

Citizenship and Social Development

Theme 2: Our Country since Reform and Opening-up

Topic: Change in people's life and overall national strength

Learning focus:

Enhancement of overall national strength (economy, culture, natural resources, education, technology, national defence, etc. )

Translated version

May 2022

# **Learning Focus**

The focus of this topic is to let students understand the meaning of overall national strength and the development of China in economy, culture, education, natural resources, technology, national defence, etc. since the reform and opening-up, as well as the importance and impacts of the enhancement of overall national strength.

## ● Learning objectives ●

### **Knowledge**

- To understand the development of China in aspects, such as economy, culture, education, natural resources conservation, technology, national defence. since the reform and opening-up.
- To grasp the changes in aspects, such as economy, culture, natural resources, education, technology, national defence. since the reform and opening-up, as well as their importance and impacts of enhancing overall national strength.

### **Skills**

- To nurture students' skills in analysis, induction and problem solving, as well as their ability in proposing practical suggestions through studying factual information on aspects, such as economy, culture, national resources, education, technology, national defence.

### **Values**

- To deepen students' national pride, sense of belonging and responsibility for China and enhance their national identity.

# Introduction: The meaning of overall national strength

- Overall national strength is the sum of all the power and resources that a sovereign country relies upon for its survival and development. It is also an index to measure a country's political power, economy, technology, culture, education, national defence, diplomatic strength, natural resources, etc.



Source: Xinhua News Agency



Source: Website of the Academy of Chinese Studies



## **Introduction: The meaning of overall national strength**

- Traditionally, the national strength of a country is measured by its military, economy, territory, population, natural resources, etc. Among them, military power is the most valued. However, in recent years, academia has been measuring a country's power, status, impact, etc from a diversified way.
- For example, technology has become an important factor in measuring overall national strength in recent years because technological development has become a more important influence on a country's economic power, national defence, diplomatic relations and politics. Another example would be the achievement in the aspect of sustainable development, which has become another important factor for consideration due to increasing awareness of environmental and resource conservation.

# Introduction: The meaning of overall national strength

- Some scholars have proposed the concepts of hard power and soft power in describing the national strength of a country. Hard power refers to the tangible aspects such as economy, national defence and natural resources. Soft power refers to the intangible, abstract and unquantifiable power such as political, diplomatic and cultural power.
- When measuring a country's overall national strength, we must consider both hard and soft power as they complement each other and are equally important.

## Examples of hard power and soft power



Source: Website of the Academy of Chinese Studies

# Introduction: The meaning of overall national strength

- There are many factors in measuring the overall national strength. However, it is not simply the sum of all factors and it is not a static index. In fact, it changes over time. Academia has no consensus on which factors should be measured. Even though the same factor (e.g. education) is chosen by different researchers, they may have different definitions and calculations of sub-items (e.g. which aspects of education should be measured). Therefore, different researchers have different measurements of a country's overall national strength.
- According to the research about China's overall national strength, it is generally agreed that it has been rising since the reform and opening-up.

# Introduction: The meaning of overall national strength

Since the reform and opening-up in 1978, various factors such as economy, culture, conservation and usage of natural resources, education, technology, and military have been greatly enhanced, leading to the steady rise of China's overall national strength:

- **Economy:** China is the second largest economy in the world which has a robust and independent industrial system;
- **Culture:** Chinese culture reaches the world so that the world understands China better. Its cultural influence continues to rise;
- **Natural resources:** the abundance of natural resources is better conserved and utilised;
- **Education:** the scale and quality of education have been greatly improved;
- **Technology:** the technological strength has transformed from quantity to quality and from scattered to systematic development; and
- **National defence:** the military power has been enhanced tremendously.

# Economy

Please watch the following video and answer the question.



Click on the image to watch the video



**Question:** Among all the achievements since the reform and opening-up mentioned in the video, which one is the most impressive to you?

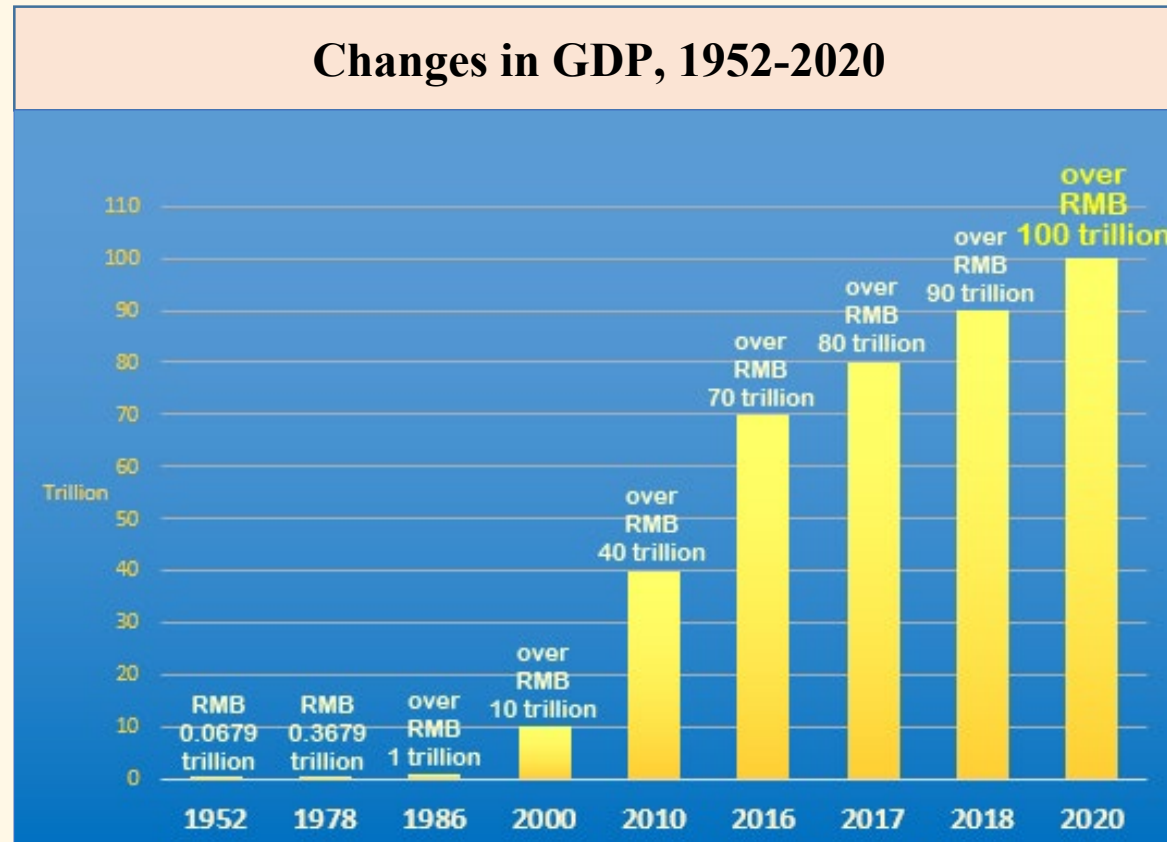


## **The Importance of economy in overall national strength**

- Economy is a very important factor in constituting the overall national strength. Not only does economy affect the industrial and agricultural productivity and level of foreign trade, it also directly affects the development and scale of the military power and education. Therefore, economy is an important component of overall national strength.
- Since economy is so important, China has been developing its economy since the reform and opening-up. Its effort has been reflected upon the ever-expanding economic scale, the ever-rising Gross National Product (GNP) per capita, and the changes in the total value of the tertiary industry. China's influence on the world's economy has also been rising.

# Size of China's economy

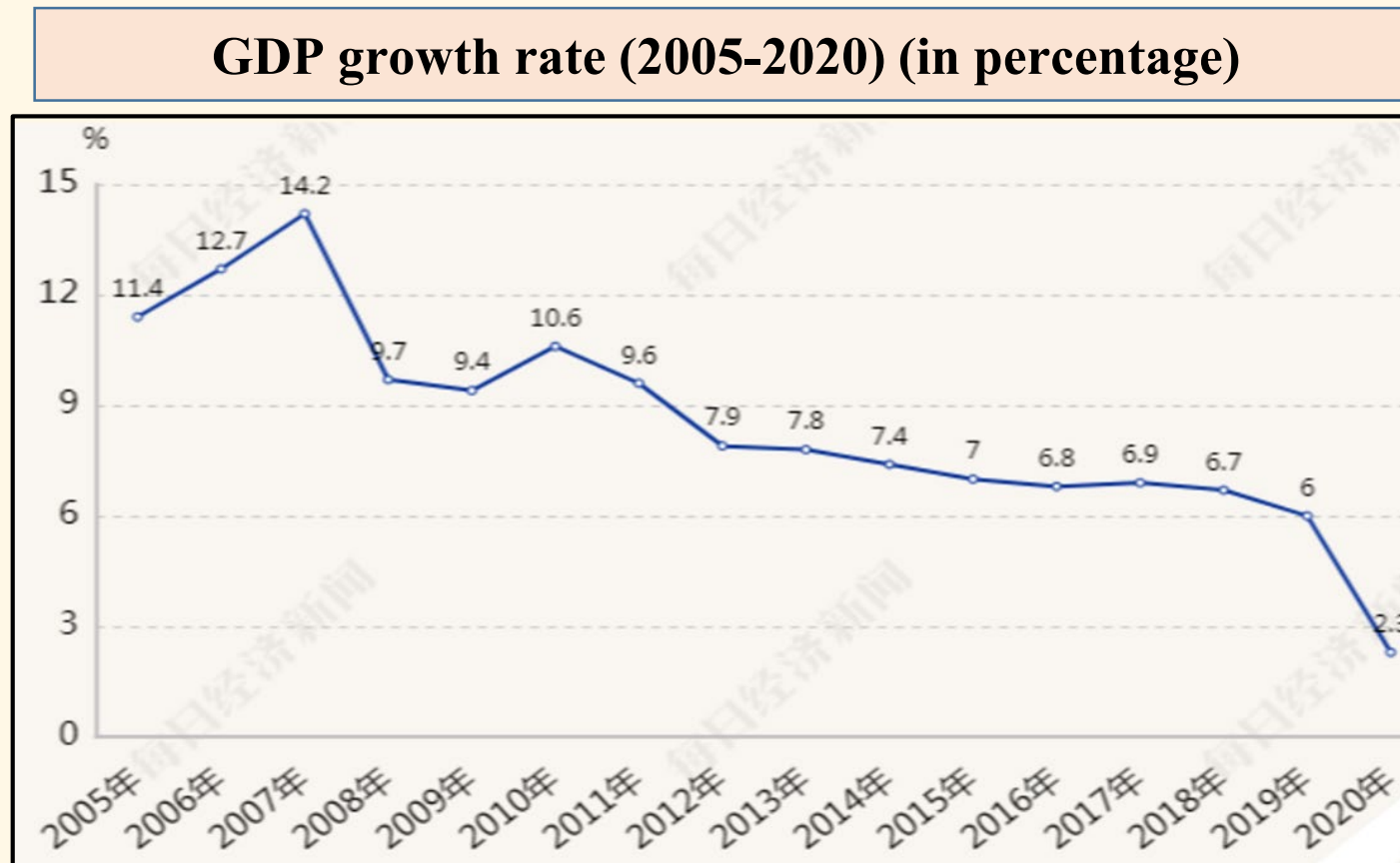
Since the reform and opening-up, the size of China's economy has been expanding. The GDP rose from RMB 367.9 billion in 1978 to RMB 100 trillion in 2020.



Source: "Milestone! Chinese economy broke the record of RMB 100 trillions".  
Xinhua Net. 18 January 2021. [http://www.xinhuanet.com/fortune/2021-01/18/c\\_1126995425.htm](http://www.xinhuanet.com/fortune/2021-01/18/c_1126995425.htm)

Since the reform and opening-up, China's GDP has grown yearly. Even though the COVID-19 epidemic affected the economy in 2020, there was still a growth rate of 2.3% compared to that of 2019, making it the only major economy with a positive growth rate in the world.

Source: "Unusual answer to an Unusual year – Review of the Statistical Communique of the People's Republic of China National Economic and Social Development (不平凡之年書寫非凡答卷—《2020年國民經濟和社會發展統計公報》評讀)". National Bureau of Statistics of China. ([http://www.stats.gov.cn/tjsj/sjjd/202102/t20210228\\_1814157.html](http://www.stats.gov.cn/tjsj/sjjd/202102/t20210228_1814157.html))



The picture is extracted from "A Hundred Year of Revival: from Poverty to GDP RMB 100 trillion! 25 pictures to see China's greatest economic achievements (百年復興路：從「一窮二白」到GDP破百萬億！25張圖看中國經濟偉大成就)". NDB. 30 June 2021. <http://www.nbd.com.cn/articles/2021-06-30/1815640.html>

## Reference

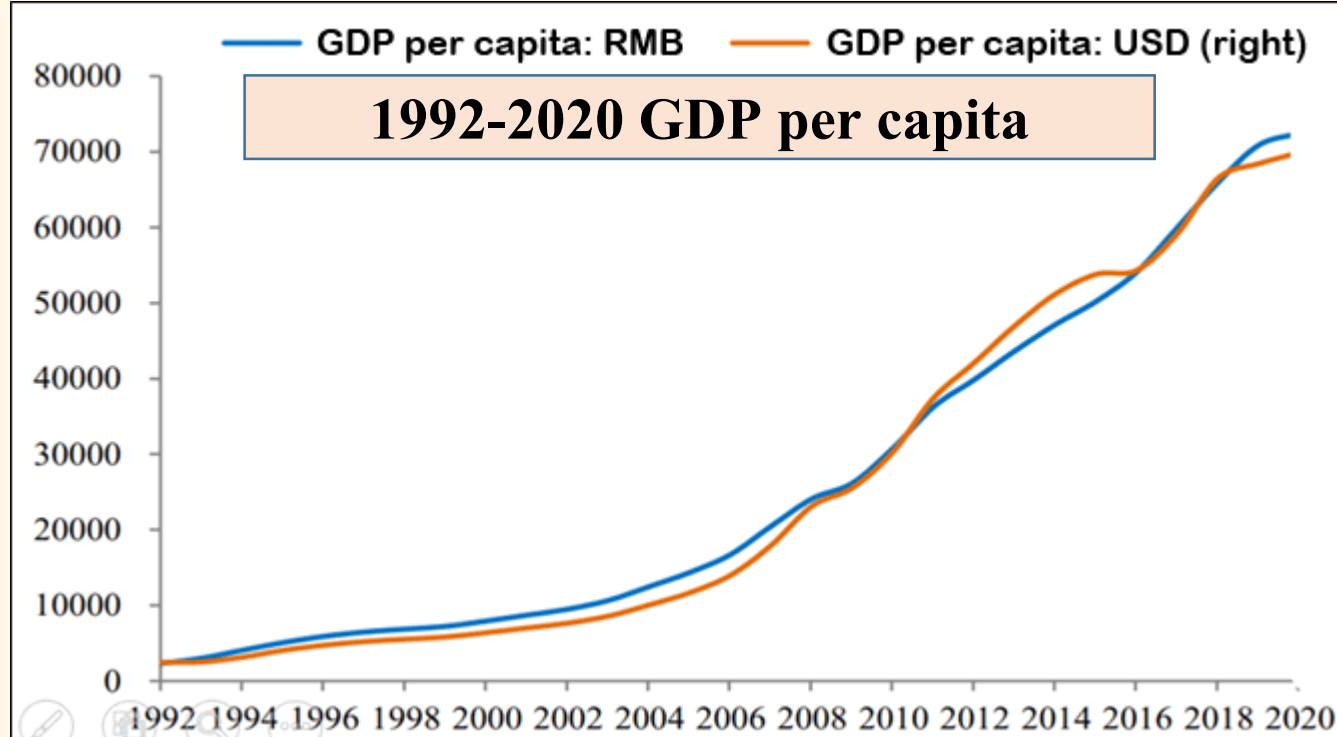
- In 1978, China's GDP was RMB 367.9 billion. It ranked 11<sup>th</sup> in the world;
- In 2000, China's GDP exceeded RMB 10 trillion, overtaking Italy and becoming the world's 6<sup>th</sup> largest economy; In 2010, it exceeded RMB 40 trillion, overtaking Japan and becoming the world's 2<sup>nd</sup> largest economy.
- Since 2016, China's GDP exceeded RMB 70 trillion, 80 trillion and 90 trillion in a row. In 2020, it exceeded RMB 100 trillion.

Source: "China's Answer of over 100 Trillions (GDP破百萬億元的中國答卷)" Website of the Central People's Government of People's Republic of China. 19 January 2021.  
[http://www.gov.cn/xinwen/2021-01/19/content\\_5580906.htm](http://www.gov.cn/xinwen/2021-01/19/content_5580906.htm)

# GDP per capita

The GDP per capita of China continuously rose from RMB 385 in 1978 to RMB 72,447 in 2020. In 2020, the GDP per capita had been exceeded USD 10,000 for two consecutive years. China's income is above average among the world. The gap between China and high income countries continues to narrow.

Source: "Statistical Communique of the People's Republic of China National Economic and Social Development". National Bureau of Statistics of China.  
[http://big5.www.gov.cn/gate/big5/www.gov.cn/xinwen/2021-02/28/content\\_5589283.htm](http://big5.www.gov.cn/gate/big5/www.gov.cn/xinwen/2021-02/28/content_5589283.htm)



The above graph is taken from 21 Caijing Wang, "Sudden thunderstorm – a look at China's future from 2020 Statistical Communique (於無聲處聽驚雷 — 從2020年統計公報看中國未來)". 3 March 2021.  
<https://m.21jingji.com/article/20210303/herald/afafc097e9d3948df47b123158d9c40d.html>

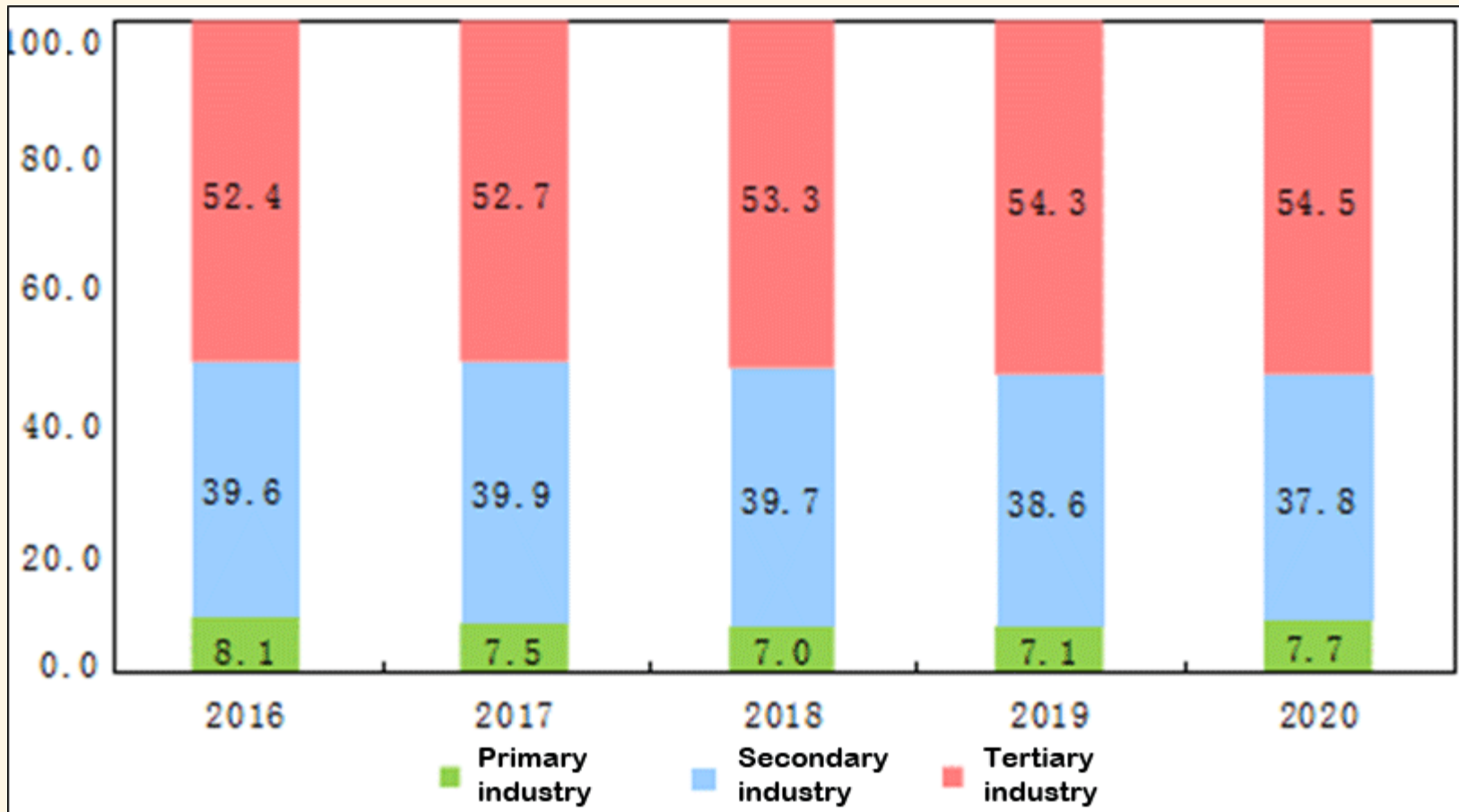


# The development of China's manufacturing industry (1978-2017)



# Changes in proportion of three sectors of industry in GDP

Since the reform and opening-up, the industrial structure has been gradually improved. The proportion of heavy industry (secondary industry) gradually dropped, while the proportion of service sector continued to rise.



Proportion of each sector in GDP (in percentage) from 2016 to 2020

Source: “Statistical Communique of the People’s Republic of China National Economic and Social Development”. National Bureau of Statistics of China. [http://big5.www.gov.cn/gate/big5/www.gov.cn/xinwen/2021-02/28/content\\_5589283.htm](http://big5.www.gov.cn/gate/big5/www.gov.cn/xinwen/2021-02/28/content_5589283.htm)

## Three sectors of industry

- The primary industry refers to industries that extract resources from the nature or rely on natural resources for their production activities, including agriculture, livestock rearing, fishery, hunting and forestry;
- The secondary industry refers to industries that manufacture semi-finished products or products by processing raw materials, including manufacturing, extracting, mining, constructing, and the provision of gas, electricity and water.
- The tertiary industry refers to the industries that provide services, including retail industry, tourism, finance, creative industries, conference and exhibition industry and education.

Since 2010, China's manufacturing industry growth rate has been ranked first in the world for 11 consecutive years, taking up 30% of the world's production. China is the world's most developed industrial system. China ranked first in the world for the output of over 40% of top 500 main industrial products.

Source: "China's manufacturing industry's growth rate has been ranked first in the world for 11 consecutive years (製造業增加值連續十一年世界第一)". People.cn. 14 September 2021. <http://sn.people.com.cn/BIG5/n2/2021/0914/c186331-34912736.html>

## Reference

The Taiyuan Iron and Steel Group in Shanxi Province develops green economy and explores green industry with low energy consumption and high technology. Old facilities that would pollute the environment were disused. Its whole process technique has been upgraded. Its main equipment is large-scale, highly efficient, energy saving and environmentally friendly.

Precision strip steel workshop of Taiyuan Iron and Steel Group



Source: Xinhua News Agency



# Changes in proportion of three sectors of industry

Since the reform and opening-up, China built a diversified modern industrial system of which the scale ranks first in the world. The industries allowed China to transform from a poor agricultural country to a modernised industrial nation and to a major economic power in the world.

- The proportion of industry in GDP has decreased, but the industrial structure is undergoing a transformation of its “nature”. China’s manufacturing industry has become “intelligent” and “creative”.
- The proportion of the service sector continues to rise. Its value rose from RMB 90.5 billion in 1978 to RMB 55.3977 trillion in 2020 with an annual growth rate of 11.6%. The service industry has become the main driving force of economic growth, overtaking heavy industry in 2013 and taking up over 50% of GDP.

Source:

- "Service Sector braces the storm for 70 years, leading the way in the new era (服務業風雨砥礪七十載 新時代踏浪潮頭領航行)". Website of the National Bureau of Statistics. 22 July 2019. <http://m.news.cctv.com/2019/07/22/ARTIeJ0vjKDgxRcEJ9slrcEK190722.shtml>
- "China’s Answer of over RMB 100 trillion (GDP破百萬億元的中國答卷)" Website of the Central People’s Government of People’s Republic of China. 19 January 2021. [http://www.gov.cn/xinwen/2021-01/19/content\\_5580906.htm](http://www.gov.cn/xinwen/2021-01/19/content_5580906.htm)



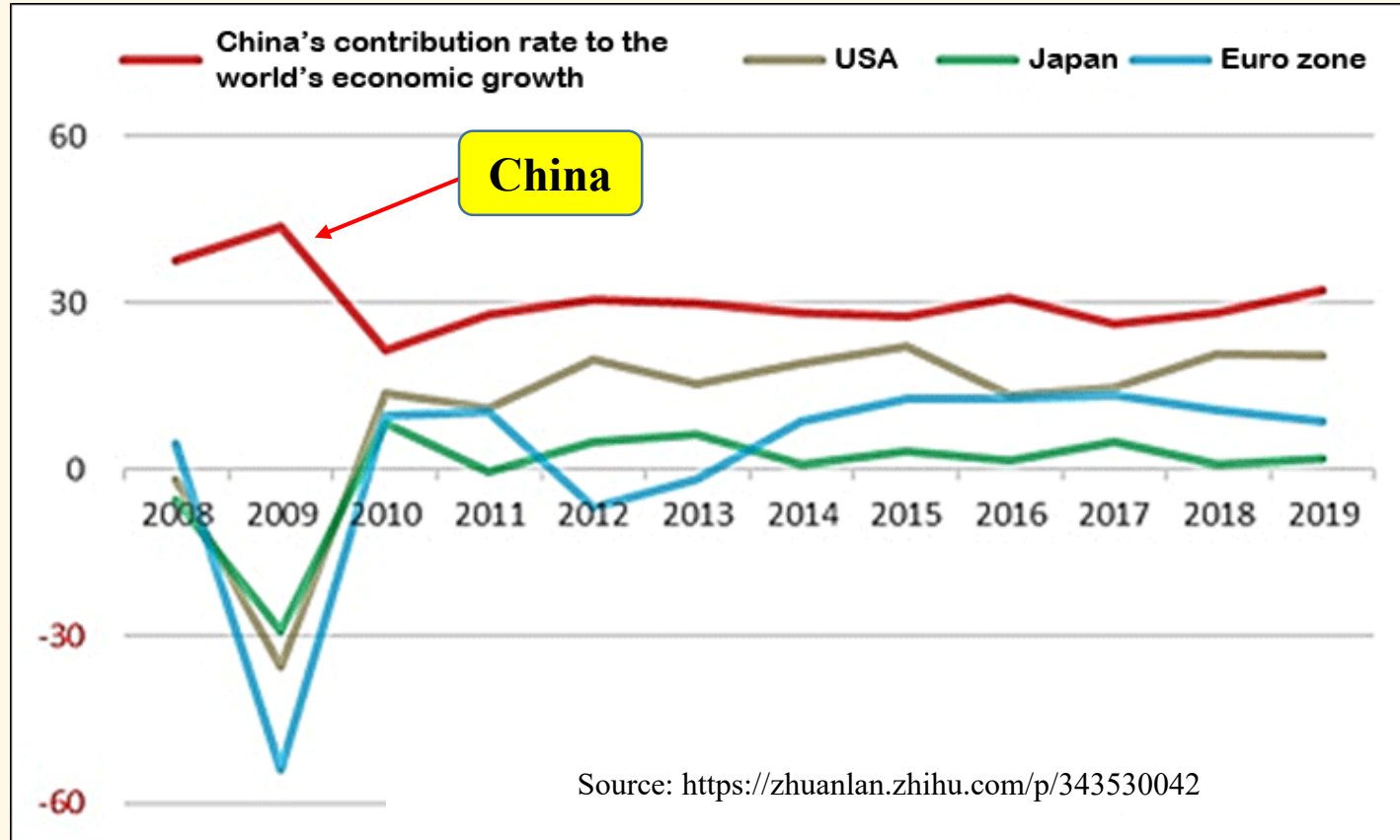
## Influence on the world's economy

- In January 1979, Deng Xiaoping's portrait occupied the cover page of the Time magazine. This internationally renowned magazine used a 48-page long article to introduce Deng and China's opening-up. The cover title was "Visions of a New China".
- 38 years later, on 13 November 2017, on the cover of the Time magazine, it was written bilingually in Chinese and English "China Won (中國贏了)". The author of the title article, Ian Bremmer said, "In the foreseeable future, China's economy will continue to be strong and stable. Its international influence will continue to rise."

