

ПР13. Принципы составления и написания научной статьи. Анализ отрывков из научных статей по различным темам. Введение и отработка новой лексики, клише.

ПР13. Writing a research paper. Analysis of extracts from scientific articles on various topics. Introduction of a new vocabulary.

Exercise 1. Tony is doing research into the panspermia hypothesis as part of a Master's degree in astrobiology. He has been investigating whether it is possible for bacteria and microorganisms to survive in an environment as harsh as the surface of Mars. He has been advised to organize the text of his introduction around five key questions. Match the beginnings to the endings of the questions.

- | | |
|---------------------|---|
| 1. What was I | a. approach the problem? |
| 2. Why was it | b. expect to know after doing the research? |
| 3. What was already | c. important? |
| 4. What did I | d. investigating? |
| 5. How did I | e. known about the subject of my research? |

Exercise 2. Read five extracts from the introduction to Tony's paper. Which question from Exercise 7 is each extract answering? Write the questions above the extracts.

1. _____
Such an extreme environment was thought to be uninhabitable, but microbial ecology studies reported the presence of microorganisms (Amaral-Zettler et al., 2002). Could the surface composition of Mars protect life against radiation?

2. _____
A number of studies have investigated different extreme Martian surface conditions on terrestrial microorganisms. Nicholson and Schuerger (2005) reported that the spores of *Bacillus subtilis* were able to survive for 19 days under Mars atmospheric pressure and composition. Saffary et al. (2002), however, found that survival decreased due to ...

3. _____
Potential habitability in the subsurface would increase if the overlaying material did play a protective role.

4. _____
For many years now, scientists have speculated about the possibility of life on Mars (Klein et al., 1976; McKay, 1997). The discovery of liquid water on Mars would increase its habitability ...

5. _____
We report here on our studies of protection by Rio Tinto Basin iron oxides and hydroxides on two microorganisms, *Acidithiobacillus ferrooxidans* and *Deinococcus radiodurans*, under simulated Mars surface conditions.

ПР14. Принципы составления и написания научной статьи. Анализ различных частей научной статьи и их особенностей.

IP14. Writing a research paper. Analysis of various sections of a scientific article.

Exercise 3. Read an extract from the introduction of a paper about the ability of lichens and microbes to survive in deep space. Put the verbs into the correct form.

Recent advances in space technology (1)_____ (provide) the possibility of studying the survival of different microorganisms in the harsh environment of space (*Demets et al., 2005; Baglioni et al., 2007*). So far, lichens (2) _____ (be) the only organisms able to survive exposure to such extreme conditions (*Sancho et al., 2007; de los Rios et al., 2010*).

It is believed that, if sufficiently protected by meteorite-like material, microorganisms may also survive the journey through space. However, Brandstatter *et al.* (2008) (3)_____ (report) that microorganisms embedded in 2 cm thick rocks on the outer surface of a re-entry capsule, simulating the entry of a meteorite, (4)_____ (not survive).

The aim of this work (5)_____ (be) to obtain further information on the resistance of rock-colonising microbial communities and lichens to outer space conditions, during the Biopan-6 flight of ESA on board a Russian Foton satellite.

Exercise 4. Complete the following summary on variables using the given words.

affects collecting controlled data dependent independent

How much a variable (1)_____ a relationship can be discovered by (2)_____ experimental (3)_____ on changes to the relationship as the variable is changed. In an experiment, there will be: one (4)_____ variable – this is the feature you are measuring; one or more (5)_____ variables – these are the variables which you change; one or more (6)_____ variables – these are not being tested and so they stay the same.

Exercise 5. Complete the lines below using the extract from the following research paper to help you.

A promising candidate among the different adsorbent materials are activated carbons. Through activation, highly porous materials can be prepared. Due to their high porosity, activated carbon materials are able to adsorb large amounts of hydrogen. Following adsorption, hydrogen molecules can be found at two possible locations: (1) on the surface of the adsorbent, or (2) as a compressed gas in the void space between adsorbent particles. (adapted from *Konowsky et al. 2009*)

Noun	Verb	Adjective
1. compression	2. compress	3. _____
4. _____	5. adsorb	6. _____
7. _____	8. activate	9. _____
10. _____		11. _____

Exercise 6. The gapped words below all describe physical or chemical properties of substances. The meaning of each word is given on the right. Complete the words with the correct vowels (a, e, i, o, u)

- | | |
|-----------------|---|
| 1. br_ttl_n_ss | how easily something can be broken |
| 2. c_p_c_t_nc_ | how well something holds an electrical charge |
| 3. c_nc_ntr_t n | how much of one substance is found in another |

4. c_nd_ct_v_ty	how well something allows heat or electricity to go
5. d_ns_ty	how much mass a given volume of a substance has
6. fl_mm_b_l_ty	how easily something burns
7. l_m_n_nc_	how much light passes through or comes from a substance
8. m_ss	how much matter is in a solid object or in any volume of
9. p_rm__b_l_ty	how easily gases or liquids go through a substance
10. p_r_s_ty	how many small holes are in a substance
11. r__ct_v_ty	how easily a chemical substance reacts
12. s_l_b_l_ty	how easily something can be dissolved to form a solution
13. v_l_c_ty	how quickly an object is travelling
14. v_sc_s_ty	how thick a liquid is
15. v_l_m_	how much space is contained within an object or solid

Exercise 7. Complete the paragraphs from the results section of a paper using the following words and phrases in the box.

**as can be seen in considerably contrast to noticeably thicker resulted in a longer
while**

During the rapid heating, the Ni near the Ni/SiC interface reacted with the SiC, which resulted in carbon atoms moving into the Ni. The carbon atoms then separated onto the surface of the Ni during the cooling procedure, forming graphene layers (1)_____Fig. 1b. In (2) _____the graphene generated using single-crystalline SiC, the graphene synthesised by this process is (3)_____easier to remove from the SiC surface.

A slower heating rate (4) _____ process. As shown in Fig. 4, more carbon atoms were released into the Ni in a long process. Higher carbon concentration in the Ni produced a (5)_____carbon nanofilm on the Ni surface, (6)_____a lower carbon concentration reduced the thickness of the carbon nanofilm and formed graphene.