

## MODULE 8

### AIR AND SEA TECHNOLOGY

“The aeroplane has unveiled for us the true face of the earth.” - *Antoine De Saint-Exupery, a French writer and pilot.*



#### Learning points for Module 8:

- **Reading:**

Text 8A. From a Dream of Flight to Modern and Future Air Travel

Text 8B. Discover the Hovercraft

Text 8C. Pioneers in the sky

- **Vocabulary in context:** Word definitions. Collocations. Synonyms
- **Grammar:** Forms of Infinitives. Infinitive Constructions
- **Speaking:** A new Birth of Closed Projects

#### Learning aims:

- to practise reading and speaking about aircraft and submersibles;
- to learn and practise active vocabulary related to the topic of the module;

-to learn more about the infinitive and its forms, to practise understanding and using different forms of infinitives and infinitive constructions;  
-to prepare for the test.

## Lead-in

### Forms of transport

#### 1. Match the words with the pictures.

##### On water

submarine / cruise ship / hovercraft / lifeboat



##### In the sky

dirigible / jet aircraft / helicopter / balloon



#### 2. Discuss in groups.

- 1 What other forms of water or air transport do you know?
- 2 Which of them have you travelled or piloted?
- 3 What is the fastest means of transport today?
- 4 What is the safest way to travel, in your opinion?
- 5 If you were going to travel to a distant destination, would you prefer to go by air or by sea? What type of transport from the pictures above would you choose?

## READING

### Part 1

#### 3. Discuss the following words and try to match them with the definitions.

ancestor	glider	marine	airframe
milestone	propeller	tyre(s)	cockpit
failure	to spin	airliner	workload

- 1 a very important event in the development of something
- 2 an adjective to describe something connected to the sea, ships or the navy
- 3 the body of an aircraft
- 4 a piece of equipment consisting of two or more blades that spin around, which makes an aircraft or ship move
- 5 a noun meaning not doing something which people expect you to do
- 6 the amount of work that a person or machine is expected to do
- 7 a large passenger plane (old-fashioned)
- 8 to turn with a circular movement around a central point, or to make something do this
- 9 a thick round band of rubber that fits around the wheel
- 10 the area in a plane where the pilot sits
- 11 a light plane that flies without an engine
- 12 the form in which a modern machine, vehicle, etc. first existed

**4. Scan the text and find the following information as quickly as possible.**

1. What is Leonardo da Vinci credited with?
2. When and where did Lomonosov demonstrate his model?
3. When did the first airplane make its first flight?
4. What might flying in the future be like?

**5. Skim the text and decide which of the following sentences best answers the question what this text is about. Why?**

1. This text is about airplanes.
2. The text tells us about the history, present and future of air travel.
3. The text tells us about how the dream of mankind to fly like birds was realised when the airplane was invented; how aircraft design continued to adapt and change over time, which ultimately led to the era of mass travel; and, also, how some designers see the future of flying.

**Text 8A**  
**FROM A DREAM OF FLIGHT TO MODERN AND FUTURE AIR**  
**TRAVEL**



(1) The fantasy of flying through the air like birds had been in people's imagination for hundreds of years before it became a reality. Many early attempts to fly ended in failure and death\*. However, famed Italian inventor Leonardo da Vinci is credited<sup>1</sup> with designing early ancestors of the airplane based on the flight of birds.

(2) Three centuries had passed before another major milestone in vertical flight appeared. Looking for a way to loft<sup>2</sup> meteorological instruments into the air, noted Russian scientist Mikhail Lomonosov designed a model that used two propellers rotating in opposite directions on the same axis<sup>3</sup>. Lomonosov demonstrated his model powered by a clock spring<sup>4</sup> to the Russian Academy of Sciences in 1754. Questions remain whether the device managed to lift itself during the demonstration or whether it was supported by a string<sup>5</sup>.

(3) The year of 1783 was considered a breakthrough year in aviation: hot air balloons became popular in Europe with the help from the Montgolfier brothers. More significant advances came at the end of the nineteenth century when gliders were developed. Aviation industry received a boost when the Wright brothers developed the theory that the air pressure exerted on different parts of the machine could be altered by making the wings adjustable<sup>6</sup> which would maintain equilibrium. Starting in 1902, the brothers developed a full sized, power-driven heavier-than-air machine. On December 17, 1903, the first airplane made its maiden<sup>7</sup> flight. The airplane was born at just the right time for its intensive development by an industrial society. Before the availability of petrol, the Wrights' invention would have been nothing more than an improvement in gliders. The

airplane found the old marine propeller and the new petrol engine for application. Pneumatic tires replaced skids<sup>8</sup>.

(4) The following years were marked by significant progress in the technology of aircraft construction. Aviation developed incredibly fast, with longer and longer flights and progressively larger planes. Aviation shortened distances between places, made it easier for people to travel from country to country and between continents. Very large passenger airliners eventually brought relatively cheap air travel within the reach of millions of people. Today's airplanes made a reality a wide range of technological advancements, including the introduction of full fly-by-wire<sup>9</sup> flight controls

technology, employing advanced materials in its airframes, developing cockpit designs that improve pilot workload and efficiency,



environmental control systems, and more. They can take us farther and faster, and move us in greater comfort than ever before.

(5) But what about the future? One of the ideas suggested by aircraft designers is an aircraft with a lace-like<sup>10</sup> structure which takes inspiration from the human skeleton, the design which is both strong and relatively lightweight. This means it could, in theory, drastically reduce the fuel costs of flying. The aim would be to 3D print the composite material that would make the structure. Other ideas for the plane of the future include an upward curve<sup>11</sup> on the tail to reflect engine noise upwards and reduce noise pollution. Inside the aircraft, engineers envisage new "zones" to replace the traditional seating, with the seats that are able to harvest energy from those sitting in them as well as change shape to fit the size of passengers. It was also suggested that instead of having small doors into the jet, as is currently the case, the planes of the future would have much wider entrances where people could leave their hand luggage. The bags would then be automatically delivered to their seats. However, design alone would not solve all the industry's problems. Other aviation industry targets are to reduce

environmental impact, to enhance efficiency, to ensure safety. Flying in the future must remain both safe and affordable while also being safe from an environmental perspective.

*\*you can find out more about the tragic story of Icarus watching this video:*

<https://youtu.be/3s2QPQnuaGk>

### **Vocabulary notes for text 8A**

<sup>1</sup> be credited	приписывать кому-либо совершение какого-либо действия
<sup>2</sup> to loft	отправлять, запускать
<sup>3</sup> axis	ось
<sup>4</sup> spring	пружина
<sup>5</sup> string	струна, веревка
<sup>6</sup> adjustable	регулируемый, настраиваемый
<sup>7</sup> maiden	начальный, первый
<sup>8</sup> skids	полозья
<sup>9</sup> fly-by-wire	электродистанционная система
<sup>10</sup> lace-like	похожая на кружево
<sup>11</sup> curve	кривая, дуга

**Note: an aircraft** - pl. **aircraft**. *About 100,000 aircraft take off and land every day.*

**6. Read the text in detail and choose the best option to complete the sentences according to the information in text 8A.**

1. The credit of designing early ancestors of the airplane goes to ...  
a. Icarus   b. Leonardo da Vinci   c. Mikhail Lomonosov
2. The device demonstrated by M. Lomonosov to the Russian Academy of Sciences in 1754 ...  
a. was supported by a string  
b. managed to lift itself  
c. either was supported by a string or managed to lift itself
3. The most important breakthrough in aviation definitely was ...

- a. the appearance of hot air balloons
  - b. the development of gliders
  - c. the development of power-driven heavier-than-air machine
4. The first successful airplane flight was made in ...
- a. 1783    b. 1902    c. 1903
5. Progress in the technology of aircraft construction resulted in ...
- a. more people travelling over long distances
  - b. distances actually becoming shorter
  - c. technological advancements in other forms of transport
6. One of the technological advancements which today's airplanes made a reality is ...
- a. high-end computer systems
  - b. the use of advanced materials
  - c. considerable reduction in fuel consumption
7. Aircraft engineers are not yet ready to introduce such technologies as ...
- a. flying without pilots      b. greater fuel efficiency      c. new generation of heat-resistant materials

**7. Read the text again and fill in the table.**

The major milestones in the history of air travel	Today's airplanes	Aircraft of the future ideas
➤ the fantasy of flying like birds	➤ shortened distances between places	➤ lace-like structure
➤ _____		➤ _____
➤ _____	➤ _____	➤ _____
➤ _____	➤ _____	➤ _____
➤ _____	➤ _____	➤ _____
	➤ _____	

**8. Work in groups of three. In turn, tell your groupmates about the history of air travel, about modern airplanes, and about airplanes of the future. Use text 8A and/or look for extra information on the Internet to add more ideas.**

**9. In pairs ask and answer the following questions. Explain your answers or give your own examples. Add two or three more questions to your list. Take notes. Summarise your partner`s answers.**

1. Did you like reading this article?
2. Are there any facts in the text which surprised you or you find particularly interesting?
3. Have you ever travelled by air? When? Where?
4. Describe one of the flights you or somebody you know have made?
5. What innovations mentioned in the text do you like the most/ find unrealistic?
6. Can you suggest one or two ideas of your own of what the planes of the future should be like?

## **READING**

### **Part 2**

**10. Read the text and write in the missing words choosing from the words given in the right-hand column.**

#### **Text 8B**

#### **DISCOVER THE HOVERCRAFT**

(1) A hovercraft, also known as an air-cushion<sup>1</sup> vehicle or ACV, *rather*



is an amphibious craft

\_\_\_\_\_ (1) of travelling *surfaces*

over land, water, ice, and

other \_\_\_\_\_(2). Two jets<sup>2</sup> *compressed*

of air are forced downwards

underneath the \_\_\_\_\_ (3). The cushion of air that is created is *capable*



held in by a flexible skirt<sup>3</sup> that surrounds the base of the vessel. The skirt doesn't hang vertically, but is drawn in slightly round *vessel* the bottom, so that air reaching the ground gets pulled back up towards the base of the craft \_\_\_\_\_ (4) than escaping out under *conventional* the bottom of the skirt. The \_\_\_\_\_ (5) air under the vessel creates invisible rollers<sup>4</sup> of air that help to hold it up off the ground. Because the craft is moving through air rather than water, it can go faster than a \_\_\_\_\_ (6) boat of similar power.

(2) The hovercraft was designed in 1955, but it had to wait a few more years to see \_\_\_\_\_ (7). Finally in 1959, the first *board* hovercraft was built and flown across the English Channel. It was an unqualified success, and the hovercraft has since been *challenging* transformed into the useful and versatile<sup>5</sup> vehicle it is today. One of the most outstanding characteristics of the hovercraft is that it *facility* can move with equal ease across a land surface or a water surface. It is possible, therefore, for passengers to \_\_\_\_\_ (8) a *the light of* hovercraft on land, and then be conveyed<sup>6</sup> out across water. No *the day* special dock \_\_\_\_\_ (9) is needed. It is an ideal form of amphibious transport in wilderness areas. Hovercraft are used *rescue* for \_\_\_\_\_ (10), commercial, and military applications to transport, save and protect people across the world's most \_\_\_\_\_ (11) environments.

