The Ultimate Step by Step Guide to Preparing for the ASVAB General Science Test

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ASVAB General Science 2026

for Beginners

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ASVAB General Science for Beginners

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A Complete Study Guide and Practice Workbook

Life science, physical science, Earth and space science

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Worked Decision: Turn a claim into a fair test

Suppose plants beside a window are taller than plants across the room. Do not jump straight to the conclusion that light caused the difference. The window plants may also experience different temperatures, watering schedules, soil conditions, or pot sizes. A fair next step is to grow similar plants under planned light conditions while holding the other important conditions as steady as possible. Height is then measured and compared.

★ Common Mix-Up

In ordinary conversation, the word *theory* can mean a guess. In science, a theory is a broad explanation supported by extensive evidence. A theory remains open to refinement, but it is not an untested hunch.

Science Lightbulb

Separate the jobs: an observation records what happened, an inference explains it, and a hypothesis predicts a measurable result. Strong evidence can support an explanation without making it immune to revision.

Quick Check

1. Which statement is an observation?

A. The liquid is colder because heat left it.
B. The thermometer gave an inaccurate reading.
C. The liquid is 18°C.
D. The liquid will always stay at 18°C.

2. Which investigation best tests whether daily light affects plant height?

A. Compare plants in two rooms that have different temperatures and different light.
B. Measure only plants that received the most light.
C. Use one tall plant as evidence for all plants.
D. Grow similar plants with planned light differences while keeping water, soil, pot size, and growing time the same.

3. Why can one experiment support an explanation without proving it forever?

A. Science does not use experiments.
B. New evidence can be checked and can strengthen, refine, or challenge an explanation.
C. Measurements are never dependable.
D. A scientific theory is only a personal opinion.

4. Which statement is a testable hypothesis?

A. If otherwise similar seedlings receive more daily light, their average height after three weeks will increase.
B. Plants like sunshine.
C. This seedling is 12 centimeters tall.
D. Light is always good for every plant.

1.2 Investigations, Variables, and Controls

When a question describes an experiment, give each part a job: find what was deliberately changed, what was measured, and what was kept comparable. That is usually enough to identify the sound conclusion.

One planned change, one measured response

An investigation can answer a cause-and-effect question only when its comparison is fair. The *independent variable* is the condition the investigator deliberately changes. The *dependent variable* is the response measured after that change. Other conditions that could influence the result should be kept as similar as practical.

For example, suppose a gardener wants to know whether fertilizer affects bean-plant height. Fertilizer amount is the planned change. Height is the response. Seed type, pot size, soil, water, light, and growing time should not quietly become additional differences between groups.

A control group is a comparison group that does not receive the treatment being tested. It is useful because it shows what happened without the planned change. Repeated trials are also valuable: a pattern seen more than once is more trustworthy than a single surprising outcome.



Look closely. The pots, plants, lamps, and setting stay comparable while only the measured amount of water changes. That is the visual signature of a fair one-variable comparison.

☞ Read an investigation as a comparison

Question	Group 1	Group 2
Does fertilizer affect bean-plant height?	0 g fertilizer per week	4 g fertilizer per week
Kept comparable	Same seed type, pot size, soil, water, light, and four-week growing time	Same seed type, pot size, soil, water, light, and four-week growing time
Measured outcome	Height of each plant after four weeks	Height of each plant after four weeks

The fertilizer amount is the independent variable. Height is the dependent variable. The shared conditions protect the comparison from obvious competing explanations.

Worked Decision: Repair a comparison that cannot answer its own question

Two groups of plants receive different amounts of fertilizer. One group also receives twice as much light. If the groups grow differently, the result does not reveal whether fertilizer, light, or both factors made the difference. Repair the design by giving both groups the same planned light exposure and changing fertilizer amount only.

★ Common Mix-Up

The independent variable is not simply the first item mentioned in a question. Find the factor the investigator purposely varies. The dependent variable is what is measured in response.

Science Lightbulb

Find the factor changed on purpose, the response measured, and the conditions kept comparable. A control supplies a baseline, while repeated trials show whether the pattern is dependable.

Quick Check

1. In the fertilizer investigation, what is the dependent variable?

A the amount of fertilizer
B the height measured after four weeks
C the kind of pot
D the amount of soil

2. A student tests whether music affects running time but changes both the music and the course length. What is the main problem?

A A larger sample makes it unnecessary to keep the course length the same.
B Course length is the dependent variable because it was changed.
C The result is confounded because two possible causes changed.
D Extra trials on the longer course can correct for changing its length.

3. Why are repeated trials useful?

A They guarantee identical results.
B They show whether a pattern is dependable instead of a one-time accident.
C They replace the need for a comparison group.
D They make it acceptable to change a second likely cause.