# China's annual contribution rate to the world's economic growth gradually rises

According to the data from the International Monetary Fund, China's contribution rate to the world's GDP reached 34% from 2009 to 2018. (according to the market exchange rate)

Source: [http://www.gov.cn/xinwen/2019-07/29/content\\_5416117.htm](http://www.gov.cn/xinwen/2019-07/29/content_5416117.htm)



China, USA, Japan and Euro zone's contribution rate to the world's economy (%)

## Contribution rate

Contribution rate is often used to analyse how effective different factors are in contributing to economic growth.


- Calculation method: Contribution rate (%) = A factor's/region's contribution (increasing amount or growth) ÷ Total contribution amount (total increasing amount or total growth) × 100%

Source: [http://tjj.beijing.gov.cn/zwfw/sjbs/ndbfw/zbjd\\_31416/202003/t20200321\\_1723737.html](http://tjj.beijing.gov.cn/zwfw/sjbs/ndbfw/zbjd_31416/202003/t20200321_1723737.html)

- For example, the contribution rate of China to the world's GDP was 34% from 2009 to 2018. It means that during this time, if the world's economy grew by 10, China contributed to 3.4 of the growth.

Source: Rewritten from [https://www.sohu.com/a/220732573\\_100110525](https://www.sohu.com/a/220732573_100110525)

Since the reform and opening-up, the proportion of China’s GDP in the world’s economy continues to rise, from 1.88% in 1978 to 15% in 2017 (see the following table). It further rose to 17% in 2020. Because of its increasing economic power, China has become more influential in the world.



Countries	1978			2017		
	Ranking	GDP (in 100 million)	Proportion to the world's economy (%)	Ranking	GDP (in 100 million)	Proportion to the world's economy (%)
World		85429			798655	
USA	1	23566	27.6	1	193906	24.3
China	11	1495	1.8	2	120146	15.0
Japan	2	10084	11.8	3	48721	6.1
Germany	3	7377	8.6	4	36848	4.6
UK	5	3359	3.9	5	26245	3.3
India	12	1355	1.6	6	26110	3.3
France	4	5082	5.9	7	25836	3.2
Brazil	8	2008	2.4	8	20550	2.6
Italy	6	3140	3.7	9	19379	2.4
Canada	7	2186	2.6	10	16524	2.1

Sources :

- "International Status Rises. China Becomes More Influential Internationally (國際地位顯著提高 國際影響力明顯增強). Website of the National Bureau of Statistics. 17 September 2018. [http://www.stats.gov.cn/tjsj/zxfb/201809/t20180917\\_1623310.html](http://www.stats.gov.cn/tjsj/zxfb/201809/t20180917_1623310.html)
- "2020 National Economy Stabilised. Complete Main Targets with Results Better than Expected (年國民經濟穩定恢復 主要目標完成好於預期)". Website of the National Bureau of Statistics. 18 January 2021. [http://www.stats.gov.cn/tjsj/zxfb/202101/t20210118\\_1812423.htm](http://www.stats.gov.cn/tjsj/zxfb/202101/t20210118_1812423.htm)

# Summary

- Since the reform and opening-up, China's economic development has obtained tremendous achievements with speedy growth in over 40 years.
- The reform and opening-up ended the hundred years of weak state for China. China was able to develop into a major world power with great influence.
- Economy is one of the important constituents of overall national strength. Since China's economy has developed exponentially, its overall national strength is also greatly enhanced.
- China's GDP per capita is at the world's mid-level, indicating that it is still the world's largest developing country. It needs to continue to develop and improve the people's living standard.



## Culture

In August 2015, Chinese science fiction writer Liu Cixin won the Hugo Award, which is known as the “Nobel prize of literature in science fiction” with his novel *The Three-Body Problem*. The Hugo Award is presented by the World Science Fiction Society. Its full name is the Science Fiction Achievement Award, named after Hugo Gernsback, the founder of the first science fiction magazine. *The Three-Body Problem* was translated into multiple languages, and it was a best-seller in Europe and the US. Its printed and electronic English versions sold over 1.5 million copies in total. The Japanese translation sold over 100,000 copies in a month.



**Question:** Do you know about the life of Liu Cixin, the author of *The Three-Body Problem*, and the story of the book?

Source:

- "Liu Cixin won the 73rd Hugo Award with his science fiction Three-Body Problem (劉慈欣憑借科幻小說《三體》獲得第73屆「雨果獎」)". China Writer. <http://www.chinawriter.com.cn/z/3tironghuoyuguojiang/index.shtml>
- "The Three-Body Problem is a best -seller in Japan! 10 new printing in a week. Celebrities recommend. (《三體》在日本火了！一週加印10次 名人爭相推薦)". Xinhua Net. 11 July 2019. [http://www.xinhuanet.com/book/2019-07/11/c\\_1210189850.htm](http://www.xinhuanet.com/book/2019-07/11/c_1210189850.htm)

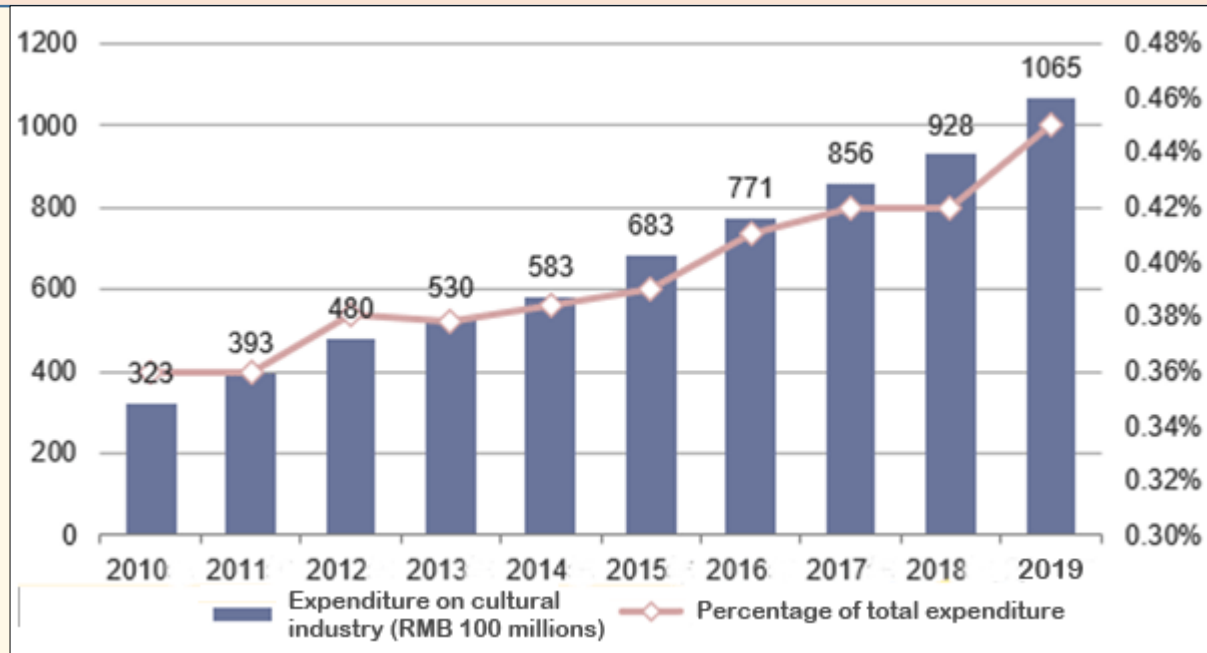
# The importance of culture in overall national strength

- Culture can unify, encourage and mobilise people. It can promote national spirit, inspire people's creativity, and generate tremendous power for national development.
- Through improving people's cultural literacy and nurturing people's creativity and innovation, cultural competitiveness can be enhanced and China has become a world cultural power. At the same time, culture gives depth to economic development, driving economic development with its innovation.
- Chinese culture has a long history. It is the basis upon which Chinese people live. It is also the treasure of the world's cultural heritage. Conservation of cultural heritage, inheritance of traditional customs and craftsmanship are important elements of China, the world's major cultural power.
- When culture spreads across the world, it becomes influential. Through cultural exchange, the influence of Chinese culture and the national image of China can be improved. The international community can also learn more about China.

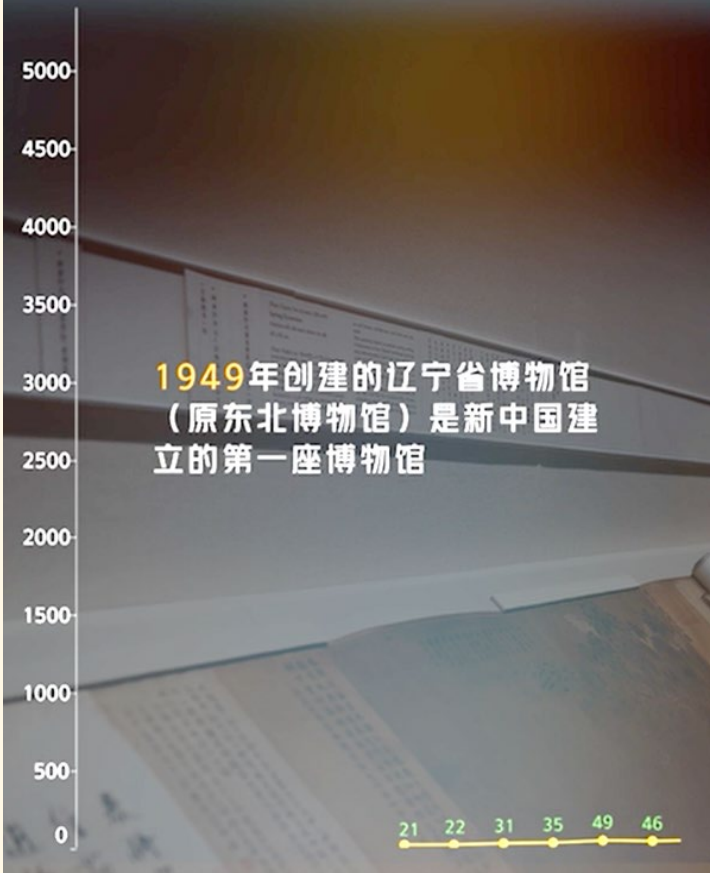
# Development of cultural industries

Since the reform and opening-up, governments of different levels are concerned with the development of cultural industries, fulfilling the role of public cultural services, increasing the funding for cultural undertakings (see the graph below). Public cultural facilities have been improved with public libraries, cultural centres, rural comprehensive cultural stations. Basic cultural infrastructure such as public broadcasting, cultural information and resources sharing and rural libraries basically cover the country. Since 2008, public museums, public libraries, monuments, art museums, cultural centres (stations) and other public cultural service facilities have gradually opened up for free.

**Expenditure of China's cultural industries (2010-2019) (unit: RMB 100 millions)**

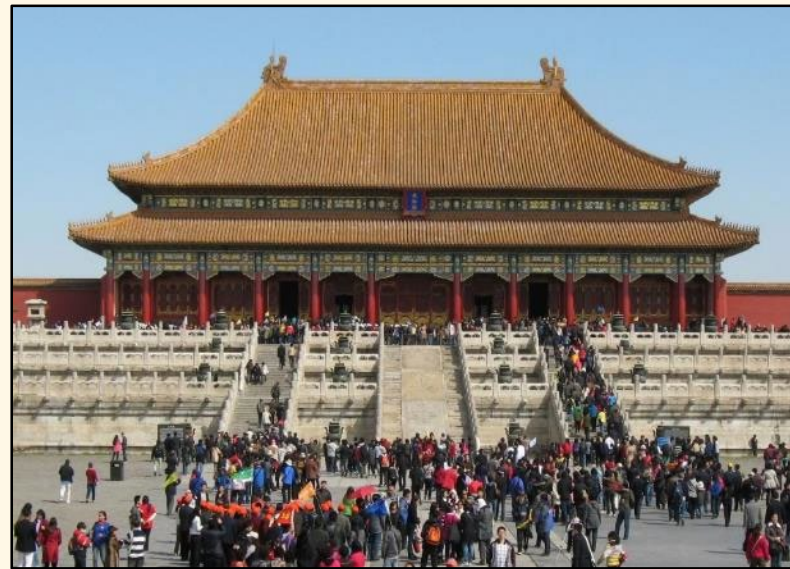


# 中国博物馆机构数 (1949-2019)



Click on the graph to watch the video

The number and types of public museums have been increasing in China. By the end of 2020, 3,510 museums are open to the public, 175 times of the number when the country was founded. In 2019, a total of 1.1 billion people have visited these museums, indicating that more people are visiting the museums and learning Chinese history and culture.



The Palace Museum



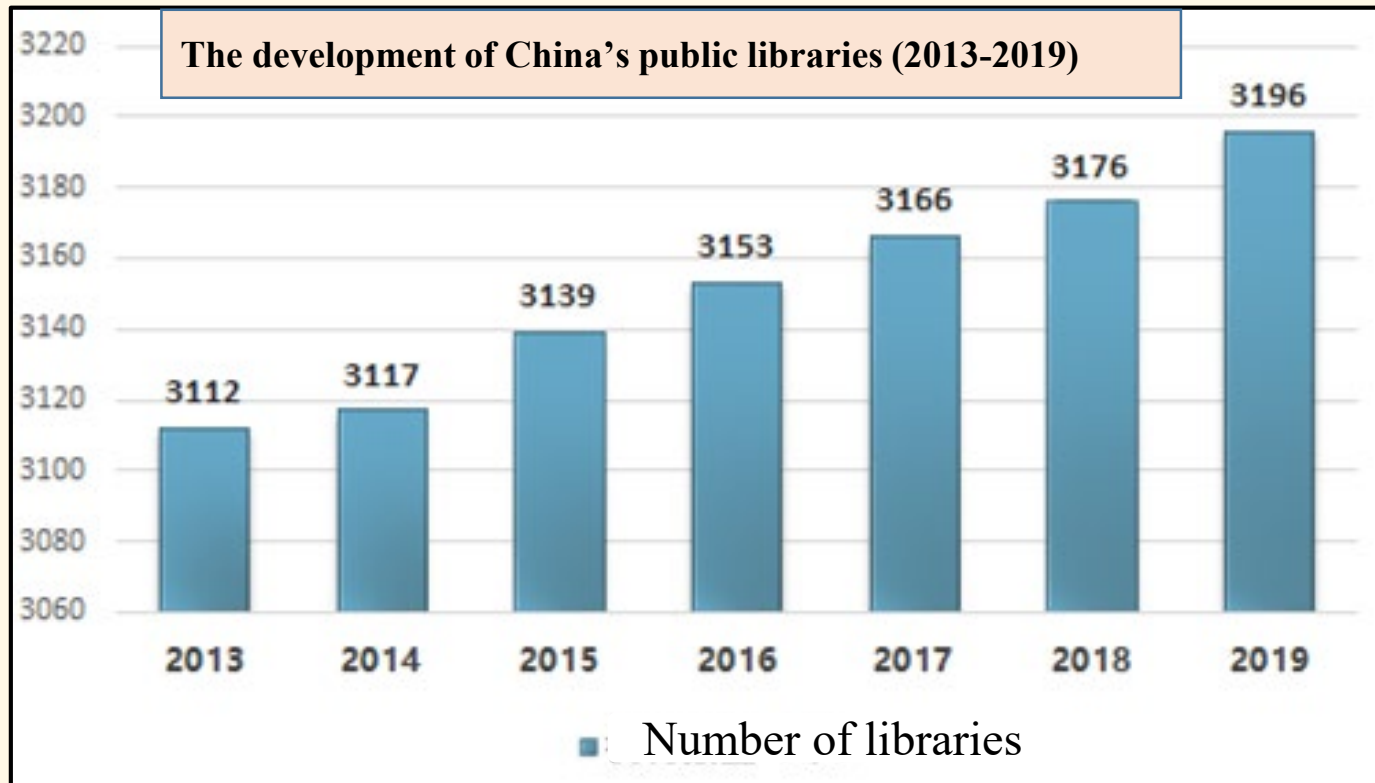
Shanghai museum

Source: "Museums are 'out of line' again (博物馆又出圈了!)" . Xinhua Net. 24 March 2021. [http://www.xinhuanet.com/video/sjxw/2021-03/24/c\\_1211081863.htm](http://www.xinhuanet.com/video/sjxw/2021-03/24/c_1211081863.htm)

Photo: taken by the resources developer



The number of public libraries in China has been increasing annually (see the graph below). The reading environment and services are improving. Many libraries not only provide a large variety of reference materials, but also organise seminars and exhibitions to fulfil diversified cultural demands. As “Nation-wide reading culture” has become China’s cultural strategy, urban and rural libraries can be seen everywhere.



Urban library



Rural library

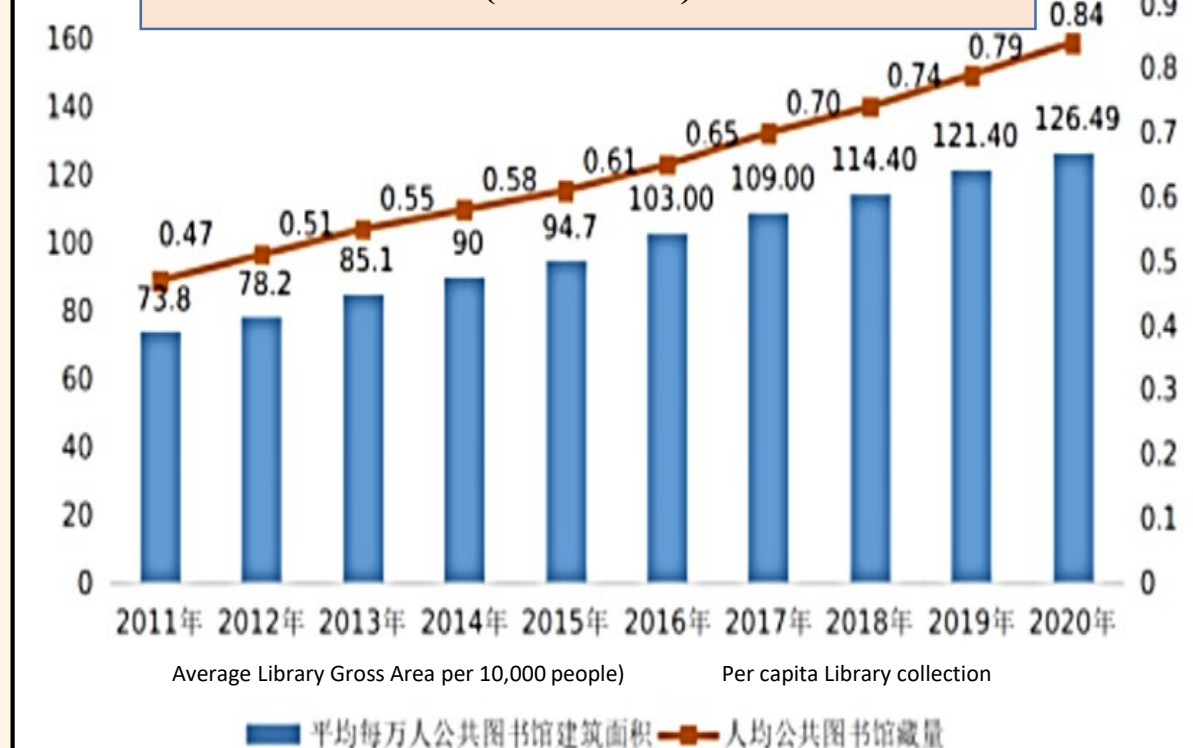
Source: “Development situation and trend of China’s public libraries in 2019 (2019年中國公共圖書館發展現狀及趨勢分析). Chyxx.com. 23 June 2020. <https://www.chyxx.com/industry/202006/876765.html>

The publishing industry has rapidly developed with increasing number of book sales and diversified types of publications. In this connection, people in China can enjoy the pleasure of reading and increase knowledge.

### Development of China's publishing industry (1978-2017)

	Types of books	Total number of Books printed (100 million copies)	Types of Newspapers and Periodicals	Total no. of Newspaper and Periodical printed (100 million copies)
1978	14,987	37.74	1,116	135.38
1988	65,962	62.25	7,402	292.98
1998	130,613	72.39	10,052	325.75
2008	275,668	69.36	11,492	473.97
2017	255,106	22.74	12,014	387.42

### Resource per capita of China's public libraries (2011-2020)



Source: "Development of China's publishing industry (國內出版業發展). Academy of Chinese Studies. <https://ls.chiculture.org.hk/tc/reform-info/344>

Source: 2020 Statistical Communique of Cultural and Touristic Development by the Ministry of Culture and Tourism of the People's Republic of China [http://zwgk.mct.gov.cn/zfxxgkml/tjxx/202107/t20210705\\_926206.html](http://zwgk.mct.gov.cn/zfxxgkml/tjxx/202107/t20210705_926206.html)



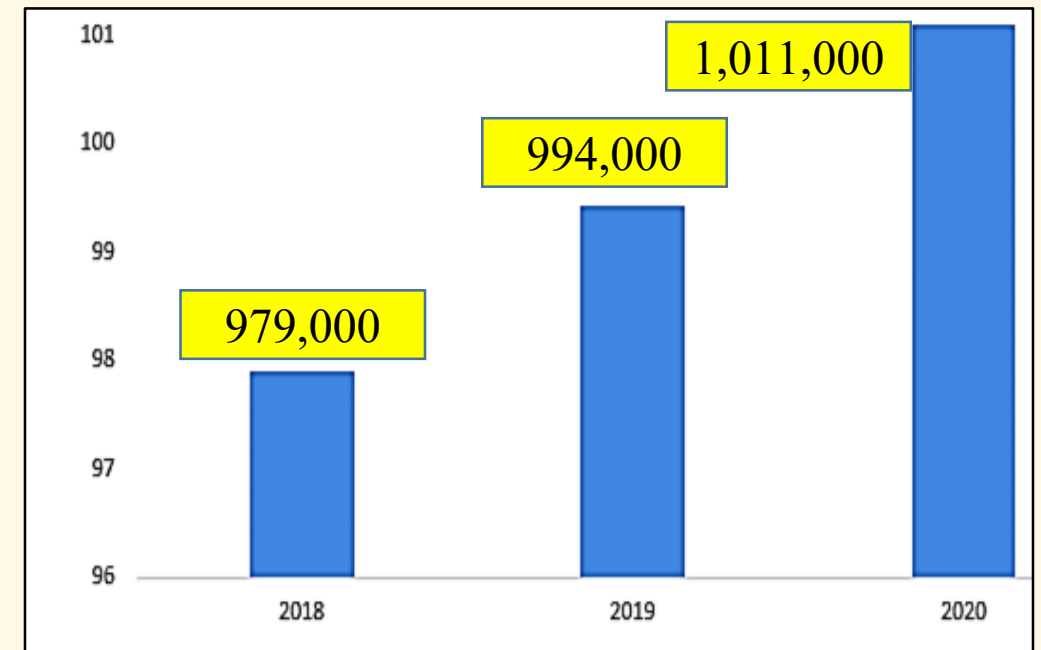
The broadcasting industry is developing rapidly. It has developed from a single broadcasting media to multimedia that includes radio stations, television stations, the Internet, broadcasting television and mobile multimedia. The production and transmission abilities have greatly improved.

**Comprehensive population coverage of national TV and radio programmes (2010-2019)**



Source: “Population coverage statistics of television and radio programmes, 2010-2019 (2010-2019)”. Radio and Television Administration of Hubei Province.  
[http://gdj.hubei.gov.cn/ywdt/xyzx/202011/t20201109\\_3020733.shtml](http://gdj.hubei.gov.cn/ywdt/xyzx/202011/t20201109_3020733.shtml)

**Number of employees in the broadcasting industry (2018-2020)**



Source: “Structural analysis of employment of the broadcasting industry 2021 (2021年中國廣播電視行業從業人員結構分析)”. Website of Forward – The Economist.  
<https://www.qianzhan.com/analyst/detail/220/210528-329a6f70.html>

## Question

Due to economic development and the improvement of people's living standard, people require further multi-layered, multi-faceted and diversified cultural experience. How can the cultural industry be further developed? Please make some suggestions.



