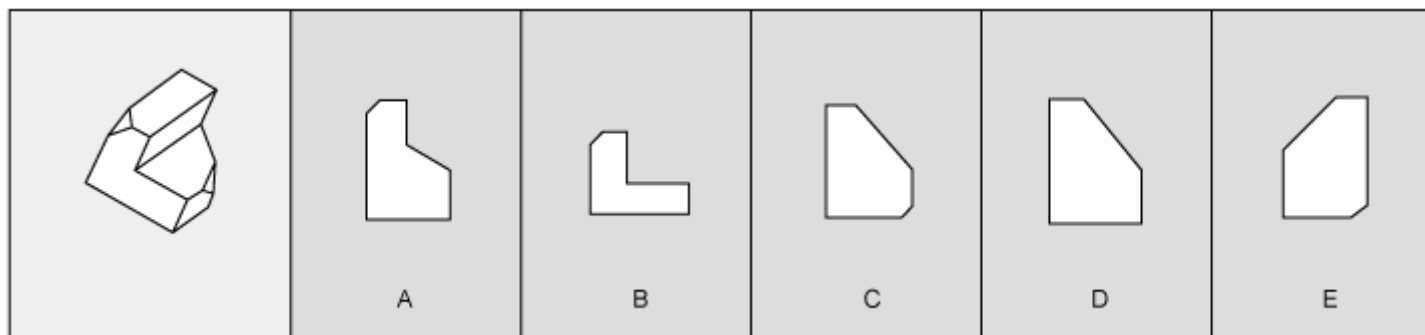
Perceptual Ability

The perceptual ability section of the ATDH assesses the candidate's ability to accurately perceive object dimensions and mentally manipulate objects in space. This includes, for example, the ability to differentiate among angles, or imagine how three-dimensional objects appear when viewed from different angles. The section includes the following question types:

Question Type	Description
Apertures	Evaluate a three-dimensional object and determine if it can pass through an opening.
View Recognition	Imagine how an object appears when viewed from different angles.
Angle Discrimination	Rank a series of angles from smallest to largest.
Paper Folding	Mentally unfold a piece of paper that has been folded one or more times and then hole-punched.
Cube Counting	Evaluate a stack of cubes and determine how much of each cube is exposed.
Spatial Relations	Identify the three-dimensional shape that a flat pattern produces when folded in a specific way.

Perceptual Ability - Apertures

For these question types, a three-dimensional object is shown at the left. This is followed by outlines of five apertures or openings.



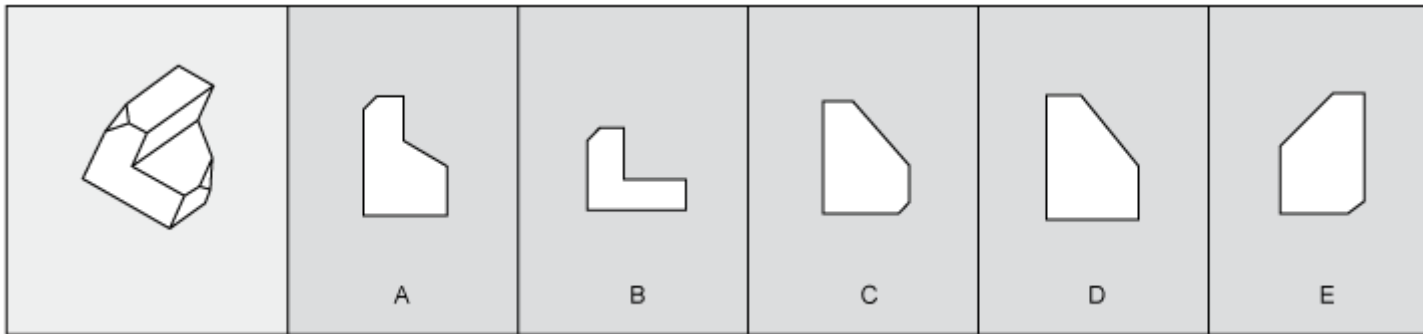
First, you are to imagine how the three-dimensional object appears from all directions (rather than from a single direction as shown). You must then identify the opening through which the object could pass directly if the proper side were inserted first.

Perceptual Ability - Apertures

Below are the rules that pertain to **Apertures** items.