### Vocabulary notes for text 8B

<sup>1</sup> air-cushion	воздушная подушка
<sup>2</sup> jet	сильная струя, поток
<sup>3</sup> flexible skirt <sup>1</sup>	гибкое ограждение воздушной подушки
<sup>4</sup> rollers of air	зд. потоки воздуха
<sup>5</sup> versatile	разносторонний
<sup>6</sup> convey	перевозить, переправлять

**11. Multiple choice quiz. Which option is correct according to the text.**

1. A hovercraft is ...  
a. an air-cushion vehicle      b. a glider      c. a submarine
2. A hovercraft cannot travel ...  
a. over water      b. over land      c. over the hills
3. A cushion of ... is created by a large fan underneath the craft.  
a. steam      b. air      c. water
4. A skirt surrounding the base of the craft ....  
a. allows the air to escape      b. prevents too much air from escaping      c. protects the craft
5. A hovercraft ... a conventional boat of similar power.  
a. cannot go faster than      b. can go faster than      c. goes as fast as
6. The first hovercraft was launched in ...  
a. 1945      b. 1955      c. 1957
7. The hovercraft has since been transformed into a(n) ... it is today.  
a. useful and versatile vehicle      b. effective tool      c. sophisticated machine
8. One of the most outstanding characteristics of the hovercraft ...  
a. low noise level      b. safety and reliability      c. the ability to move across land or water with equal ease
9. To board the hovercraft passengers ...  
a. need a special dock facility      b. should use a boarding terminal      c. don't need a special dock facility
10. Hovercraft is an ideal form of amphibious transport ....  
a. in big cities      b. in mountainous areas      c. in natural areas



**12. Retell Text 8B using the words below as clues.**

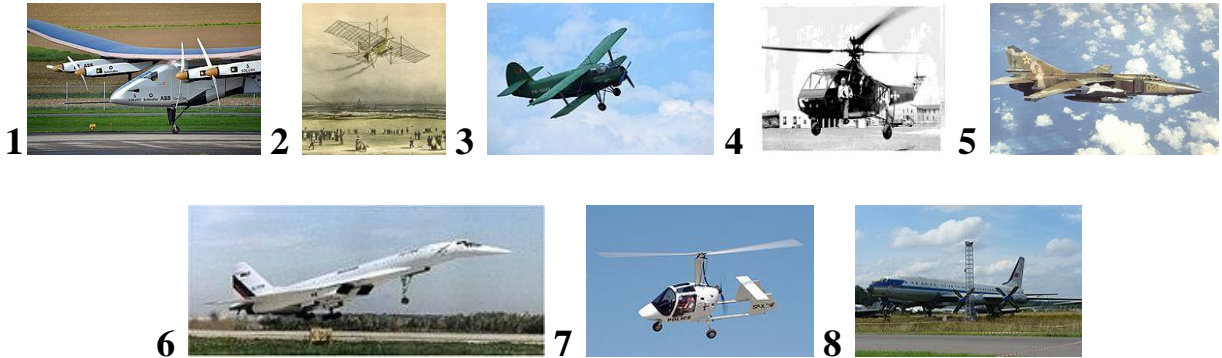
A hovercraft, an air cushion vehicle, create, surface(s), to hold up, compressed air, rather than, capable of, a vessel, conventional, to launch, to see the light of the day, an unqualified success, useful and versatile, outstanding

characteristics, to board a hovercraft, wilderness areas, rescue, applications, challenging environments.

## READING

### Part 3

13. Match the pictures (1-8) with the titles (A-G).



- A. An Antonov An-2 biplane
- B. An autogyro
- C. Solar Impulse 2 at the Payerne Air Base in November 2014
- D. The Tupolev Tu-144; the first supersonic aircraft to enter service and the first to leave it
- E. The Tu-114 at Monino Museum. (A turboprop-powered long-range airliner)
- F. Sikorsky Helicopter HNS-1 C.G. 39040
- G. The 1842 Aerial Steam Carriage of Henson and Stringfellow
- H. Air fighter. A Soviet Air Force MiG-23MLD

14. Look at the title. What kind of information do you think you will find in the article? Read the article and choose the most suitable heading from the list A-E for each part (1-4) of the article. (There is one extra heading which you do not need to use)

- A. The race for supersonic flight.
- B. Agile like a bird.
- C. Modern supersonic fighter.
- D. How to make a heavy machine fly.

E. The flagman of the Soviet aircraft industry.

### Text 8C

## PIONEERS IN THE SKY

(1) How could a man make such heavy machines fly? The power of thought of a human being is amazing. Build a model, then you'll know what the issues are and whether it is viable. If Icarus's mishap is true, the engineers have advanced a long way since then. Now we know that to make a heavy machine fly one should take into account the laws of aerodynamics. Aerodynamics from Greek (ἀήρ aero-air + δυναμική-dynamics) is the study of motion of air, particularly when affected by a solid object, such as an airplane *wing*. In modern times George Cayley invented the first flying machine that technically demonstrated the chambered *lifting* wing, stabilisers, control surfaces and identified the four *forces* acting on an aircraft: propulsion<sup>1</sup> (he used a horse to get into the air more quickly) countered by *drag*, aerodynamic *lift* countered by *weight*.

(2) What modern aircraft can do is the most spectacular thing in transportation technologies. The Su-35 with vectored thrust<sup>2</sup> engines and unstable design, is probably the most maneuverable plane. The aerobatics of the Su-35 leaves the impression that the aircraft is weightless: it can stop in mid-air and descend<sup>3</sup> in circles, *sailing* like a leaf on the wind. There are plenty of airshow videos showing the Sukhoi do backflips and J turns and what not. It can *hover*, move in any direction and stop on a dime, rotate very quickly through any axis, stop and immediately reverse. Nothing we have seen really comes close to doing what it can do in terms of maneuverability.

(3) The Tu-114 is a long-haul aircraft, which is made for the transport of passengers and is equipped with turboprop<sup>4</sup> engines. It was designed in the mid-1950s on the basis of the Tu-95 bomber. The Tu-114 had no equal in the world *in terms* of the number of



passengers that could be accommodated *on board* and it had remained the largest passenger plane until the early 1970s. *Due to* the fact that the aircraft was low-wing, the designers *equipped* it with a *fairly* high chassis, which was not found in any aircraft of this class. But this landing gear<sup>5</sup> system also *brought its disadvantages* to the aircraft. With the help of this plane, as many as 32 world records were set. They were obtained for the following achievements:

- this was the largest turbofan aircraft at the time that was able to carry passengers on board;
- it was also the fastest passenger *liner* in the world with this type of engine;
- it had the most powerful engines in the world back in its time.

At the moment, there are no operating Tu-114s left in the world. Only three *non-operational* versions exist and all the three are used as museum exhibits. During its service life, only two Tu-114s crashed. So, probably, it was also one of the safest aircraft ever.

(4) Although it is the Concorde that earned a place in history, the lesser known Tu-144 beat it twice: it had its maiden flight on December 31, 1968, two months before Concorde, and then achieved its first *supersonic flight* in June, 1969, beating the competitor by four months. Both planes were clearly ahead of their time, as civil aviation had barely just transitioned from *props* to *jets*. But their striking similarities have long fuelled spy stories. Although they looked alike and could fly at nearly twice the speed of sound cutting travel time in half, they were rather different planes. The Tu-144 was bigger and faster than the Concorde. Europeans managed to create a liner more suitable for the conditions of market operation. It was more economical, had a longer range and was definitely safer. The Tu-144 had been in passenger service for a year before it was withdrawn<sup>6</sup> over *safety* concerns, after only 55 flights. Concorde had been twenty-seven years in service and was retired three years after the crash outside Paris on July 25, 2000. So, at this moment there is no supersonic passenger plane *in service*. Still some companies are working on its development. Will we fly supersonic again?

<https://www.rbth.com/science-and-tech/333904-tu-114-history-of-ussrs-biggest-airplane>

## Vocabulary notes for text 8C

<sup>1</sup>propulsion- the action of driving or pushing, typically forward or onward

<sup>2</sup>thrust- *syn.* propulsion

<sup>3</sup>descend- to move oneself downwards

<sup>4</sup>turboprop- a turboprop engine is a turbine engine that drives an aircraft propeller

<sup>5</sup>landing gear- the landing equipment (*syn.* a chassis US: /'tʃæsi/, UK: /'jæsi/; plural chassis /-iz/ шасси)

<sup>6</sup>be withdrawn - take away, stop working

**15. Read the text paying attention to the words in italics and try to figure out their meaning with the help of the context or look them up in a dictionary.**

***Circle any other words you do not understand and find out their definitions or Russian equivalents using a dictionary.***

**16. Answer the questions using the information from text 8C.**

1. Why does the author suggest building a model of a plane?
2. What does the author call 'Icarus's mishap'?
3. What did George Cayley invent?
4. Why does the Su-35 leave the impression that the aircraft is weightless?
5. In what way was the Tu-144 the best at its time?
6. What were the achievements which allowed the Tu-114 to set 32 records?
7. Why Concorde and the Tu-144 were ahead of their time?
8. Why was the history of their development full of spy stories?
9. In what features were they different?
10. What passenger supersonic planes are in service now?

**17. Watch one of the videos using the links below. Take notes. Prepare to tell your groupmates about what you have learned. Add your comments. Prepare 3-5 questions to ask your listeners after your talk to check their understanding.**

Visions of future flying: <https://www.youtube.com/watch?v=7oQY0uC52jY>

Meet the dazzling flying machines of the future: <https://youtu.be/RCXGpEmFbOw>

The Aircraft Seats Of Tomorrow: <https://youtu.be/Es89BsdB6a8>

The Future of Flying Robots: <https://youtu.be/ge3--1hOm1s>



## WRITING

### Four Forces of Flight



**18. Look at the picture and answer the questions. Then match the words with numbers 1-6 with the words with letters (a-f).**

Which of the forces moves the aircraft forward?

Which of the forces moves it up? Which of the

forces are natural and which are artificial?

- |                              |                    |
|------------------------------|--------------------|
| 1. the forward acting force  | a. drag            |
| 2. the downward acting       | b. to oppose       |
| 3. the backward acting force | c. lift            |
| 4. the upward acting force   | d. weight          |
| 5. to counter                | e. driving forward |
| 6. propulsion                | f. thrust          |

**19. Complete the sentences with the words below.**

*Backwards, forward, lift, thrust, countered, can't fly, upwards, drag, weight, propulsion.*

1. \_\_\_\_\_ is the force that moves an aircraft in the direction of the motion. 2. \_\_\_\_\_ is the force that that acts opposite to the direction of motion. 3. \_\_\_\_\_ is the force caused by gravity. 4. \_\_\_\_\_ is the force that holds an airplane. 5. If thrust is greater than drag, the plane moves \_\_\_\_\_. 6. If drag is greater than thrust, the plane moves \_\_\_\_\_. 7. If lift is greater than weight, the plane moves \_\_\_\_\_. 8. If weight is greater than lift, the plane stays on the ground and \_\_\_\_\_. 9. During the flight the weight is \_\_\_\_\_ by both lift and drag. 10. To overcome drag, airplanes use a \_\_\_\_\_ system to generate thrust.