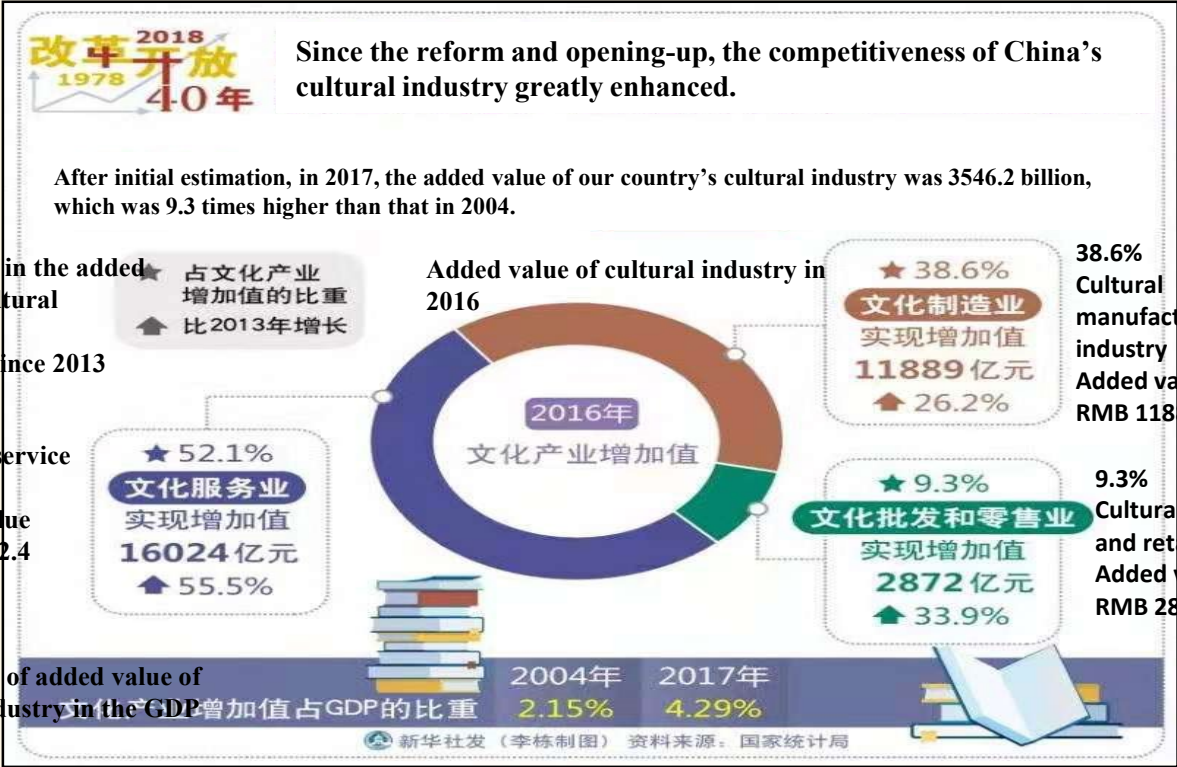
### Suggested answers

- To provide more free services
- To prolong service hours
- To build more cultural venues so it can be more convenient
- To increase investment continuously

Have you ever been to a book city in the Mainland? Please share your experience.

# Development of cultural industry

The cultural industry includes cultural products and services. Since the reform and opening-up, China has implemented a series of policies and measures that are conducive to cultural development. Therefore, the cultural industry has been developing rapidly.

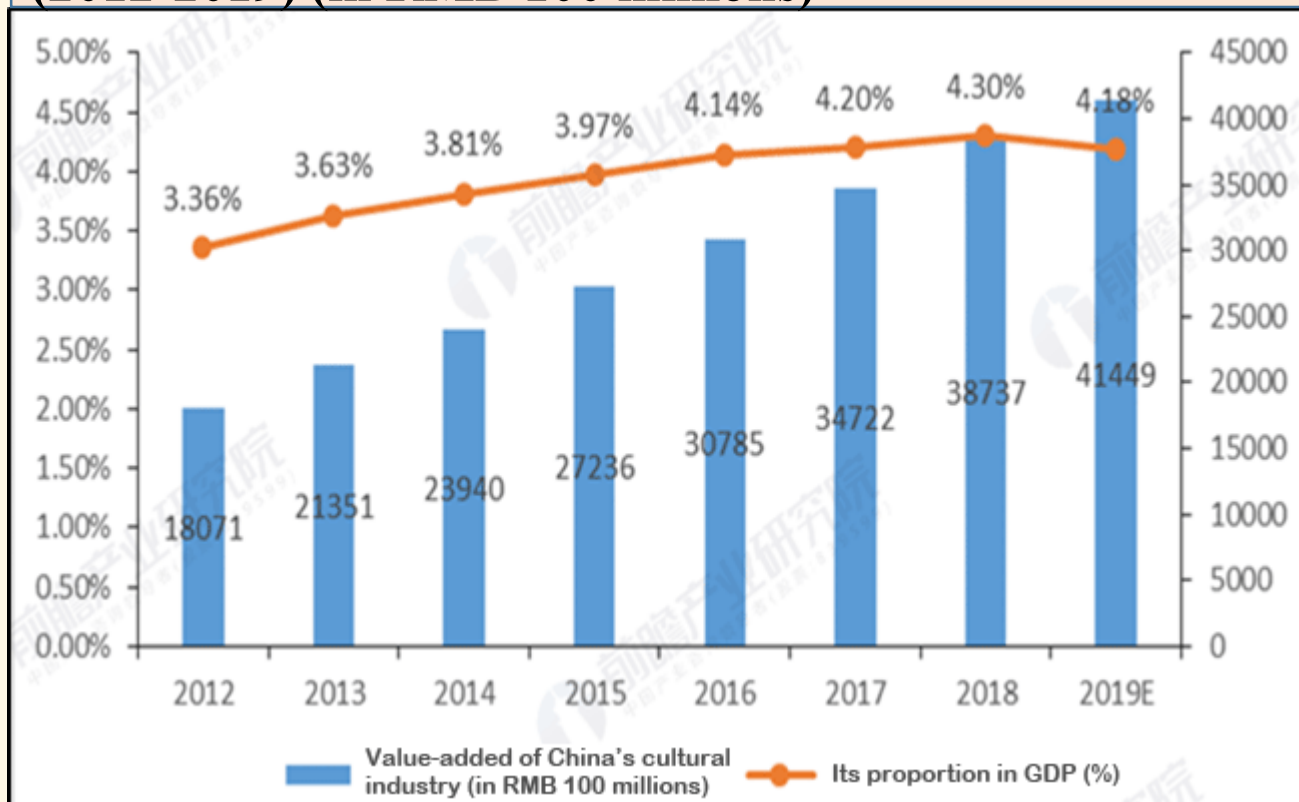


Relationship between cultural undertakings and cultural industry			
		Cultural undertakings	Cultural industries
Differences	Nature	Cultural charity	Cultural enterprises
	Targets	Mainly seek spiritual and societal benefits	Mainly seek value and profits
	Methods	Mainly rely upon government investment	Work under law of value and market
Relationship		They are both concerned with culture and are important parts of China's cultural development. They aim to fulfil people's spiritual needs and they are part of the overall national strength.	

Source: Website of the Central People's Government of People's Republic of China.  
[http://www.gov.cn/shuju/2018-09/27/content\\_5326081.htm](http://www.gov.cn/shuju/2018-09/27/content_5326081.htm)

The proportion of added value of China’s cultural industry in GDP has increased year by year. The industry provides a greatly increased GDP contribution rate and influence.

**Changes in added value of China’s cultural industry (2012-2019) (in RMB 100 millions)**



**Reference**

In 2019, China’s cultural and related industries occupy 4.5% of GDP, increased by 0.02% as compared to 2018.

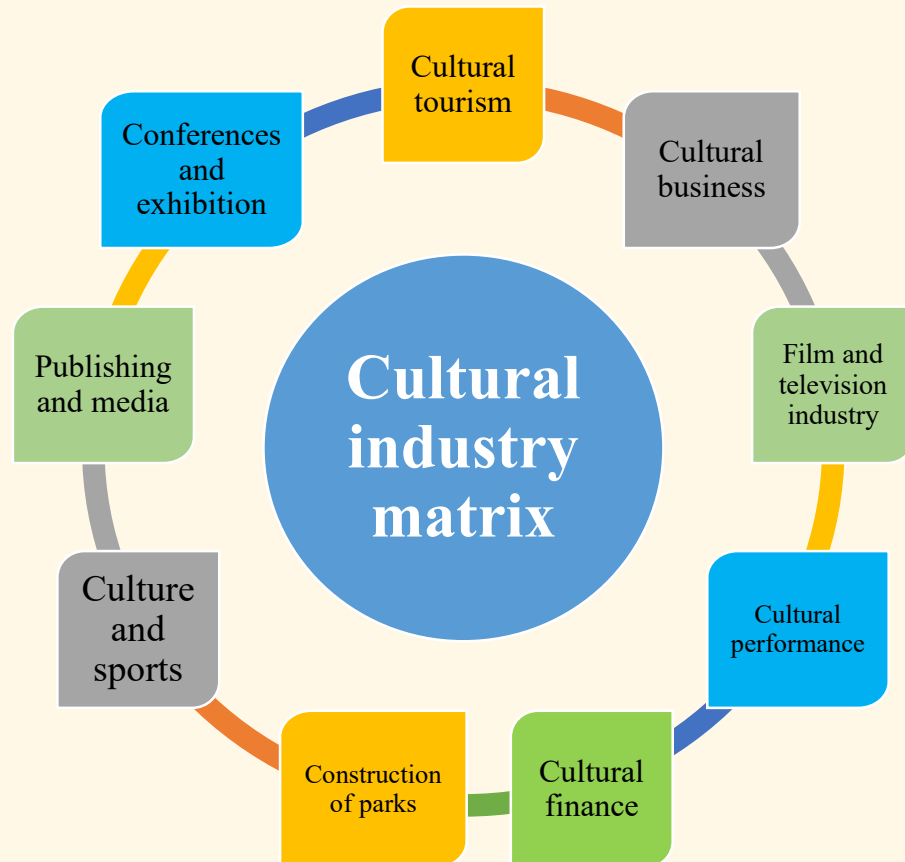
Regarding its contribution to economic growth, the cultural industry’s average contribution rate to GDP was 3.9% from 2004-2012, which increased to 5.5% from 2013-2018.

Source: “2019 China’s cultural and related industries occupy 4.5% of GDP (2019年中國文化及相關產業增加值佔GDP比重為4.5%)”. China News. 5 January 2021.

<https://www.chinanews.com/cj/2021/01-05/9378973.shtml>

Source: “China’s cultural and creative industry is clusterised (2020年我國文化創意產業市場競爭格局分析集群化趨勢明顯)”. Website of Forward – The Economist. <https://www.qianzhan.com/analyst/detail/220/200709-4ab9a643.html>

There is a trend for cultural industry clustering. Under the guidance of China's planning and policy, the number of competitive and strong cultural industries has increased drastically. The planning and construction of cultural industry parks and bases are currently in steady progress.



## Reference

According to the National Bureau of Statistics, by the end of 2018, there were 10 national-level cultural industry demonstration parks, 10 national-level cultural industry experimentation parks, and 335 national-level cultural industry demonstration bases, indicating that China's cultural industry is developing in an intensive, specialised and large scale direction.



The cultural market prospers. Since the reform and opening-up, the cultural market has transformed from small- to large-scale, from weak to strong, from disorganised to regularized. It has formed a cultural service and product market that includes performance, TV and films, music, entertainment, tourism, etc.

**Basic situation of performance art organisations in China (2011-2020)**

Year 年份	No. of organisations (个)	No. of employees (10,000) (万人)	No. of performance (10,000) (万场)	No. of audience (100 million) (亿人次)	Income (RMB 100 million) (亿元)
2011	7055	22.66	154.72	7.46	52.67
2012	7321	24.20	135.02	8.28	64.15
2013	8180	26.09	165.11	9.01	82.07
2014	8769	26.29	173.91	9.10	75.70
2015	10787	30.18	210.78	9.58	93.93
2016	12301	33.29	230.60	11.81	120.86
2017	15742	40.30	293.57	12.47	147.68
2018	17123	41.64	312.46	11.76	152.27
2019	17795	41.25	296.80	12.30	126.78
2020	17581	43.69	225.61	8.93	86.63

Source: Ministry of Culture and Tourism of the People's Republic of China  
([http://zwgk.mct.gov.cn/zfxxgkml/tjxx/202107/t20210705\\_926206.html](http://zwgk.mct.gov.cn/zfxxgkml/tjxx/202107/t20210705_926206.html))



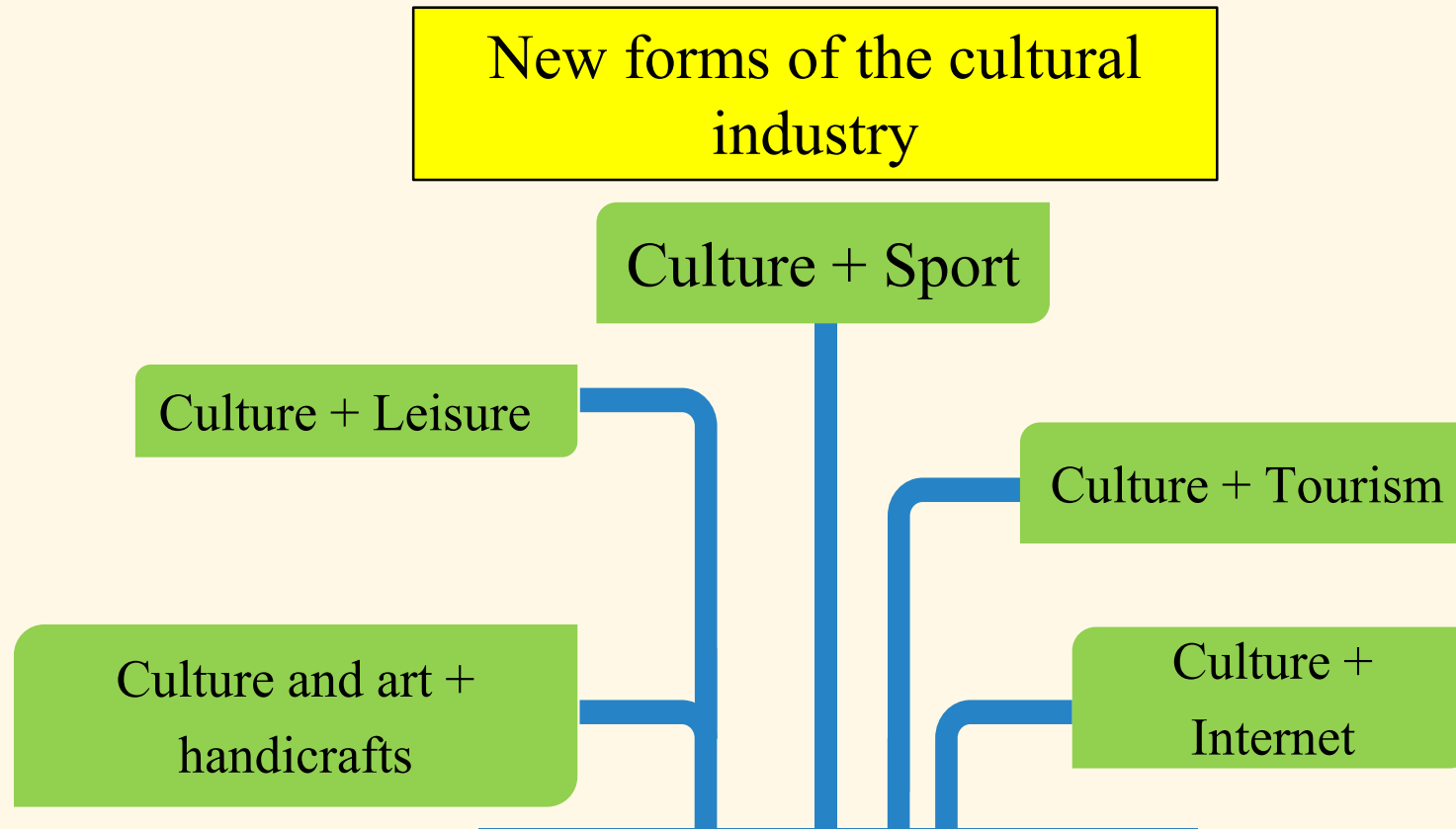
In February 2021, the film *Hello! Li Huanying*'s box office revenue exceeded RMB 4 billion after it had been released in 10 days.



Cultural creative products the "Palace Cat Family" series of the Palace Museum are very popular among consumers.

Photo: Xinhua News Agency

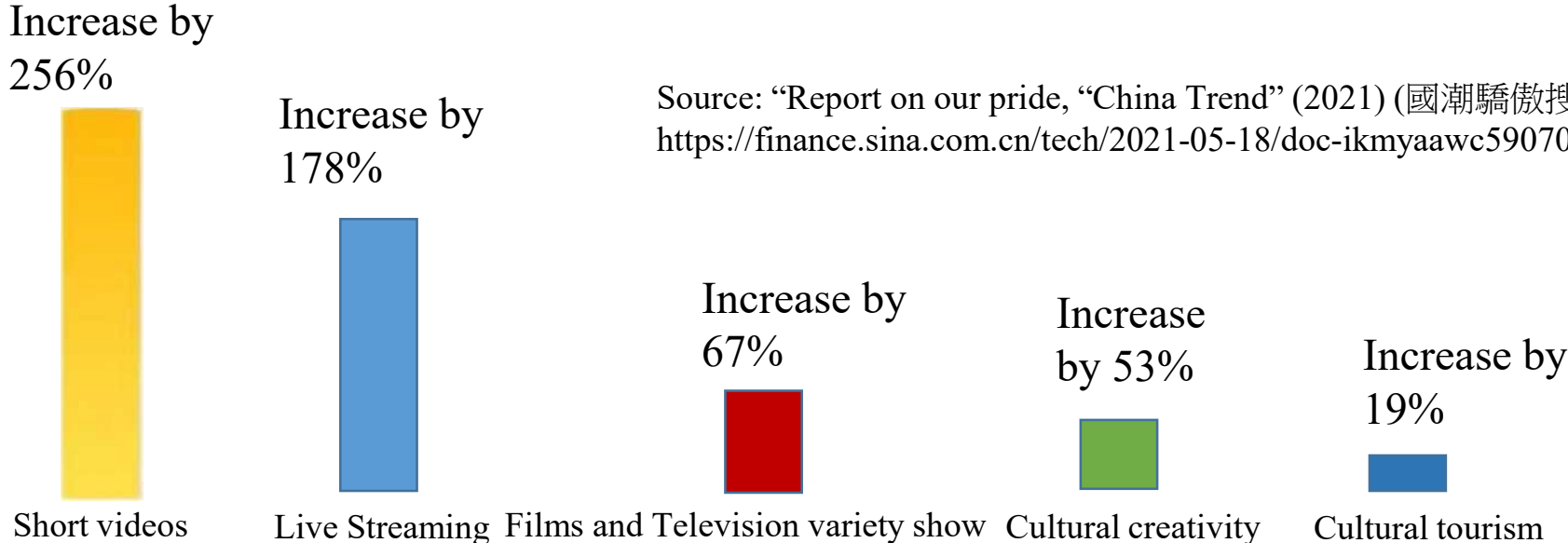
A new trend in the cultural industry is booming. Combination of culture and industries such as the Internet, tourism and sports has become the characteristics of cultural industry development. The digitalized production, transmission and consumption of cultural products and services have formed a new format for the cultural industry. Manga, animation, games, video streaming, online fiction, etc. have become the new energy and points of growth of the cultural industry.





In recent years, people have been less attracted to foreign productions, but China’s productions of films, games, manga, animation, etc. This is called the “China Trend”. Among them, five culture carriers, short videos, live streaming, films and television variety show, cultural creativity and cultural tourism, have drawn the most attention.

**Growth in awareness of the five most popular “China Trend”-related cultural carriers (2011-2021)**



Source: “Report on our pride, “China Trend” (2021) (國潮驕傲搜索大資料報告)”.  
<https://finance.sina.com.cn/tech/2021-05-18/doc-ikmyaawc5907006.shtml>



Question: People pay much more attention to the “China Trend”. What does this reflect?

# Conservation of cultural heritage

Cultural heritage is the treasure left to us by history. It can be divided into tangible cultural heritage and intangible cultural heritage. The former consists of artefacts with historical, artistic and scientific values. The latter are the intangible traditions that have been passed down through generations and are closely related to the day-to-day life of people.

## Question:

Do you know which day is “China Cultural Heritage Day”?

Answer: The second Saturday of June



Tangible cultural heritage includes historical relics, architecture, cultural ruins, etc. which are immovable. China has passed laws, increased investment and strengthened promotion to conserve the cultural heritage.



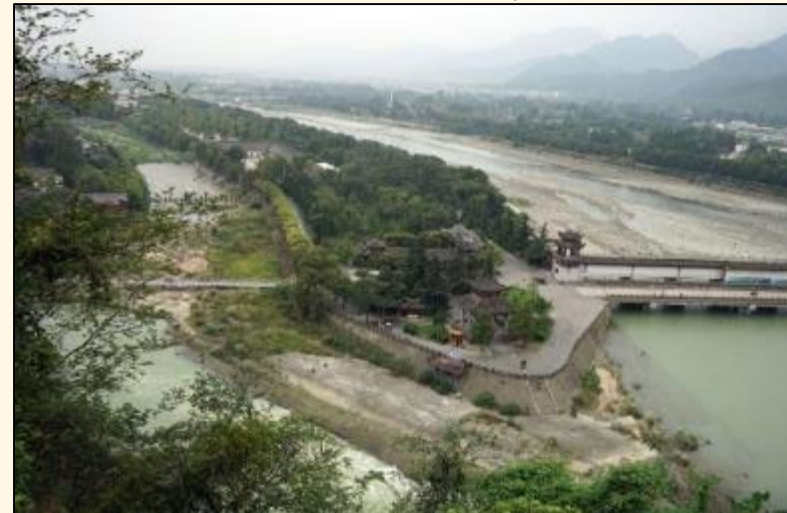
The Great Wall



Terracotta Army



Potala Palace



Dujiangyan irrigation system

Photo:  
Academy of Chinese Studies and  
taken by resources developer (upper  
left)



- China has become a State Party of the World Heritage Convention in 1985 and began nominating properties for inscription on the World Heritage List since 1987.
- By July 2021, 56 properties in China had already been inscribed on the World Heritage List, ranked second in the world. Among these, there are 38 cultural heritage sites (e.g. the Great Wall and the Forbidden Palace), 14 natural heritage sites (e.g. Jiuzhaigou and Tianshan in Xinjiang), and 4 mixed heritage sites (e.g. Mount Huangshan and Mount Tai).



Source: Photo taken by resources developer

Source: “These things on the World Heritage Committee’s 44<sup>th</sup> session are not to be missed (第44屆世界遺產大會 這些亮點不容錯過)”. Xinhua Net. 6 July 2021. [http://www.xinhuanet.com/fortune/2021-07/06/c\\_1127624429.htm](http://www.xinhuanet.com/fortune/2021-07/06/c_1127624429.htm)

By the time teachers use the material, some of the materials may have been updated. Teachers can browse the website for the latest information.

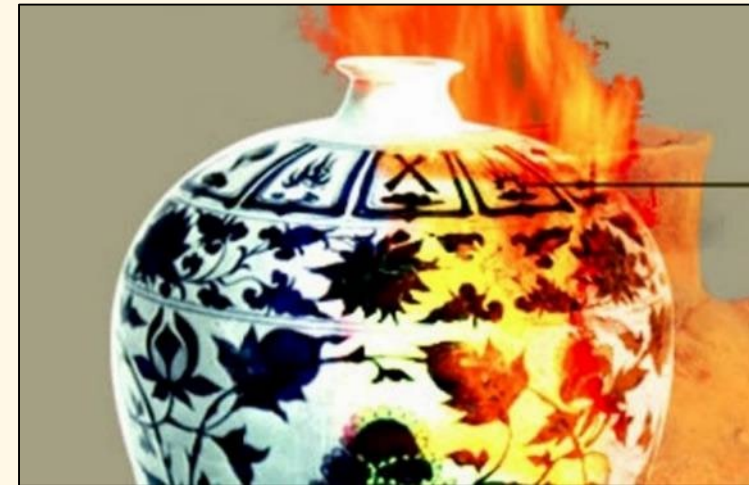
Intangible cultural heritage includes various performance arts, knowledge system, craftsmanship, etc. China combines conservation and utilisation to nurture inheritors of the culture and provide subsidies to conserve the cultural heritage.

Embroidery



Shadow puppetry

Dragon boat races



Pottery making



## Examples of Chinese intangible cultural heritage on the List

- Regarding intangible cultural heritage, China has become a State Party of the Convention for the Safeguarding of the Intangible Cultural Heritage and has been actively applying for inscription to the UNESCO Intangible Cultural Heritage Lists.
- By December 2020, China had 42 intangible cultural heritage items on the list, ranking first in the world. This reflects that China's protection for cultural heritage has improved, China has promoted the richness of cultural culture to the world, and China has enhanced the influence of Chinese culture internationally.



Kunqu opera



Xinjiang Uyghur Muqam



Zhusuan



Taichi

Source and photo credit: China's intangible cultural heritage site. <http://www.ihchina.cn/>

We must keep the precious and fragile cultural heritage safe and sustainable so that the heritage could be passed to our future generations. Since the reform and opening-up, China has implemented laws, policies and measures to protect cultural heritage.

### Three Conventions of the UNESCO

- *Convention Concerning the Protection of the World Cultural and Natural Heritage* was adopted on 16 November 1972. China became a State Party in 1985.
- *Convention for the Safeguarding of the Intangible Cultural Heritage* was adopted on 17 October 2003. China became a State Party on 28 August 2006 and it became effective on 20 April 2006.
- *Convention on the Protection and Promotion of the Diversity of Cultural Expressions* was adopted on 20 October 2005. China became a State Party on 29 December 2006 and it became effective on 16 March 2007.

China has become a State Party of the three major Conventions to fulfil its duty to protect cultural heritage

### Laws on cultural heritage protection in China

- *Regulation for the Implementation of the Cultural Relics Protection Law of the People's Republic of China* was enacted in 1982 and amended in 2002.
- *Intangible Cultural Heritage Law of the People's Republic of China* was enacted in 2011.

China protects cultural heritage according to laws



- China has great achievements in cultural heritage protection and is recognised by the World Heritage Committee.
- According to the authoritative report “World Heritage Outlook 2020” published by the consulting organisation - International Union for Conservation of Nature, China’s protection for cultural heritage is above the international average level. For example:
  - Among the world’s natural and mixed heritage sites, 63% are in condition of “Good” or “Good with some concerns”, while 89% of those heritage sites in China are listed as such. While 7% of world’s heritage sites are in critical condition, China has zero.
  - The 18 natural and mixed heritage sites are properly protected. There is no site in critical condition.

Source: “Chinese world natural heritage and mixed heritage number ranked first in the world (中國世界自然遺產、自然和文化雙遺產數均列世界第一)”. China News. 14 July 2021. <http://www.chinanews.com/gn/2021/07-14/9519240.shtml>

## Reference: Conservation case studies

Photo credit: Xinhua News Agency and taken by the resources developer (upper right)



**Protection via digitalisation**

In Datong city of Shanxi Province, researchers at the Yungang Grottoes Research Institute are collecting data and conducting emergency conservation to the Grottoes via digital means.