1. Prior to passing through the aperture, the three-dimensional object may be turned in any direction. It may be started through the aperture on a side not shown.
2. Once the object is started through the aperture, it may not be turned or twisted. It must pass completely through the opening. The opening is always the exact shape of the appropriate external outline of the object.
3. Both objects and apertures are drawn to the same scale. Thus it is possible for an opening to be the correct shape but too small for the object. In all cases, however, differences are large enough to judge by eye.
4. There are no irregularities in any hidden portion of the object. However, if the object has symmetric indentations, the hidden portion is symmetric with the part shown.
5. For each object there is only one correct aperture.

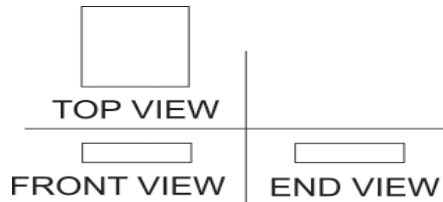
Practice Question 19



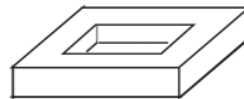
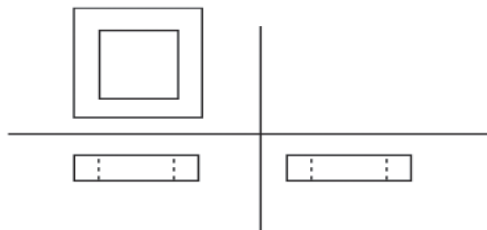
Correct Response: D
Content Classification: *Perceptual Ability:
Apertures*

Perceptual Ability – View Recognition

The pictures that follow are top, front, and end views of various solid objects. The views are without perspective. That is, the points in the viewed surface are viewed along parallel lines of vision. The projection looking DOWN on the object is shown in the upper left-hand corner (TOP VIEW). The projection looking at the object from the FRONT is shown in the lower left-hand corner (FRONT VIEW). The projection looking at the object from the END is shown in the lower right-hand corner (END VIEW). These views are ALWAYS in the same positions and are labeled accordingly.



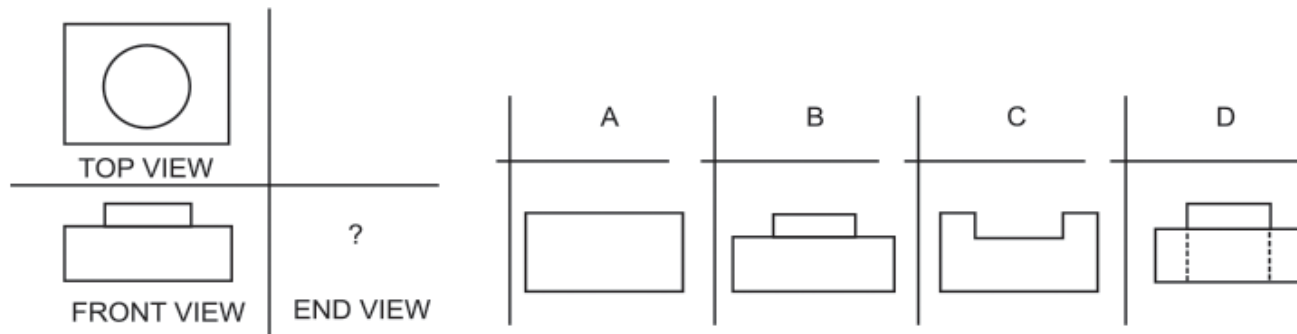
If there were a hole in the block, the views would look like this:



Note that lines that cannot be seen on the surface in some particular view are DOTTED in that view. In the practice questions that follow, two views will be shown, with four options to complete the set. You are to select the correct option.

Perceptual Ability – View Recognition

Example:

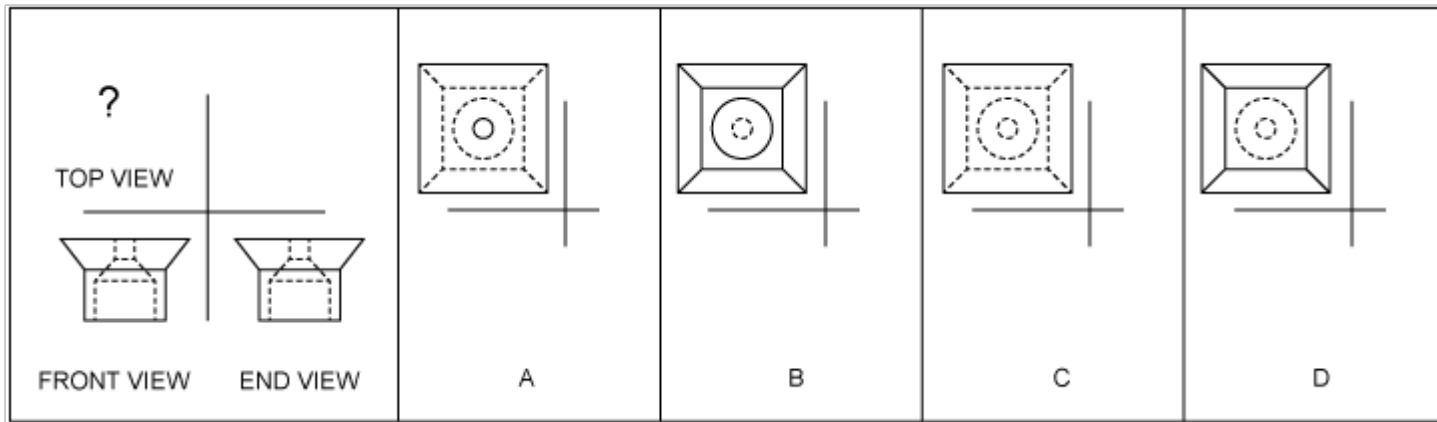


The front view shows that there is a smaller block on the base and that there is no hole.

The top view shows that the block is round and in the center of the base. The answer, therefore, must be B.

For view recognition questions, it is not always the end view that must be selected. For some questions, the top view or front view must be selected.

Practice Question 20



Choose the correct TOP VIEW.

Correct Response: A
Content Classification: *Perceptual Ability:
View Recognition*

Perceptual Ability – Angle Discrimination

Below is an example of an **angle discrimination** item.

You are to examine the four INTERIOR angles and rank each in terms of degrees from SMALL to LARGE. Choose the alternative that has the correct ranking.

Example:



1



2



3



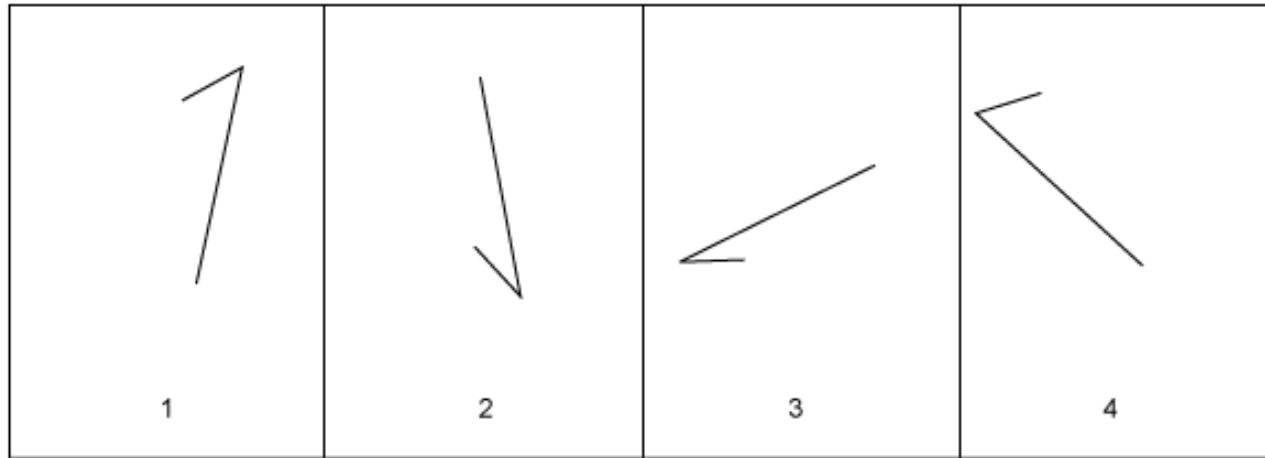
4

Alternatives:

- A. 1-2-3-4
- B. 2-1-4-3
- C. 1-3-2-4
- D. 3-4-1-2

The correct ranking of the angles from small to large is 2-1-4-3. Therefore, alternative B is correct.