**20. Use the phrases to write about how an aircraft takes off.**

Thrust pushes.../...accelerates engine.../...propulsion system... created by engine.../...by increasing propulsion system.../ Thrust counters.../Drag reduces.../...friction between aircraft... /Lift pushes ...up against.../...gravity reduces.../ Weight pulls...to.../If Lift is greater than.../...the plane moves.../Special design of the wing...

**VOCABULARY**

**Module 8 Word List**

Essential Vocabulary	Additional Vocabulary
<b>Text 8A</b>	<b>Text 8B</b>
adjustable (adj)	board (v) a ship/plane
ancestor (n)	capable (adj) of
as well as (prep)	challenging (adj) environments
bring (v) within reach (n)	convey (v)
deliver (v)	escape (v)
efficiency (v)	facility (n)
ensure (v)	rather than doing smth
envisage (v)	rescue (v, n)
exert (v) pressure (n)	see (v) the light of the day
failure (n)	surface (n)
incredibly (adv)	underneath (prep)
luggage (n)	unqualified (adj) success
maintain (v) smth.	vessel (n)
	<b>Text 8C</b>



make (v) a reality	accommodate (v)
manage (v) to do smth.	be in service
marine (adj)	descend (v)
milestone (n)	gear (n)
opposite (directions)	long-haul (adj)
perspective (v)	propulsion (n)
propeller (n)	retire (v)
receive (v) a boost	spectacular (adj)
reduce (v)	striking (adj)
reflect (v)	suitable (adj) for
rotate (v)	supersonic (adj)
support (v, n)	thrust (n)
take (v) inspiration (n)	viable (adj)
target (n)	wing (n)
upward (adj/adv)	withdraw (v)
workload (n)	

**21. Look at the words below. Give their definitions and try to recall how they were used in text 8A.**

Failure, milestone, propeller, opposite, support, rotate, glider, adjustable, marine, reduce, incredibly, workload, deliver, efficiency, upward, reflect, luggage, perspective, as well as, target.

**22. Fill in the gaps with the words from Exercise 21 in the right form. The first letters are given. Translate the sentences into Russian.**

1. A new **m**\_\_\_\_\_ in aviation industry was reached when Charles Lindberg made his first transatlantic flight which changed the world's views on possibilities of travel. 2. A few centuries ago people believed that the sun and all the planets **r**\_\_\_\_\_ around the Earth. 3. The first successful heavier-than-air craft were unpowered **g**\_\_\_\_\_ designed to fly without an engine. 4. The oil spill seriously threatened **m**\_\_\_\_\_ life around the Gulf of Mexico in 2010. 5. Doctors today are having to cope with an ever expanding **w**\_\_\_\_\_ . 6. The sound as **w**\_\_\_\_\_ as the picture quality are best on new TV



screens. 7. The loud plane was an open **t**\_\_\_\_\_ for the enemy. 8.

The noun phrase the "Icarus paradox" refers to the situation when a business fails after a period of success, where this **f**\_\_\_\_\_ is brought about by the very elements that led to the initial success. 9. A mechanical

device for propelling a boat or aircraft, consisting of a revolving shaft (ось, вал) with two or more blades attached to it is called a **p**\_\_\_\_\_. 10. With an **u**\_\_\_\_\_ trend in inflation we expect prices to rise. 11. If your **l**\_\_\_\_\_ is overweight when you check in for a flight, you should pay extra. 12. Sometimes we need to look at life from a different **p**\_\_\_\_\_. 13. Most over the ear headphones are **a**\_\_\_\_\_, so that they could fit many different head sizes. 14. His car turned over and caught on fire and yet, **i**\_\_\_\_\_, he wasn't hurt. 15. The reduction in the number of workers needed to make a car allowed its producers to increase the **e**\_\_\_\_\_ in automotive industry. 16. The results of the recent studies have demonstrated the **s**\_\_\_\_\_ of the government's decisions. 17. The plane **r**\_\_\_\_\_ speed as it approached the airport. 18. The documents are **d**\_\_\_\_\_ by special messenger. 19. The light **r**\_\_\_\_\_ off the surface of the water. 20. To get to the other side of the street you need to walk in the **o**\_\_\_\_\_ direction.

**23. Match the words with numbers (1-10) with the words with letters (a-j) to make up word collocations. Explain the meaning of these expressions and try to recall how they were used in text 8A.**

- |                      |                     |
|----------------------|---------------------|
| 1. opposite          | a. to lift itself   |
| 2. to exert          | b. reach            |
| 3. to make something | c. direction        |
| 4. to envisage       | d. a boost          |
| 5. to maintain       | e. inspiration from |
| 6. to manage         | f. pressure         |
| 7. to bring within   | g. new zones        |
| 8. to receive        | h. safety           |
| 9. to take           | i. equilibrium      |
| 10. to ensure        | j. a reality        |

**24. Complete each sentence with the correct word to make up a word collocation from Exercise 23. Translate the sentences into Russian.**

1. With the top Toyota's hybrid Tundra pickup model fuel economy and car performance will receive a \_\_\_\_\_. 2. The aircraft designers envisage a range of \_\_\_\_\_ for passengers, for example, a gaming zone where passengers will be able to play virtual games. 3. Although many human activities exert \_\_\_\_\_ upon wildlife, the extent of their impact on climate change might be overestimated. 4. On the morning of December 17, 1903, the first heavier-than-air craft built by the Wright brothers managed \_\_\_\_\_ and soared into the air over a distance of 120 feet. 5. The runway at the Sheremetyevo airport was extended to ensure the \_\_\_\_\_ of take-off and landing. 6. When the volcano began to erupt, all the drivers were told to drive in the opposite \_\_\_\_\_ from the volcano. 7. Scientists are increasingly taking \_\_\_\_\_ from living organisms to create new technologies. 8. More and more people realise how small our planet is and how important it is to maintain ecological \_\_\_\_\_. 9. Study shows that higher

education brings success within \_\_\_\_\_ of not only an individual but also his family. 10. One of the keys to reach your goal is to believe in what you want to see happen in your life and do something to make it \_\_\_\_\_.

**25. Look at the words below. Try to recall how they were used in text 8B.**

Capable of, surface, underneath, vessel, rather than, to escape, unqualified success, to see the light of the day, to board a ship/plane, to convey, facility, rescue, challenging environments.

**26. Match each word with numbers (1-12) with the correct definition of this word as it is used in text 8B. Think of your own example sentences with some of these words.**

- |                                |  |
|--------------------------------|--|
| 1. capable of doing smth.      | a. situated directly below something                     |
| 2. a surface                   | b. an act of saving from danger                          |
| 3. a vessel                    | c. to become publicly known                              |
| 4. rather than                 | d. having the ability to do something                    |
| 5. to escape                   | e. a ship or a large boat                                |
| 6. to see the light of the day | f. to go aboard a plane                                  |
| 7. to convey                   | g. difficult, not easy to deal with                      |
| 8. a facility                  | h. something that is built to serve a particular purpose |
| 9. rescue (n)                  | i. to get away   |
| 10. challenging                | j. instead of  |
| 11. beneath                    | k. to transfer or deliver                                |
| 12. to board a plane           | l. the outside part of something                         |

**27. Complete the sentences with the words given below. Translate the sentences into Russian.**

*Facility, the light of the day, board, challenging, capable, rather, rescue, escaped, conveyed, vessel, surface.*

1. Lockdown was a \_\_\_\_\_ time for people in many countries. 2. The fire and other \_\_\_\_\_ services should be provided by professionals. 3. Nuclear research scientists work in a nuclear research \_\_\_\_\_. 4. Lots of goods are \_\_\_\_\_ by ship today. 5. Nobody knows how many great ideas have never seen \_\_\_\_\_. 6. \_\_\_\_\_ than driving he rode his bike to work. 7. Not many passengers \_\_\_\_\_ from the sinking \_\_\_\_\_. 8. If the \_\_\_\_\_ of the sea is rough our trip will be cancelled. 9. He was one of the best students in his group because he was \_\_\_\_\_ of working hard. 10. After they spent six hours at the airport because of the bad weather, everyone was happy when the passengers were allowed to \_\_\_\_\_ their plane.

**28. Match the words with numbers (1-10) with their opposites (a-j).**

**Example:** 'to evolve' is the opposite of 'to decrease, worsen'

- |                       |                      |
|-----------------------|----------------------|
| 1. failure            | a. similar direction |
| 2. efficiency         | b. increase          |
| 3. opposite direction | c. get off a plane   |
| 4. receive a boost    | d. incapable/unable  |
| 5. safety             | e. success           |
| 6. reduce             | f. decrease          |
| 7. upward             | g. above             |
| 8. board a plane      | h. inefficiency      |
| 9. underneath         | i. danger            |
| 10. capable of        | j. downward          |

**29. Rewrite each sentence replacing some of the words by the words in brackets so that it has an opposite meaning to the first sentence. Translate the sentences into Russian.**

1. All their plans ended in failure. (success) 2. The production efficiency is the result of good work. (inefficiency/bad) 3. His car hit a van coming in the opposite direction. (similar) 4. Their production rates received a boost from growing competition. (decrease/because of) 5. You should fasten your seat belts for extra safety. (if you don't/might/in danger) 6. Some people think that the use of electronic equipment in cars might lead to reducing the number of road accidents. (increase) 7. Unfortunately, prices continue their upward trend. (luckily/downward) 8. One of the ideas is that the planes of the future will have wide entrances which should let passengers to board the plane faster. (get off) 9. The new tunnel goes underneath the city centre. (bridge/above) 10. This robot is capable of understanding spoken commands. (incapable)

**30. Complete the table.**

**Example:** *sustainability* → *to sustain* → *sustainable*

Noun	verb	adjective
1. safety	save	safe
2. reality		
3. boost		
4. reduction		
5. facility		
6. success		
7. direction		
8. efficiency	xxxxxxxxxxx	
9. support		
10. challenge		

**31. Complete the sentences with the correct form of the words in capitals at the end of each sentence.**

1. Scientists are now looking for \_\_\_\_\_ evidence \_\_\_\_\_ the theory of black holes. DIRECTION, SUPPORT 2. This device is very \_\_\_\_\_ at processing complex calculations. EFFICIENCY 3. A lot of ideas sound good in theory but are not useful in the \_\_\_\_\_ world. REALITY 4. Due to the use of composite materials, the airplanes got more \_\_\_\_\_ and \_\_\_\_\_. EFFICIENCY, SAFETY 5. There is a pressing need for the \_\_\_\_\_ in the numbers of cars in big cities. REDUCE 6. Holidays without Wi-Fi really \_\_\_\_\_ young people today. CHALLENGING 7. If you work hard you will finally \_\_\_\_\_ in your quest to become an IT professional. SUCCESS 8. The construction of the new terminal will \_\_\_\_\_ passenger service at the airport. FACILITY

**32. Work in groups. Choose 5-7 words from Module 8 Word list and prepare a short news story to tell your group using these words. Ask your listeners to note down the words while they listen to your story. Compare your lists.**

**Example:** At 21 hours and covering almost 17,000 kilometers, a **direct flight** from Sydney to London would be the longest in the world. Travelling this far without a break is an attractive proposition for airlines. The technology is ready to go, with manufacturers saying they've built planes **capable** of the journey. So, the industry's all set to take to the skies for the best part of a day but are pilots and passengers **on board** with the idea? Airlines are keen to **facilitate** passengers' **adjusting** to being in the air for so long. But what about the crew? Ultra-**long-haul** flights require four pilots to share the **workload**. Although pilots can refuse to fly if they are tired, the report found most of them believed it would harm their careers to do so. The growing number of longer, **direct flights** is part of a move away from using hub airports where passengers change planes to complete their journeys. As well as saving time for passengers, **direct** flights by more **fuel-efficient jets** are also better for the environment.