**Including intangible cultural heritage in the school-based curriculum**

A master of woodblock printing is introducing the steps of this cultural heritage in Yangzhou, Jiangsu Province. Intangible cultural heritage can be spread via school curriculum.



**Apprenticeship**

In Rui'an city of Zhejiang province, 18 masters have taken about 20 apprentices to teach them intangible cultural heritage such as movable type printing, Wenzhou Guci (温州鼓词), lanjiaxie (蓝夹缬).



**Combining conservation and commerce**

At the weekend market to promote intangible cultural heritage and alleviate poverty in Conjiang County, Guizhou Province, artists from the Dong ethnic group were playing pipa while selling their handicraft.



**Reference: Conservation case studies  
(Click on the images to watch the video)**



Kaiping Diaolou (開平碉樓)



Dragon boat and zongzi (sticky rice dumplings) at the Dragon Boat Festival



Guard of the Potala Palace



Suzhou fan making

Source: The China Current

- <https://chinacurrent.com/education/article/2021/07/22359.html>
- <https://chinacurrent.com/education/article/2021/06/22185.html>
- <https://chinacurrent.com/education/article/2021/05/22089.html>
- <https://chinacurrent.com/hk/story/20556/chinese-hand-fans-suzhou>

# Spreading Chinese culture overseas

- The Confucius Institute is a non-profit educational institute founded by Chinese-foreign collaboration. It aims to spread the Chinese language, deepen people's knowledge of Chinese language and culture, promote cultural exchange and enhance international understanding.
- The Confucius Institute provides the following services:
  - Chinese language teaching
  - Chinese teacher training
  - Provide information about Chinese education, culture, economy, society, etc.



Source:

- Chinese International Education Foundation. <https://www.cief.org.cn/zjkzxy>
- Academy of Chinese Studies. <https://ls.chiculture.org.hk/tc/idea-aspect/72>



Photo credit: Chinese International Education Foundation.  
<https://www.cief.org.cn/zjkzxy>

- China has been promoting the education of Chinese language internationally to facilitate communication. This has led to an increase in the number of Chinese learners around the world.
- According to the Ministry of Education, by 2020, over 70 countries have included the Chinese language into their education system. Over 4,000 universities, 30,000 primary and secondary schools and 45,000 Chinese schools and training institutions have introduced the Chinese language courses. There are about 200 million Chinese learners and speakers outside of China.
- By the end of 2020, over 220,000 students from over 100 countries have participated in various types of Chinese language tests in over 600 examination centres. In 2021, Chinese has become an official language of the UN World Tourism Organization.

#### Source

- "200 millions people are learning Chinese outside of China (中國以外累計學習中文人數達2億)". Website of the Central People's Government of People's Republic of China. 5 September 2020. [http://www.gov.cn/xinwen/2020-09/05/content\\_5540872.htm](http://www.gov.cn/xinwen/2020-09/05/content_5540872.htm)
- "Another climax in the 'Chinese frenzy' (「漢語熱」在全球又掀新高潮)". China Daily. 8 March 2021. <https://cn.chinadaily.com.cn/a/202103/08/WS6045cca2a3101e7ce9742ddf.html>



- The museums in China have become more and more popular. Not only has museum exchange become more frequent, but more and more Chinese precious artefacts such as the Terracotta Army, important archaeological findings, Silk Road artefacts and Palace collection have been displayed overseas to introduce Chinese culture to foreigners.
- Foreign visitors can be exposed to ancient Chinese culture and thus deepen their understanding of China and Chinese culture.



The President of Greece visited the exhibition of artefacts from the Forbidden Palace in Athens, September 2019.

Source:

- “List of exhibitions by Art Exhibitions China (1971-2021) (中國文物交流中心舉辦展覽一覽表 (1971-2021) .)”. Website of Art Exhibitions China. [http://www.aec1971.org.cn/art/2021/8/24/art\\_418\\_36472.html](http://www.aec1971.org.cn/art/2021/8/24/art_418_36472.html)
- ”Chinese artefacts visit the world. Foreigners listen to their stories. (中華文物逐漸走出國門 外國人聽中國文物講故事)”. Overseas Chinese Affairs Office of the State Council. <http://www.gqb.gov.cn/news/2018/0323/44594.shtml>



## Summary

- Since the reform and opening-up, China has remarkable development in its cultural undertakings and industries. Cultural heritage is protected and inherited. The number of world heritage and intangible cultural heritage in China is among the highest in the world.
- Cultural development enriches the spiritual landscape of the Chinese, and enhance their overall national quality. Chinese culture has a growing influence in the world.

## Lead-in

# Education

When the People's Republic of China was founded, the national illiteracy rate reached 80%, indicating that most Chinese people could not read or write. Today, under the compulsory education system in China, there are 210,000 schools and 150 million students.

### Activity

Watch the video to learn the development of education in China.

Video: The story of 150 million people learning to read.



**Click on the image to watch the video**

Video taken from The China Current

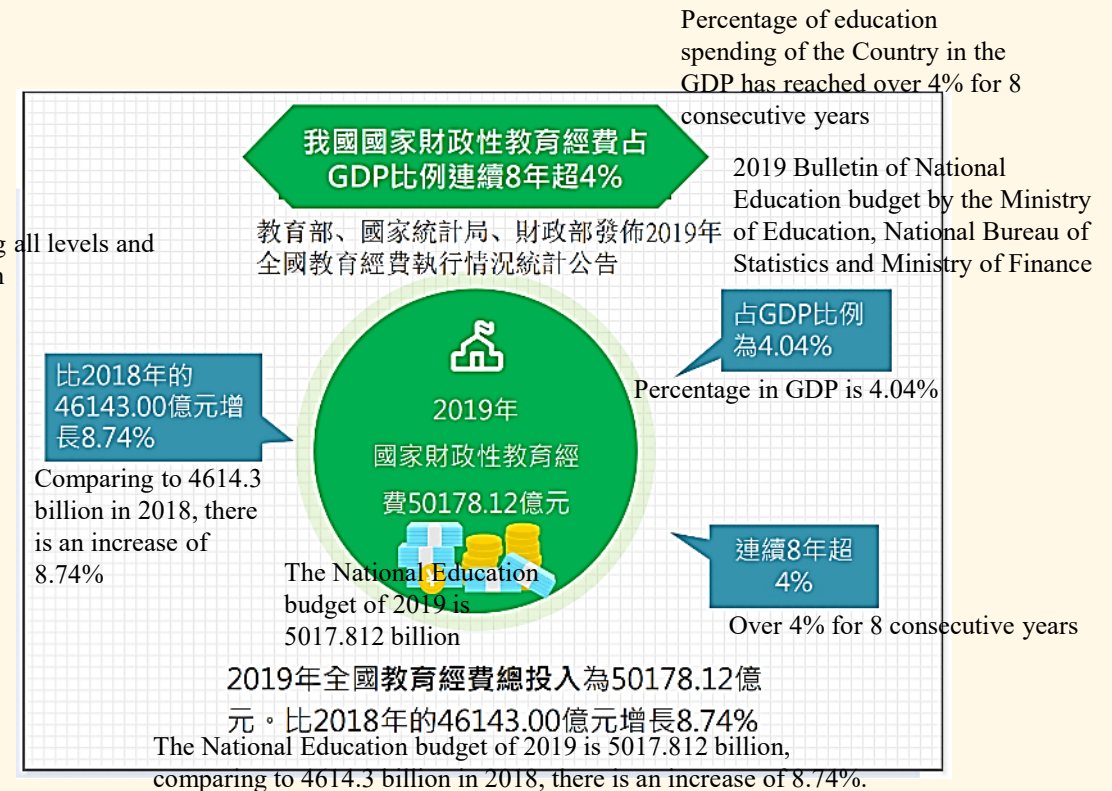
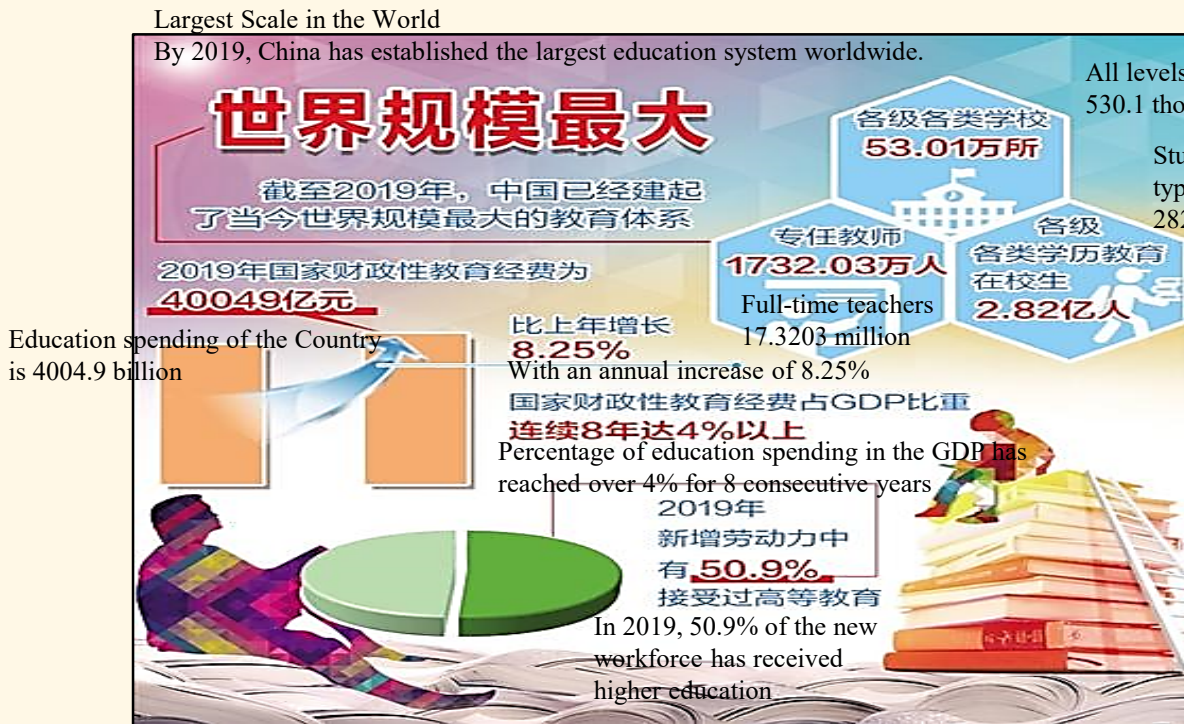
<https://chinacurrent.com/education/article/2019/11/21938.html>

# The importance of education in overall national strength

- Education can enhance the national quality of people, nurture talents for the society to develop economy and the country. Therefore, it is especially important for enhancing the overall national strength.
- Education is not only an important factor of overall national strength, but also the basis for other factors to develop. When education is improved, other factors of overall national strength can be developed. Therefore, there is a positive correlation between education and other factors.

# Expanding the scope of education

Since the reform and opening-up, the progress of China's education system has been improved, forming a giant and comprehensive education system of kindergartens, primary schools, secondary schools and universities. In just a few decades, compulsory education has reached everywhere in the country. Higher education has become popularised.



Source: Economic Times (Beijing). 9 October 2020.  
[http://www.ce.cn/xwzx/gnsz/gdxw/202010/09/t20201009\\_35863913.shtml](http://www.ce.cn/xwzx/gnsz/gdxw/202010/09/t20201009_35863913.shtml)

Source: Consolidated from the "2019 Bulletin of National Education Budget by the Ministry of Education, National Bureau of Statistics, Ministry of Finance"  
[http://www.moe.gov.cn/srcsite/A05/s3040/202011/t20201103\\_497961.html](http://www.moe.gov.cn/srcsite/A05/s3040/202011/t20201103_497961.html)

# Compulsory education

On 12 April 1986, the 4<sup>th</sup> plenary session of the 6<sup>th</sup> National People's Congress of PRC adopted the *Compulsory Education Law* of the People's Republic of China, implementing 9 years of compulsory education. China has announced in January 2001 and November 2011 that it had accomplished the mission to fully implement universal 9-year compulsory education. At the same time, China is addressing the issue of imbalance implementation among regions, urban and rural areas, schools and access to education via various means.

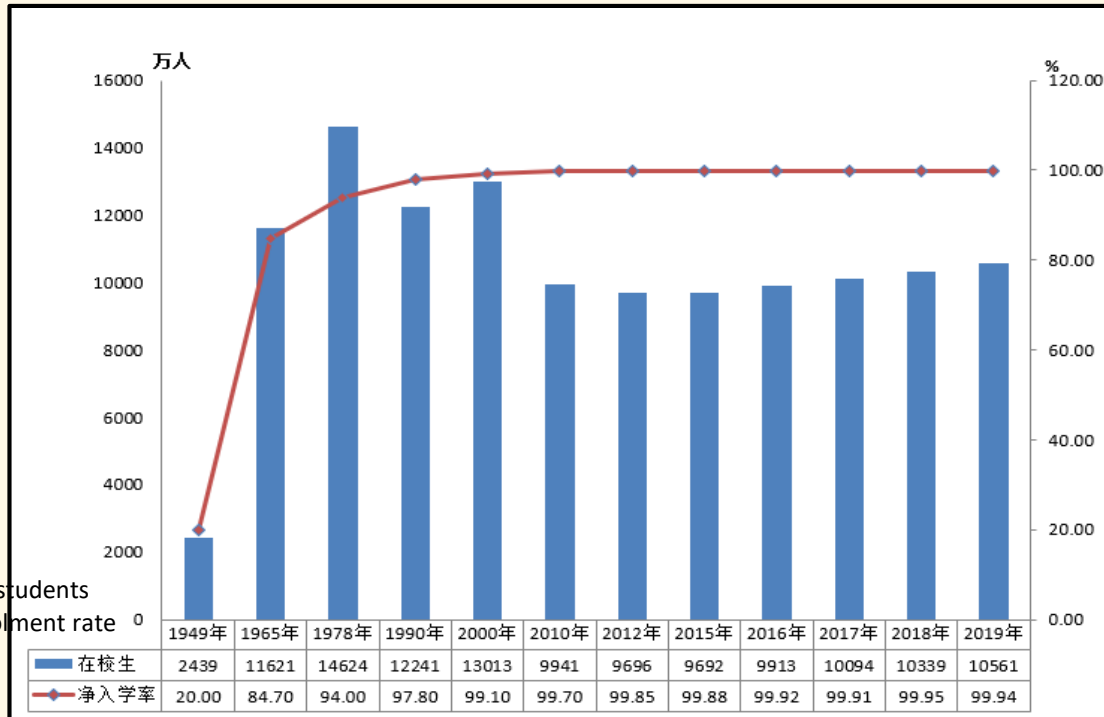
## Reference

Compulsory education refers to free and compulsory schooling for all school-age children. Within the 9 years of compulsory education (6 years of primary school and 3 years of secondary school. In some provinces and cities, there are 5 years of primary school and 4 years of secondary school), no tuition fee and other fees would be charged.

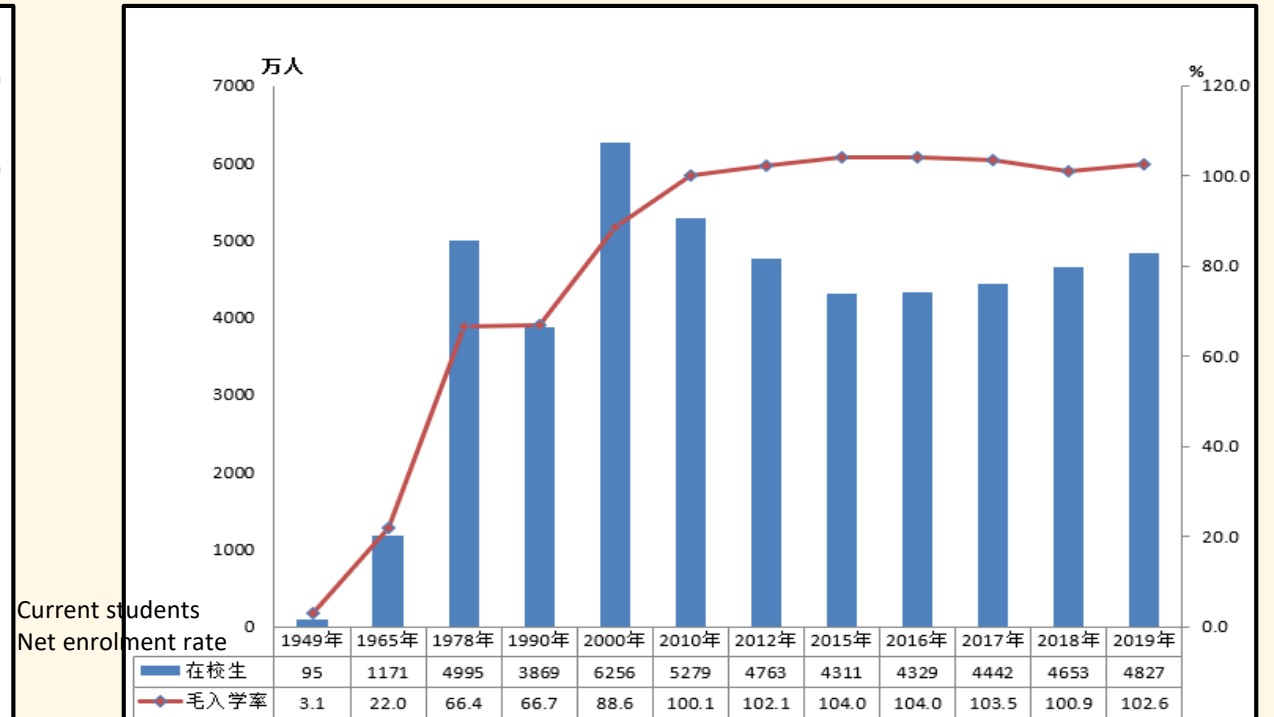


# Compulsory education

Number of primary students and net enrolment rate



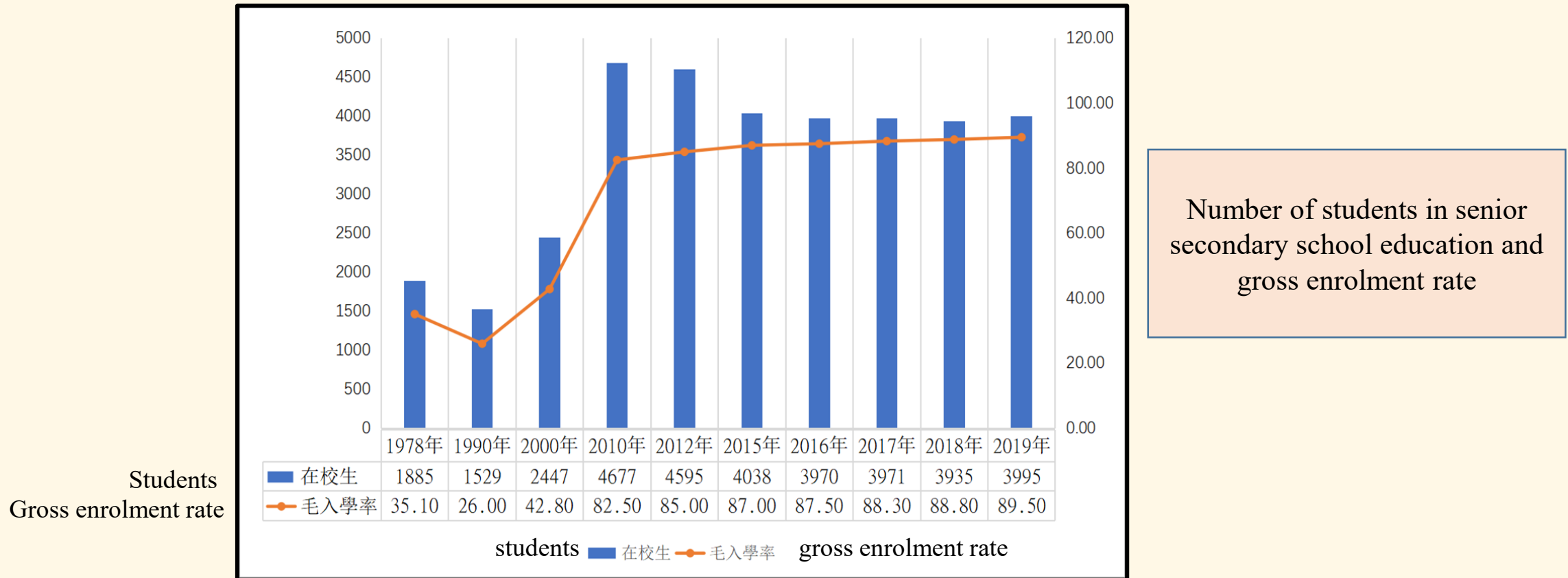
Number of secondary students and gross enrolment rate



- Net enrolment rate is the percentage of school-age students in primary schools among the school-age population. It is calculated according to different school ages and systems in different regions.
- Gross enrolment rate is the percentage of students regardless of age among the school-age population of a certain grade. Since it includes informal age groups (over-age or under-age), the gross enrolment rate may be over 100%.

# Senior secondary school education

Senior Secondary School Education refers to either general (academic) senior secondary school or vocational senior secondary school. According to the “Senior Secondary School Education Access Plan (2017-2020) (高中階段教育普及攻堅計劃 (2017-2020年))”, China promotes nation-wide senior secondary school education. At the same time, China aims to address the lack of educational resources in poor regions and the declining number of students in vocational education so that senior secondary school education can be diversified.



Source: “Statistical communique of national education development 2019”. Website of the Ministry of Education.  
[http://www.moe.gov.cn/jyb\\_sjzl/sjzl\\_fztjgb/202005/t20200520\\_456751.html](http://www.moe.gov.cn/jyb_sjzl/sjzl_fztjgb/202005/t20200520_456751.html)

## Senior secondary school education

- In 2020, there were 24,400 senior secondary schools, admitting 15.04 million students. The total number of students was 41.278 million. The gross enrolment rate was 91.2%.
- There were 14,200 high schools, admitting 8.7644 million students. The total number of students was 24.9445 million. There were 1.9332 million teachers.
- There were 9,865 vocational schools, admitting 6.2756 million students. The total number of students was 16.2814 million. There were 849,500 teachers.

Source: “Announcement of the main result of national education census 2020”. 2 March 2021.  
[http://www.moe.gov.cn/jyb\\_xwfb/s5147/202103/t20210302\\_516416.html](http://www.moe.gov.cn/jyb_xwfb/s5147/202103/t20210302_516416.html)

# Special education

Special education is an important supplementary measure for social development. It emphasizes respect for diversities and highlighting characteristics to realise the fairness and benefits of universal education. Since the reform and opening-up, special education has been greatly developed. In 2019, there were 2,192 special education schools, increased by 40 when compared with 2018, with a growth rate of 1.86%. There were 62,400 teachers for special education, increased by 3,700 when compared to 2018, with a growth rate of 6.31%.



## Second Phase of Improvement of Special Education Programme (2017-2020)

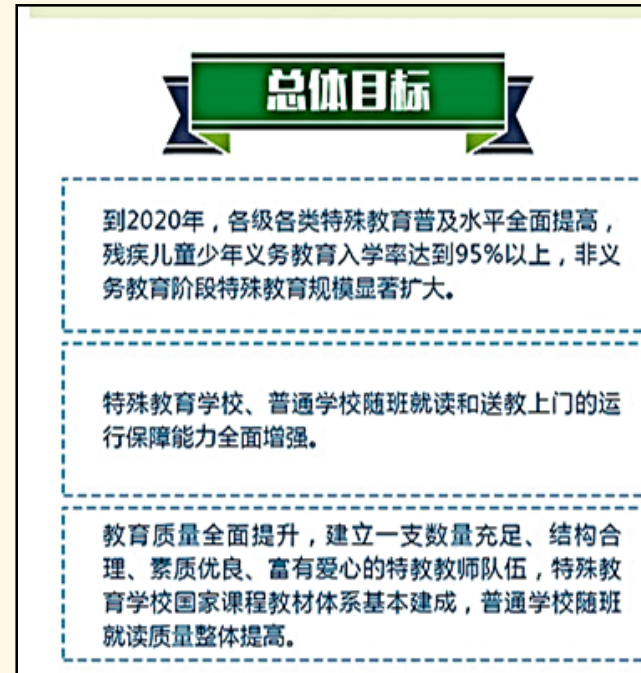
### Basic Principle

Strive for planning and promoting, integration of universal basic education and special education, to fully promote integrated education

Strive for respecting the diversities and diversified development, to reinforce the direction of special education

Strive for supporting both universal basic education and special education, and special arrangement for special education, to increase the support for special education

Strive for leading by the government and participation of stakeholders, to generate the synergy of the whole society supporting special education



### Objectives

To increase the level of various ages and types of special education in 2020, that the admission rate of disabled children and juveniles to compulsory education is 95%. There is a significant increase in the scale of special education outside compulsory education.

To reinforce the capability to guarantee the operation of special education schools, students required special education attending normal schools and home teaching.

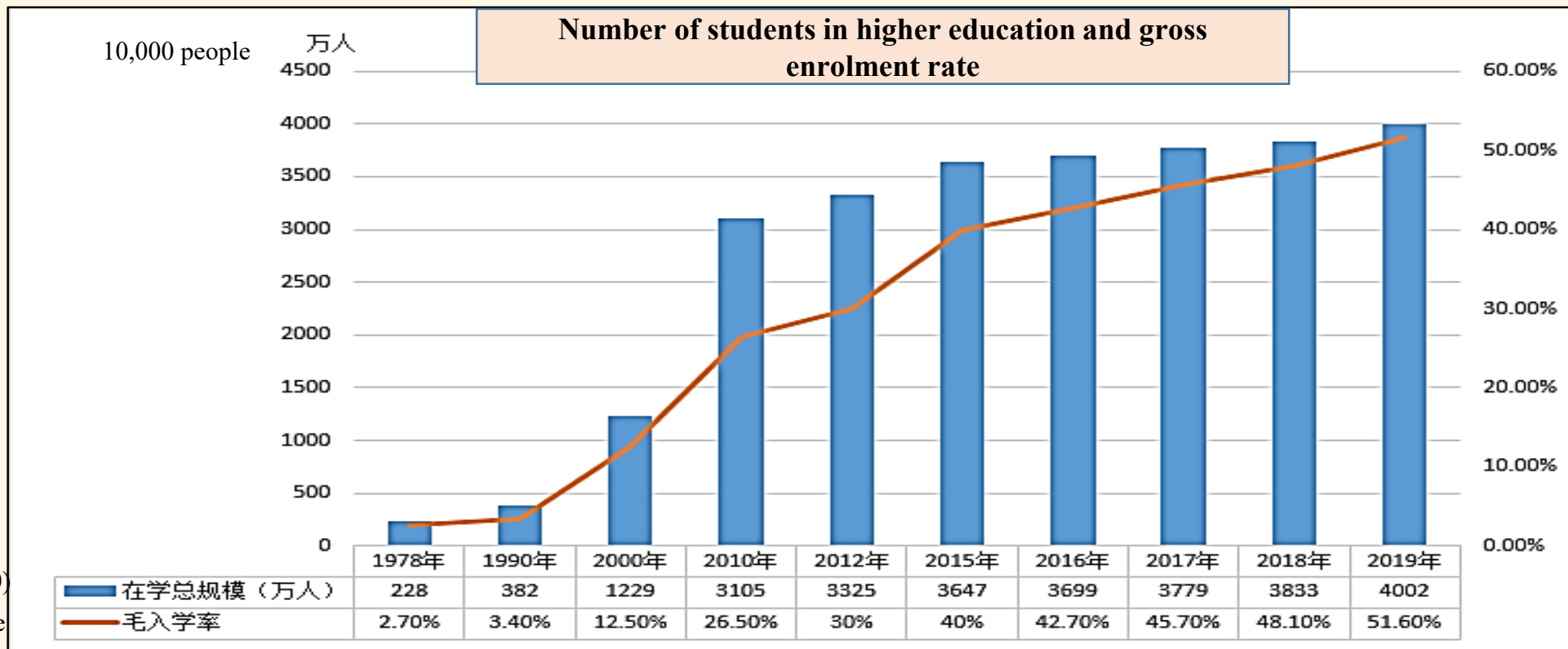
To improve the overall education quality, to build a team of high quality and loving special education teachers, with adequate number of teachers in a reasonable structure. To establish the national special education teaching material system. To improve the quality of education for students required special education attending normal schools.