Practice Question 21



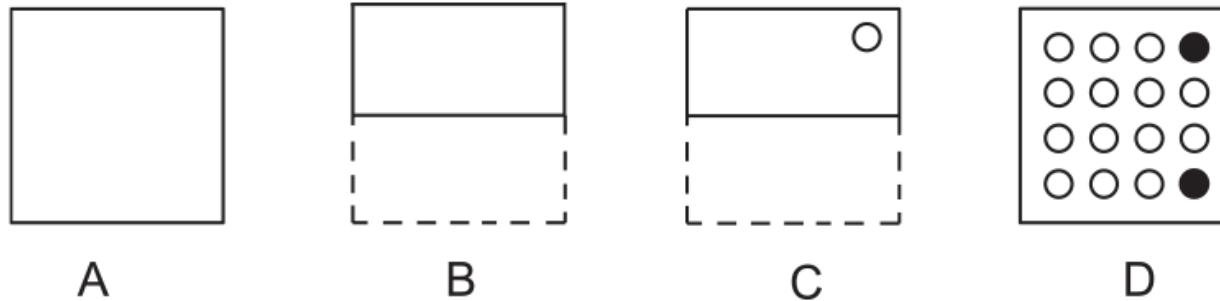
- A) 2-3-4-1
- B) 2-3-1-4
- C) 3-2-1-4
- D) 3-2-4-1

Correct Response: C
Content Classification: *Perceptual Ability:
Angle Discrimination*

Perceptual Ability – Paper Folding

A flat square of paper is folded one or more times. The broken lines indicate the original position of the paper. The solid lines indicate the position of the folded paper. The paper is never turned or twisted. The folded paper always remains within the edges of the original square. There are multiple folds in each item. After the last fold, a hole is punched in the paper. Your task is to mentally unfold the paper and determine the position of the holes on the original square. Choose the pattern of black circles that indicates the position of the holes on the original square. There is only one correct pattern for each item.

Example 1.

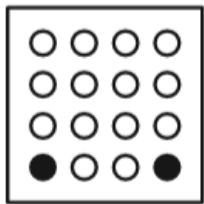
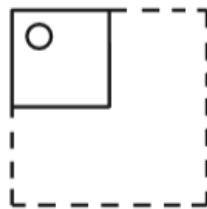
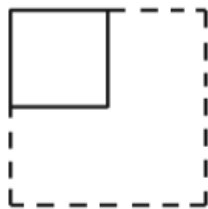
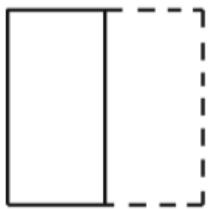


In Example 1 Figure A shows the original paper. Figure B shows the result of the first fold. Figure C shows the position of the punched hole on the folded paper. When the paper is unfolded the pattern of the holes on the original square is shown by the dark circles in Figure D. The answer has two holes since the paper was two thicknesses when punched.

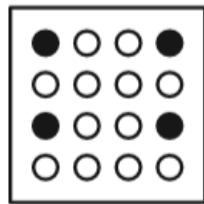
Perceptual Ability – Paper Folding

Example 2 shows an item as it appears on the test.

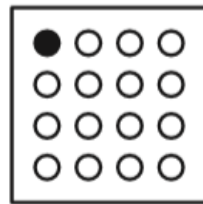
Example 2:



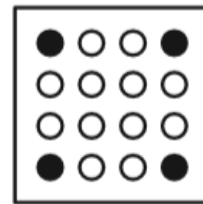
A



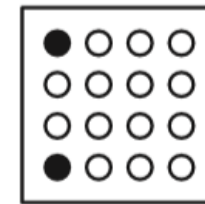
B



C



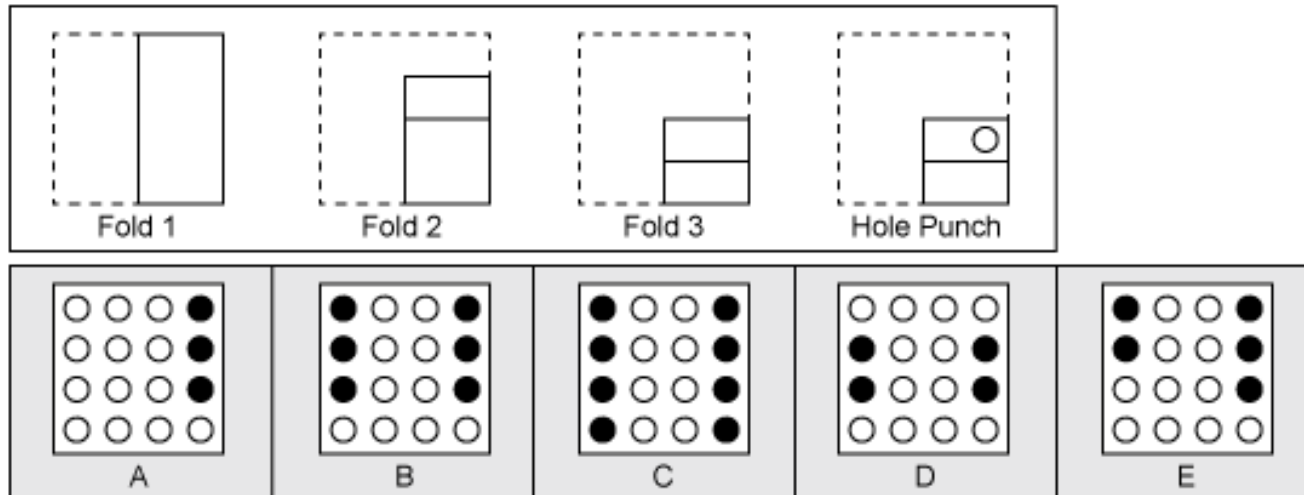
D



E

The correct answer to Example 2 is D. The paper was four thicknesses when punched and the holes are located in each of the four corners.

Practice Question 22



Correct Response: B
Content Classification: *Perceptual Ability:
Paper Folding*

Perceptual Ability – Cube Counting

Each figure has been made by cementing together cubes of the same size. After being cemented, each group was painted on all sides EXCEPT for the bottom on which it is resting. The only hidden cubes are those required to support other cubes.

For the following questions you are to examine each figure closely to determine how many cubes have:

only **one** of their sides painted.

only **two** of their sides painted.

only **three** of their sides painted.

only **four** of their sides painted.

all **five** of their sides painted.

Note: there are no problems for which zero (0) is the correct answer.

Perceptual Ability – Cube Counting

Example:

PROBLEM Z

In Figure Z, how many cubes have two of their exposed sides painted?

- A. 1 cube ← **Answer**
- B. 2 cubes
- C. 3 cubes
- D. 4 cubes
- E. 5 cubes

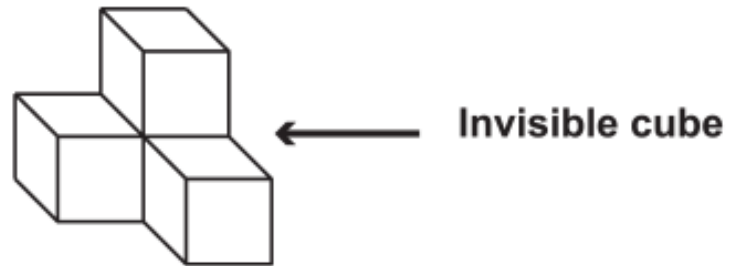
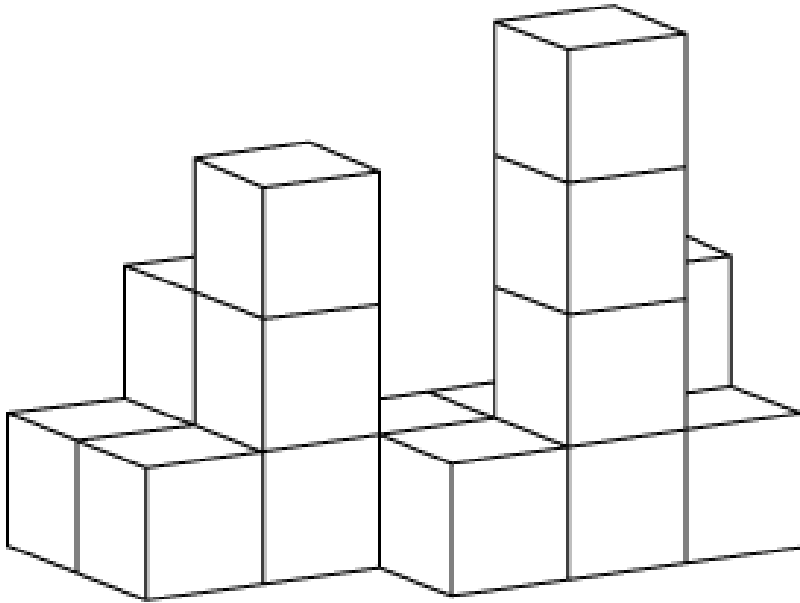


FIGURE Z

There are four cubes in Figure Z, three that are visible and one supporting the top cube that is invisible. The invisible cube has only two sides painted. The top cube has five sides painted. The remaining two cubes have four sides painted.