**33. To find out more about the Tu-114, watch the following film using the link below and summarise the information about this passenger airliner in English.**

## **SPEAKING AND DISCUSSION**



**34. Look at the words given below. Which vehicles - air, water or both - do they refer to?**

*Beach, wave, fly, on the move, flying machine, journey, vessel, cargo, stealth, high-speed, manoeuvre, abandoned, rust.*

**35. Guess if 1-5 below are true (T) or false (F).**

1. ☐ In the photo below you can see an aircraft which can “land” on water.
2. ☐ The pilot can fly just above the runway for a long time.
3. ☐ Some laws of aerodynamics are used in cars, aircraft and ships.
4. ☐ Currently many flying ships - hybrid between airplanes and ships - are in service.
5. ☐ Some vehicles are able to move not high over the surface of the ground or the water.

**36. Now read the text and check your answers.**

### **A New Birth of Closed Projects**



Beached on the western shores of the Caspian Sea, it looks like a colossal aquatic beast - a bizarre creation more at home in the deep than above the waves. It certainly does not look like something that could ever fly. But fly it did, albeit a long time ago. After lying dormant for more than three decades, the Caspian Sea Monster has been on the move again. One of the most eye-catching flying machines ever built, it is completing what could be its final journey.

In July 2020 after 14 hours at sea, a flotilla of three tugs<sup>1</sup> and two escort vessels maneuvered slowly along the shores of the Caspian Sea to deliver their bulky special cargo to its destination, a stretch of coast near Russia's southernmost point.



It is here, next to the ancient city of Derbent, in Russia's republic of Dagestan, that the 380-ton "Lun-class Ekranoplan" has found its new, and most likely definitive, home.

The last of its breed to sail the waters of the Caspian "Lun" was abandoned in the 1990s, left to rust away at Kaspiysk naval base, some 100 kilometres up the coast from Derbent. But before it could fade into oblivion<sup>2</sup>, it has been rescued thanks to plans to make it a tourist attraction right at the time when this unusual travel concept could be poised to make a comeback.

Ground Effect Vehicles, also known as "ekranoplans," are a sort of hybrid between airplanes and ships. The International Maritime Organisation classifies these vehicles as ships, but, actually, they derive their unique high-speed capabilities from the fact that they skim the surface of the water at the height of between one and five meters (three to 16 feet). They move over water without actually touching it. They take advantage of an aerodynamic principle called "ground effect".

In aviation, ground effect is a phenomenon in which an airplane's lift is increased and its drag is decreased due to the airplane's wings being close to the ground.

Pilots can use this effect by flying just above the runway to be able to reach the climbing speed easier because of the improved lift and lesser drag. Ground effect is also exploited in automotive aerodynamics to create downforce, particularly in racing cars. In ekranoplans, this combination of speed and stealth due to their proximity to the surface makes them difficult to detect by radar, which could have been a significant advantage during missions.

<sup>1</sup>tug - буксир

<sup>2</sup>fade into oblivion - кануть в лету

<https://edition.cnn.com/travel/article/caspian-sea-monster-ekranoplan/index.html>

**37. Read the list of some characteristics of ekranoplan and decide if they are advantages or disadvantages. Complete the table below.**

The ability to land on the water even with strong waves; more economical than airplanes due to the specifics of the flight; used only in good weather conditions (absence of very strong waves); high speed of movement in combination with a

large load capacity; the ability to fly over land and ice; low visibility for radars ; necessity to fly at an extremely low altitude; the ability to fly at low altitudes; low maneuverability; specific piloting (requires long-term training); bulky construction; faster than hovercraft (as they reach speeds of 500 kilometers per hour); do not need an airfield.

<i>Advantages</i>	<i>Disadvantages</i>

**38. Discuss these questions about the future of the technology of the ground effect.**

1. What are the advantages of the technology of the ground effect (GEV)?
2. What are its disadvantages?
3. Do you think the latest developments of modern technologies will give a new birth to the GEV?



Read the passage which can give you some ideas.



“In the XXI century, amateur projects of aircraft models-screens were created. One of these aircraft models, created in 2021, is controlled by a computer, and the distance to the surface under the device is measured by a lidar (light detection and ranging technology). A person is not able to control the device due to the excessive complexity of its piloting

The ekranoplan that has been moved to Derbent is the only one of its class ever completed and entered service in 1987.”

4. Do you think it is more difficult to pilot a ground effect vehicle than a plane?
5. Why do you think they are safer than the conventional aircraft?
6. What other advantages over planes and ships does it have?
7. What is the Achilles’ heel of ground effect vehicles?

8. Do you think that developers of ground effect vehicles will bring them back to life? If yes, for what purposes?

## GRAMMAR

### DIFFERENT FORMS OF THE INFINITIVE

#### Lead-in

#### 39. Which of the following words are the Infinitives?

To read; work; looking; to be writing; kept; to have missed out; answered; be treated

#### STUDY NOTE

Besides **Simple Infinitives**, e.g.: *to prove, to live, ...* there are also **Continuous, Perfect** and **Passive** Infinitive forms.

Compare:

*It is nice **to be sitting** here with you. (Continuous/Progressive Infinitive – suggests that the action is continuing around the time we are talking about)*

*I meant **to have phoned**, but I forgot. He should **have finished** his work. (Perfect Infinitive emphasises that something happened before something else or refers to things that didn't happen –unreal past)*

*There's a lot of work **to be done**. (Passive Infinitive has the meaning similar to Passive Tense forms)*

*Try **not to be** late (Negative Simple Infinitive)*

*He could **have been working** outside. (Perfect Continuous)*

#### 40. Fill in the table below with more examples of different Infinitive forms.

Infinitive	Active	Passive
Simple	<i>to help,</i>	<i>to be helped,</i>
Continuous	<i>to be helping,</i>	xxx

Perfect	<i>to have helped,</i>	<i>to have been helped,</i>
Perfect Continuous	<i>to have been helping,</i>	xxx

**41. Find the Infinitives in the following examples. Decide what forms they are. Explain their meaning.**

1. I was glad to answer their questions. 2. I was prepared to be asked questions. 3. I am sorry to have kept you waiting. 4. I might have left my phone at home. 5. It is quite common not to understand everything in lectures. 6. He doesn't seem to be listening. 7. It seems to be raining outside. 8. I want to be treated with more consideration. 9. It is nice to have finished the work. 10. She must have been studying all night.

### STUDY NOTE

The **Perfect Infinitive** is used to emphasise that the action expressed by the Infinitive happened before the action expressed by the predicate of the sentence.

**42. Rewrite these sentences using Perfect Infinitives. Explain their meaning or translate them into Russian.**

**Example:** *I am sorry I have interrupted you.* → I am sorry **to have interrupted** you.

1. He expects he `ll have passed his exams by June. 2. I was glad I had done my homework. 3. It seemed that he had misunderstood me (He seemed...) 4. We were pleased we had written our tests well. 5. I am happy that I have met you. 6. I was upset because I had lost my wallet. 7. It seems that she `s forgotten about the appointment. (She seems...) 8. It is known that he has won the race. (He is known...) 9. I hope I'll have finished writing the essay by that time. 10. She was sorry that she had left without saying good-by.

**43. Use the appropriate form of the Infinitive in brackets.**

1. I' m glad (to introduce) to you. 2. Her mood seemed (to change) for the worse. We had better not (to speak) to her now. 3. I'm sorry (to disappoint) you but I

didn't mean anything of the kind. 4. He is happy (to award) the Nobel Prize. 5. He was anxious (to take) the first place in competition. 6. The poem can easily (to memorise). 7. You should (to tell) me you were ill. 8. I didn't expect (to ask) that question. 9. He must (to read) something funny; he is smiling all the time. 10. These are the letters (to answer).

## INFINITIVE CONSTRUCTIONS

### Lead in

**44. Read the sentences paying attention to the highlighted phrases. What do these phrases consist of? Do you know what they are called?**

1. Lomonosov is believed to have designed a model of a flying apparatus that used two propellers rotating in opposite directions on the same axis.
2. A full sized, power-driven heavier-than-air machine is known to have been developed by the Wright brothers.
3. Only few people watched the first airplane make its maiden flight on December 17, 1903.
4. Aviation shortened distances between places, made it easier for people to travel from country to country and from continent to continent.
5. An aircraft with a lace-like structure is thought to take inspiration from the human skeleton.
6. Composite materials that would make the structure are planned to be 3D printed.
7. The planes of the future are supposed to have wider entrances where people will be able to leave their hand luggage.
8. It is possible for passengers to board a hovercraft on land, and then be conveyed out across water.
9. We know hovercraft to be used for a variety of applications to transport, save

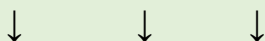
and protect people across the world's most challenging environments.

10. The Tu-144 is reported to have been in service for a year before it was withdrawn over safety concerns.

### STUDY NOTE

Infinitives are often used as a part of an **Infinitive Construction** or **Clause**. There are two main types of Infinitive Constructions. The Objective-with-the-Infinitive Construction (**Complex Object**) consists of an object (a noun or pronoun) + an infinitive with 'to' or without 'to'; it is equivalent to an object clause where the subject corresponds to the nominal element of the construction and the predicate to the infinitive.

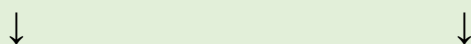
#### Complex Object



*We see materials **science** (object) **turn** (infinitive) into a dynamic and exciting field.*

The Subjective Infinitive Construction (**Complex Subject**) consists of a subject (noun or pronoun) + an infinitive as part of a predicate; it is similar in meaning to a complex sentence with an object clause.

