

The Central Propaganda Department of the Ministry of Science and Technology
Chinese Citizens' Scientific Quality Standards

State Council Bulletin No. 24, 2016

http://www.gov.cn/gongbao/content/2016/content_5103155.htm

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Provinces, autonomous regions, municipalities directly under the Central Government, cities with separate plans, deputy provincial city science and technology departments (committees and bureaus), Party Committee Propaganda Department, Xinjiang Production and Construction Corps Science and Technology Bureau, Party Committee Propaganda Department, central and State Council departments, directly affiliated institutions, Central Military Commission Science and Technology Committee, various people's organizations:

In order to implement the "People's Republic of China Science and Technology Popularization Law", implement the "National Medium and Long-term Science and Technology Development Planning Outline (2006-2020)", "National Science and Technology Action Plan Outline (2006- 2010-2020)" (hereinafter referred to as "Science Compendium" and other scientific tasks, the General Office of the State Council has determined that the Ministry of Science and Technology, the Ministry of Finance, the Central Propaganda Department, and the Central Organization Department will participate in the formulation of the "Chinese Citizens' Scientific Competency Benchmark"), establish a monitoring index system for the implementation of the "Outline of Scientific Qualities", regularly carry out surveys of Chinese citizens' scientific qualities and national statistical work on science popularization, and provide measurement standards and guidance for citizens to improve their scientific qualities.

After organizing expert research, in some provinces (cities) for pilot evaluation, and extensively soliciting opinions from departments, localities, and all sectors of society, a "benchmark" was formulated on the basis of forming a broad consensus (the electronic version can be downloaded from the portal of the Ministry of Science and Technology, etc.), Now issued. All localities and departments are invited to seriously organize cadres, workers, farmers, science and technology, educators, urban and rural laborers, military officers and soldiers, students, and people from all walks of life in the party and government organs; party and government organs, scientific research institutions, enterprises, institutions, Schools, military units, and social organizations should

organize the "benchmark" learning and training activities; the news media and websites should widely publicize the "benchmark", vigorously promote the scientific spirit, popularize scientific knowledge in the whole society, and raise the scientific and technological awareness and scientific literacy of the whole people. Form a good atmosphere to encourage public entrepreneurship and innovation, and lay a solid social foundation for implementing the innovation-driven development strategy, building an innovative country and achieving the goal of fully building a well-off society.

Ministry of Science and Technology

Propaganda Department

April 18, 2016

Chinese Citizens' Scientific Qualities Benchmark

The "Chinese Citizens' Scientific Quality Standard" (hereinafter referred to as "the Standard") refers to the standard of basic scientific and technological knowledge and capabilities that Chinese citizens should possess. Citizens with basic scientific qualities generally mean understanding the necessary scientific and technological knowledge, mastering basic scientific methods, establishing scientific thoughts, advocating scientific spirit, and having the ability to apply them to deal with practical problems and participate in public affairs. The formulation of the "benchmark" is an important part of improving the monitoring and evaluation of citizens' scientific quality system, and will provide measurement standards and guidance for citizens to improve their own scientific quality. The "benchmark" has 26 benchmarks and 132 benchmarks, which basically cover the scientific spirit, knowledge or knowledge that citizens need to have, or the ability to possess. Each benchmark lists the corresponding benchmarks and explains and explains the benchmarks..

The "benchmark" is applicable to citizens of the People's Republic of China who are over 18 years of age and capable.

During the evaluation, 50 benchmark points were randomly selected from 132 benchmark points for inspection. 50 benchmark points need to cover all 26 benchmarks. Design questions based on each benchmark to form a survey question bank. During the evaluation, 50 questions are randomly selected from the 500 question bank (must cover 26 benchmarks) for testing in the form of judgment questions or multiple choice questions, each with 2 points. A 60% accuracy rate is considered to have basic scientific qualities.