Source:

- “Second phase of improvement of special education programme (2017-2020)”. Seven departments including the Ministry of Education. [http://www.gov.cn/xinwen/2017-07/28/content\\_5214071.htm](http://www.gov.cn/xinwen/2017-07/28/content_5214071.htm)
- Website of the Ministry of Education. [http://www.moe.gov.cn/jyb\\_sjzl/sjzl\\_fztjgb/202005/t20200520\\_456751.html](http://www.moe.gov.cn/jyb_sjzl/sjzl_fztjgb/202005/t20200520_456751.html)

# Higher education

Since the reform and opening-up, higher education has developed rapidly. At the moment, a mass higher education system has been developed. In 1977, among the 5.7 million students who took *Gaokao* (university entrance exam), 273,000 were admitted to universities with an admission rate of 4.8%. By 2020, the admission rate has reached 54.4%. This marks the transformation of China's higher education from elite education to universal education.



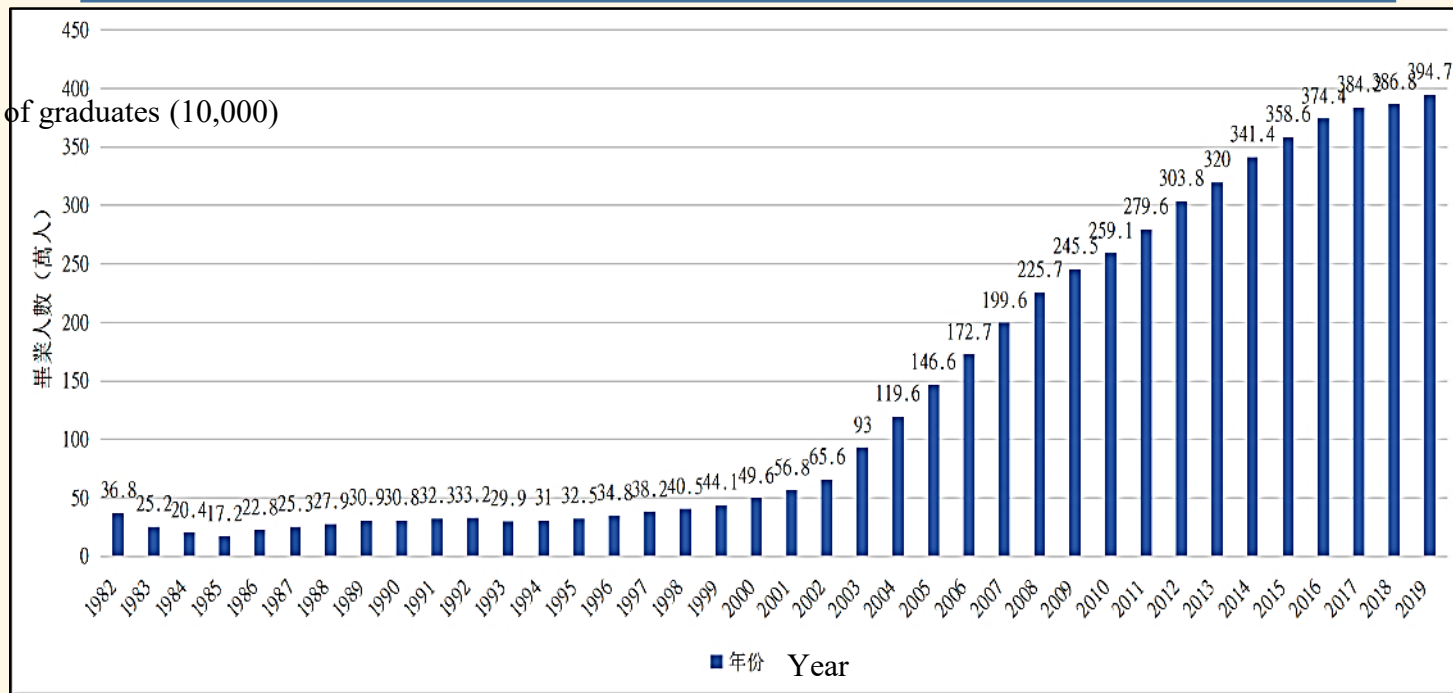
Source: Website of the Ministry of Education. [http://www.moe.gov.cn/jyb\\_sjzl/sjzl\\_fztjgb/202005/t20200520\\_456751.html](http://www.moe.gov.cn/jyb_sjzl/sjzl_fztjgb/202005/t20200520_456751.html)



# Higher education

From the “Report of China’s Higher Education Quality (中國高等教育品質報告)” released by the Ministry of Education in 2017, the undergraduate education in China has positive effect on promoting economic and social development and nurturing specialised talents. The report also points out that there is room for improvement in the model and system of talent nurturing.

## Number of graduates with a bachelor degree, 1982-2019



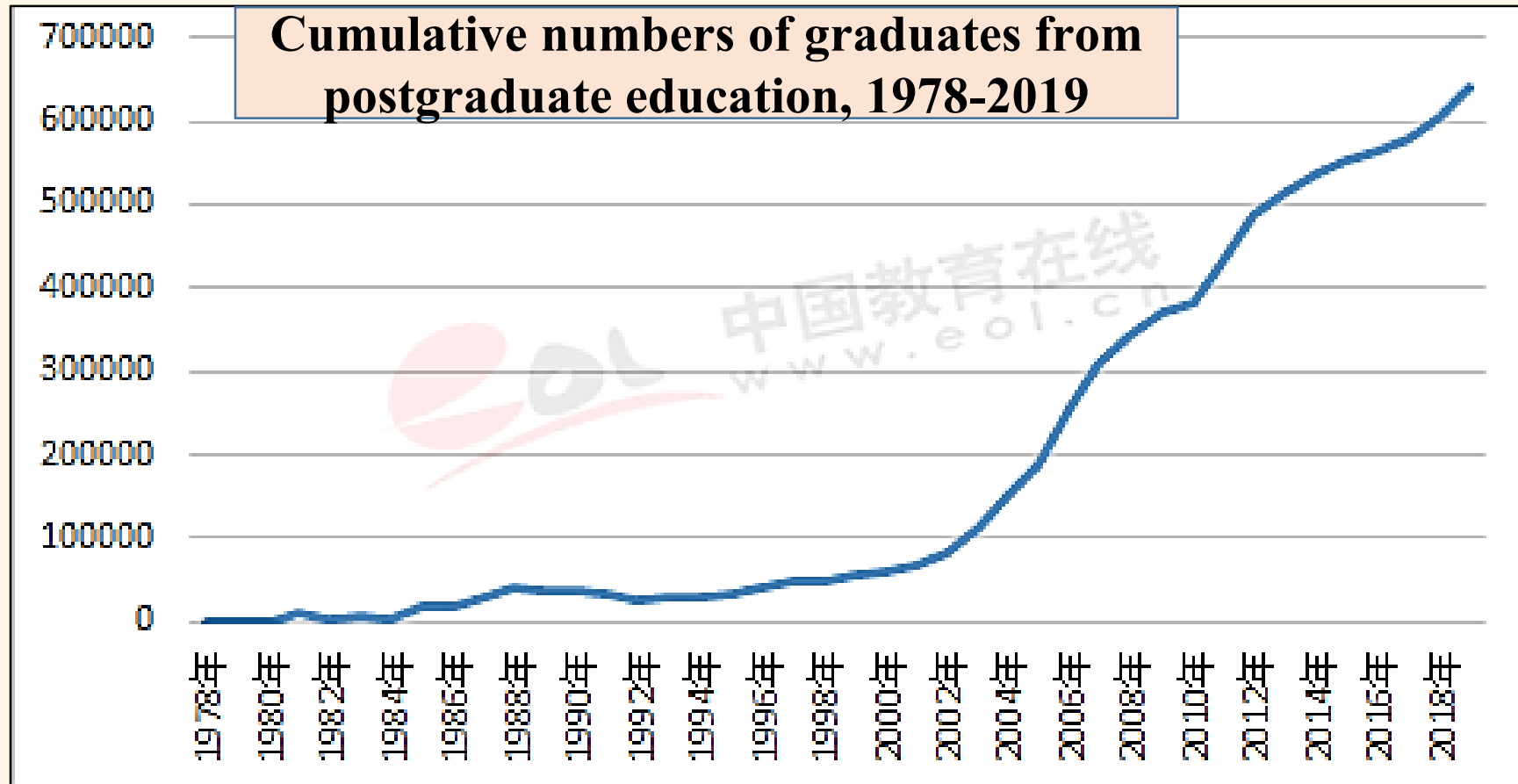
In 2020, there were 2,738 higher education institutions. Among them, there were 1,270 universities and 1.833 million teaching staff.

Source: “Announcement of the main result of national education census 2020”. 2 March 2021.  
[http://www.moe.gov.cn/jyb\\_xwfb/s5147/202103/t20210302\\_516416.html](http://www.moe.gov.cn/jyb_xwfb/s5147/202103/t20210302_516416.html)

Source: The National Bureau of Statistics, from Tencent Net.  
<https://new.qq.com/omn/20210730/20210730A07LI300.html>

# Postgraduate education

From 1978 to 2019, the number of postgraduate students rose consistently. The growth rate after 2002 was particularly high. In 2003, the number of postgraduate students exceeded 100,000 for the first time. In 2013, the number was over 500,000. There was a total of 7.76 million graduates from 1978 to 2019.



Source: "Report on national postgraduate students enrolment survey (2020年全国研究生招生调查报告)". Website of China Education Online.  
[https://www.eol.cn/e\\_ky/zt/report/2020/content01.html](https://www.eol.cn/e_ky/zt/report/2020/content01.html)

# Establishment of world-class universities to enhance international competitiveness

China has implemented Project 211(「211工程」), Project 985(「985工程」) and the Double First-Class University Plan(「雙一流」) to enhance the quality of higher education.

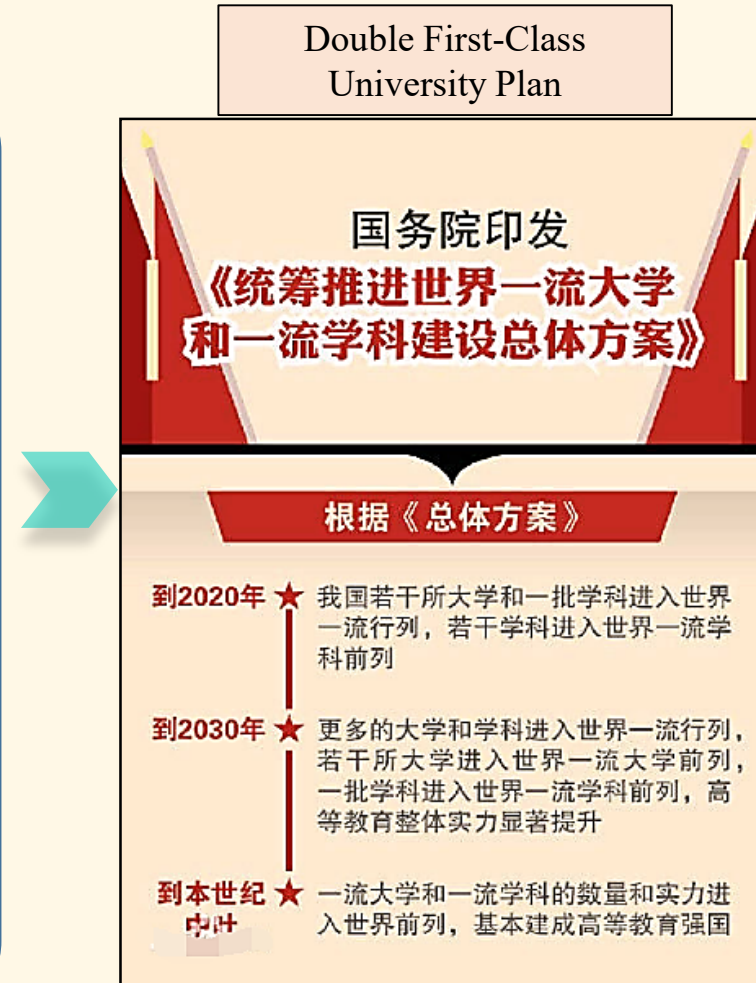
## Project 211

Project 211 is a project to establish around 100 higher education institutions and develop key disciplines in the 21<sup>st</sup> century. In November 1995, the State Council approved this project. The Project aims to tackle the challenge of the world's new technology to establish world-class higher education.

## Project 985

On 4 May 1998, President Jiang Zemin announced that “to modernise, China must have several world’s first-class universities”. In 1999, Project 985 began. 39 universities of China were listed as leading research institutions.

## Double First-Class University Plan



The World First Class University and First-Class Academic Discipline Construction published by the State Council

According to the plan,

By 2020, several universities and several disciplines should be listed as world first class.

By 2030, more universities and disciplines shall be listed as world first class. The overall quality of higher education should be enhanced.

By mid-21<sup>st</sup> Century, the number of first-class universities and disciplines should be ranked among the top of the world. China should become a great power of higher education.

## Reference



According to the Times Higher Education Asia University Ranking in 2021, Tsinghua University has been the top university for three consecutive years. Peking University rose places to second in Asia in 2020 and kept its status in 2021. National University of Singapore ranked third and the University of Hong Kong ranked fourth.

Universities in the Mainland performed well in the ranking with 31 universities included in the list of top 100 in Asia. 15 of them were ranked top 50. China has the highest number of universities on the list, while South Korea came second with 12 universities and Japan came third with 11 universities. Moreover, 10 universities were ranked for the first time. The ranking of 65 universities has risen or remained unchanged.

Times Higher Education Asia University Ranking (some of the rankings)

1. Tsinghua University
2. Peking University
3. National University of Singapore
4. University of Hong Kong

## **More international students study in China, showing that the education in China is appealing**

- According to the Ministry of Education, in 2018, 492,200 international students from 196 countries studied in China. China has the highest number of international students in Asia.
- More and more international students are coming to China for degree programmes. In 2018, there were 85,000 international postgraduate students, increased by 12.28% as compared with 2017. The professional structure of international students continued to optimise. More students are studying engineering, management, science, art and agriculture, which shows that the professional education programmes in China are becoming more appealing.
- In 2018, 63,000 students from 182 countries were awarded scholarship from the Chinese Government. The scholarship has become more attractive to high-level talents. It shows that China's international students are at a higher level and of higher quality.

### Source:

- "Over 490,000 international students came to China last year (去年來華留學生超49萬)". People.cn. 4 June 2019. <http://world.people.com.cn/n1/2019/0604/c1002-31118531.html>
- For information about the Chinese Government Scholarship, please visit the website of the Ministry of Education. [http://www.moe.gov.cn/s78/A20/gjs\\_left/moe\\_850/tnull\\_1205.html](http://www.moe.gov.cn/s78/A20/gjs_left/moe_850/tnull_1205.html)



# Higher vocational education

To fulfil social demands, higher vocational education nurtures technical professionals. Since the reform and opening-up, China's higher vocational education institutions have been developing rapidly with a drastic increase in the number of students. Its system is also improving. The higher vocational education must develop based on industry-school-research to construct, adjust, collaborate and combine, so that educational resources can integrate with enterprises.



Admission of Higher Vocational Education increased to 1 million in 2019

To promote the popularization phase of national higher education

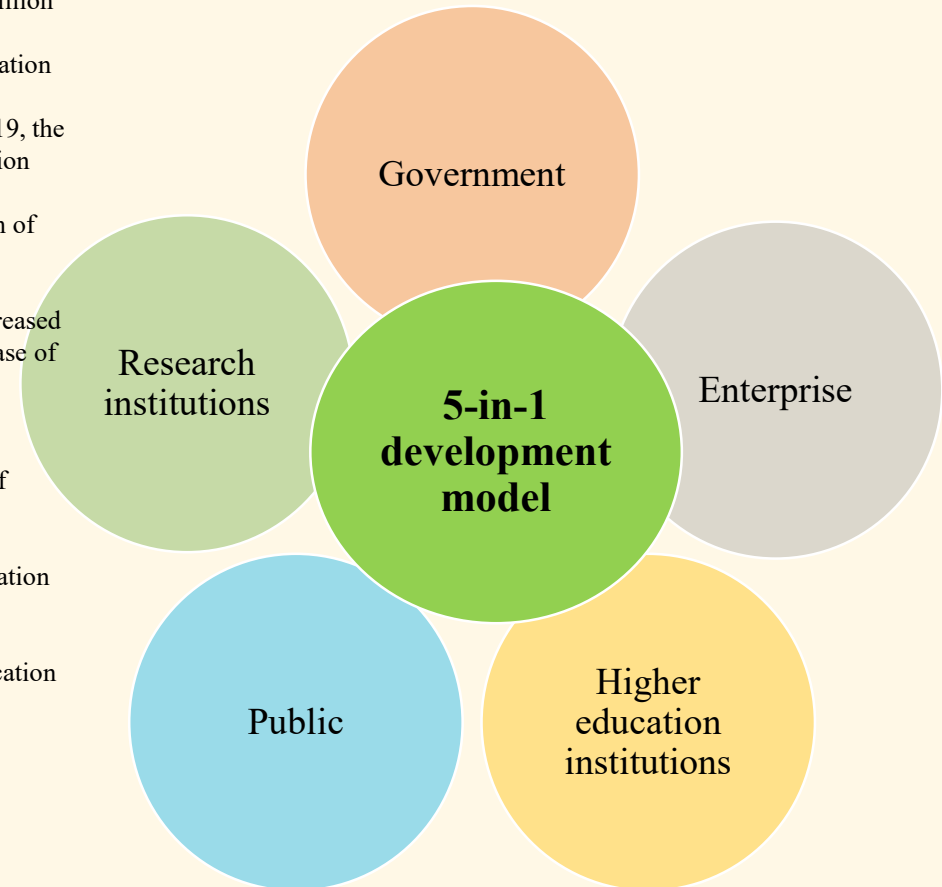
According to the Report on the Work of the Government 2019, the admission of higher vocational education increased to 1 million

The Ministry of Education held a press conference on the 8th of May

- The mission will be realised on time
- The admission of higher vocational education has increased to 1 million, directly promoting the popularization phase of national higher education

Wang Ji-ping, the Director General of the Department of Vocational Education and Adult Education of the Ministry of Education of the People's Republic of China, said

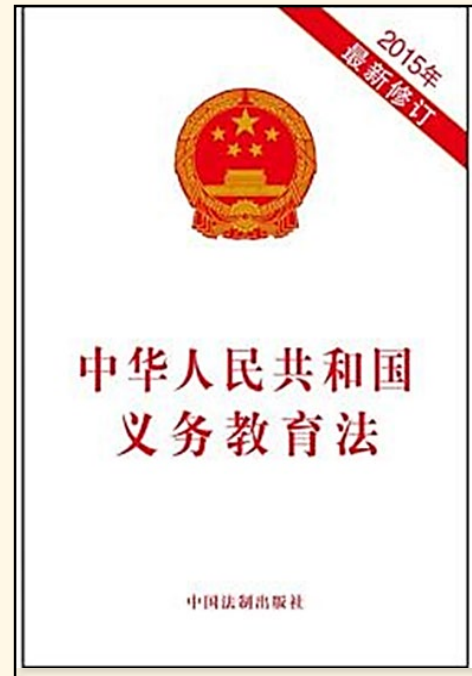
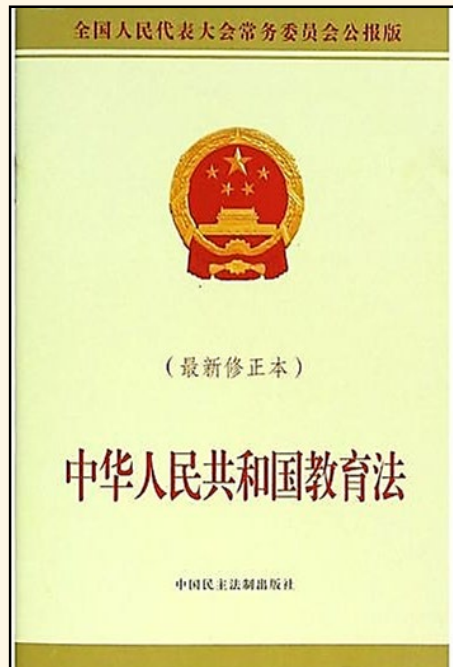
- 2018- 7.9 million students studied in higher education  
Gross enrolment ratio has reached 48.1%
- 2019- Gross enrolment ratio will exceed 50%  
Realising the popularisation of higher education



Source: Website of the Central People's Government of the People's Republic of China  
[http://big5.www.gov.cn/gate/big5/www.gov.cn/xinwen/2019-05/08/content\\_5389812.htm](http://big5.www.gov.cn/gate/big5/www.gov.cn/xinwen/2019-05/08/content_5389812.htm)

# Education laws and regulations in China

Since the reform and opening-up, China has been active in the implementation of education laws and regulations such as the Education Law of the People's Republic of China. Priorities are put on nurturing individuals and moral education. All-round development of students is emphasised. China aims to implement quality education and build an education system of higher quality .



## All-round education

In recent years, schools of all levels and types have been focusing on nurturing students' moral qualities, patriotism and striving spirit. They implement many age-appropriate social practical activities to develop student's positive values, proper behaviours and habits. Apart from instilling knowledge, students are encouraged for innovation, developing their generic skills, cultivating their curiosity, imagination, thirst for knowledge and interest for learning. Students are guided patiently to live up to their potentials. It aims to develop students' integrated competence and emphasis on all-round education.



Tongji Experimental School in Qingdao of Shandong introduced fencing into the curriculum by hiring professional coaches to teach etiquette, basic steps and practical skills.



Beichen District of Tianjin organised "Xiqu comes to school". In the photo, a member of the Tianjin Youth Peking Opera Troupe was guiding students.

Photo credit: Xinhua News Agency

# Summary

- Since the reform and opening-up, China has implemented the strategy for “invigorating China through science and education”. Education is a priority with strategic importance.
- The quality and level of education continue to improve to provide talents and intellects to enhance the overall national strength.
- China also aims to discourage over-competitiveness among students, alleviate stress, and provide all-round education for students.



# Natural resources

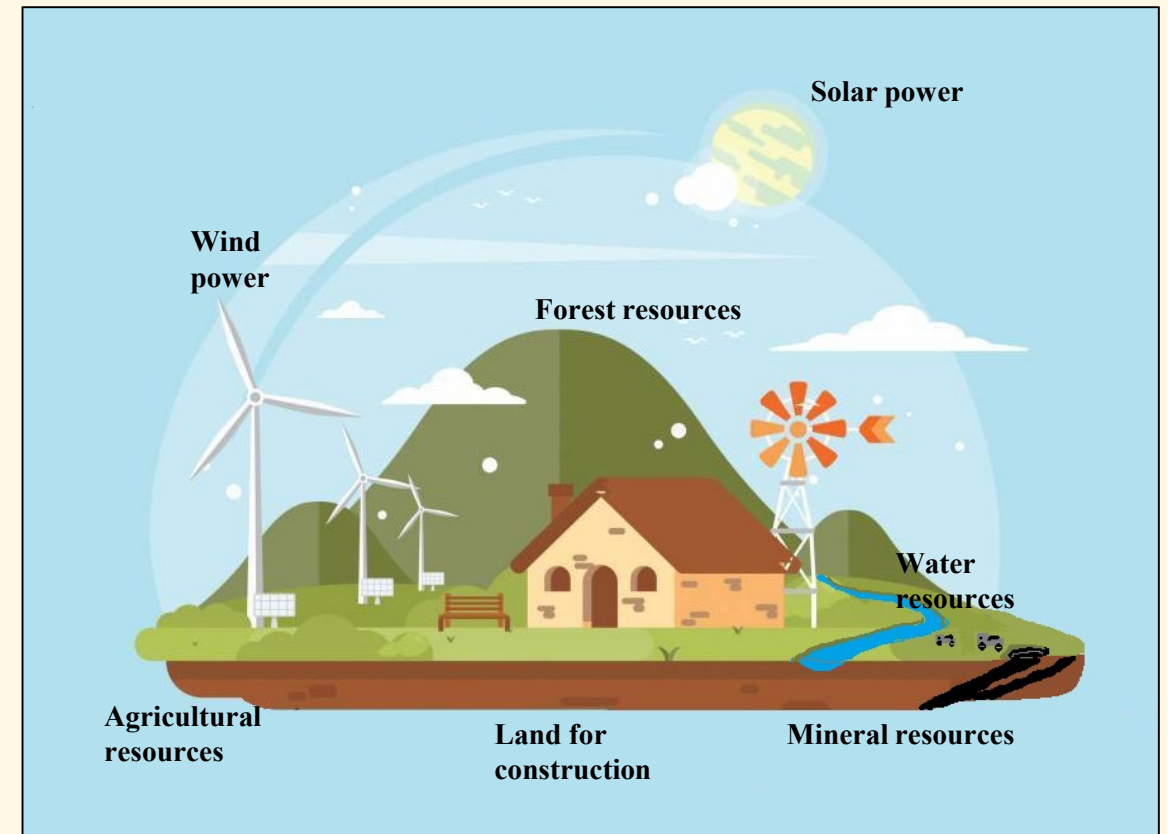
## Natural resources around us



### Questions:

- What kinds of natural resources are used in everyday products?
- What are renewable natural resources?
- What kinds of natural resources does China import in large quantity?