4. In a fertilizer investigation, why include plants that receive no fertilizer?

A They show how comparable plants grow without the treatment.
B They make plant height the independent variable.
C They guarantee that every treated plant grows taller.
D They remove the need to keep water and light comparable.

1.3 Data, Graphs, and Evidence

A graph is evidence, not decoration. Before judging its shape, read both axis labels, the units, and the range of data actually shown.

Describe the pattern without claiming too much

The horizontal axis commonly shows a condition selected by the investigator, such as time, temperature, or dosage. The vertical axis commonly shows a measured response. These are common conventions, not rules: the labels, units, and scale tell you what the graph truly represents.

PART II

Matter and Chemistry

CHAPTER 2

Matter and Its Properties

Learn how matter is described, how it changes state, and how density, temperature, and pressure explain everyday science.

An ice cube melts, a bicycle tire warms in the sun, and a small metal block can feel surprisingly heavy. Those ordinary moments are matter questions. Once you connect particles, mass, volume, and energy, the facts stop feeling separate.

2.1 Mass, Volume, and Density

When a question asks why one object floats, sinks, or feels "heavier for its size," begin with mass and volume. Density compares them.

Start with two different measurements

Mass tells you how much matter an object contains. Volume tells you how much space it occupies. Density combines those two ideas:

$$\text{density} = \frac{\text{mass}}{\text{volume}}.$$

If a sample has a density of $2\ \text{g/cm}^3$, every cubic centimeter of that material has a mass of 2 grams. This is why an object can be small but dense, or large but not very dense. Size by itself does not answer a density question.

☞ Same size does not mean the same density



Scan Me

Treat the cubes as equal-volume samples only when the question states that they are. One floats and one sinks because each cube's mass compared with its volume—its average density—is different from the other's. The scale and cylinder are the tools used to measure mass and volume; the exact values must come from the question, not from the illustration.

Worked Decision: Calculate first; then compare

A metal sample has a mass of $54\,\text{g}$ and a volume of $18\,\text{cm}^3$. Write the relationship before doing arithmetic:

$$\text{density} = \frac{54\,\text{g}}{18\,\text{cm}^3} = 3\,\text{g/cm}^3.$$

Water has a density close to $1\,\text{g/cm}^3$. The sample's density is greater than water's, so the sample sinks in water. Notice the order: calculate the object's density, compare it with the fluid, then make the prediction.

Volume can be measured in more than one useful way

For a rectangular solid, multiply length, width, and height. For an irregular solid, a graduated cylinder can show volume by water displacement only when the object does not dissolve, react with, or absorb the water. It must be fully submerged without trapped air. If the water level rises from $35\,\text{mL}$ to $47\,\text{mL}$, the object has a volume of $12\,\text{mL}$. Because $1\,\text{mL}$ equals $1\,\text{cm}^3$, either unit works for a density calculation when the mass is in grams. A floating object needs a method that accounts for any tool used to hold it under water.

★ Common Mix-Up

Heavy and **dense** are not synonyms. A large beach ball can have more mass than a marble, while the marble has much more mass in each small unit of volume. Also, floating is always a comparison with a particular fluid. An object can sink in one fluid and float in another.



Science Break. The beach ball wins on size; the metal sphere wins on mass packed into each unit of volume. Water responds to average density, not bragging rights.

Science Lightbulb

Density is mass divided by volume. To predict floating or sinking, compare the object's average density with the fluid's density; total size or mass alone is not enough.

Quick Check

1. Two blocks have equal volume. Block X has twice the mass of Block Y. Which statement is supported?

A) Block X has the greater density.
B) Block Y has the greater density.
C) The blocks must have equal density because they have equal volume.
D) Density cannot be compared until the blocks are placed in water.

2. A sample has a mass of 72 g and a volume of 24 cm^3. What is its density?

A) 48 g/cm^3
B) 0.33 g/cm^3
C) 1,728 g/cm^3
D) 3 g/cm^3

3. A sealed object has an average density of 0.80 g/cm^3. It is placed in water with density 1.00 g/cm^3. What happens?

A) It stays suspended because it is sealed.
B) It floats because its average density is lower than water's.
C) It sinks because its density is not zero.
D) It dissolves because water has greater density.

4. An object has density 1.20 g/cm^3 and is placed in a liquid with density 0.90 g/cm^3. What is the best prediction?

A) It floats because its density is greater.
B) It must dissolve in the liquid.
C) It sinks because it is denser than the liquid.
D) Its behavior depends only on its total mass.

2.2 States and Phase Changes

A state-of-matter question is usually testing particle arrangement and energy. Ask what the particles are doing, not whether the material has become a different substance.

The same substance can behave differently

A solid keeps both its shape and volume because its particles stay close together near average positions and mainly vibrate in place. A liquid keeps its volume but takes the shape of its container because particles remain close while sliding past one another. A gas has neither a fixed shape nor a fixed volume because its particles are far apart and move freely through the container.

☞ One substance, three observable states

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