Structure Chart of "Chinese Citizens' Scientific Quality Standards"

Serial number	Benchmark content	Reference point number	Datum point
1	Knowing that the world can be recognized, can understand the world with a scientific attitude.	1-5	5 Ge
2	Know to analyze and solve problems in a systematic way.	6-9	4 pcs
3	Have a basic scientific spirit and understand the basic process of scientific and technological research.	10-12	3 Ge
4	Have innovation awareness, understand and support technological innovation.	13-18	6 Ge
5	Understand the relationship between science, technology and society, and realize that the impact of technology has two sides.	19-23	5 Ge
6	Establish the concept of ecological civilization and live in harmony with nature.	24-27	4 pcs
7	Establish the concept of sustainable development and effectively use resources.	28-31	4 pcs
8	Advocate science and have the basic ability to distinguish the authenticity of information.	32-34	3 Ge
9	Master scientific methods for acquiring knowledge or information.	35-38	4 pcs
10	Master basic mathematical operations and logical thinking skills.	39-44	6 Ge
11	Master basic physics knowledge.	45-52	8 Ge
12	Master basic chemistry knowledge.	53-58	6 Ge
13	Master basic astronomical knowledge.	59-61	3 Ge
14	Master basic earth science and geography knowledge.	62-67	6 Ge

15	Understand the basics of life phenomena, biodiversity and evolution.	68-74	7 Ge
16	Understand human physiology.	75-78	4 pcs
17	Know common sense of common diseases and safe medication.	79-88	10 Ge
18	Master the basic knowledge of diet and nutrition, and develop good habits.	89-95	7 Ge
19	Master the basic knowledge of safe travel and use transportation properly.	96-98	3 Ge
20	Master the common sense of safe electricity and gas consumption, and be able to use household appliances and electronic products correctly.	99-101	3 Ge
21	Understand the basic knowledge and methods of agricultural production.	102-106	5 Ge
22	Have basic labor skills and can use related tools and equipment correctly.	107-111	5 Ge
23	Have a sense of safety in production and abide by the production rules and operating procedures.	112-117	6 Ge
24	Master the rescue knowledge and first aid methods for common accidents.	118-122	5 Ge
25	Master the basic methods of natural disaster prevention and emergency avoidance.	123-125	3 Ge
26	Understand the hazards of environmental pollution and their countermeasures, and make rational use of land and water resources.	126-132	7 Ge

Reference points (132)

1. Know that the world is cognizable, and understand the world with a scientific attitude.

(1) Establish a scientific worldview and know that the world is material and can be recognized, but human beings have limited knowledge of the world.

(2) Respect for objective laws can make us live in harmony with the world.

(3) Science and technology are constantly evolving, and scientific knowledge itself needs to be continuously deepened and expanded.

(4) Knowing that philosophy and social sciences, like natural sciences, is an important tool for people to understand the world and transform the world.

(5) Understanding Chinese excellent traditional culture plays an important role in understanding nature and society and developing science and technology.

2. Know to use systematic methods to analyze and solve problems.

(6) Know that the world is universally connected, and things are developed and changed by movement and unity of opposites; can understand and solve problems with a universally connected and developmental perspective.

(7) Knowing that the various parts of the system are interconnected and interacting, the complex structure may be composed of many simple structures; realize that the whole has functions that the sum of the parts does not.

(8) Know that there may be multiple ways to analyze and solve problems, and know that solving one problem may cause other problems.

(9) Knowing the traditional Chinese philosophical concepts such as Yin and Yang, the five elements, the unity of heaven and man, and knowledge-giving to knowledge is the simple materialism and overall systematic methodology of ancient China, and has practical significance.

3. Have a basic scientific spirit and understand the basic process of scientific and technological research.

(10) Have the scientific spirit of seeking truth, questioning, and empirical knowledge, knowing that scientific and technological research should have the basic elements of curiosity, observation, and honesty.

(11) Understand the basic process and methods of scientific and technological research.

(12) For those who intend to become the subjects of the experiment, they should fully inform themselves or their stakeholders of the possible risks of the experiment.

4. Have innovation awareness, understand and support technological innovation.

(13) Know the importance of innovation for personal and social development, have a sense of seeking new ideas, and advocate solving problems with new knowledge and new methods.

(14) Knowing that technological innovation is the guarantee for enhancing the core competitiveness of individuals and units.