Remember, after being cemented together, each figure was painted on all exposed sides EXCEPT the bottom.

Practice Question 23



How many cubes have two of their exposed sides painted?

- A) 1 cube
- B) 2 cubes
- C) 3 cubes
- D) 4 cubes
- E) 5 cubes

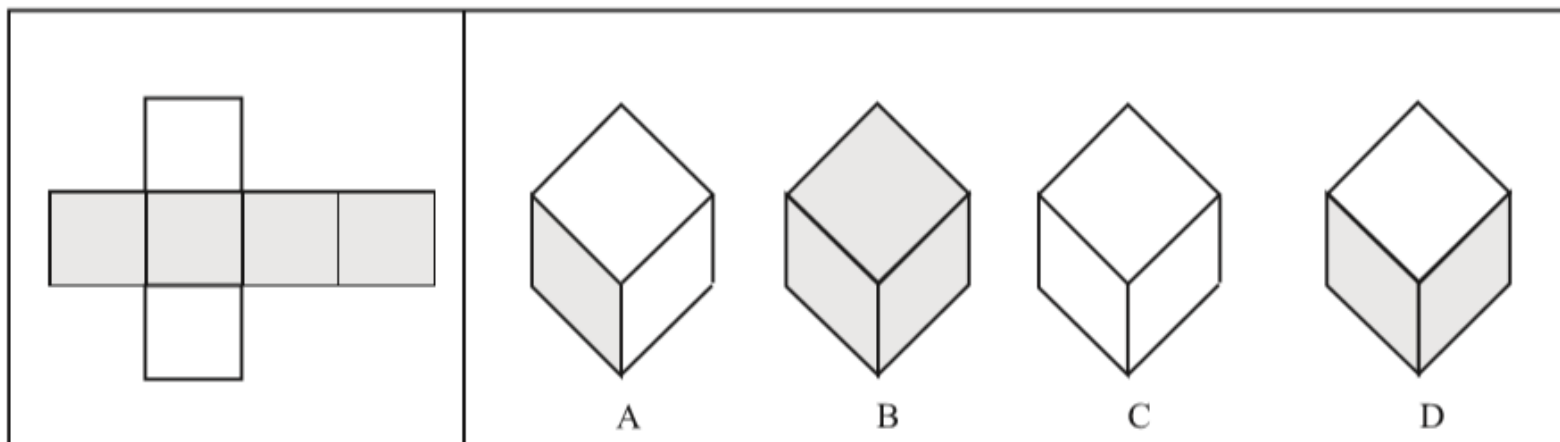
Correct Response: D

Content Classification: *Perceptual Ability:
Cube Counting*

Perceptual Ability – Spatial Relations

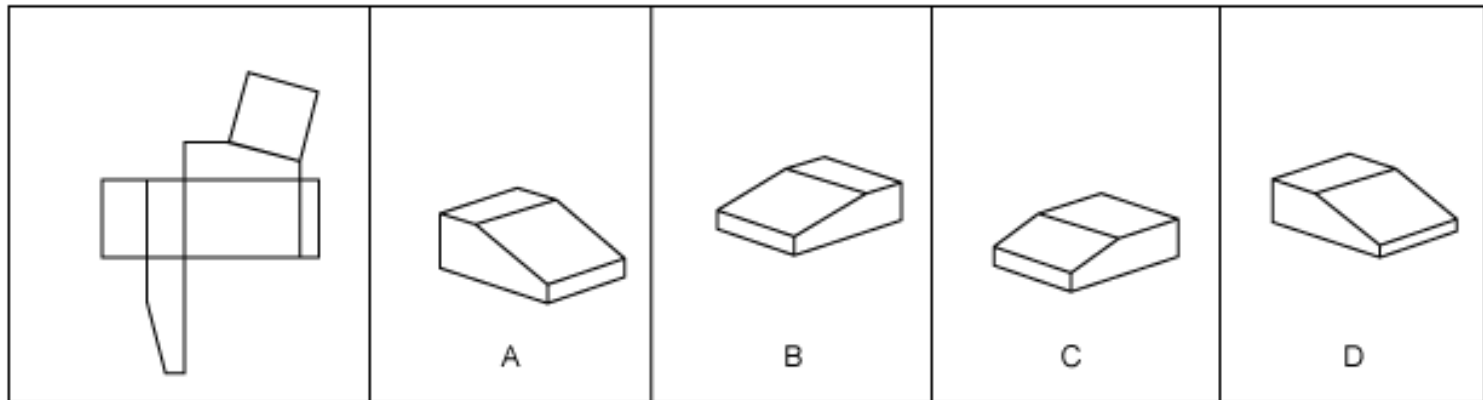
A flat pattern will be presented. This pattern is to be folded into a three-dimensional figure. The correct figure is one of the four given at the right of the pattern. There is only one correct figure in each set. The outside of the pattern is what is seen at the left.

Example:



One of the above figures (A,B,C or D) can be formed from the flat pattern given at the left. The only figure that corresponds to the pattern is D. If the shaded surfaces are looked at as the sides of the box, then all four sides must be shaded, while the top and bottom are white.

Practice Question 24



Correct Response: B
Content Classification: *Perceptual Ability:
Spatial Relations*

Biology

Biology

The biology section of the ATDH assesses the candidate's ability to understand, apply, and integrate introductory concepts in biology that are relevant to the health sciences. Questions are targeted at the level of the college-ready high school graduate who has successfully completed a high school course in biology. The following topics are included:

Topic	Subtopics
Cell and Molecular Biology	Cell metabolism; Cellular processes; Organelle structure and function; Mitosis/meiosis; Cell structure; Biomolecules
Diversity of Life: Biological Organization and Relationship	Plantae; Animalia; Protista; Fungi; Eubacteria (Bacteria); Viruses
Structure and Function	Homeostasis; Communication; Nutrient processing; Water balance; Gas exchange; Movement