Examples of natural resources



# Importance of natural resources in overall national strength

- Natural resources include land, water, forest, minerals, energy, etc. They are the basic and fundamental material resources a country relies on for survival and development. If there is an abundance of resources, there is an important foundation for a country to develop and enhance its power.
- Natural resources also affect a country's international status. For example, China is rich in rare-earth elements, and Middle Eastern countries are rich in petroleum. These resources have a great impact on the global economy, indicating the importance and status of countries that possess them.
- Some natural resources are non-renewable, but through reasonable exploitation, the utilisation of the resources can be enhanced. Moreover, to meet the development needs, China has been proactively exploring new energy under the direction of sustainable development. This can enhance the role and value of natural resources in the overall national strength.

# Land resources

In a board sense, land resources include farmland, parkland, forest, pasture land, construction land, inland water bodies and oceans. The ocean is included in land and natural resource management because there is deep connection between ocean and economy nowadays.



Sanjian Plain before the summer harvest



High capacity construction land in Shanghai

Photo credit: Xinhua News Agency and taken by the resource developer (Right)



## Vast total land resources but low per capita

- China's land area ranks fourth in the world, but its population ranks first.
- Due to climate and landscape, the ratio of arable land to the total territory is relatively low. The total size of arable land of China is smaller than that of India, USA and Russia, meaning the size of arable land per capita is small. In the western China, there are vast areas of pasture land.



In April 2021, herdsmen of Fuhai County, Xinjiang were herding animals to cross the Irtys River to reach the pasture land for spring and autumn.



## Basic information about land resources

According to the third National Land Survey released on 25 August 2021, basic information about China's land resources is as follows: (1 hectare = 10,000 m<sup>2</sup>, equals to the size of a standard football field)

- **Arable land** 127.8619 million hectares. 64% of arable land spreads across the north of Qinling-Huaihe. Heilongjiang, Inner Mongolia, Henan, Jilin and Xinjiang, occupying 40% of all arable land.
- **Parkland** 20.1716 million hectares. It mainly spreads across the south of Qinling-Huaihe, occupying 66% of all parkland.
- **Forest** 284.1259 million hectares. Sichuan, Yunnan, Inner Mongolia and Heilongjiang have large forests, occupying 34% of all forests.

Source: "Bulletin of the third national land survey". Ministry of Land and Resources. 25 August 2021.  
[http://www.mnr.gov.cn/dt/ywbb/202108/t20210826\\_2678340.html](http://www.mnr.gov.cn/dt/ywbb/202108/t20210826_2678340.html)

To be  
continued in  
the next page

## Basic information on land resources

- **Grassland** 264.5301 million hectares. It mainly spreads across Tibet, Inner Mongolia, Xinjiang, Qinghai, Gansu and Sichuan, occupying 94% of all grassland.
- **Wetland** 23.4693 million hectares. It mainly spreads across Qinghai, Tibet, Inner Mongolia, Heilongjiang, Xinjiang, Sichuan and Gansu, occupying 88% of all wetland.
- **Urban land and mine** 35.3064 million hectares.
- **Land for transportation** 9.5531 million hectares.
- **Water bodies and water conservancy facilities** 36.2879 million hectares. Tibet, Xinjiang, Qinghai and Jiangsu have larger water bodies, occupying 45% of all water bodies in China.

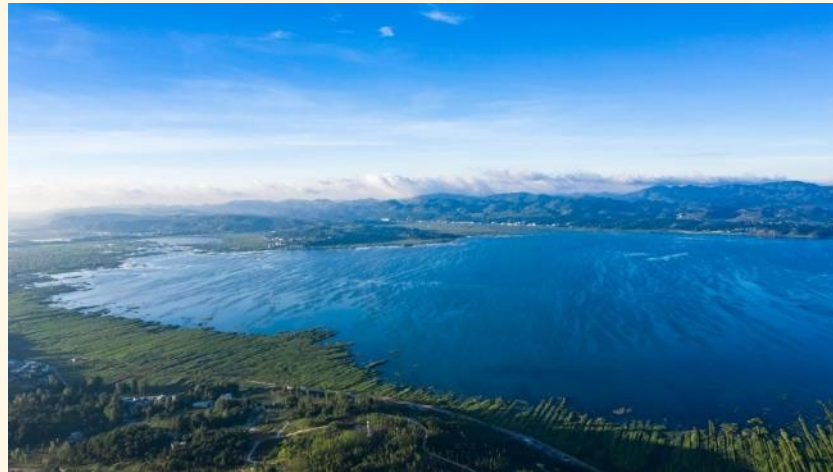
Source: "Bulletin of the third national land survey". Website of Ministry of Land and Resources. 25 August 2021.  
[http://www.mnr.gov.cn/dt/ywbb/202108/t20210826\\_2678340.html](http://www.mnr.gov.cn/dt/ywbb/202108/t20210826_2678340.html)

# Effective protection of land resources

Since 1978, China has promulgated many laws related to land conservation, such as the Land Administration Law of the People's Republic of China. Even during rapid urbanisation, these laws and regulations maintain the total amount of arable land. At the same time, China has improved the ecosystem through various engineering projects and restoring farmland to their original use.



Spotty mountains in Mount Jiyuan, Henan.  
Soil erosion/ engineering project.



Caohai Lake in Weining, Guizhou  
Ecological degradation of the lake/  
Restoring lake from farmland



The wetland along the coast of  
Hepu, Guangxi diminished/  
Wetland Protection Law

# Water resources

It refers to the freshwater bodies on land and water resources to generate hydroelectricity. People's livelihood is closely linked with freshwater bodies. However, freshwater bodies only occupy 3% of all water bodies in the world, and they mainly exist in the form of glaciers. Most places make use of surface water such as rivers and lakes, the amount of fresh water of which is relatively small.

## **Large total amount of water resources, uneven distribution between the north and the south**

China has 6% of the world's water resources, which is among the top of the world. However, due to the size of the population, water resources per capita is low, with the north having less.

To enhance the efficiency of water usage, promote sustainable development, and develop the culture of water conservation, China released the *Action Plan for Water Conservation* (國家節水行動方案) in 2019, targeting at a total water usage of 700 billion m<sup>3</sup> in 2035 (total water usage in 2020 was 581.29 billion m<sup>3</sup>). It also aims to achieve world-class water conservation and recycling.

Source:

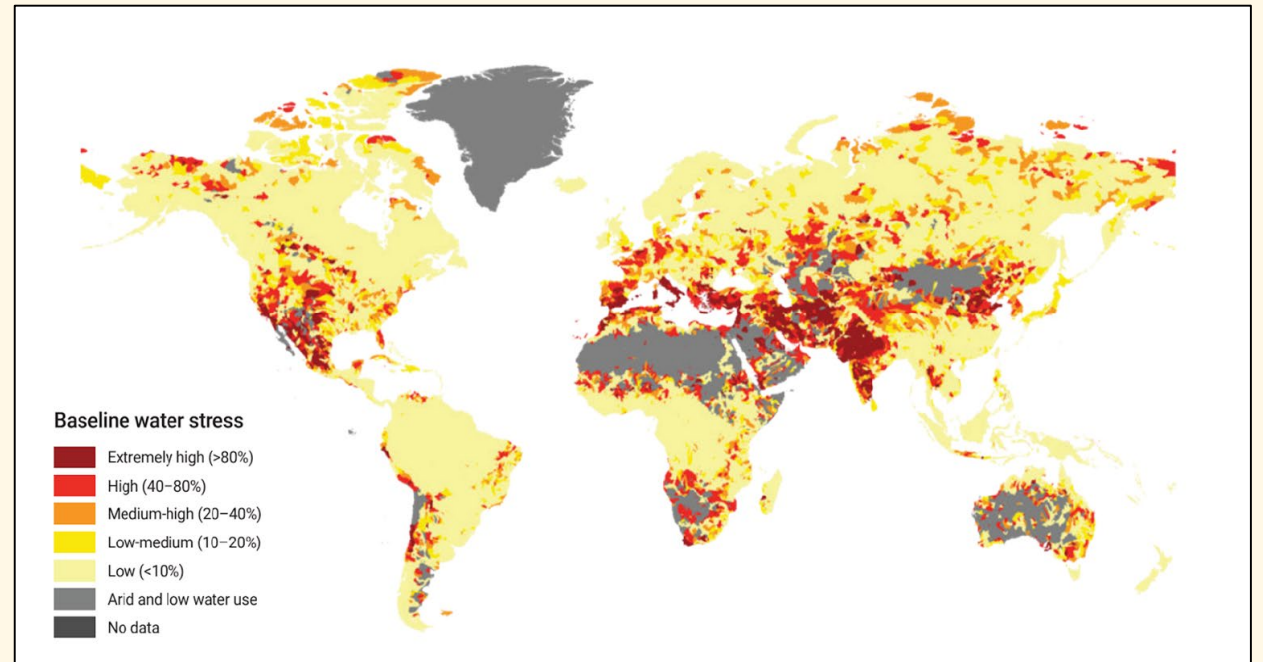
- The Action Plan for Water Conservation jointly released by National Development and Reform Commission and the Ministry of Water Resources . Website of the Central People's Government of the People's Republic of China. 19 April 2019.  
[http://big5.www.gov.cn/gate/big5/www.gov.cn/xinwen/2019-04/19/content\\_5384418.htm](http://big5.www.gov.cn/gate/big5/www.gov.cn/xinwen/2019-04/19/content_5384418.htm)
- China Water Resources Bulletin 2020 published. People.cn. 21 July 2021.  
<http://finance.people.com.cn/BIG5/n1/2021/0712/c1004-32155643.html>



China's water resources per capita is only 2,300 m<sup>3</sup>, which is only ¼ of the world's average standard. Therefore, China is one of the countries that has the most scarce water resources per capita in the world. However, China is rich in hydroelectric power. The hydroelectric power of Changjiang, Huanghe and Zhujiang ranks top three in the world.



The Three Gorges Hydroelectric Power Station which generated 111.8 billion kilowatt-hours (kWh) of clean energy in 2020. (Teachers can visit the website of the China Three Gorges Corporation to understand more about how the Three Gorges Dam generates power. <https://www.ctg.com.cn/>)



The graph on water stress from the United Nations World Water Development Report 2020 shows that the northern China faces greater challenge of water stress.

Source: <https://unesdoc.unesco.org/ark:/48223/pf0000372985.locale=en>



# Hydraulic engineering plays a significant role

China's freshwater resources face regional and seasonal differences. China is located in the Asian monsoon region, so the distribution of rainy seasons in a year is uneven. As a result, there are frequent floods and droughts.

Since the reform and opening-up, there are many newly constructed hydraulic engineering projects, such as reservoirs, dams, pumping stations and aqueducts. The most famous hydraulic engineering project is the South-North Water Diversion Project. These projects play a significant role in urban life, economic development and ecological conservation.

## Reference



Click on the image to watch the video

Watch the following video to learn the South-North Water Diversion Project and its implementation.

Video title: Water resources South-North Imbalance: South-North Water Diversion Project

Video taken from The China Current  
<https://chinacurrent.com/story/21046/china-south-to-north-water-diversion-project>

## Forest resources

**Forest resources are the sum of natural forest and forest plantation**



Forest shelter belt along the expressway in Yulin.



Xishui National Forest Park in Shangganling, Yichun, Heilongjiang Province

Compare the two pictures and tell the differences.



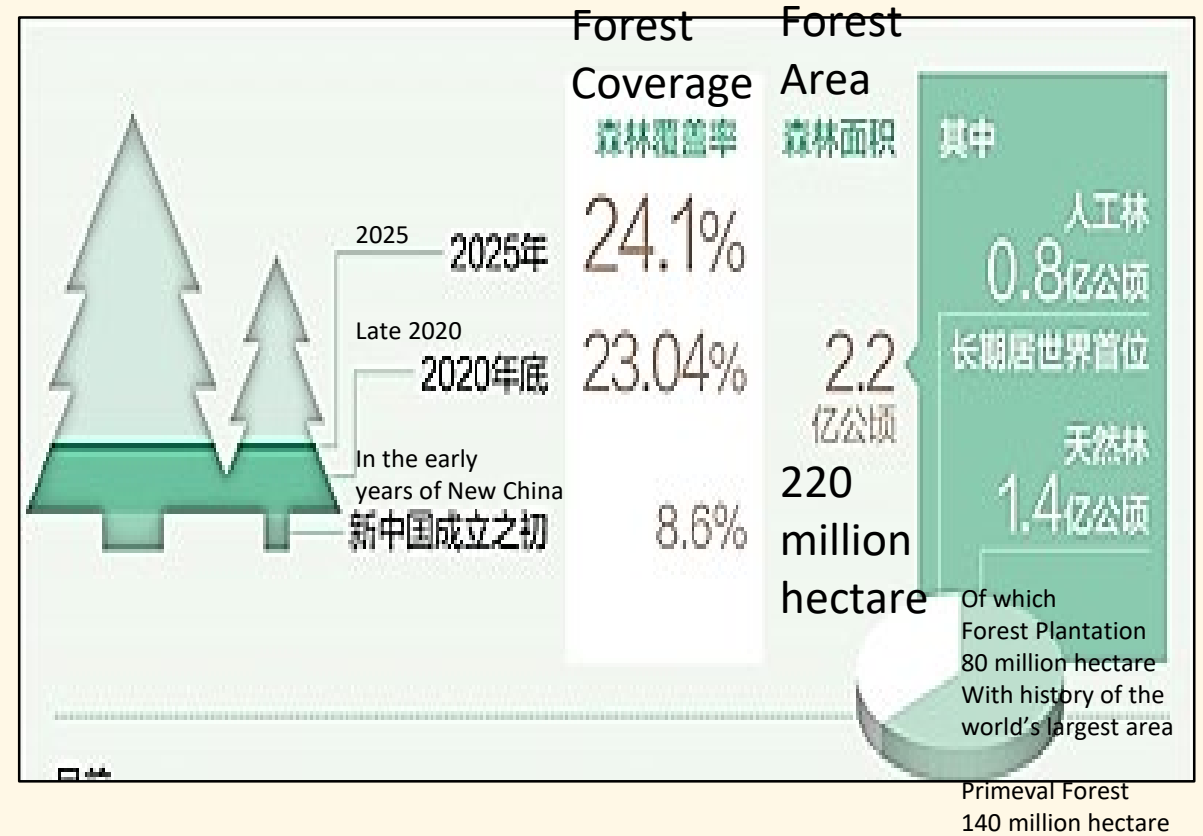
Answers: forest plantation/natural forest, low density/high density.

# Large forest area, low forest stock volume

When the People's Republic of China was founded, the forest area was only 8.6%. By 2020, it grew to 23.04%. The forest stock volume reached 17.5 billion m<sup>3</sup>, while the forest area reached 220 million hectares.

On the other hand, the forest area of China is still lower than the world average of 32%. Forest area per capita is 1/4 of the world average. It is necessary to continue greening the country to improve the ecological environment.

(Teachers can browse the website <http://www.forestry.gov.cn/gjslzyqc.html> for more information on China's forestry.)



Source: Xinhua News Agency  
 (http://www.xinhuanet.com/politics/2021-08/06/c\_1127734985.htm)



# Multiple measures to restore forests

Since the reform and opening-up, China has passed a series of laws to implement policies such as reforestation, afforestation and closing the mountains to protect forests. These measures suppressed the malpractice of deforestation, expanded the forest area, restored the ecological environment of forests and greened the country for the people.



Saihanba National Forest Park  
(Afforestation-in the North)



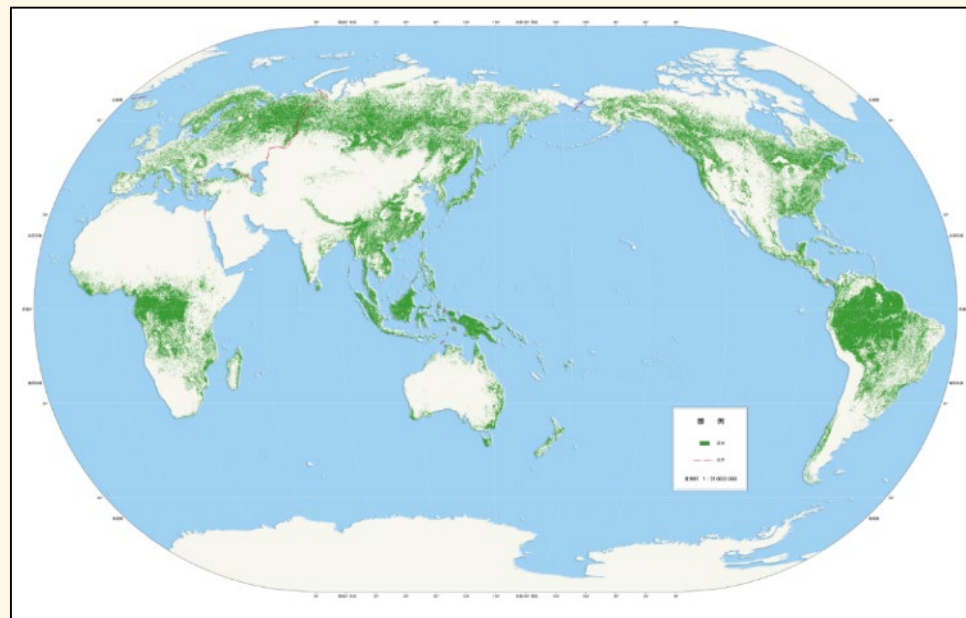
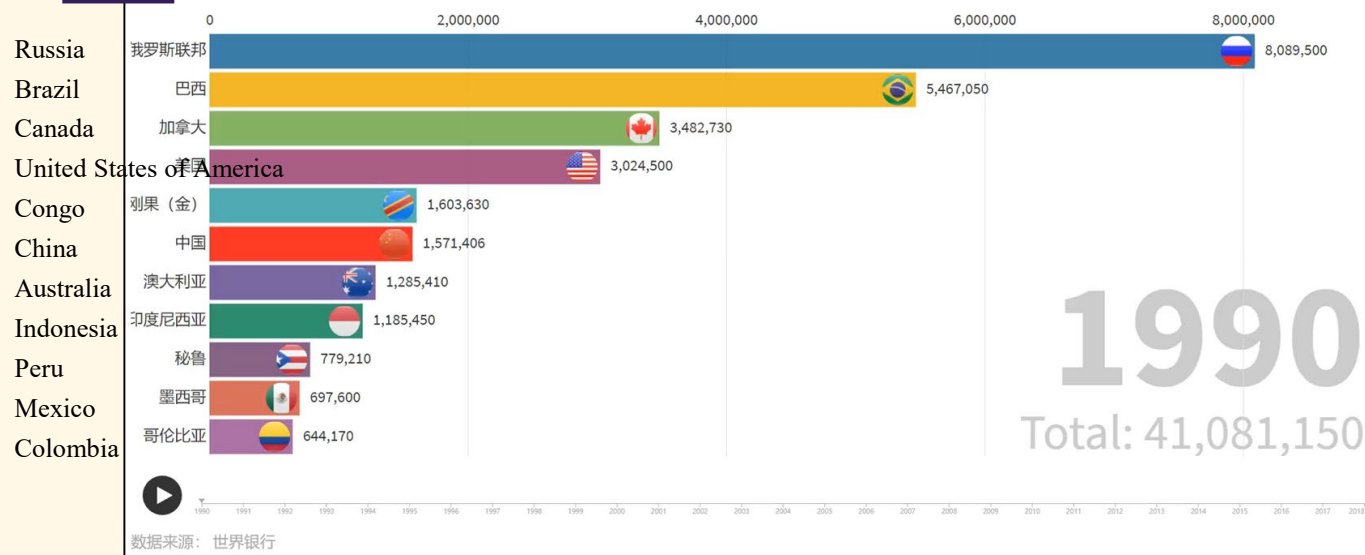
The Dawn Redwood boulevard in Sanming, Fujian  
(Protect the forest by closing the mountain in the South)

## Question

Read the graph on the left which shows the trend of increasing forest area in China and the graph on the right which shows the forest distribution in the world. Where is the major distribution of China's forest? Think about where in China has the greatest pressure on forests.



Changing forest area in the world (km<sup>2</sup>)



Answer: Rainfall concentrates in the East, so most forests concentrate there. However, the East also has high population density. Therefore, it has the greatest pressure on forest protection.

The 30m resolution graph of forest area in 2018 was created combining images from foreign countries and China. Published by the Aerospace Information Research Institute, Chinese Academy of Science.

Source:

- Map: the Aerospace Information Research Institute, Chinese Academy of Science.
- ([http://www.aircas.cas.cn/dtxw/tpxw/201911/t20191120\\_5439409.html](http://www.aircas.cas.cn/dtxw/tpxw/201911/t20191120_5439409.html))
- Video: <https://www.bilibili.com/s/video/BV1dE411L7dz>



## Reference

# Green leaf area

NASA of the US published a report, which points out that the green leaf area in 2017 was 5% larger than that in 2000, in the UK's "Nature – Sustainable Development" in February 2019. The main contributors were China and India. China's contribution rate was 25%. The increase in green leaf area in China was mainly due to the increase in forest and farmland area, contributing 42% and 32% respectively.

Source: People.cn.

(<http://scitech.people.com.cn/BIG5/n1/2019/0214/c1007-30671090.html> )

Watch the following video to learn how China contributes to make the world a greener place.



Click on the image to watch the video

Video title: Make the world a greener place

<https://chinacurrent.com/education/article/2020/04/21966.html>

Video taken from The China Current

## Lumberjacks became forest keepers in Qinling



Forest keepers are on patrol. They are positioning themselves with devices to record the forest data at their location.

Qinling is located between the temperate and subtropical zones and thus has a lot of forests. Since 1998, China has implemented “natural forest protection project”, and many forests have become reserves – no lumbering is allowed. The lumberjacks did not become unemployed. Instead, they have become forest keepers.

Source: The Beijing News. (<https://www.bjnews.com.cn/detail/157676526815856.html>)

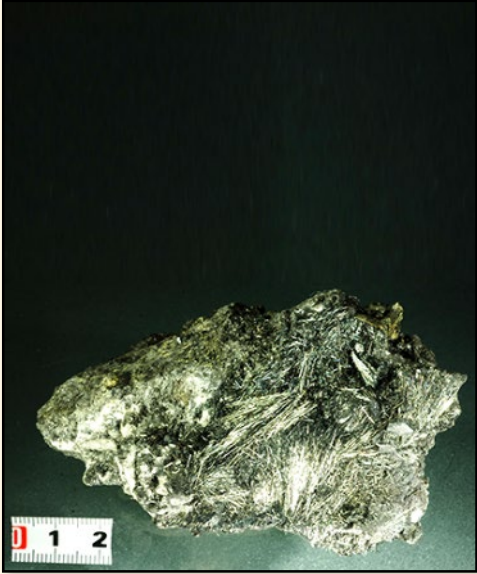
# Mineral resources

## Rich mineral resources

There are many kinds of minerals under China's vast territory. The followings are a few examples of them:



Hematite



Boulangerite



Pyromorphite



Fluorite and calcite  
crystal cluster

▶ You can see introduction on minerals on the website of Geological Museum of China:  
<http://www.gmc.org.cn/mineral.html>

# China is a major producer of rare earths

Rare earth is not earth. It is a combination of 17 chemical elements, including scandium, yttrium and lanthanum. It is an important raw material for metallurgy, petrolchemical industry, electronic production, ceramics and glass making. China is the world's largest producer of rare earths. Not only does China possess a large amount of it, but it also has all the rare earth elements and minerals. The quality of rare earths in China is high and it is reasonably distributed.

## Reference

Watch the following video to learn more about rare earth.



Click on the image to watch the video

Video title: “Rare earth is earth and rare? How do we come to know rare earth?”  
[https://www.youtube.com/watch?v=gG\\_JoxKPGao](https://www.youtube.com/watch?v=gG_JoxKPGao)



## Application of rare earths

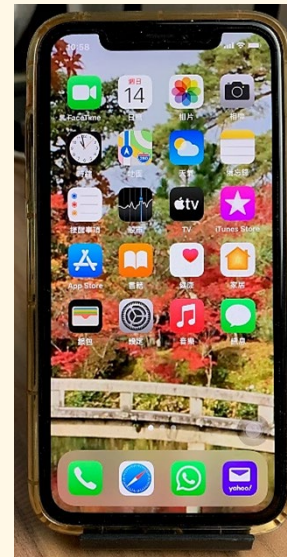


One of the key materials to produce the earliest magnetic-levitation (maglev) train in Shanghai is superdiamagnetic ceramics. In order to produce this material, rare earths must be used.



Rare earth alloys are hard, corrosion resistant and wear-resistant. Rare earths can be used to produce high-precision products, but it can also be used to make everyday products such as flintstone on a lighter.

Photo credit: Xinhua News Agency



To produce the battery, screen, circuit, and outer shell of a smartphone, over 70 chemical elements are needed. The screen alone requires 8 rare earth elements.

Source: taken by the resource developer.

# Exploration and restoration of mines

Since the reform and opening-up, geologists continue to find large-scale, important mines of minerals. During this period, the production of minerals catered for the consumption demands of more than half of the major minerals.

Take potassium as an example. China is a major agricultural nation and thus requires a large amount of potassium as fertiliser. However, for a long time, China needed to import potassium. Since geologists found large potassium mines and provided the raw material for fertiliser, China's agriculture has been further developed.



Lop Nur is the largest potassium salt mine in China

Photo credit: Xinhua News Agency

## Reference

Since the 1990s, China has been restoring the ecological environment of abandoned mines to encourage redevelopment. The following pictures show two examples of such cases.

Jiulongshan Kuangshan Ecology Repair Park in Wuan, Hebei had more than 20 abandoned mines. The project turned this place into an ecological park.



The Yuanshi Chateau in Zhihui, Ningxia was a quarry. After restoration, it has become a vineyard, winemaking facility and touristic site.



## Green energy

Green energy refers to energy with little pollution and can be used directly in production and everyday life. Apart from hydroelectric power, there is nuclear power, wind power, solar power, geothermal energy, hydrogen power, tidal energy, wave energy, marine current power and so on.

### Reference

According to the data from the National Energy Administration, China's coal energy consumption was 57.7% of total energy consumption in 2019, decreased by 10.8% as compared with 2012. Green energy such as gas, hydroelectric power, nuclear energy and wind energy composes 23.4% of total energy consumption, increased by 8.9% as compared to 2012. Green Energy plays an important role in reducing carbon emission. The level of carbon emission in 2019 reduced by 48.1% as compared with 2005.

Source: People.cn.  
(<http://finance.people.com.cn/BIG5/n1/2021/0615/c1004-32130107.html>)



# Improve the environment to increase efficiency

The sites of green energy plants not only provide green energy, but also improve the ecological environment and preserve land resources.