(15) Respect for intellectual property rights and have the awareness of protecting patents, trademarks and copyrights; know the important role of intellectual property protection system in promoting technological innovation.

(16) Understand the important role of technical standards and brands in market competition, know the leading and supporting role of technological innovations on standards and brands, and have the awareness of brand protection.

(17) Pay attention to new knowledge and new technologies related to your life and work.

(18) Pay attention to the development of science and technology. Know high-tech technologies such as "genetic engineering", "stem cells", "nanomaterials", "thermonuclear fusion", "big data", "cloud computing", and "Internet+".

5. Understand the relationship between science, technology and society, and realize that the impact of technology has two sides.

(19) Knowing that solving technical problems often requires new scientific knowledge, and the application of new technologies often promotes scientific progress and social development.

(20) Understand the four major inventions in ancient China, the astrology of agricultural medicine, modern scientific and technological achievements and their contribution to the world.

(21) Know that the impact of technology has two sides, and often exceeds the original intention of the design, which can benefit mankind and may have a negative effect.

(22) Knowing the value of technology may be different for different people or at different times.

(23) Objectively and fairly analyze the decisions related to science and technology, and express opinions rationally.

6. Establish the concept of ecological civilization and live in harmony with nature.

(24) Know that people are part of nature, love nature, respect nature, conform to nature, and protect nature.

(25) Knowing that we live on an interdependent earth, not only the global ecological environment is interdependent, but other factors such as economic society are also interrelated.

(26) Know global environmental problems such as climate change, sea level rise, land desertification, atmospheric ozone depletion and their harm.

(27) Knowing that once an ecosystem is destroyed, it is difficult to recover, and recovering a damaged or degraded ecosystem is costly, difficult, and long-lived.

7. Establish the concept of sustainable development and effectively use resources.

(28) Knowing that development must not only meet the needs of contemporary people, but also not impair the ability of future generations to meet their needs.

(29) Knowing that the population carrying capacity of the earth is limited; knowing renewable and non-renewable resources, knowing that mineral resources, fossil energy, etc. are non-renewable, have a crisis awareness of resource shortages and save material resources, energy awareness.

(30) Knowing that the development and utilization of clean energy such as hydropower, wind energy, solar energy, marine energy, and nuclear energy is an important way to solve the energy shortage; knowing that the hazards of nuclear power plant accidents and the radioactivity of nuclear waste are controllable.

(31) Understand that the recycling of materials can save resources, achieve domestic waste sorting and stacking, and the recycling of renewable resources to reduce emissions; save on the use of various materials and less disposable items; understand the basic measures and methods of building energy conservation .

8. Advocate science and have the basic ability to distinguish the authenticity of information.

(32) Knowing that practice is the only standard for testing truth, and experiment is an important means of testing the authenticity of science.

(33) Know that explaining natural phenomena depends on scientific theory, respects objective laws, seeks truth from facts, and is not superstitious or blindly following natural phenomena that cannot yet be explained by scientific theory.

(34) Know that the information may be affected by the background and intention of the publisher, have the ability to identify the authenticity of the information, and do not believe the unverified information.

9. Master the scientific method of acquiring knowledge or information.

(35) Pay attention to the knowledge and information related to life and work, and have the ability to retrieve and collect the required knowledge and information through books, newspapers and the Internet.

(36) Know the difference between the original information and second-hand information, and know that the original information can be obtained through surveys, interviews, and consulting original documents.

(37) Have the ability to process and organize the information obtained and integrate the new information into the existing knowledge.

(38) Have the consciousness of using multiple learning methods for lifelong learning.

10. Master basic mathematical operations and logical thinking skills.

(39) Master the four operations of addition, subtraction, multiplication and division, and be able to deal with problems in daily life and work with the help of quantitative calculation or estimation.

(40) Master basic international measurement units such as meters, kilograms, seconds and their conversion to commonly used measurement units.

(41) Master the basic knowledge of probability and use probability knowledge to solve practical problems.

(42) Relevant analysis and judgment can be made based on statistical data and charts.