#### Complex Subject



*Materials **science** (subject) is considered **to be** (infinitive) one of the oldest forms of technology and applied science.*

**45. Read the sentences in the table below paying attention to the verbs and other expressions which can be followed by Infinitive Constructions (clauses).**

**Translate the sentences into Russian.**

#### Complex Object

1. I want you to help me.

#### Complex Subject

1. He is said to know five languages.

- |   |   |
|---|---|
| 2. I'd like her to be invited to the concert too.       | 2. This book is expected to be published soon.      |
| 3. I saw him cross the street.                          | 3. The technology is supposed to be a success.      |
| 4. I didn't notice her enter the room.                  | 4. They were believed to be on their way to Moscow. |
| 5. Have you heard him play the piano?                   | 5. Is this method thought to be really innovative?  |
| 6. I suppose him to be about 40.                        | 6. The delegation is reported to have left.         |
| 7. I believe him to be in Moscow now.                   | 7. He seems to be well prepared for the exam.       |
| 8. We expect all the deadlines to be met.               | 8. He proved to be a good doctor.                   |
| 9. I find him (to be) very clever.                      | 9. I happened to be there at that time.             |
| 10. The manager asked the letter to be sent at once.    | 10. He is likely to know the answer.                |
| 11. The officer didn't allow the luggage to be checked. | 11. They are certain to find out the truth.         |

**46. Fill the table adding the verbs and expressions to the following groups of verbs from the example sentences in the previous exercise and the list of verbs below. Think of your own examples to illustrate each group. In groups discuss how Infinitive Constructions can be best translated into Russian.**

(To wish, to like, to desire, to hate, to watch, to observe, to feel, to think, to declare, to order, to command, to imagine, to decide, to explain, to forget, to remember, to understand, to decide, to show, to teach, to tell, to rely upon, to count on, to announce, to state, to suppose, to turn out, to chance, to be sure)

<b>Complex Object</b> is used after	<b>Complex Subject</b> is used after
1. verbs denoting wish or expectation: <i>to want, ...</i>	1. verbs of saying and thinking used in the Passive Voice: <i>to say, to believe, ...</i>

2. verbs of saying, thinking, believing: <i>to believe, ...</i>	2. other verbs like <i>to seem, to appear, ...</i>
3. verbs of physical perception*: <i>to see, ...</i>	3. some adjectives/adverbs used with the verb 'to be': <i>likely/unlikely, ...</i>
4. verbs expressing request, order, permission: <i>to ask, ...</i>	
5. other verbs: <i>make, let, ...</i>	

\*Sometimes after verbs of perception (sense verbs) we use the **-ing** Participle to convey uncompleted aspect. The infinitive signals that the complete action was observed.

E. g.: *I saw her walk across the street. I saw her walking across the street.*

#### ***47. Translate from English into Russian paying attention to the Infinitive Constructions.***

1. He didn't prove to be a good doctor. 2. The answer is unlikely to be given today. 3. He wants the work to be done at once. 4. I don't want you to be sitting here doing nothing. 5. He ordered everybody to leave. 6. They are supposed to be on their way to St. Petersburg. 7. I didn't see him leave the room. 8. The officer ordered everybody to stay where they were. 10. We expect her to arrive any minute. 11. Nobody asked him to pay for the meal. 12. Why won't you let me explain? 13. I don't consider him (to be) an honest man. 14. I expect the contract to be signed tomorrow. 15. I like people to tell the truth.

#### ***48. Look at the following examples. Why are some verbs followed by object + to + infinitive and others are used without to? Is it a mistake? What is the rule?***

1. I want you to help me.
2. I saw him leave the building.
3. I've never heard him say a single word of truth.
4. I'd like you to help me with my essay.



5. Our coach never lets us drink water during the play.

### STUDY NOTE

Verbs of physical perception (*to see, to notice, to watch, to hear, to feel*, etc.), the verbs *to help, make and let* are followed by a bare infinitive:

*E. g. My parents let me do what I want. We saw him run as fast as he could.*

**But** if these verbs are used in the passive, they are followed by a 'to'-infinitive clause:

*E. g. The students are made to write lots of tests.*

### 49. Complete the sentences with the bare or to-Infinitive of the verbs in brackets.

1. They saw him ... (to jump) from the bridge. 2. Her parents won't let her ... (to go) to the disco. It's so unfair! 3. Nobody can make her ... (to do) something she doesn't want to. 4. Last Friday I invited her ... (to have) dinner with me. 5. After dinner I asked her ... (to explain) her strange choice. 6. One day I heard him ... (to sing) a song, he has such a beautiful voice! 7. I don't want you ... (to get) upset about it. 8. We made them ... (to apologise). They were so rude! 9. They were made ... (to apologise) because they were rude. 10. He was seen ... (to leave) the house early in the morning.

### 50. Look at the pairs of example sentences and try to translate them into Russian. Explain the difference in meaning between these sentences.

1. We expect the train to arrive at 10.

The train is announced to have arrived.

2. They are likely to be at home.

They are likely to have reached the place.

3. Our boss wants us to work overtime.

We are certain to be given a pay-rise next month.

4. The girl seemed to be crying.

The girl seemed to have been crying.

### STUDY NOTE

Besides the ordinary infinitive, progressive, perfect and passive infinitive forms are often used in infinitive constructions. They can have the same kind of meaning as progressive, perfect and passive tense forms.

*E. g.: He seems **to be smoking** a lot. (the action is continuing around the time we are talking about)*

*The train is certain **to have left**. (the infinitive refers to an earlier event)*

*I'd like my friend **to be promoted**. ('my friend' is the object of the action expressed by the infinitive)*

**51. Translate into Russian paying attention to different forms of Infinitives in Infinitive Constructions.**

1. He is certain to support our project. 2. He is known to have supported a few similar projects on previous occasions. 3. His working hard allowed him to fulfil the contract. 4. This allowed the contract to be fulfilled. 5. This information enabled the analyst to make a forecast for the next year. 6. This information enabled forecasts for the next few years to be made. 7. They considered all water on the surface of this planet to have been liberated by volcanic action. 8. They consider volcanic activity on this planet to be moderate. 9. This analysis helped them deal with the problem. 10. This analysis helped the problem be dealt with. 11. The results of the experiment caused them to change their views. 12. The results of the experiment caused the views to be changed.

**52. Use the appropriate form of the Infinitive in Infinitive Constructions.**

1. They are said (to finish) the work already. 2. Don't interrupt them. They seem (to prepare) for the lesson. 3. He is known (to be) a good swimmer. 4. She is supposed (to do) it yesterday. 5. We are really glad. Our company is reported (to achieve) good financial results. 6. He didn't seem (to remember) my name. 7. They proved (to be) highly motivated and hardworking. 8. I can't find her anywhere. She seems (to leave) the town. 9. It is very quiet. The children must (to play) a new computer game. 10. The text turned out (to be) more difficult than I expected.

**53. Write these sentences in another way, beginning as shown. Use the underlined word in your sentence.**

**Example:** It is expected that the cold weather will end soon. → The cold weather is *expected to end soon*.

1. It is supposed that the film about space travel is fantastic. The film about space travel is \_\_\_\_\_. 2. It is known that hackers steal your personal information with the help of malicious programs. The hackers \_\_\_\_\_. 3. It is reported that billions of dollars are spent on space exploration. Billions of dollars \_\_\_\_\_. 4. It is thought that the thief broke into the shop by climbing over a wall. The thief \_\_\_\_\_. 5. It is alleged that the new material doesn't need any electricity to work. The new material \_\_\_\_\_. 6. It is reported that the building has been badly damaged by fire. The building \_\_\_\_\_. 7. It is said that the company is losing a lot of money. The company \_\_\_\_\_. 8. It is believed that the company lost a lot of money last year. The company \_\_\_\_\_. 9. It is expected that the company will lose money this year. The company \_\_\_\_\_.

**54. Complete each sentence using an Infinitive Construction so that its meaning is similar to the first sentence.**

**Example:** My boss said I could use his car. → My boss let *me use his car*.

1. I was surprised that it was raining outside. I didn't expect it \_\_\_\_\_. 2. Don't stop him doing what he wants. Let him \_\_\_\_\_. 3. He looks older when he wears glasses. Glasses make \_\_\_\_\_. 4. I think you should know the truth. I want \_\_\_\_\_. 5. I didn't want to go to university but my parents persuaded me. My parents persuaded \_\_\_\_\_. 6. My friend said I shouldn't say anything to the police. My friend advised \_\_\_\_\_. 7. I was told that I shouldn't believe everything they say. I was warned \_\_\_\_\_. 8. If you've got a car, you are able to travel more easily. Having a car enables \_\_\_\_\_.

**STUDY NOTE**

The structure **for +noun/pronoun+ infinitive** is very common in English. It is used when an infinitive needs its own subject. The subject of the infinitive is the object of the preposition for. The structure is often used to express possibility, necessity, wishes, suggestions, plans, etc.

**55. Read the following sentences paying attention to the Infinitive Constructions with the preposition for.**

1. We will be happy for the staff to answer all your questions. 2. My idea was for her to learn English intensively. 3. For you to expect anybody to solve your problems would be a big mistake. 4. The tutor asked for the designs to be ready by the end of the month. 5. Can you arrange for the goods to be delivered on Monday? 6. He waited for them to begin a conversation. 7. I'm anxious for the party to be a success. 8. There's no need for them to change an agreement. 9. It is too late for you to go there. 10. It was a challenging task for me to prepare for this presentation.

**56. Write your own example sentences using Complex Subjects/Objects. Work in groups. Read out your sentences for your groupmates to translate.**

*Example: Don't ask me to do it now. I'm really busy.*

## **INDEPENDENT FURTHER STUDY**

**57. You are going to read about four Russian aircraft designers. Read the article once. Why are they so famous?**

**Aleksander Fyodorovich Mozhaysky.** Russian naval officer and early experimenter with flying machines with wings. After conducting his own studies of aerodynamic phenomena, Mozhaysky constructed a series of flying models and kites. It is claimed that he designed a glider that was towed into the air by horses. His plans for a full-scale powered flying machine were studied and approved by a government commission that included the great Russian chemist Dmitry Ivanovich Mendeleev.

**Andrey Nikolaevich Tupolev.** Russian and Soviet aircraft engineer, academician of the Academy of Sciences of the USSR. He designed more than 100 airplanes, 70 of which were mass-produced. Well-known abbreviations, ANT and Tu, stand for aircraft created by Andrey Nikolaevich Tupolev. For example, the Tu-104, the first Soviet jetliner, which appeared in 1955 and became one of the first jet transports to provide regular passenger service; or the Tu-114, a long-range passenger plane, the largest propeller-driven aircraft ever in regular service. In 1968 new horizons were achieved - the display of the first supersonic passenger liner, the Tu-144. Between them, there was also the Tu-95, the first atomic bomb carrier, one of the most durable military aircraft ever built.

“The Il airplane, why are you hunchbacked? It is because I have carried the whole war on my back.” This joke, popular during the World War II, has a grain of truth: Il-2 nicknamed ‘hunchback’ was a ‘workhorse’ of the war. Designed by **Sergey Vladimirovich Ilyushin**, it really occupies a place of honour. The list of models that followed later includes the piston-engine Il-14, the turbo-prop Il -18, and the second-generation machine Il-62, which would set the speed records and serve as aircraft No.1 for carrying the leaders of the USSR. The Il-76 and all other machines were designed and built without Ilyushin, yet the memory of him was preserved in model names.

