

## READING A

## RESEARCH AND DEVELOPMENT

1. The term R&D, or research and development, refers to a specific group of activities within a business. R&D activities differ from company to company, but there are two main functions common to all research and development groups: 1) to develop new products and 2) to discover and create new knowledge. **Although new knowledge is usually necessary to develop new products, developing a new product is not a must for creating new knowledge.**
2. Research and development includes a range of interesting subjects, advanced technologies, and high-quality products. Scientific research generally takes place at technical universities or in other public or private research institutes. Companies also aim to develop scientific knowledge because they want to use this knowledge to make profitable products, services, or processes. Companies have to invest in R&D activities in order to survive in increasingly competitive markets.
3. Research and development plays an essential role in the improvement of our world. It is a significant factor that contributes to economic and social growth. No matter what the purpose is, the knowledge from today's research will benefit all the members of society in the future. With R&D, technology and information processes evolve and become more efficient every day. Therefore, both public and private investment in R&D has increased over the years.
4. A good example of research and development for public benefit is in the health sector. R&D activities in health care systems have resulted in improved health services, high technology used in hospitals, and new medicines. All around the world, the quality of life has improved as a result of this progress in health care. Because of this, many people think governments should finance R&D. They believe the use of some knowledge such as the chemical formula for cancer medication should be non-rival. The fact that one company discovered it should not stop other companies from using it. Once it is discovered, it should be available to everyone because human health is valuable.
5. Research shows that there is a direct link between government support for R&D and the quality of life in that country. **Countries where research and development is properly financed enjoy better life standards in general.** On the other hand, countries where R&D is **neglected** are generally poorer. Not only are these countries poorer, but also they lose their most brilliant scholars and researchers to more developed countries. If a country does not invest enough in R&D, scientists and engineers in that country tend to migrate to more developed countries. This is called *intellectual exodus*. The social and economic cost of intellectual exodus can be terrible for homeland country because social and economic progress becomes almost impossible in these countries.

## A

6. Although governments may not always give money for research and development directly, there are ways to encourage it. First, governments protect intellectual property with patents and copyrights. **These** encourage private investment in R&D. A patent gives a company the legal right to a new product for twenty years from the date that product is invented. Other companies either have to wait for twenty years or buy the rights to manufacture the patented product. On the other hand, artistic creations such as books, films, music and software are not patented, but they have copyright protection. Without protection, companies, authors, engineers and scientists would not have the motivation to do research because they would not profit from it. People do business to make money. Naturally, profit is one of the motivating forces behind R&D. Patent and copyright laws make it possible for businesses to profit from R&D. Without profit, private investment in R&D would **halt**.
7. Another government policy that encourages research and development is to **subsidize** it. Governments can support businesses for R&D activities by giving credit through government-owned banks or by giving them tax benefits. When governments give credit at low interest rates, and let businesses pay less tax, R&D activities become less expensive and more attractive for businesses.
8. The final way for governments to encourage research and development is to finance education. Good education makes it possible to have qualified and skilled workers that can do research in different areas. Without engineers, architects, scientists, researchers, laboratory workers and qualified experts, R&D is not possible. Therefore, governments can and should help increase the number of these people. This can be achieved in different ways. Governments can provide free education and support public colleges and universities financially. They can also give scholarships to support students' education expenses. This is one of the most common educational policies to support successful students. In order for R&D to improve and grow, a rich intellectual and technical environment is necessary. Such an environment can only be achieved with a government-funded education system.
9. Besides government support, financial support of the private sector is a major driving force behind research and development. World-leading multinational enterprises, or MNEs, such as Apple, Microsoft, Toyota, and Adidas are spending billions of dollars on R&D activities for the development of better products and more efficient technologies. Cars parking themselves with cameras and sensors, or smart phones are just a few examples of the outcome of R&D by the private sector. In addition to the development of new products and services, R&D by the private sector results in economic growth and regional development of many Asian and Middle Eastern countries.
10. With globalization, MNEs have started to play an important role in the economies of developing countries. These big companies are the key investors in research and development. MNEs are investing huge amounts of money in R&D activities outside their home countries. One of the main reasons for them to invest in R&D in developing countries is the search for lower costs since engineers and researchers outside Europe and the USA are much

## A

cheaper. Also, these companies aim to access knowledge and a highly educated workforce. In addition, access to markets and future markets is also a strong reason for the growth of R&D towards developing countries. China and India are on the top of the list of countries that attract the R&D activities of MNEs. They are already big markets with their huge populations and the number of skilled workers in these countries makes it possible for MNEs to lower their R&D costs.