(43) Have certain logical thinking ability and master basic logical reasoning methods.

(44) Knowing that there are inevitable and accidental phenomena in nature, pay attention to regularity in solving problems and avoid blindness.

11. Master basic physics knowledge.

(45) Knowing that molecules and atoms are particles that constitute matter, all matter is composed of atoms, and atoms can combine into molecules.

(46) Distinguish the main physical properties of substances, such as density, melting point, boiling point, conductivity, etc., and use them to explain simple phenomena in nature and life; know the conditions for the three-state change of common substances in solid, liquid, and gas.

(47) Understand the common forces in life, such as gravity, elasticity, friction, electromagnetic force, etc.; know the changes in atmospheric pressure and its impact on life.

(48) Know that force is the cause of the movement of all things in nature; it can describe Newton's laws of mechanics and can be used to explain the common movement phenomena in life.

(49) Know that sunlight is composed of seven different monochromatic lights. Recognize that sunlight is the main source of energy required for life activities on the earth; know that radio waves, microwaves, infrared rays, visible light, ultraviolet rays, and X-rays are electromagnetic waves.

(50) Master the basic knowledge of light reflection and refraction, and understand the imaging principle.

(51) Master the basic knowledge of voltage, current and power, and know the basic composition and connection method of the circuit.

(52) Knowing the law of conservation of energy, energy will neither be generated nor destroyed, it will only be transformed from one form to another, or transferred from one object to another, while the total amount remains unchanged.

12. Master basic chemical knowledge.

(53) Know the composition and main properties of water, give examples of the effects of water on living bodies.

(54) Know the main components of air. Know the main properties of gases such as oxygen and carbon dioxide, and list their uses.

(55) Know the basic elements and classifications that exist in nature.

(56) Knowing the law of conservation of mass, the chemical reaction only changes the original form or structure of the substance, and the total mass remains unchanged.

(57) Identify metals and non-metals, and know the main chemical properties and uses of common metals. Know the conditions of metal corrosion and common methods to prevent metal corrosion.

(58) Can describe the properties of some important acids, bases and salts, can explain the use of acids, bases and salts in daily life, and can use them to explain the simple phenomena in nature and life.

13. Master basic astronomical knowledge.

(59) Know that the earth is a planet in the solar system, the sun is a star in the Milky Way, and the universe is made up of a large number of galaxies; understand the theory of the "Big Bang".

(60) Know that the earth rotates from west to east for one day, forming a day and night alternation; the earth revolves around the sun for one year, forming a four season change; the moon revolves around the earth for January, with a full moon and a lack of moon.

(61) Be able to identify the Big Dipper and understand astronomical phenomena such as solar eclipses, comets and meteors.

14. Master basic earth science and geography knowledge.

(62) It is known that a solid earth is composed of the crust, mantle, and core. The movement of the earth and the anisotropy inside the earth produce various forces that cause natural disasters.

(63) Know that the earth's surface is the interface between the earth's atmosphere, lithosphere, hydrosphere, and biosphere, and it constitutes the earth's environment closely related to humans.

(64) Knowing the percentage of land area and ocean area in the total area of the earth, we can name seven continents and four oceans.

(65) Knowing the main landform features, population distribution, ethnic composition, administrative divisions and main neighboring countries of China, can tell the main mountain ranges and water systems.

(66) Know that the weather refers to the cold, hot, dry, wet, sunny and other atmospheric conditions within a short period of time, and the climate refers to the general state of the atmosphere such as temperature and precipitation for many years; understand the weather forecast and meteorological disaster warning signals.

(67) Know that the water on the earth continues to move through evaporation, water vapor transport, precipitation and runoff under the action of solar energy and gravity to form a water cycle; know that the uneven spatial and temporal distribution of water during the water cycle causes floods, droughts and other disasters .

15. Understand the basic knowledge of life phenomena, biodiversity and evolution.

(68) Know that cells are the basic unit of life.

(69) Know that organisms can be divided into animals, plants and microorganisms, and identify common animals and plants.

(70) Knowing that the species on the earth evolved from early species, and that humans evolved from ancient apes.