Aircraft designer **Oleg Konstantinovich Antonov** was the creator of many models of aircraft for various purposes. In 1948 he produced the An-2 – a classic all-purpose airplane often called “the aircraft of the century”. Antonov designed his first machine as a biplane. Its remarkable durability, high lifting power, and the ability to take off and land from poor runways have given it a long service life. Passenger airplane the An-10, multipurpose short takeoff and landing aircraft the An-14, the world’s first wide-body airliner the An-22 “Antei”, the largest for its time transport aircraft the An-124 “Ruslan”, and the An-225 “Mriya”, the biggest heavy cargo-lifting aircraft – all these models were designed by Oleg Antonov.

Source: “Scientific Russia” (<https://scientificrussia.ru/>)

**58. Read the extracts again and answer questions 1-10 from memory.**

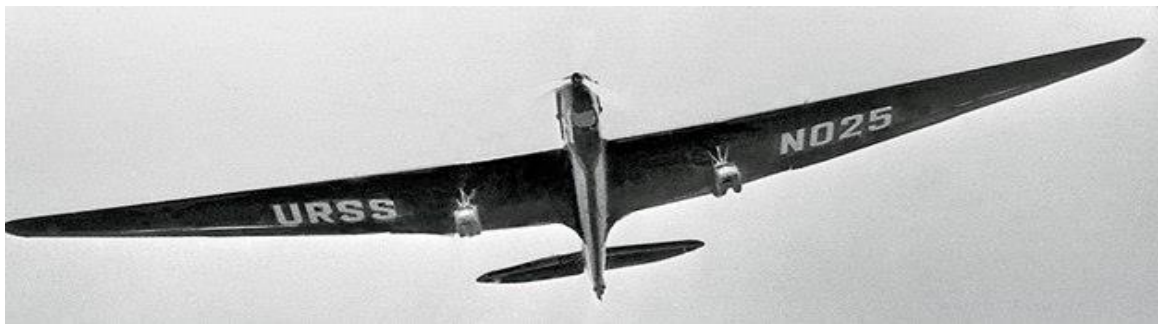
*Which designer or designers ...*

1. designed aircraft No. 1 for carrying the leaders of the USSR?
2. designed one of the first jet transports to provide regular passenger service?
3. is the creator of the aircraft of the century?
4. designed a plane which is also called the 'workhorse' of the war?
5. made plans for a full-scale powered flying machine?
6. designed the largest for its time transport aircraft?
7. designed more than one hundred airplanes?
8. was a naval officer?
9. built one of the most durable military aircraft?
10. is (are) the most prominent?

**59. Read the text about the Chkalov flight and fill in the missing phrases below into the appropriate gaps (1-10). Use the questions to help you if necessary.**

- a. ...made it possible to prepare for the flight and complete it
- b. ...the sky was clouded, and the oxygen supply was almost depleted.
- c. ...the advancement of aircraft engineering and air navigation in the world.
- d. ...the aircraft industry in the Soviet Union...
- e. ...the modern ANT-25 airplane could cover 12,000 kilometers in 75 hours
- f. ...to land at a military airport in Vancouver.
- g. ...suffered from oxygen deficiency.
- h. ...had a rest and prepared for the trip
- i. ...aircraft icing, complicated location finding, and the need to proof the airplane against extremely low temperatures.
- j. ...made the aircraft unstable.

**CHKALOV FLIGHT CELEBRATES 80TH ANNIVERSARY**



June 2022 marked the 85th anniversary of the Chkalov flight — first nonstop transpolar flight over the North Pole in a single-engine airplane. This achievement proved to the whole world that the Soviet Union was a leading aviation nation.

A flight over the North Pole is difficult for a variety of reasons, among which are

1. \_\_\_\_\_. Bravery, professionalism, and perseverance of the crew
2. \_\_\_\_\_ despite the severity of the conditions.

The idea of a nonstop Moscow-San Francisco flight was brought up for the first time in 1935. The length of the primary route — over the Atlantic Ocean — was 14,000 kilometers, whereas the shortest one went through the North Pole and was 9,605 kilometers long. The results of the latest test flights showed that

3. \_\_\_\_\_ in 75 hours without a landing, so it was chosen for the transpolar flight. So far, no one had ever used an aircraft to cross the North Pole.

On June 18, 1937, the airplane with three crew members on board (Georgy Baydukov, copilot; Alexander Belyakov, navigator; Valery Chkalov, pilot) took off at the Shchelkovo airport. During the flight, the aviators would take shifts at the aircraft's controls. Since most of the time the flight was above 3,000 meters, the temperature in the cockpit remained below zero, and the crew also

4. \_\_\_\_\_. On its way to the pole, the plane flew into a cyclone.

The situation did not become any better after they crossed the North Pole.

The station in Alaska that the crew was supposed to establish communication with did not respond, the sky was covered in thick clouds. To avoid them, the pilots had to climb up to 5,000 meters. Flying at such an altitude 5. \_\_\_\_\_.

The final part of the flight posed many other difficulties: the crew was exhausted,

6. \_\_\_\_\_ . All these factors took their toll, and in order to make it to the United States, the ANT-25 had to lose speed. As a result, the temperature in the cockpit dropped. Eating and sleeping became impossible. The crew made the decision 7. \_\_\_\_\_. On June 20, 1937, at 4:20 p.m. GMT, the aircraft landed, having traveled 11,430 kilometers in 63 hours 16 minutes. The heroes were greeted personally by Gen. George Marshall, the commander of Vancouver Barracks, Washington state. The crew then 8. \_\_\_\_\_ to San Francisco, Chicago, and later to Washington, where they would meet President Roosevelt. Apart from Yuri Gagarin, no Russian has since received such an honorable welcome in the U.S.

This flight gave a huge boost to 9. \_\_\_\_\_. It allowed to study how ice protection, fuel and oxygen supply systems work in extreme conditions. It also gave impetus to 10. \_\_\_\_\_ and became the basis for the development of top-class aircraft later on.

### ***Questions:***

1. Why is a flight over the North Pole difficult?
2. What did bravery, professionalism, and perseverance of the crew make possible?
3. What did the results of the test flight show?
4. What did the crew suffer from because of the low temperature in the cockpit?
5. What did flying at the altitude of 5,000 metres result in?
6. What difficulties did the final part of the flight pose?
7. What decision did the crew make?
8. What did the crew do on landing in Vancouver?
9. What did the Chkalov flight give a boost to?
10. What did it also give impetus to?

### **Prepositions**

### **STUDY NOTE**



**Prepositions** are the words that we commonly use to show a relationship in space or time or a logical relationship between two or more people, places or things. Prepositions are most commonly followed by a noun phrase or pronoun (underlined):

*The last time I saw him he was walking **down** the road.*

*I'll meet you in the cafe **opposite** the cinema.*

*It was difficult to sleep **during** the flight.*

In some cases, pairs or groups of words operate like single prepositions:

*They were unable to attend **because of** the bad weather.*

*Mike will be playing **instead of** me.*

**60. Check your knowledge of prepositions by filling in the gaps in the sentences below.**

*On, in, from, into, for, after, among, during, in front of, up to, with, because of, since.*

1. Lots of information is readily accessible \_\_\_\_\_ the Internet. 2. The cause of the crash was determined to be a loss of control \_\_\_\_\_ unknown reasons. 3. The roads were closed \_\_\_\_\_ a public holiday \_\_\_\_\_ safety concerns. 4. The new model designer appeared last night \_\_\_\_\_ a current affairs program. 5. He didn't give any reason \_\_\_\_\_ being late. 6. This site provides customers \_\_\_\_\_ comprehensive information about new models. 7. The company has spent huge amounts \_\_\_\_\_ advertising new products. 8. Clean energy could help us \_\_\_\_\_ solution of the problem of pollution. 9. When this message appears \_\_\_\_\_ the screen, reboot your computer. 10. They didn't finish the maintenance work \_\_\_\_\_ the lack of time. 11. I always get nervous when I have to speak \_\_\_\_\_ an audience. 12. We estimate that there'll be \_\_\_\_\_ 10,000 people at the concert. 13. It was the worst storm \_\_\_\_\_ the 1990s. 14. Scientists say that \_\_\_\_\_ the next ten years there is a growing likelihood that debris \_\_\_\_\_ a falling rocket could hit someone on Earth? 15. \_\_\_\_\_ doing research on the number of rockets launched \_\_\_\_\_ space, scientists called on nations and companies that send rockets to be more responsible. 16. The

Pan African Heritage Museum in Ghana which is set to open soon will be \_\_\_\_\_ the top 100 world's greatest places to visit.

## **Saying Numbers**

**61. Say the following numbers. Use the information in the Skill Section to help you with this task.**

1. 598,346; 2. 1,654,890; 3. 3.456; 4. 0.00789%; 5. 3.14159; 6. \$13.60; 7. £8.95; 8. 19,999; 9. 1,999 years; 10. In 1999; 11.  $40 \times 15 = \dots$ ; 12.  $40 + 15 = \dots$ ; 13.  $-5^{\circ}\text{C}$ ; 14. The score of the match is 3-0; 15. The tennis game finished 30-0; 16. The phone number is 012 276 400; 17. I'm in room 804; 18. He was born in 2005; 19. It's a white Ford, registration number T015662XT; 20. The car has a 2l engine.

**62. Complete the number sequences.**

1. 1, 2, 3, 5, 7, \_\_, \_\_, \_\_
2. 2, 5, 10, 17, 26, \_\_, \_\_, \_\_
3. 0, 1, 10, 11, 100, 101, \_\_, \_\_, \_\_

**63. Read these questions and then answer them.**

1. What is five cubed? 2. What is the next prime number after 17? 3. What's 15% of 300? 4. What is  $10^{-3}$ ? 5. What is  $\sqrt[3]{27}$ ?

## **CHECK YOURSELF**

### **1. The History of Aviation Quiz.**

1. What engine was on the first plane of the Wright brothers?  
a. Diesel    b. Gasoline    c. Electric
2. In what century did the Montgolfier brothers lift the first balloon into the air?  
a. 19th    b. 18th    c. 17th
3. Who is called "father of Russian aviation"?  
a. Sikorsky    b. N. Zhukovsky    c. K. Tsiolkovsky
4. Which military figure and inventor built an airplane in 1883 at his own expense?  
a. Mozhaisky    b. Wrangel    c. Spassky
5. What does "aviation" mean in Latin?