Genetics	Molecular genetics; Human genetics; Mendelian genetics; Gene expression
Evolution and Ecology	Natural selection; Ecology

Practice Question 25

What is the major function of the Golgi apparatus?

- A) Making steroid hormones
- B) Sorting secretory and membrane proteins
- C) Translating messenger RNA into protein
- D) Replicating chromosomal DNA

Correct Response: B
Content Classification: *Biology:
Cell and Molecular Biology*

Practice Question 26

Which might have an RNA genome?

- A) Viruses
- B) Bacteria
- C) Fungi
- D) Protists

Correct Response: A
Content Classification: *Biology:
Diversity of Life: Biological
Organization and Relationship*

Practice Question 27

To maintain homeostasis, a drop in body temperature in a mammal is generally followed by

- A) shivering.
- B) sweating.
- C) decreasing blood flow to the core.
- D) a fever.

Correct Response: A
Content Classification: *Biology:
Structure and Function*

Practice Question 28

Which type of RNA binds an amino acid and carries it to the ribosome?

- A) Small nuclear
- B) Messenger
- C) Ribosomal
- D) Transfer

Correct Response: D
Content Classification: *Biology:*
Genetics

Practice Question 29

Which condition is characterized by a symbiotic association between two species, without harm to either, but with some benefit to both symbionts?

- A) Mutualism
- B) Predation
- C) Parasitism
- D) Commensalism

Correct Response: A
Content Classification: *Biology:
Evolution and Ecology*

General Chemistry

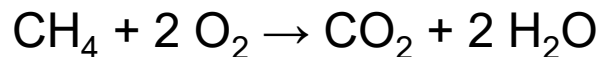
General Chemistry

The general chemistry section of the ATDH assesses the candidate's ability to understand, apply, and integrate introductory concepts in general chemistry that are relevant to the health sciences. Items are targeted at the level of the college-ready high school graduate who has successfully completed a high school course in chemistry. The following topics are included:

Topic	Subtopics
Stoichiometry and General Concepts	Percent composition; Balancing equations; Moles, molar mass, molecular formula; Density; calculations from balanced equations; Chemical nomenclature; Oxidation-reduction reactions; Periodic properties and trends
Gases	Kinetic molecular theory of gases; Dalton's gas law; Boyle's gas law; Charles's gas law; Ideal gas law
Liquids and Solids	Intermolecular forces; Phase changes; Vapor pressure; Polarity; Properties
Solutions	Polarity (intermolecular forces); Colligative properties; Concentration calculations
Acids and Bases	pH; Strength; Brønsted-Lowry reactions; Calculations
Kinetics, Thermodynamics, Equilibria	Le Chatelier's principle; Laws of thermodynamics; Enthalpies and entropies; Heat transfer; Activation energy; Half-life
Atomic and Molecular Structure	Electron configuration; Lewis-Dot diagrams; Molecular geometry; Bond types; Sub-atomic particles
Nuclear Reactions	Balancing equations; Decay processes; Particles; Terminology
Laboratory	Basic techniques; Equipment; Error analysis; Safety; Data analysis

Practice Question 30

Which is the maximum number of moles of CO_2 that could be formed from 7 moles of CH_4 and 8 moles of O_2 by the reaction described?



- A) 4
- B) 7
- C) 11
- D) 16

Correct Response: A
Content Classification: *General Chemistry:*
Stoichiometry and General Concepts

Practice Question 31

A sample containing helium gas at 0.20 atm compresses so that its volume is halved at constant temperature. Which is the new pressure in atmospheres?

- A) 0.10
- B) 0.20
- C) 0.40
- D) 0.80

Correct Response: C
Content Classification: *General Chemistry:
Gases*

Practice Question 32

Which is the strongest attractive interaction in pure ethanol?

- A) Dipole-dipole forces
- B) Hydrogen bonding
- C) Ionic bonding
- D) London dispersion forces

Correct Response: B

Content Classification: *General Chemistry:
Liquids and Solids*

Practice Question 33

How many L of 3.0 M NaCl is needed to make up a 5.0 L solution of 2.0 M NaCl?

A) $\frac{(5.0)(2.0)}{(3.0)}$

B) $\frac{(5.0)(3.0)}{(2.0)}$

C) $\frac{(3.0)}{(5.0)(2.0)}$

D) $\frac{(2.0)}{(5.0)(3.0)}$

Correct Response: A
Content Classification: *General Chemistry: Solutions*

Practice Question 34

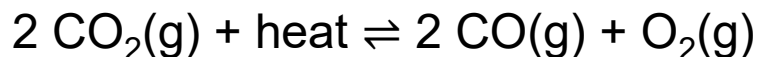
Which is the pH of a 0.001 M solution of HNO_3 ?

- A) 2.0
- B) 3.0
- C) 11
- D) 12

Correct Response: B
Content Classification: *General Chemistry:
Acids and Bases*

Practice Question 35

Which change in the reaction shown below will lead to an increase in the concentration of CO at equilibrium?



- A) Decreasing the concentration of CO_2
- B) Decreasing the temperature
- C) Increasing the pressure
- D) Increasing the volume

Correct Response: D

Content Classification: *General Chemistry:*
Kinetics, Thermodynamics, Equilibria

Practice Question 36

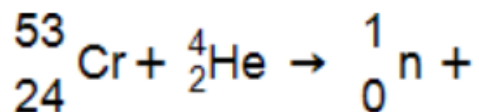
How many electrons are in the valence shell of a monatomic ion of formula Sn^{2+} ?

- A) 2
- B) 3
- C) 4
- D) 5

Correct Response: A
Content Classification: *General Chemistry:
Atomic and Molecular Structure*

Practice Question 37

Which is the other product of the nuclear reaction?



- A) ${}_{26}^{56}\text{Co}$
- B) ${}_{26}^{56}\text{Fe}$
- C) ${}_{26}^{57}\text{Co}$
- D) ${}_{26}^{57}\text{Fe}$

Correct Response: B
Content Classification: *General Chemistry:*
Nuclear Reactions

Practice Question 38

A one liter solution of 0.7 M KCl (74 g/mol) is evaporated and 10 g of KCl are recovered. Which is the percent recovery of KCl?

A) $\frac{10(100)}{0.7(1)(74)}$

B) $\frac{10(1)(100)}{(74)}$

C) $\frac{74(100)}{10(0.7)}$

D) $\frac{0.7(1)(100)}{74}$

Correct Response: A

Content Classification: *General Chemistry:
Laboratory*