(71) Know the significance of photosynthesis, and know that the oxygen on the earth mainly comes from the photosynthesis of plants.

(72) Understand the role of genetic material, know DNA, genes and chromosomes.

(73) Understand that various organisms are connected through the food chain and resist the behavior of hunting, selling and eating rare wild animals.

(74) Knowing that biodiversity is the result of long-term evolution of organisms, protecting biodiversity is conducive to maintaining ecosystem balance.

16. Understand human physiology.

(75) Understand the physiological structure and physiological phenomena of the human body, and know the location and physiological functions of the main organs such as heart, liver, lung, stomach, kidney and so on.

(76) Know the normal range of human body temperature, heart rate, blood pressure and other indicators, and know your blood type.

(77) Understand the developmental process of the human body and the physiological characteristics of each developmental stage.

(78) Know that each person's physical condition varies with gender, weight, activities, and lifestyle habits.

17. Know common sense of common diseases and safe medication.

(79) Awareness of disease prevention and timely medical treatment.

(80) Can correctly use thermometers, weight scales, sphygmomanometers and other household medical appliances to understand their own health status.

(81) Know the harm of mosquito bites to the human body and preventive and therapeutic measures; know that viruses, bacteria, fungi and parasites may infect the human body and cause disease; know that sewage and fecal treatment, animal and plant quarantine and other public health epidemic prevention and detection measures control The importance of disease.

(82) Know the characteristics of common infectious diseases (such as infectious hepatitis, tuberculosis, AIDS, influenza, etc.), chronic diseases (such as hypertension, diabetes, etc.), sudden diseases (such as cerebral infarction, myocardial infarction, etc.) and Related preventive and first aid measures.

(83) Understand the basic knowledge of common occupational diseases and take basic preventive measures.

(84) Know the importance of mental health, understand the basic characteristics of mental illness and mental illness, and know the basic methods of prevention and adjustment.

(85) Know to follow the doctor's advice or take the medicine according to the instructions for the medicine, and understand the common knowledge of safe medication, rational medication and adverse drug reactions.

(86) Know the difference between prescription and over-the-counter medicines, and know the medicines that are allergic to yourself.

(87) Understand that traditional Chinese medicine is a traditional Chinese medical method and has its own advantages compared to Western medicine.

(88) Know the types and hazards of common drugs and stay away from drugs.

18. Master the basic knowledge of diet and nutrition, and develop good habits.

(89) Choose foods that are beneficial to health and achieve reasonable nutrition and a balanced diet.

(90) Master the knowledge of drinking water, food hygiene and safety, and have a certain ability to identify the quality of daily food hygiene.

(91) Know the characteristics of food poisoning and methods to prevent food poisoning.

(92) Know the health risks of smoking and excessive drinking.

(93) Know that proper exercise is good for your health.

(94) Know the importance of protecting your eyes and loving your teeth, and develop a good habit of loving your teeth and protecting your eyes.

(95) Know the harm to health caused by irregular work and rest, and develop good work and rest habits.

19. Master the basic knowledge of safe travel and can use transportation properly.

(96) Understand the meaning of basic traffic rules and common traffic signs, and the rescue methods for traffic accidents.

(97) Be able to use bicycles and other daily household vehicles correctly, and regularly repair and maintain the vehicles.

(98) Understand the safety rules for taking various types of public transportation (cars, rail transit, trains, airplanes, ships, etc.).

20. Master the common knowledge of safe electricity and gas consumption, and be able to use household appliances and electronic products correctly.

(99) Understand the general knowledge of safe electricity use, and master the basic skills of prevention and first aid of electric shock.

(100) Safe use of gas appliances and preliminary grasp of first aid methods for carbon monoxide poisoning.

(101) Can correctly use household appliances and electronic products, such as induction cookers, microwave ovens, water heaters, washing machines, electric fans, air conditioners, refrigerators, radios, televisions, computers, mobile phones, cameras, etc.

21. Understand the basic knowledge and methods of agricultural production.

(102) Ability to distinguish and select common agricultural products.