- a. To fly    b. Flight    c. Bird
6. What type of engine was not used by the English inventor of the first half of the XIX century, Sir George Cayley, in his aircraft?
- a. External combustion    b. Steam    c. Internal combustion
7. What is Igor Sikorsky best known for developing?
- a. hover.    b. helicopter    c. glider
8. What is the world's largest passenger plane?
- a. Airbus A380    b. Boeing 747    c. Tu-144
9. What is the largest cargo-carrying aircraft in the world?
- a. A-350    b. An-225 "Mriya"    c. An-124 "Ruslan"
10. A. Tupolev designed or oversaw the design of more than \_\_\_\_ types of civilian and military aircraft in the Soviet Union.
- a. 50    b. 100    c. 30
11. The sonic barrier is the large increase in aerodynamic drag and other undesirable effects experienced by an aircraft when it approaches:
- a. the speed of sound    b. subsonic speed    c. Mach1
12. What happens if lightning strikes the plane?
- a. The plane will shake, as in severe turbulence
- b. There may be minor damage to the skin that does not pose a threat
- c. People on board may be electrocuted
13. In honour of which hero is the Russian passenger plane named, developed under the guidance of aircraft designer I. I. Sikorsky?
- a. Ilya Muromets    b. Alyosha Popovich    c. Dobrynya Nikitich
14. How often do planes take off and land in the world?
- a. every 5 seconds    b. every 2 seconds    c. every 10 seconds
15. What kind of aircraft does not exist in terms of flight speed?
- a. supersonic    b. subsonic    c. hypersonic

**2. Explain the meaning of the following words in English.**

**Example:** *petrol* → *liquid obtained from oil used as a fuel for cars and other vehicles (US gas).*

A failure, an ancestor, efficiency, a glider, a surface, a vessel, a facility, a target, a perspective, challenging environments, to rotate, adjustable, incredibly, marine, workload, as well as, capable of, to escape, to convey, rescue, beneath.

### **3. Guess the words from M8 texts using their definitions.**

**Example:** *a very important event in the development of something* → *a milestone.*

- 1 the body of an aircraft;
- 2 the amount of work that a person or machine is expected to do;
- 3 to turn with a circular movement around a central point;
- 4 the area in a plane where the pilot sits;
- 5 difficult, not easy to deal with;
- 6 to go aboard a plane;
- 7 having the ability to do something;
- 8 an act of saving from danger;
- 9 to become publicly known;
- 10 situated directly below something;
- 11 a ship or a large boat;
- 12 something that is built to serve a particular purpose;
- 13 a verb meaning to get away;
- 14 a synonym phrase to instead of;
- 15 a verb meaning to transfer or deliver;
- 16 a light plane that flies without an engine;
- 17 an adjective used to describe something connected to the sea, ships or the navy;
- 18 the form in which a modern machine or vehicle first existed.

**4\*. Rewrite each sentence below replacing the underlined word by one of the words given below so that the new sentence will have the same meaning as the first one. Translate the sentences into Russian.**

**Example:** *The difficult driving conditions led to several accidents. (cause)*

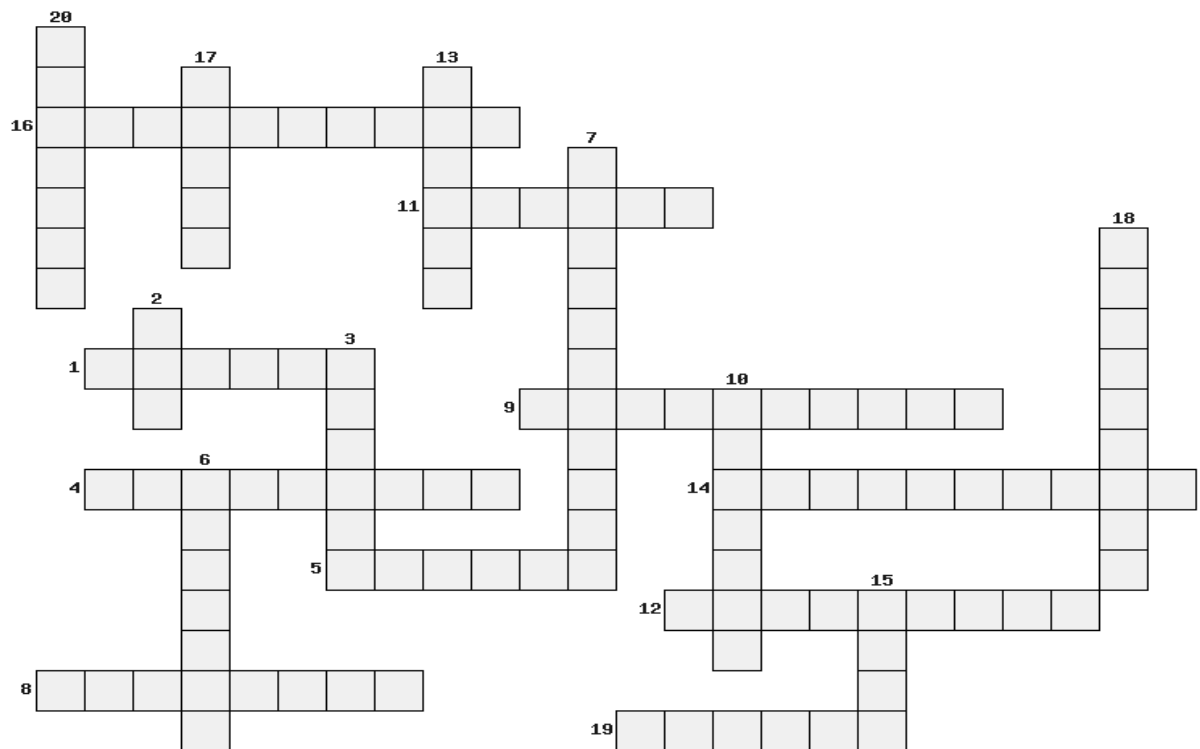
*The difficult driving conditions caused several accidents.*

To envisage, manage, ensure safety, bring something to reality, to inspire, go upward to, to exert, to maintain, efficiency, opposite, an ancestor, receive a boost, a failure, bring within reach, board a plane.

1. The crash happened because the car in front of the driver suddenly turned around and went in a different direction. 2. The governments must put pressure on manufacturing companies to reduce harmful emissions. 3. If you really want to achieve your goals, you should be determined and focus on what you want to achieve. 4. If more people could imagine the consequences of global warming, they would try to do their best to prevent it. 5. If our company keeps its high standards of service at the current level, it will get a competitive advantage. 6. If more measures are taken to support renewable energy sources, humans will be able to reduce air pollution. 7. The reduction in ticket prices made the best seats available for everyone. 8. Public interest in medical issues has increased considerably since the outbreak of the new pandemic. 9. I've always wanted to know what motivates people to set and achieve ambitious goals in life. 10. One of the ways to provide a safe working environment is to inform and to train employees. 11. Passengers are asked to take their seats half an hour before a take-off. 12. Because of her expertise we got all the work done in a few hours. 13. The modern airplane can fly as high as 20,000 feet. 14. The last product of the company was not a success compared to previous versions. 15. Babage's invention is considered to be a predecessor of the modern computer.

**5. Do the crossword.**





### Across

1. a ship or a large boat
4. someone who is travelling in a vehicle, plane, boat, etc.
5. how tall someone or something is
8. the natural force that prevents one surface from sliding easily over another surface
9. a type of an aircraft with large metal blades on top
11. a light plane that flies without an engine
12. a very important event in the development of something
14. the natural ability that makes a machine or person able to do something
16. cheap enough for most people to afford
19. the process of making a drawing of something to show how you will make it

### Down

2. a fast plane with a reaction engine
3. to start something, usually something big or important
6. the top layer of an area of water or land
7. progress or development in your job, level of knowledge, etc.

- 10. the area in a plane where the pilot sits
- 13. a journey in a plane or space vehicle
- 15. to turn around and around very quickly, or to make something do this
- 17. to get on a bus, plane, train, etc. in order to travel somewhere
- 18. at the present time
- 20. a typical quality or an important part of something

**6. Translate from English into Russian paying attention to the Infinitive Constructions.**

1. The article seems to have been published already. 2. He seems to have left his phone at home. 3. Our teacher proved to be very strict. 4. They are unlikely to be here soon. 5. The museum is said to have been closed. 6. He didn't happen to be there. 7. The answer is unlikely to be given today. 8. A new shopping center is reported to be built next to our house. 9. She seemed to be talking a lot. 10. He is said to be writing a new novel. 11. The weather appears to be improving. 12. She seems to have forgotten her promise. 13. The house appears to have been built by a famous architect. 14. The eruption of the volcano is reported to have stopped. 15. Moscow metro is considered to be the most beautiful in the world. 16. Chinese is supposed to be one of the most difficult languages to learn.

**7. Transform the following sentences using Complex Subject/Object Constructions.**

**Example:** *I know that he can speak English well. → He is known to be able to speak English well.*

**I.** 1. Everybody thinks he is a good engineer. (He is thought ... ) 2. I saw that she crossed the street. (I saw her... ) 3. It is likely that these changes will be introduced quite soon. (These changes... ) 5. I know that he has graduated from university. (He... ) 6. People say that LCD monitors are better than CRT ones. (LCD monitors...) 7. It turned out that our approach was wrong. (Our approach... ) 8. Everybody supposes that this test is too difficult. (This test ... ) 9. I do not believe

that he is a good student. (He ... ) 9. It seems they have taken advantage of the favourable conditions. (They... ) 10. They say he graduated from Oxford. (He ... )

**II.** 11. It is not likely that he will finish his course successfully. 12. We know that our tutor is concerned with the problem. 13. It turned out that he had been wrong. 14. They were certain that the project would be completed on time. 15. When they arrived they saw that the bank was closed. 16. They don't believe that he is a good teacher. 17. They estimated that the theory of superconductivity would explain this phenomenon. 18. It was found that the results of the experiment were not as expected. 9. It seems that he knows well what he is talking about. 10. We expect that we will solve this problem.

**8\*. Transform the following sentences with Complex Subject/Object**  
**Constructions according to the example.**

**Example:** *Science is known to contribute to every aspect of man's life. It is known that science contributes to every aspect of man's life.*

1. Molecular biology is expected to dominate other sciences. (It is expected...) 2. The data are assumed to correlate with the present theory. 3. He seems to be working at the same problem. 4. He is likely to argue about it. 5. The results of these experiments are found to overlap. 6. Some people seem to be disappointed in science. 7. The work is likely to contribute to the solution of the problem. 8. Science is considered to affect people's lives.

**9\*. Transform the following sentences using Complex Subject/Object.**

**Example:** *It is known that science contributes to every aspect of man's life. → Science is known to contribute to every aspect of man's life. Or We know science to contribute to every aspect of man's life.*

1. We know that gravity pulls on every particle of a body. 2. They say that his son entered the University. 3. Experiments proved that heat and other forms of energy are mutually convertible. 4. They expect that the project will be ready by the end of the term. 5. It is likely that he will finish his course successfully. 6. They say that



this scientist is keeping in touch with his colleagues from different countries. 7. When we arrived we saw that our train was leaving. 8. It appeared that he hadn't prepared properly for his exam. 9. Everybody finds that our tutor is a very clever man. 10. It happened that he was out when you called.

**10. *Translate into English using Complex Object or Complex Subject:***

1. Известно, что он хороший учитель. 2. Сообщают, что погода будет тёплой. 3. Он оказался хорошим другом. 4. Говорят, что она выиграла гонку. 5. Мне случилось встречать его раньше. 6. Ему разрешают смотреть телевизор каждый вечер. 7. Ожидают, что поезд прибудет вовремя. 8. Его видели бегущим по улице. 9. Было слышно, как она пела. 10. Говорят, что он провалился на экзамене. 11. Я, кажется, не помню его адреса. 12. Учитель казался сердитым. 13. Полагают, что доклад будет интересным. 14. Нам сказали остаться после уроков. 15. Их заставили переписать упражнение.