11. Other countries attract MNEs because of their growing population and government support for research and development by the private sector. As a result of population growth, governments are trying to find ways to create more jobs in their countries. For example, the Turkish government gives about \$ 100 thousand tax benefit to businesses for each new person they employ. There are several examples of such MNEs operating in Turkey. A good case example of one of these is the Bridgestone Corporation, a tyre manufacturer originally from Tokyo, Japan. Bridgestone formed a joint venture with the Turkish company Hacı Ömer Sabancı Holding AS (SAHOL). The joint company is now known as BRİSA. When a sector-leading multinational company such as Bridgestone joins **its** resources with a smaller company in a developing country, both sides benefit from this. The advantages for the local companies are clear and immediate: they will benefit from all the knowledge and the wide network of contacts of the bigger company. Another benefit for the local company is the positive image and marketing skills of the global brand. As for the multinational enterprise, it will benefit from the already skilled cheap workforce of the smaller company.
12. In the absence of research and development, there would be very limited knowledge and very little improvement in people's lives. Therefore, research and development is necessary for a better and wealthier future, not only from a financial and economic point of view but also from a social perspective.

**Answer the following questions using the information in the text. Mark all your answers on the OPTIC FORM.**

1. **“Although new knowledge is usually necessary to develop new products, developing a new product is not a must for creating new knowledge”** is closest in meaning to...
  - A. it is necessary to develop new products so that new knowledge is created.
  - B. R&D groups can work on something only for the purpose of discovering knowledge.
  - C. R&D groups must know how to create new products in order to discover new knowledge.
  - D. it is possible to develop new products without creating new knowledge.
2. It is necessary for the companies to invest in R&D activities because...
  - A. they have to keep their position in the market.
  - B. scientific knowledge is not transferable to new products.
  - C. there are not enough technical universities.
  - D. R&D activities include different subjects and technologies.

## A

3. According to paragraph 4, if some knowledge is “**non-rival**”, it is...
- A. used in health care. C. professional.  
B. easily accessible. D. scientific.
4. In paragraph 5, “**Countries where research and development is properly financed enjoy better life standards in general.**” is closest in meaning to...
- A. countries with better life standards usually move R&D activities to poorer countries.  
B. richer countries can finance research and development because of better life standards.  
C. better life conditions result from proper finance of research and development.  
D. spending money on research and development decreases citizens’ quality of life.
5. Intellectual exodus is ...
- A. a benefit of research and development. C. weakening for the homeland country.  
B. an improvement in social progress. D. a problem for developed countries.
7. In paragraph 6, “**these**” refers to...
- A. governments. C. research and development.  
B. patents and copyrights. D. intellectual property.
8. In paragraph 6, “**halt**” is closest in meaning to...
- A. come to an end. C. decrease motivation.  
B. continue to improve. D. increase quality.
9. Which of the following is **TRUE** about the difference between patents and copyrights?
- A. Patents cover artistic work, and new products are copyrighted.  
B. Manufactured goods are patented, but software is copyrighted.  
C. Copyright protection ends in 20 years, but patents don’t have a time limit.  
D. Patent protection covers all kinds of creations, but books are copyrighted.
10. Patent and copyright laws are important for businesses because...
- A. they motivate people to create new things.  
B. governments profit from new creations.  
C. profit from R&D is used for the good of society.  
D. researchers protect their companies by making money.
11. In paragraph 7, “**subsidize**” is closest in meaning to...
- A. check. C. allow.  
B. sponsor. D. create.
12. Governments can finance education by doing **ALL** of the following **EXCEPT** for...
- A. offering free education to all citizens. C. helping students with their school costs.  
B. giving money to public schools. D. finding skilled researchers in institutions.

**A**

13. Apple, Microsoft, Toyota, and Adidas are given examples to...
- A. show that the private sector spends huge amounts of Money on R&D.
  - B. prove that the contributions of the private sector to R&D is insignificant.
  - C. compare government support to financial support of the private sector.
  - D. discuss the effects of research and development on the private sector.
14. Which of the following is **ONE** of the reasons why MNEs do their R&D activities in developing countries?
- A. To attract developing countries.
  - B. To sell in new markets.
  - C. To educate their workforce.
  - D. To lower the number of engineers.
15. The example of Turkish Government shows that...
- A. R&D activities can be expensive for governments.
  - B. \$ 100,000 is not enough to support R&D.
  - C. R&D is a way to decrease unemployment.
  - D. Turkey has a strong economy to support R&D.
16. In paragraph 11, what does "its" refer to?
- A. joint venture's
  - B. multinational company's
  - C. BRISA's
  - D. developing country's

Match the sentence halves to make meaningful sentences according to the information in the text. There are **TWO EXTRAS** in Column B.

A	B
17. China and India...	A. ... have recently started to cooperate.
18. Bridgestone and SAHOL...	B. ... benefit from regional development in Middle Eastern countries.
19. Multinational Enterprises...	C. ... attract businesses because they help lower R&D costs.
	D. ... have been affected negatively by globalization.
	E. ... are moving their R&D activities to other countries.

Match the paragraphs with their main ideas. There are two extra main ideas.

20. Paragraph 3	A. R&D is essential to economic and social growth.
21. Paragraph 4	B. Public investment is the key contributor in R&D activities.
	C. R&D will increase the number of researchers in a country.
	D. Health research has improved people's quality of life.