(103) Know the basic conditions, laws and related knowledge of crop growth.

(104) Know that the soil is the loose surface layer of plants that can grow on the earth's land surface, and it is the basis for humans to engage in agricultural production activities.

(105) Agricultural producers should master the basic knowledge and methods for proper use of pesticides and rational use of chemical fertilizers.

(106) Understand the relevant knowledge of pesticide residues and the method of removing pesticide residues from fruits and vegetables.

22. Have basic labor skills and can use related tools and equipment correctly.

(107) Follow the technical standards or norms of production or service in the industry in this job.

(108) Can correctly operate or use tools or equipment related to his job.

(109) Pay attention to the service life of production tools, know that maintenance can keep the production tools in good working condition and extend the service life, and can perform maintenance such as cleaning, refueling, adjustment and other production tools according to the procedures specified in the user manual.

(110) Can use common tools to diagnose simple faults in production, and can timely repair.

(111) Can try to shorten the work cycle and improve labor efficiency through the optimization and improvement of working methods and processes.

23. Have a sense of safety in production and abide by the production regulations and operating procedures.

(112) Producers should establish a sense of safety in production and business activities and consciously perform their duties.

(113) Strictly abide by safety production regulations and operation manuals during labor.

(114) Understand the potential risk factors in the working environment and place, as well as emergency measures to prevent and handle accidents, and consciously wear and use labor protective equipment.

(115) Know the safety signs of toxic materials, radioactive materials, flammable or explosive materials, lasers, etc.

(116) Know the preventive measures for accidents such as explosions and work-related injuries in production. Once accidents occur, they can protect themselves and report to the police in time.

(117) Understand the impact of production activities on the ecological environment, know the clean production standards and related measures, and

have the social responsibility to supervise the polluted environment, safe production, transportation, etc.

24. Master the rescue knowledge and first aid methods of common accidents.

(118) Understand the conditions of combustion, the principle of fire extinguishing, master the use of common fire-fighting tools and the general method of self-rescue in fire escape.

(119) Understand the basic first aid methods for emergencies such as drowning and obstruction of the trachea by foreign objects.

(120) Choose environmentally friendly construction materials and decorative materials to reduce and avoid the harm of benzene, formaldehyde, radioactive materials, etc. to the human body.

(121) Understand the countermeasures and first aid methods for hazardous gas leakage.

(122) Understand the basic first aid methods for dogs, cats, snakes and other animal bites.

25. Master the basic methods of natural disaster prevention and emergency avoidance.

(123) Understand the distribution of major natural disasters in my country and the common natural disasters in this area.

(124) Understand the characteristics and emergency avoidance methods of major natural disasters such as earthquakes, landslides, debris flows, floods, typhoons, lightning, sandstorms, and tsunamis.

(125) Can deal with secondary disasters caused by major natural disasters.

26. Understand the hazards of environmental pollution and its countermeasures, and make reasonable use of land and water resources.

(126) Knowing that water bodies such as the atmosphere and oceans have limited capacity to contain waste and self-purification of the environment, and that the rate of human pollutant discharge cannot exceed the self-purification rate of the environment.

(127) Know the types of air pollution, sources and types of pollutants, and the main technical means to control air pollution. Can understand the air quality report. Know the meaning of cleaner production and green products.

(128) Consciously protect the local drinking water source. Know that sewage must be properly treated to meet the standards before it can be discharged into the water body. Do not discard or dump waste into water bodies.

(129) Knowing that pollutants from industry, agricultural production and life enter the soil, it will cause soil pollution and will not dump garbage.

(130) Protect cultivated land, use land resources sparingly, understand the rational use of grassland and forest farm resources, prevent overgrazing, and know that unused land such as barren mountains and slopes should be developed rationally.

(131) Knowing that excessive exploitation of groundwater will cause land subsidence, lower groundwater level, and seawater backfilling in coastal areas; choose water-saving production technologies and living appliances, know how to use rainwater and reclaimed water reasonably, and pay attention to the leak plugging of water used in public places.

(132) Have the consciousness of protecting the ocean and know the importance of reasonable development and utilization of marine resources.