**11\*. *Complex Object and Complex Subject are commonly used in academic and technical texts. Here are more examples for you to look at. Translate them into Russian using a dictionary.***

1. One can assume this to be self-evident. 2. Most people believe the amount of effort in science to be correlated with the standard of living in the country. 3. One can watch more and more people move into biology from other areas of research. 4. An efficient laboratory head always knows how to get people to do their work properly and on time. 5. Most scientists regard biology rather than physics to be the central ground of scientific advance in the near future. 6. One of the major problems at present for a university is to have young people interested in long-range problems. 7. Assuming this to have direct bearing on the future of man, the author goes into a detailed analysis of the present status of science and scientists in advanced countries. 8. He achieves his aim by having the reader follow his story of this new area of research from its early days up to now. 9. All of the Cooper pairs would have to be halted at the same time for the current to stop, which is very unlikely to occur.

**12. Answer the following questions. Consult Module 8 texts if necessary.**

1. Who designed early ancestors of the airplane?
2. What important breakthroughs had been made before the first airplane was born?
3. What theory did the Wright brothers develop?
4. How did the development of aviation influence people's lives?
5. What technological advancements have today's airplanes brought to reality?
6. What will airplanes of the future be like according to the ideas of aircraft designers?
7. What is a hovercraft and where is it used?
8. What did the Concorde and the Tu-144 have in common?
9. What records were set with the help of the Tu-114?
10. What can the Su-35 do in terms of maneuverability?

**MODULE 8 PROGRESS TEST**

**Vocabulary.** *Decide which answer a, b or c best fits into each gap.*

A **radical idea** is being explored at Delft University of Technology in the Netherlands. Researchers there are working on a new aircraft 1. \_\_\_\_\_ known as the "Flying-V". It is a new concept for a 2. \_\_\_\_\_ aircraft, which they claim would be up to 20% more 3. \_\_\_\_\_ than state-of-the-art modern planes. They suggest abandoning the idea of a 4. \_\_\_\_\_ fuselage. But in this case the shape is more like an arrowhead, with two wings stretching out behind the 5. \_\_\_\_\_ in a V. Passengers and cargo would be carried within the wings themselves. The designers think it would be cheaper to build than the blended 6. \_\_\_\_\_ because the two arms of the V could be "plugged" into the rest of the fuselage. So the aircraft could be built in parts, 7. \_\_\_\_\_ all at once. The design takes 8. \_\_\_\_\_ from the ideas of a graduate student which formed part of his thesis. It is being developed with 9. \_\_\_\_\_ from the Dutch airline KLM and Airbus and in July a scale model took to the skies for the first time. The flight of the test aircraft was deemed a 10. \_\_\_\_\_.

- |                   |                  |                 |
|-------------------|------------------|-----------------|
| 1. a. design      | b. pattern       | c. outline      |
| 2. a. distant     | b. long duration | c. long-haul    |
| 3. a. effluent    | b. effective     | c. efficient    |
| 4. a. convenient  | b. conventional  | c. constructive |
| 5. a. pilot zone  | b. cockpit       | c. cabin        |
| 5. a. domination  | b. power         | c. authority    |
| 6. a. wave        | b. wind          | c. wing         |
| 7. a. rather      | b. rather than   | c. instead      |
| 8. a. inspiration | b. creativity    | c. illumination |
| 9. a. maintenance | b. support       | c. assist       |
| 10. a. succeed    | b. succession    | c. success      |

**Grammar.** *Decide which answer a, b or c best fits into each gap.*

- Aviation industry received a boost when the Wright brothers developed the theory that the air pressure exerted on different parts of the machine could \_\_\_\_\_ by making the wings adjustable.  
a. alter    b. be altered    c. have been altered
- There are many things \_\_\_\_\_ into consideration while designing an aircraft.  
a. to be taken                      b. to have taken                      c. be taking
- One of the major problems of a hypersonic flight is \_\_\_\_\_ the heat that builds up on the aircraft.  
a. to dealing with    b. to be dealt with                      c. to deal with
- Invisible rollers of air created by the compressed air under the vessel are supposed \_\_\_\_\_ it up off the ground.

a. to hold   b. to have held   c. be holding

5. Launched in 1955, the first hovercraft had to wait a few more years \_\_\_\_\_ the light of the day.

a. to see   b. to be seen   c. to have seen

6. We may not yet be living in an age of flying cars but new technologies seem \_\_\_\_\_ a reality that is just as exciting and almost as far-fetched.

a. to be created   b. to be creating   c. to have been creating

7. The Su-35 was expected \_\_\_\_\_ the combat capability of the air force over the coming years.

a. to ensure   b. to have ensured   c. to be ensured

8. Some people will naturally think such course of events \_\_\_\_\_ disastrous not only for science but for the future of mankind.

a. to be   b. being   c. have been

9. The author's major concern is to make the reader \_\_\_\_\_ the full implication of genetic engineering.

a. to realise   b. realise   c. have realised

10. Nobody likes his ideas being criticised without an attempt \_\_\_\_\_ them.

a. to understand   b. to be understood   c. to have understood

***Transform the following sentences using Complex Subject/Object constructions.***

***Example:*** *I know that he can speak English well. → He is known to be able to speak English well.*

1. The researcher claims that the results of the experiment are promising.

2. The teacher expected we would do the task easily.

3. I know that this book has been published recently.

4. It is unlikely that my sister will come to the party.

5. It turned out that the cooling system was broken.

6. It was Mary who saw that Jane was crying.

7. He managed to notice that the software had been changed.
8. We all heard that Mr. Black spoke to our neighbour.
9. Everybody believes that this film is the best one.
10. People say that portable computers are better than the stationary ones.

## APPENDIX M 8

### Full table

Complex Object is used after	Complex Subject is used after
<p>1. verbs denoting wish or expectation: <i>to want, to expect, to wish, 'd like, to like, to desire, ...</i></p> <p>2. verbs of saying, thinking, believing: <i>to believe, to suppose, to know, to find, to think, to declare, to say, to consider, to imagine, to explain, to remind, to announce, to admit, to state...</i></p> <p>3. verbs of physical perception: <i>to see, to observe, to watch, to feel, to hear, to notice...</i><sup>1</sup></p> <p>4. verbs expressing request, order, permission: <i>to ask, to order, to tell, to command, to allow,</i></p> <p>5. other verbs: <i>make, let, rely upon, to count on, ...</i></p>	<p>1. verbs of saying, thinking, believing, expectation and some others used in the Passive Voice: <i>to say, to believe, to suppose, to expect, to report, to consider, to hear, to know, to find, to think, to declare, to imagine, to remind, to announce, to admit, to state ...</i></p> <p>2. other verbs like <i>to seem, to prove, to turn out, to happen, to chance, to appear, ...</i></p> <p>3. some adjectives/adverbs used with the verb 'to be': <i>likely/unlikely, possible, certain, sure...</i></p>

<sup>1</sup>Sometimes after verbs of perception (sense verbs) we use the **-ing** Participle to convey uncompleted aspect. The infinitive signals that the complete action was observed.

*E. g.: I saw her walk across the street. I saw her walking across the street.*

## Saying Numbers

### 1. OH, ZERO, LOVE, NOUGHT, NIL

The above are all ways of saying 0 in English. We say **oh** after a decimal point, in telephone numbers, in bus numbers, in hotel room numbers, in years:

*The area of the village is only 35.03 sq. km. (thirty five point oh three)*

*His phone number is 12 01 39. (one two seven oh one three nine)*

*Get the No. 201 bus. (two oh one)*

*I'm in Room 206. (two oh six)*

We say **nought** before the decimal point:

*0.02 (nought point oh two)*

*It started in 1901. (nineteen oh one)*

We say **zero** for the number 0 for temperature:

*It's -5°C. (five degrees below zero)*

We say **nil** in football scores:

*Spain won 5-0. (five nil)*

We say **love** in tennis:

*The score is 15-0. (fifteen love)*

### 2. THE DECIMAL POINT

In English, use a point (.) and not a comma (,) for decimals. Commas are used in figures only when writing thousands:

*9,001 is nine thousand and one.*

*9.001 is nine point oh oh one.*

In English all the numbers after a decimal point are read separately:

*6.55 (six point five five) Not six point fifty five*

But if the number after the decimal point is a unit of money, it is read like a normal number:

*\$12.50 twelve dollars and fifty cents*

*£ 2.95 two pounds and ninety-five pence*

### 3. PER CENT

The stress is on the *CENT* of per cent. Notice how the following are said in English:

27%            *twenty-seven percent;*

0.5%           *a half of one per cent;*

0.25%          *a quarter of a percentage point*

*For example: The Bank of England raised interest rates this morning **by** a quarter of a percentage point.*

#### 4. HUNDREDS, THOUSANDS, AND MILLIONS

In British English you hear *a hundred **and** twenty-three*. In American English you usually hear *a hundred twenty-three*.

The number 1,229 is said *one thousand two hundred and twenty nine*.

The year 1999 is said *nineteen ninety-nine*.

The year 2000 is said *the year two thousand*.

The year 2009 is said *two thousand and nine*.

The year 2025 is said *two thousand and twenty-five* or *twenty twenty-five*.

1.000.000 is a million or ten to the power six. ( $10^6$ )

1.000.000.000 is a billion or ten to the power nine. ( $10^9$ )

#### 5. SQUARES, CUBES, AND ROOTS

$10^2$  is ten squared or ten to the power of two.

$10^3$  is ten cubed or ten to the power of three.

$^2\sqrt{6}$  is the square root of six.

$^3\sqrt{9}$  the cube root of nine.

#### 6. TELEPHONE NUMBERS

We usually give telephone as individual digits: 012736344 *oh one two seven three six three four four*; 344 can also be said as *three double four*.

#### 7. FRACTIONS

Fractions are mostly like ordinal numbers (fifth, sixth, twenty third, etc.):

$\frac{1}{3}$  - *a third*     $\frac{1}{5}$  - *a fifth*     $\frac{1}{6}$  - *a sixth*

But:

$\frac{1}{2}$  - *a half*     $\frac{1}{4}$  - *a quarter*     $\frac{3}{4}$  - *three quarters*     $2\frac{3}{4}$  - *two and three quarters*.

## 8. CALCULATING

Remember to pronounce the s in equals as /z/. It is singular: the part on the left equals the part on the right.

$10 + 4 = 14$  *ten plus four is fourteen* or *ten and four equals fourteen*

$10 - 4 = 6$  *ten minus four is six* or *ten take away four equals six*

$10 \times 4 = 40$  *ten times four is (or equals) forty* or *ten multiplied by four is forty*

$10 : 4 = 2\frac{1}{2}$  *ten divided by four is two and a half*

Also: + = add, - = subtract (or deduct), x = multiply, : = divide

## 9. NUMBERS AS ADJECTIVES

When a number is used before a noun like an adjective, it is always singular:

*a fifty-minute lesson*      not      *a fifty-minutes lesson*

*For example: sixteen-week semester, a thirty-five rouble book*