The Kubuqi Desert solar power plant is located in the 7<sup>th</sup> largest desert in China. The environment was used to be barren and have frequent sandstorms. Since placing a large amount of solar panels, the solar radiation decreased and thus reduced water evaporation. The ecological condition of vegetation has thus improved.



Zhejiang province is densely populated and highly urbanised. The demand for land is high. Therefore, most wind power plants are on the sea.

Reference: Case studies of green energy in China  
(Click on the images to watch the videos)



Six world's firsts: Baihetan Hydropower Station



The world's largest wind power station



The artificial-sun, an inexhaustible supply of energy



Sunflowers on the desert: photothermal power station

Source: The China Current

- <https://chinacurrent.com/education/article/2021/08/22442.html>
- <https://chinacurrent.com/education/article/2020/08/21982.html>
- <https://chinacurrent.com/hk/story/20704/next-generation-nuclear-plant>
- <https://chinacurrent.com/hk/story/20544/desert-clean-energy>

# Summary

- China is vast in territory and rich in natural resources. However, the natural resources per capita is low. Moreover, a large amount of natural resources are needed for economic development. Therefore, natural resources must be exploited at a reasonable rate and utilised efficiently. In this aspect, China has done a lot to maximise the efficient use of resources.
- Energy conservation, raising the natural resource utilization rate and protection of the ecological environment are the measures that must be taken to maintain sustainable development of China. They are also the keys to ecological and resource security.



# Technology



### Questions:

1. Which technological achievements was mentioned in the video? How are they related to China's technological advancement?
2. Why does China put so much emphasis on technological achievements?



### Suggested answers:

1. Quantum Satellite Micius, Tianyan Telescope, Fuxing highspeed trains, Long March 5, Beidou Satellite...
2. Technological achievement is the realisation of a country's technological level and ability. It is the key to enhancing a country's competitiveness.



Click on the image to watch the video

Video : China's innovative achievements in these five years

<https://www.chinanews.com/gn/shipin/2020/10-27/news871278.shtml>

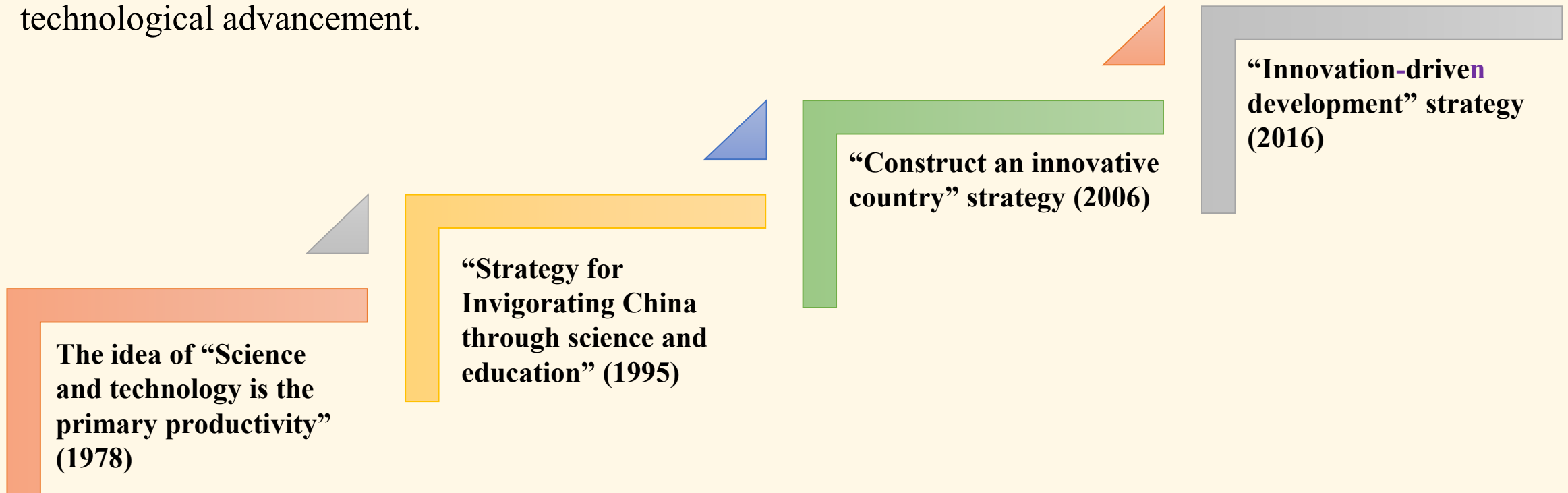


# Importance of technology in overall national strength

- The level of a country's technological development reflects its modernisation level. To enhance the overall national strength, a country must maintain top-level technological advancement in the world. It is also closely related to national security.
- Technology is not only about the latest high-end products or national defence projects, it is also related to basic technological research and technology that improves people's livelihood. Overall national strength can be further enhanced only when we develop both high-end and basic technology to improve people's quality of life.
- Technology also needs to complement other factors of overall national strength, such as exploitation and usage of natural resources to improve their efficient utilisation. Technological achievements can also enhance China's international influence and status, which brings advantages to China in diplomacy.

# From “science and technology constitute a primary productivity force” to “innovation-driven development strategy”

In 1978, Deng Xiaoping pointed out that “science and technology is the primary productivity”. In 1988, he emphasised that “science and technology constitute a primary productive force”. From strategies such as strategy for invigorating China through science and education, and nurturing talents to implementation of innovation-driven development strategies, from enhancing self-innovating ability to constructing an innovative country, these strategies, policies and measures keep abreast of the times in promoting technological advancement.



China proposed a series of development plans on basic scientific research, high-level technological research, development of fundamental technological conditions and transformation of technological achievements. These major plans promoted breakthroughs and advancement in China's high-level and basic technological research.

### Reference



**863 Programme:** On 3 March 1986, four scientists Wang Daheng, Wang Ganchang, Yang Jiachi, and Chen Fangyun proposed to the government that China must adhere to the world's technological level and develop advanced technology. Deng Xiaoping approved and the State Council launched the “Outline of the State High-Tech Development Plan (863 Programme)”. This strategic plan has been implemented for over 30 years and has improved China's high technology and industrial development.



**973 Programme:** In June 1997, the 3<sup>rd</sup> meeting of the China Technology Leading Group adopted suggestions from scientists to create a plan to tackle the country's great demands on key research development. The implementation of the 973 programme has realised the nation's demand driven basic research, established the “double-driven” (driven by free exploration and nation's demand) basic research grant system to improve the basic research plan.

# Investment on research and development

China's research and development (R&D) investment has increased rapidly. In 2020, China's R&D expenditure was RMB 2,442.6 billion, increased by 10.3% as compared to 2019. Among them, RMB 150.4 billion was spent on basic research, increased by 12.6% as compared to 2019. The increase remains rapid.



Since the Reform and Opening-up The spending on national research and development has consistently increased in a rapid way		
Spending on National Research and Development		
2017 Reached 1,760.6 billion, which was 123 times of that in 1991 1992-2017 Increased 20.3% annually on average, which exceeded the average growth of GDP by 5.3%		
This brought a strong guarantee of capital for the development of technology and innovation of China		
According to the exchange rate, the total spending on national research and development <ul style="list-style-type: none"> <li>Exceeded that of the UK and Germany respectively</li> <li>Exceeded Japan in 2013</li> <li>Became the country with the second highest spending on research and development, right after the USA</li> <li>The current contribution to the global research and development budget exceeds one-sixth every year</li> </ul>		
Since the reform and opening-up, the spending on national research and development has increased every year		
2002 First time exceeded 1%	2014 Reached 2.02% Achieved a new level of 2%	2017 Increased to 2.13% Reached the level of moderately developed country

Source: National Bureau of Statistics  
[http://www.stats.gov.cn/tjsj/zxfb/202109/t20210922\\_1822342.html](http://www.stats.gov.cn/tjsj/zxfb/202109/t20210922_1822342.html)

Website of the Central People's Government of the People's Republic of China.  
[http://www.gov.cn/xinwen/2018-09/23/content\\_5325200.htm](http://www.gov.cn/xinwen/2018-09/23/content_5325200.htm)



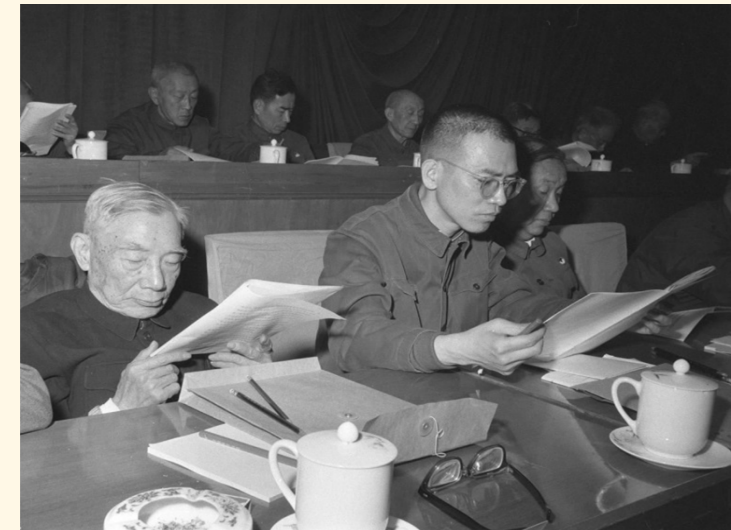
## Reference

In May 1966, mathematician Chen Jingrun published the paper “On the representation of a large even integer as the sum of a prime and the product of at most two primes” (1+2). It created a worldwide sensation. He was known as “the first person who conquered the ‘Goldbach’s Conjecture’”. His theory is known as the Chen’s theorem.

You may read more about Chen Jingrun’s story in his biography written by Xu Chi. (Public Library Call Number 895 2837)



Representatives of academics attended the National Science Conference in 1978



Mathematician Chen Jingrun (left) attended the National Science Conference in 1978

Photo credit: Xinhua News Agency

The annual State Science and Technology Prizes Conference awards the Highest Science and Technology Award. Certificates signed by the President and monetary awards are presented to celebrate scientists' great achievements.

You may see the list of award winners in 2020 at this website: <http://www.most.gov.cn/ztl/gjxjsjldh/jldh2020/index.html>

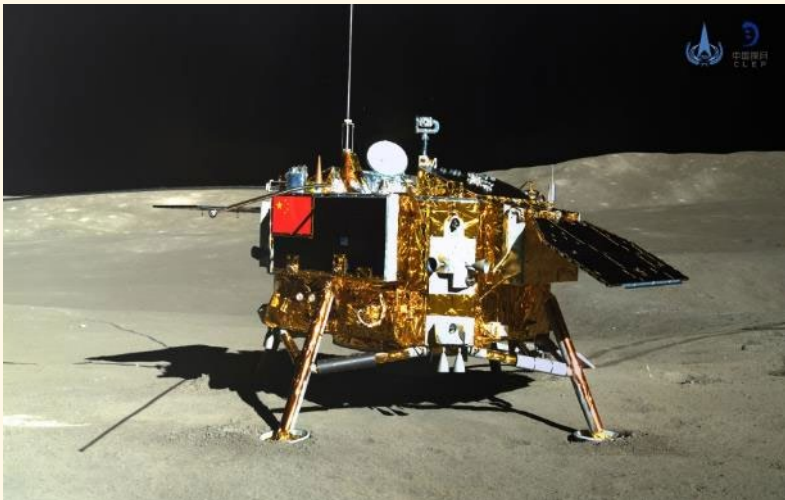


Click on the image to enter the website

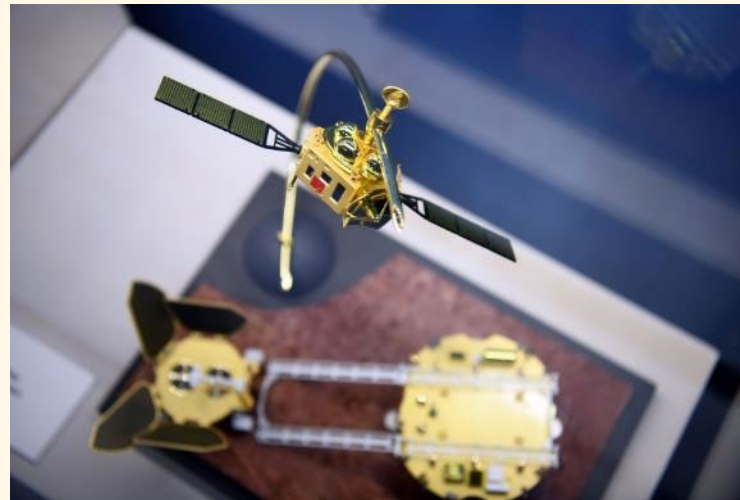
# Becoming an innovative country

## New horizon for high technology

Since the reform and opening-up, China's technological workers have been committed in developing the deep space, deep sea, deep earth and deep blue (meaning the domains of Internet, information technology and AI) in an innovative way. Currently, China's high technology develops rapidly. The technology development in some domains have reached the world-class.



Chang'e 5 collected samples on the Moon



Tianwen-1 began Mars exploration



Beidou Satellite system was launched





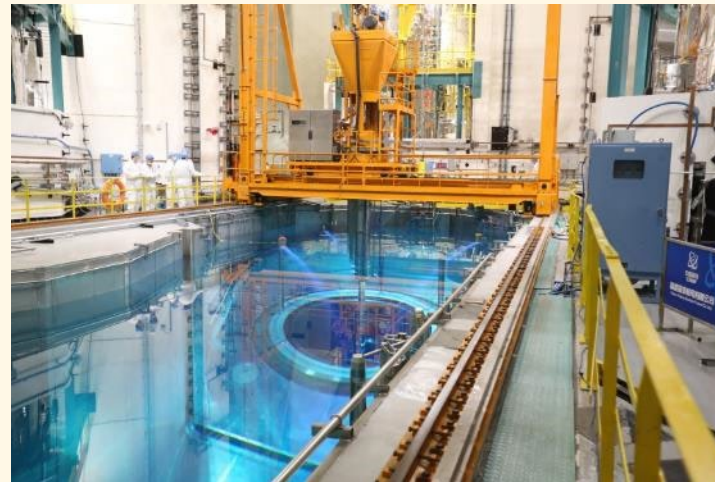
“Haidou 1” completed its underwater deep sea mission.



“Struggle” manned submersible successfully sat at the bottom of Mariana Trench



“Guohe One” represents a new generation of China’s nuclear power and technology.



“Hualong One” had a breakthrough with its third generation nuclear power technology.



The virgin voyage of the heavy dredging device “Tian Kun Hao” was a success.



On 15 May 2021, Tianwen-1 sent the Zhurong Rover to Mars. The Zhurong Rover consists of various scientific devices to conduct multiple scientific research on Mars. Many Hong Kong scientists joined the scientist research team.

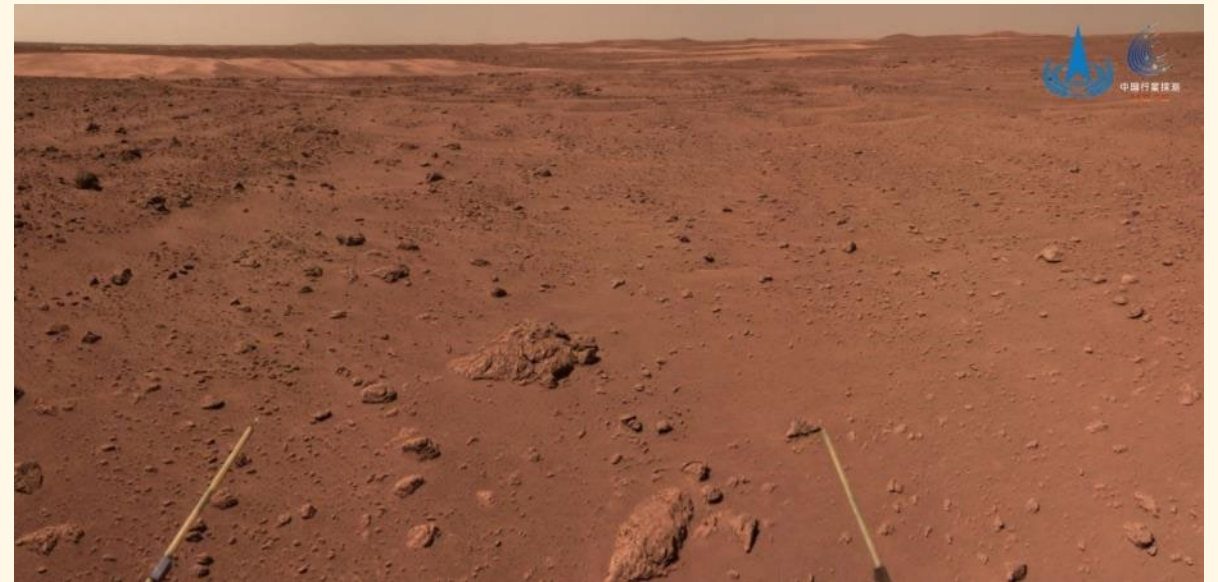


Photo of Mars sent by Zhurong

According to the *48th China Internet Development Statistics Report* published by the China Internet Network Information Center in August 2021, China's 5G network had three great achievements in scale, number of standards and innovative applications.

- In terms of scale, China has constructed 993,000 5G stations, connecting over 392 million users of 5G mobile network.
- In terms of number of standards, China has over 38% 5G standard patented, ranking first in the world.
- In terms of innovative applications, there are over 10,000 application case studies of the 5G network in China, covering 22 important industries and areas related to national economy, such as steel, electricity, and mining.

Source: People.cn. (<http://finance.people.com.cn/BIG5/n1/2021/0909/c1004-32221913.html>)

Source: Case studies of China's 5G network development



The following two videos are from The China Current

Video title: Full speed 5G application, the strength of Shenzhen  
<https://chinacurrent.com/story/20445/5g-shenzhen>

Video title: World's highest 5G station. The unusually high level of China's 5G  
<https://chinacurrent.com/story/20451/5g-on-mount-everest>

Click on the images to watch the videos

# Important progress of basic research

Basic research is the source of technological innovation and a prerequisite for technological prowess. It allows us to know the unknown and be certain of the uncertain. Since the reform and opening-up, China's strength in basic research in fields such as chemistry, physics and engineering has been greatly enhanced.

## The meaning of basic research

Basic research is a type of experimental and theoretical research to obtain basic theories and new knowledge on phenomena and observable facts. It does not aim at producing specialised application.

The quantity and quality of scientific papers represents the level of basic research. Since the reform and opening-up, the number of China's publications of scientific papers has increased rapidly.

**Ranking of countries (regions) that have published high quality international papers in 2019**

国家/地区	高质量国际论文数(篇)	占高质量国际论文比例(%)	位次
美国	62717	32.89	1
中国	59867	31.40	2
英国	19875	10.42	3
德国	16515	8.66	4
加拿大	11232	5.89	5
法国	11204	5.88	6
澳大利亚	10990	5.76	7
西班牙	8760	4.59	8
意大利	8418	4.42	9
日本	7927	4.16	10
韩国	7126	3.74	11
荷兰	6955	3.65	12
瑞士	6010	3.15	13
印度	5410	2.84	14
瑞典	4761	2.50	15
巴西	4539	2.38	16
伊朗	3689	1.93	17
比利时	3669	1.92	18
丹麦	3603	1.89	19
新加坡	3114	1.63	20

**Ranking of research institutes that have published high quality international papers in 2019**

国家/地区	研究机构名称	高质量国际论文数(篇)	占高质量国际论文比例(%)	位次
中国	中国科学院生态环境研究中心	492	0.26	1
美国	美国疾病预防控制中心	396	0.21	2
中国	中国科学院化学研究所	377	0.20	3
以色列	魏茨曼科学研究所	356	0.19	4
美国	霍华德休斯医学研究所	317	0.17	5
中国	中国科学院地理科学与资源研究所	301	0.16	6
中国	中国科学院大连化学物理研究所	274	0.14	7
法国	巴斯德研究所	265	0.14	8
日本	日本国立材料科学研究所	265	0.14	8
瑞士	保罗谢勒研究所	243	0.13	10
中国	中国科学院物理研究所	243	0.13	10
中国	中国科学院长春应用化学研究所	232	0.12	12
中国	中国科学院金属研究所	230	0.12	13
中国	中国科学院大气物理研究所	230	0.12	13
中国	中国科学院海西研究院	196	0.10	15
中国	中国科学院宁波工业技术研究院	185	0.10	16
中国	国家纳米科学中心	182	0.10	17
韩国	韩国基础科学研究所	171	0.09	18
美国	美国国家海洋和大气管理局	166	0.09	19
德国	德国赫姆霍兹环境研究中心	161	0.08	20

注：中国科学院所属各机构论文数按各研究机构统计

Source: "2020 Statistics on Scientific Papers in China". Institute of Scientific and Technical Information of China.  
<https://www.istic.ac.cn/upload/1/editor/1609204464597.pdf>



# A new step in international patents

Since the reform and opening-up, the effectiveness of establishing a patent system was obvious. People's awareness of intellectual property protection has been enhanced. In 2019 and 2020, China's number of applications for international patents was ranked first in the world.

**World Intellectual Property Organization: China became top filer for international patent**

According to WIPO's press released on 7 April Geneva time,

**China 58,990**

**USA 57,840**

**Japan 52,660**

**Germany 19,353**

**Korea 19,085**

China ended the USA's reign as the biggest user of the Patent Cooperation Treaty (PCT) System in 2019.

**200 times**



In 1999, China had filed 276 patent applications.

**Increase by 200 times  
in 20 years**

# New breakthroughs in high technology

High technology is characterised by its high investment on research and development, high technological level, high value-added, low pollution, low emission and great competitive-advantage. It is at the top of the industry chain. In China, the development of high technology, such as AI, digital economy, pattern and speech recognition, 5G mobile technology and drones, is prospering and continues to be innovative, leading the industry to expand rapidly.



The large C919 aircraft completed its debut test flight voyage at Shanghai Pudong International Airport. C919 is ready to launch.



The tunnel boring machine with the largest diameter in the world had a successful launch.



China's 600km/h maglev train performed its first test run



The Clean energy car was assembled in the assembly line at the New Energy Industry Base in Xian.

# Technology related to people's livelihood is greatly enhanced

Technology related to people's livelihood aims to serve the people by lowering the cost, increasing efficiency and improving people's quality of life. In recent years, China's technological development has put the safeguarding and improvement of people's livelihood at a prominent position. The development of technology related to people's livelihood has great achievement regarding health, security, environment, disaster prevention and mitigation, poverty alleviation and meteorological mapping.

Photo credit: Xinhua News Agency



“Intelligent farming” has boosted farm production.



Drone assists meteorological mapping



## Reference

For many years, China needed to feed 22% of the world's population with just 7% of the world's arable lands. Therefore, it is vital to increase food productivity. The Father of Hybrid Rice, Yuan Longping (Right) who was an agricultural scientist, understood the importance of food production. For decades, he lived in a remote rural area in Hunan to conduct research of hybrid rice. His technology has been spread to over 30 countries and regions in the world. Hybrid rice technology plays a significant role in enhancing the production of food in China and the world.

To learn more about Yuan Longping's story and contribution, please watch the following video:

“Sunday file: Father of Hybrid Rice – Yuan Longping”

<https://www.youtube.com/watch?v=elqWPSR-C9k>

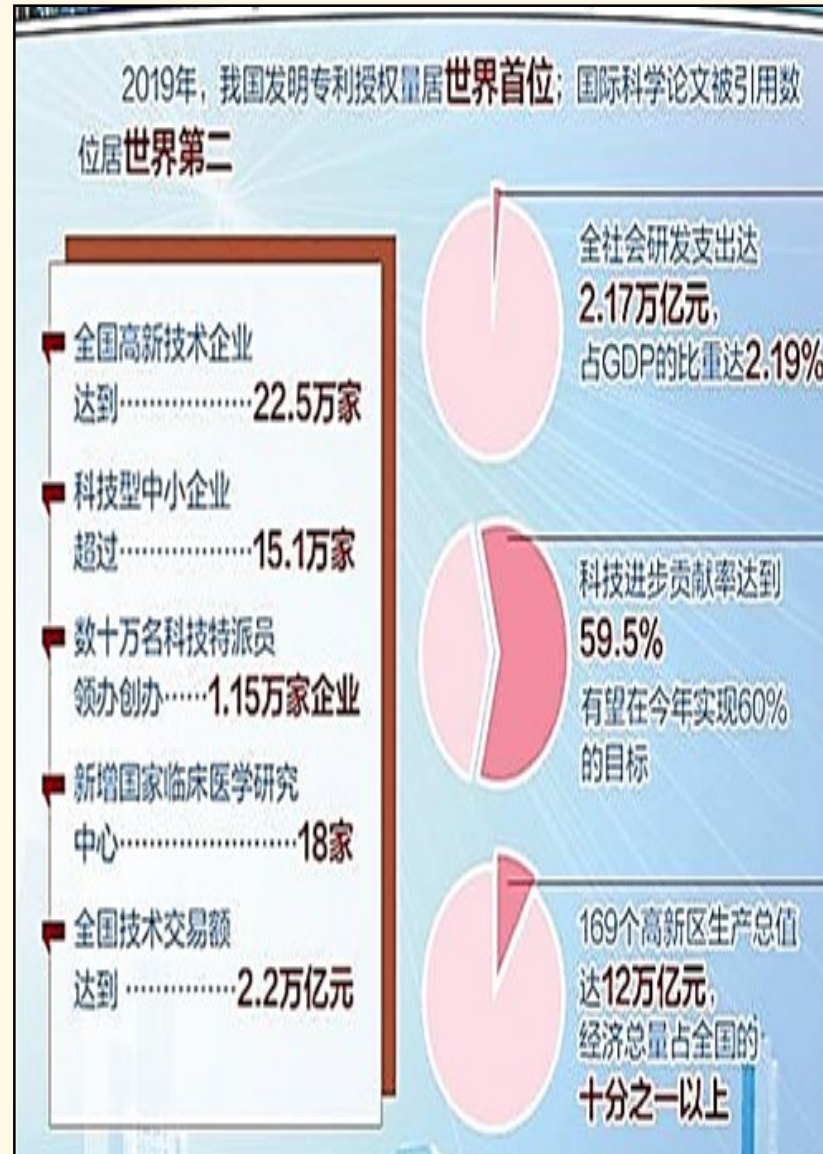


Photo credit: Xinhua News Agency



## China is transforming into an innovative country

Technological innovation is a determining factor of overall national strength. Since the reform and opening-up, the overall technological level of China has been greatly improved. The quantity of technological advancement has led to a transformation in quality. The breakthrough of individual cases led to the development of the system. Technological innovation has achieved historical heights. Overall speaking, China's technology level is increasing. It has become a technological power.



In 2019, our Country had the largest number of invention patents in the world. Our country had the second largest number of international research paper cited in the world.

Number of new innovative technology companies in the country - 225 thousands

Number of technology-based small-medium enterprises – 151 thousands

Several hundred thousands of technology specialists led and started 11.5 thousands companies

Number of newly found national research centres for clinical medicine – 18

National Technology transaction volume -- 2.2 trillion dollars

Social research and development expenses -- 2.17 trillion dollars which accounts for 2.19% of GDP

Contribution rate of scientific and technological progress reached 59.5%

It is expected to reach the target of 60% this year (i.e. 2020)

The gross productivity of 169 high technology and innovation area reached 12 trillion dollars  
It is more than 10% of the national aggregate economic volume.

## Reference

China has the most comprehensive bridge construction technology and advanced, modernised equipment to lay down railway tracks in all types of land. The high-speed train uses a low-resistant aerodynamic design and smooth surface to lower the resistance. China also has the world's largest traction power network and monitoring and control system for high-speed trains to fulfil the high demand of a massive network and the practice of double-heading. China has the world's largest high-speed train network with an intensive command system.

Watch the following video to learn the history of China's high-speed train and the economic efficiency brought to cities by high-speed trains.



Click on the image to watch the video

Video title: High-speed train economic zone

<https://chinacurrent.com/story/22694/high-speed-rail-economic-zone>

Source of video: The China Current

# Summary

- Since the reform and opening-up, our country's capability in technological innovation has been raised. Technology has brought tremendous change to China's economy, society and other areas. It also supports the development of industries, enhances China's overall national strength and competitiveness in the world. It is also incredibly important in safeguarding national security.
- Technological innovation and education are the two main pillars for revitalization in China. China has implemented the strategy of "invigorating China through science and education". Science and education work together to facilitate the development of overall national strength in China.

# National Defence

## Importance of national defence in overall national strength

- The power of national defence refers to the ability to protect national security and interest. It includes the size, composition, training, equipment, mobility, industrial production and reserve of the military. It is an important part of overall national strength as it reflects a country's ability to stabilise the society and ability to defend its territories, sovereignty and interests in the international society.
- The status and impact of national defence in the overall national strength are equally important in different periods of time. At war, it determines whether a country can win; at peace, it should not be overlooked, as only the countries with powerful national defence ability can safeguard its own national security.



## Lead-in

## Activity

Browse the website of the Central People's Government of the People's Republic of China and learn about the land area, the length of coastline, the area of inland waters and border sea and the number of islands.



Photo credit:

Website of the Central People's Government of the People's Republic of China.  
<http://www.gov.cn/xhtml/2016gov/images/guoqing/bigmap.jpg>

## Building a national defence force and the path to military power

From 1978 to 1991, the guiding ideology of military and national defence stressed that the military must obey China's overall national construction. It aimed to build a modernised and standardised national military to implement the military strategy of active defence. At this stage, the defence and military construction were at a low input state.

From 1992 to 2012, China has made great achievements in economic development as China became the second largest economy in the world in 2010, laying a solid foundation for defence and military construction. At this stage, China stressed that the country must “strengthen the military, strengthen its national defence and ensure the smooth progress of the reform, opening-up and economic construction.” It clearly stated that national defence should be developed in co-ordination with economic development. This stage can be considered as the “initial stage of development” of national defence and military construction.

Since 2012, China's economic construction has grown rapidly for a relatively long time, laying the foundation for the military and national defence construction. With the support and guarantee of national defence expenditure, national defence and military construction has shown great progress. Weapons and equipment have been upgraded and training level has been continuously improved. The entire army has taken on a new look. During this period, emphasis was placed on building national defence and the military commensurate with China's international status, national security and development interests. National defence and military construction has entered the "all-round development stage".

Type 99 Main Battle tank



Chinese naval fleet went to the Gulf of Aden



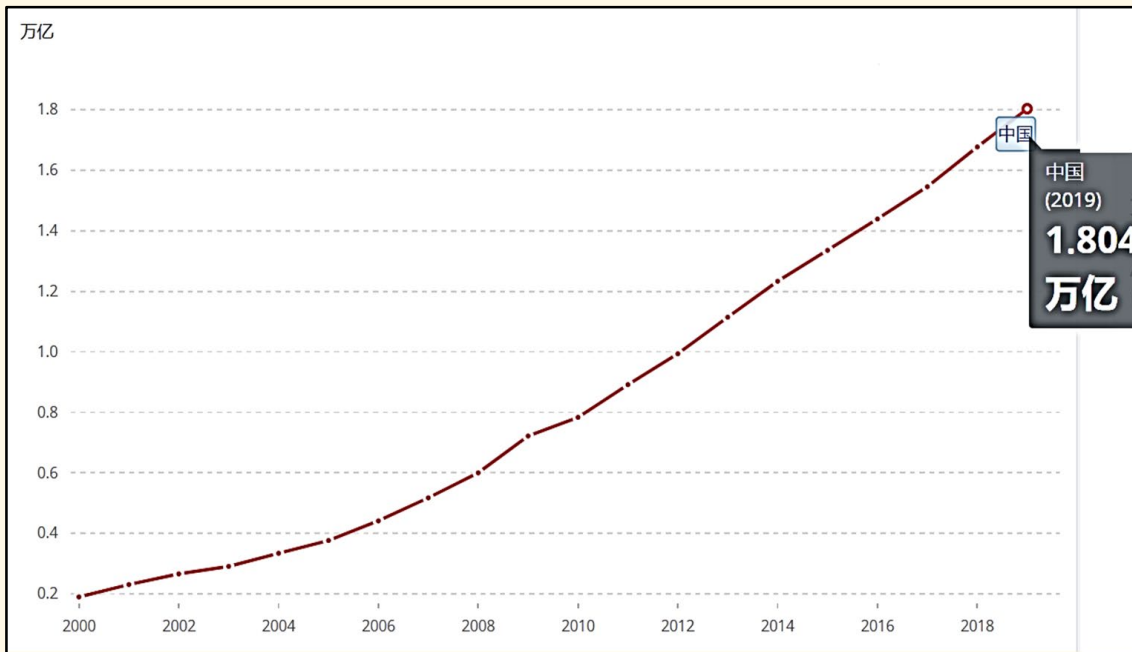
J-15 fighter jet took off from the aircraft carrier Liaoning



Photo credit: Academy of Chinese Studies

Since around year 2000, in order to safeguard national security and development interests, China's national defence expenditure has steadily increased on the basis of rapid economic development (bottom left), but this has not caused national economic and financial difficulties. The main reason is that the national economy is strong, and the military expenditure has always maintained a low level and remained stable in proportion to GDP (bottom right).

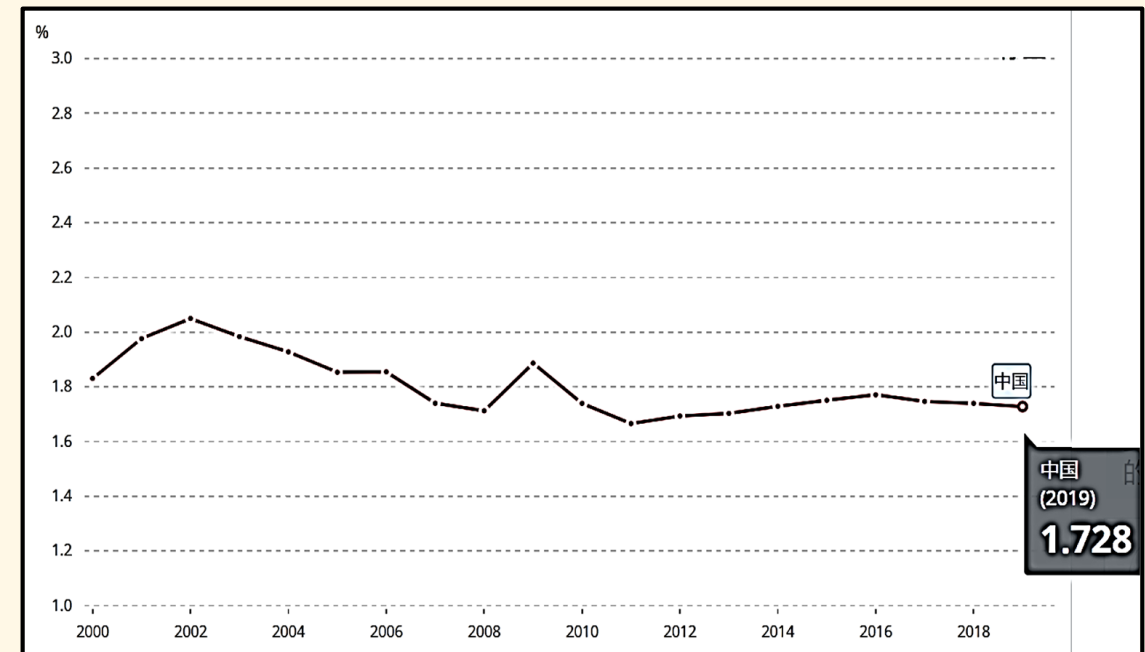
China's national defence expenditure, 2000-2019 (RMB)



Source: Website of World Bank

<https://data.worldbank.org.cn/indicator/MS.MIL.XPND.CN?end=2019&locations=CN&start=1989&view=chart>

China's national defence expenditure as a percentage of gross national product, 2000-2019



Source: Website of World Bank

<https://data.worldbank.org.cn/indicator/MS.MIL.XPND.GD.ZS?end=2020&locations=CN&start=1989>



In 2021, China's national defence expenditure budget ranked second in the world, and the USA ranked first was 3.5 times of China's national defence expenditure. The per capita national defence expenditure of the USA was more than 15 times of China's. Among the top ten countries with the highest spending on national defence, China's per capita national defence spending was among the lowest (see the figure below).

Top Ten National Defence Expenditure Budgets in the World, 2021

Ranking	Country/Region	Defence expenditure (US\$100 million)	Population (in 10,000)	Defence expenditure per capita (USD/person)	GDP per capita (USD/person)	Ratio of defence expenditure per capita to GDP per capita (%)	Region
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China's spending on national defence aims to maintain a peaceful environment for development rather than dominating the world.

排序	国家/地区	国防开支(亿美元)	人口(万人)	人均国防开支(美元/人)	人均国内生产总值(美元/人)	人均国防开支占人均GDP(%)	所属区域
1	美国	7405.0	33100	2237.1	54225.4	4.1	北美
2	中国	2090.0	141178	148.0	15308.7	1.0	亚洲
3	印度	736.5	138000	53.4	6426.7	0.8	亚洲
4	德国	574.3	8378	685.5	45229.2	1.5	欧洲
5	英国	560.4	6789	825.5	39753.2	2.1	欧洲
6	日本	517.0	12648	408.8	39002.2	1.0	亚洲
7	沙特阿拉伯	485.0	3481	1393.1	49045.4	2.8	亚洲
8	韩国	480.0	5127	936.2	35938.4	2.6	亚洲
9	法国	477.0	6756	706.0	38605.7	1.8	欧洲
10	澳大利亚	427.0	2550	1674.5	44648.7	3.8	大洋洲

Source: "Ranking of national defence expenditure budgets of countries and regions in the world in 2021 (2021年世界各国与地区国防开支预算排行榜)". Chanye Xunxi Wang. 7 June 2021. <https://www.chyxx.com/bang/202106/955719.html>

## Building a world-class army

The world today is undergoing tremendous and unprecedented changes in a century. In order to adapt to the development trend of a new military revolution in the world and to fulfil the national security needs, China must comprehensively strengthen the reform of national defence and the army, and achieve the goal of building the People's Liberation Army into a world-class and all-rounded military force by the mid-21<sup>st</sup> Century. At the same time, China promotes the foreign policy of win-win co-operation and seeks to promote world peace. Military construction is neither a measure aimed at any country nor a threat.

### Reference

In March 2021, President Xi Jinping stated that the current security situation in China is unstable and uncertain. The entire military should devise comprehensive plans and be prepared for wars. It should be ready to tackle all kinds of complicated and difficult situations at any time. The military should resolutely safeguard the national sovereignty, security and development interests, providing a strong support for the construction of a socialist and modernised country.

# National defence development goals from 2020 to the mid-21<sup>st</sup> Century

2020

To realise mechanisation, to achieve significant progress in informatisation construction, and to substantially improve strategic capability.



2035

To achieve national defence and military modernisation.



Mid-21<sup>st</sup> Century

To build a world-class People's Liberation Army in an all-rounded way.

Photo credit: Press release of the Government of Hong Kong Special Administrative Region (<https://www.info.gov.hk/gia/general/201707/07/P2017070700380.htm>)



On the morning of 1 October 2019, the celebration of the 70<sup>th</sup> anniversary of the founding of the People's Republic of China was held in the Tiananmen Square in Beijing. It was followed by a grand military parade to showcase the country's military strength in national defence.



Photo credit: Website of the Chinese Government. <http://www.gov.cn/zhuanti/2019guoqing/>



The scale structure and strength of the military have been optimised. Reforming the scale structure and strength of the military is a key step to promote the modernisation of the army and build a modern military power with Chinese characteristics. In accordance with the requirements of adjusting and optimizing the structure, developing new types of forces, rationalizing the major proportionate relationship, and reducing the quantity, China is promoting the transformation of the army from quantity-scale and manpower-intensive type to a quality-efficient and technology-intensive type.



Xi Jinping: China will reduce the number of army by 300 thousand  
 On 3 September, Xi Jinping, the General Secretary of the Chinese Communist Party, the President, Chairman of the Central Military Commission, announced that China will reduce the number of army by 300 thousand during his speech at the Commemoration of the 70th Anniversary of the Victory of the Chinese People's War of Resistance Against Japanese Aggression and the World Anti-Fascist War.

Army Groups

Reduced from 18 to 13

Navy, Rocket Force

Increased

Air Force

- Maintain the original size.
- A new support force is set up.

Military force (10,000)

Decided to reduce the scale of army (10 thousands)

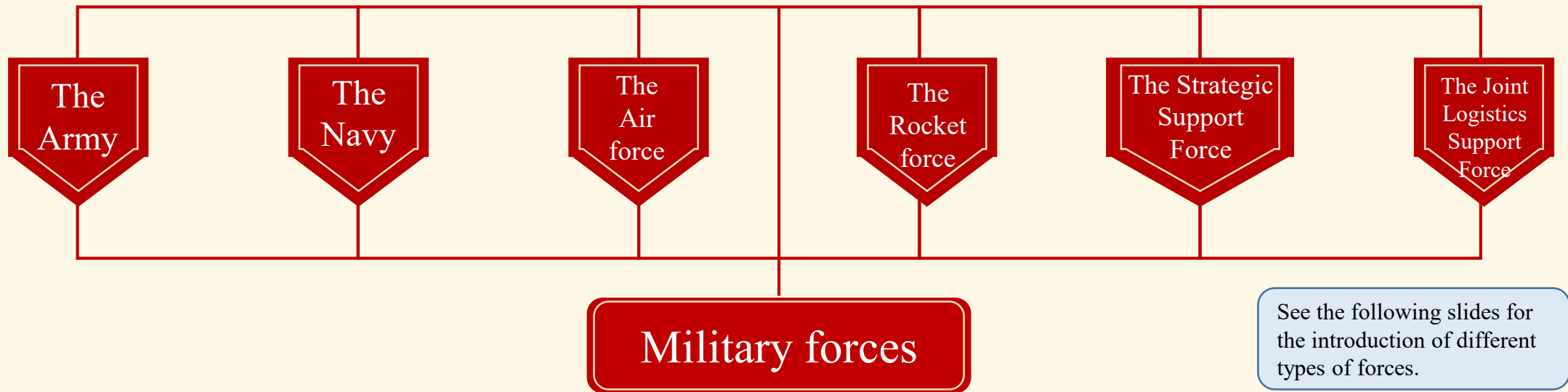
Since the Reform and Open Policy, the Chinese army has 3 large-scaled reductions.

Photo credit: Xinhua News Agency



The leadership and management system of services and army forces is improved. A leadership and management system of “Central Military Commission-Army Services-Army Forces Unit” has been established.

## Central Military Commission



See the following slides for the introduction of different types of forces.

## Structure of the military leadership management system

## The Army

The army plays an irreplaceable role in safeguarding national sovereignty, security and development interests. According to the strategic requirements of mobile operations and all-rounded attack and defence, the transformation from regional defence to global operation is implemented, and the capabilities of precision operation, all-rounded operation, global operation, multi-functional operation and sustained operation are improved. It strives to become a powerful modern new army.

Photo credit: Xinhua News Agency



The tank phalanx on the military parade of 2019 National Day



Wheeled assault tank phalanx was being inspected



## The Navy

The navy plays an important role in national security and development. According to the strategic requirements of “Near Seas Defence and Far Seas Protection”, China aims to speed up the transformation from near sea defence to far seas protection, improve strategic deterrence and counterattack, maritime mobile operations, maritime joint operations, comprehensive defence operations and comprehensive support capabilities. It strives to build a powerful modern navy.



China's first domestic aircraft carrier, Shandong, was delivered to the Navy at a military port in Sanya, Hainan.



The Navy organised live-fire confrontation exercise in the sea and airspace near Hainan Island and Xisha, and officers and crew were operating of the Chinese destroyer Hefei.



## The Air Force

The Air Force plays a determining role in national security and military strategy. According to the strategic requirements of integrating air and space with both offensive and defensive capabilities, China speeds up the transformation from national air defence to the enhancement of both offensive and defensive capabilities, improves the capabilities of strategic warning, air strike, air defence and anti-missile, information countermeasure, airborne combat, strategic delivery and comprehensive support, and strives to build a powerful modern air force.



The Xian-6K bombers and Shenyang J-15 fighter jets of an Air Force regiment flew over Miyako Strait for training.



Chengdu J-20 debuted in the 11<sup>th</sup> China International Aviation and Aerospace Exhibition.

## The Rocket Force

The Rocket Force plays a vital role in safeguarding national sovereignty and security. According to the strategic requirements of having both nuclear and regular capabilities and having global deterrence, China strengthens its reliable nuclear deterrence and nuclear counterattack capabilities, strengthens the construction of medium-and long-range precision strike forces, enhances strategic checks and balances, and strives to build a powerful modern rocket force.



The Rocket Force organised combat training with live ammunition in Gobi training field.



A squad leader of a rocket regiment was conducting a theoretical presentation in the training field.



# The Strategic Support Force

The Strategic Support Force is a new type of combat force to safeguard national security. It includes battlefield support, information and communication support, information security defence, testing of new technology and other support forces. According to strategic requirements of system integration and integration of military and civilian technologies, China promotes the leap-forward development in key areas and accelerates the integrated development of new combat forces.



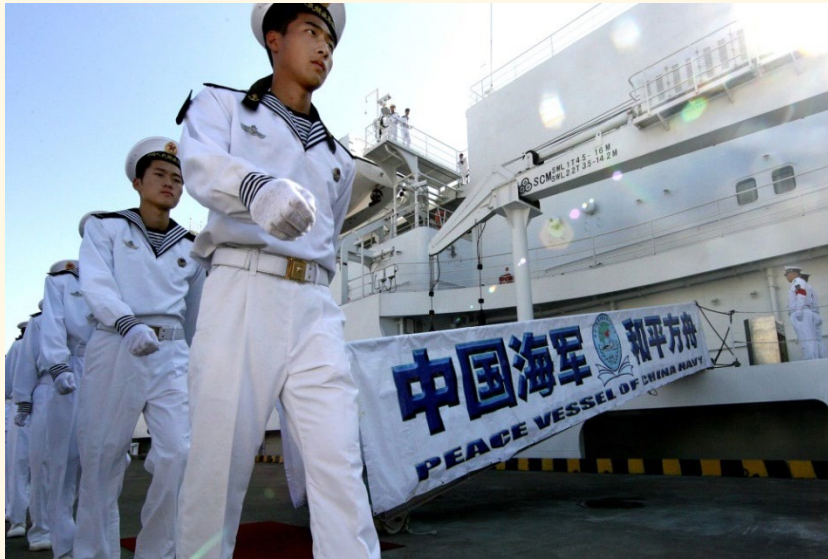
The Strategic Support Force's fourth team responsible for military intelligence participated in the National Day Military Parade on 1 October 2019.



Provide information support and security for the combat troops.

# The Joint Logistics Support Force

The Joint Logistics Support Force is the main force to implement joint logistics support and strategic campaign support, and it is an important part of a modern military power system with Chinese characteristics. It includes warehouses, medical services, transportation and delivery, oil pipelines, engineering construction management, reserve asset management, procurement, etc. According to the requirements of joint operations, joint training and joint support, China accelerates the integration of the joint operations system and improves the integrated joint support capability.



Chinese hospital ship Peace Ark went abroad for the first time to provide medical services.



Strategic airlifter Xi'an Y-20 carries relief supplies to Tonga.



## ➤ The importance of national defence: Safeguarding national security

A first-class army can only be built by actively recognising, understanding and responding to changes. A first-class army needs to rely on first-class talents, equipment, system, establishment and training. Only by building a first-class army can China defend its national sovereignty, unity and territorial integrity, bringing prosperity to China.



A national army brigade conducted battle drill.



China and Russia conducted the “Maritime Joint-2019” military exercise. The picture shows a Chinese naval frigate launching a rocket.



The Far Sea Training Formation of the South China Fleet cruised the James Shoal and took the oath to serve.

## ➤ The importance of national defence: Safeguarding the country's overseas interests

The People's Liberation Army provides strategic support for safeguarding the country's overseas interests. Wherever our national interests are, security must be guaranteed.



The Navy's 37<sup>th</sup> formation set sail for the Gulf of Aden to carry out targeted training such as rescue of hijacked merchant ships, anti-terrorism and anti-piracy training, inspection and arrest, and joint search and rescue of ships and aircrafts. They also escort Chinese ships.



The completion and commissioning of the overseas support base of the Chinese People's Liberation Army in Djibouti will fulfill its international obligations such as escorting in the Gulf of Aden and Somali waters, and carrying out humanitarian relief. The picture shows the Chinese naval frigate Ma'anshan successfully berthing at Port de Djibouti for rest and replenishment.



# ➤ The importance of national defence: Contributing to world peace and development

China has always adhered to peaceful development, win-win co-operation, upholds the concept of common, comprehensive, co-operative and sustainable security and a defensive national defence strategy. China has always been a builder of world peace and a defender of international order, making contributions to world peace and development.



China's peacekeeping force in Mali conducted the first joint exercise with the armies of many countries.



China's peacekeeping force in Lebanon have completed their 18 rotations.

# Summary

- Economy development is the foundation of national defence development, and the strength of national defence and economic strength should complement each other.
- With the improvement in China's economic strength, national defence and military construction are growing in size and strength, and from marching on foot to information warfare. It is currently building a world-class army.
- China has always adhered to peaceful development, win-win co-operation, upholds a common, comprehensive, co-operative and sustainable security concept and a defensive national defence strategy.
- China has always been a builder of world peace and a defender of the international order, making contributions to world peace and development.



# Summary of lesson

Since the reform and opening-up, China's economic strength has been continuously improving. China is a country with a long history and cultural tradition. It has gained new vitality since the reform and opening-up. The expansion of the education scale and the improvement of education quality guarantee human resources for economic and social development. Natural resources have been effectively utilised and protected. The scientific and technological innovation competence has been improved rapidly. China has made new progress in the modernisation of national defence and the military force.

To conclude, the overall national strength of China has been significantly enhanced, and China's influence in the international community is growing day by day, and its position is significant.

# Websites for further reading

## 1. Related departments of the Chinese Government

- Central People's Government of the People's Republic of China. <http://english.www.gov.cn/>
- National Bureau of Statistics. <http://www.stats.gov.cn/english/>
- Ministry of Culture and Tourism. <https://www.mct.gov.cn/>
- Ministry of Education. <http://en.moe.gov.cn/>
- Ministry of Natural Resources. <http://www.mnr.gov.cn>
- Ministry of Science and Technology. <https://en.most.gov.cn/>
- Ministry of National defence. <http://eng.mod.gov.cn/>

## 2. Recent white papers released by the Chinese Government

- China's Armed Forces: 30 Years of UN Peacekeeping Operations. 18 September 2020.  
[http://english.www.gov.cn/archive/whitepaper/202009/18/content\\_WS5f6449a8c6d0f7257693c323.html](http://english.www.gov.cn/archive/whitepaper/202009/18/content_WS5f6449a8c6d0f7257693c323.html)
- China and the World in the New Era. 27 September 2019.  
[https://english.www.gov.cn/archive/whitepaper/201909/27/content\\_WS5d8d80f9c6d0bcf8c4c142ef.html](https://english.www.gov.cn/archive/whitepaper/201909/27/content_WS5d8d80f9c6d0bcf8c4c142ef.html)
- China's National Defence in the New Era. 24 July 2019.  
[https://english.www.gov.cn/archive/whitepaper/201907/24/content\\_WS5d3941ddc6d08408f502283d.html](https://english.www.gov.cn/archive/whitepaper/201907/24/content_WS5d3941ddc6d08408f502283d.html)

## 3. Related resources by the Education Bureau and other organisations

- Liberal Studies Curriculum Resources Booklet Series: Modern China.  
[https://ls.edb.hkedcity.net/file/about/related\\_publications/modern\\_china\\_e1.pdf](https://ls.edb.hkedcity.net/file/about/related_publications/modern_china_e1.pdf)
- China Current. <https://chinacurrent.com/>
- Academy of Chinese Studies. <https://chiculture.org.hk/tc>
- Liberal Studies: Modern China. <https://ls.chiculture.org.hk/tc>

# User Guide

- The primary users of this resource are teachers. It aims to provide teachers with content knowledge relevant to the topic to enable teachers to have a deeper understanding of teaching content when preparing for their lessons.
- All data, videos, photos, pictures, questions and suggested answers can be used for multiple purposes, such as teachers' teaching materials, references for curriculum planning and learning and teaching, and student assignments, etc. To align with Citizenship and Social Development Curriculum and Assessment Guide (Secondary 4-6) (2021) (C&A Guide), this resource should be adapted to cater for students' learning diversity and the needs of classroom teaching, etc.
- Teachers may provide appropriate supplementary notes/ explanations to enrich this resource in order to enhance students' understanding of the topic and information provided.
- In accordance with the curriculum rationale and aims, teachers may select other learning and teaching resources which are correct, reliable, objective and impartial to help students build up a solid knowledge base, develop positive values and attitudes as well as enhance critical thinking and problem solving skills, and various generic skills.
- If some information cannot be provided in this resource due to copyright issue, teachers may visit relevant websites provided.
- Some information may have been updated when being used by teachers, teachers may visit the corresponding websites to obtain the up-to-date information.
- Please also refer to the C&A Guide to understand the requirements and arrangements of the learning and teaching of the curriculum. Teachers are welcome to point out the areas need improvement, and welcome to provide updated information to enrich the content for all teachers' reference.

# Notice and Disclaimer

- Some sources were not translated into English as the official English version is not available.
- In case of any discrepancy between the Chinese and English versions, the Chinese version shall prevail.