Academic Reading 1 (AR1)
Sample Final Test (3)
Test Booklet

Instructions to Students

1. TURN OFF your cell phone.
2. Place your student ID, pencils, and eraser on the desk. Put everything else in your bag and put your bag on the floor.
3. Before the test begins, you will receive this test booklet and an answer sheet. The test booklet contains 9 pages plus this cover page.
4. Do NOT open the test booklet before you are told to do so by the examiner.
5. At the top of the answer sheet, write the information required about yourself and your Academic Reading class.
   • Day (Monday, Tuesday, Wednesday, Thursday, or Friday)
   • Class Period (1, 2, 3, 4, or 5)
   • Teacher's Name
   • Student ID
   • Student Name
6. Write all your answers on the answer sheet.
7. Dictionaries are not allowed.
8. The following behavior during the test is considered cheating and is subject to severe punishment.
   • the use of a camera or a cell phone
   • looking at notes
   • looking at another student's answer sheet
   • providing answers to another student
9. You will have 60 minutes to complete the test.
10. When the test is completed, wait quietly for the examiner to collect all of the answer sheets.
11. Take this test booklet home with you.

Important Note

The questions in this sample test are from AY2018 and earlier. Future tests will be based on the current list of Science News items listed on the AR1 web page. The questions here should therefore be seen as samples of the kinds of questions that may appear on the AR1 final test.

Part I (Goal 6): Science News

Instructions: Answer the following questions based on the information contained in the assigned science news articles.

1. What kind of evidence was found on the Canadian Pacific coast that reveals that people migrated from Eurasia to North America?
   a. ancient human footprints
   b. dense forest land
   c. tools and firepits
   d. intertidal beach sediment

2. Which word best fits in the blank? “Rare earth deposits sufficient to meet global demand for centuries have been found in Japan's _____ economic zone (EEZ) near one of the Ogasawara islands some 2,000 kilometers southeast of mainland Tokyo.”
   a. national
   b. eastern
   c. exclusive
   d. normal

3. Researchers accidentally discovered an enzyme. Why was it an important discovery?
   a. Because it was found in Japanese landfills.
   b. Because it digests plastic and can help solve the plastic pollution in waterways like oceans.
   c. Because researchers made it clear how it was developed from an older cutin-eating enzyme.
   d. Because researchers made it inexpensive to use inside of an industrial process.

4. Which word/phrase best fits in the blank? “Researchers at the University of Limerick in Ireland demonstrated that depression symptoms are linked with _____.”
   a. weight loss
   b. weight gain
   c. weight lifting
   d. medication

5. Which of the following has the greatest share of the Earth's biomass?
   a. humans
   b. plants
   c. cows
   d. bacteria

6. Which of the following most recently showed evidence that they understand numerical zero?
   a. worms
   b. preschool children
   c. bees
   d. parrots

7. What kind of innovation have CO2 researchers made recently?
   a. They've discovered an old method to recapture CO2 from the atmosphere.
   b. They've developed a cheaper method to recapture CO2 from the atmosphere.
   c. They've discovered a new method to decrease CO2 emissions to the atmosphere.
   d. They've developed a cheaper method to decrease CO2 emissions to the atmosphere.

8. What action do guppies do as a sign of aggression to rivals?
   a. open mouth wide
   b. swim in circles
   c. increase body size
   d. change eye color

Part II (Goal 2): Recognizing Common Linguistic Features

Instructions: Read texts **[A]** – **[E]** and answer the questions that follow each.

[A] Scientists in France began their research by training bees to sip sugar water from a series of platforms paired with images. The images featured different numbers of dots. Researchers used the setup to teach the bees <u>inequality</u> relationships.

[Adapted from Hays 2018]

9. What does <u>inequality</u> mean?
   a. being the same
   b. having a certain number (e.g., of dots)
   c. having a different value
   d. being related by images

[B] (1)Pilot data from a recent study suggest that sleep paralysis and hypnogogic hallucinations as you are falling asleep or waking up are widespread in student athletes and are independently associated with symptoms of depression. (2)Occasional sleep paralysis was reported by 18 percent of the sample, and 7 percent reported that this happens at least once per week. (3)Hypnogogic hallucinations (which are dream-like experiences that occur while falling asleep or waking up) were reported by 24 percent of the sample, and 11 percent reported that they experience these symptoms at least once per week. (4)Compared to those who never experience sleep paralysis or hypnogogic hallucinations, those who did experience them—even rarely—also reported higher depression scores.

[Adapted from American Academy of Sleep Medicine 2018]

10. Which sentence contains a technical term and its definition?
    a. sentence (1) b. sentence (2) c. sentence (3) d. sentence (4)

11. How is the definition highlighted?
    a. parentheses b. commas c. period d. italics

[C] The basic building blocks of all matter (all gases, liquids, and solids in both living and nonliving systems) are atoms. Only 92 different kinds of atoms occur in nature, and these are known as the 92 naturally occurring elements. How then can the innumerable materials that make up our world be made up of just 92 elements? Elements are analogous to Lego® blocks: From a small number of basic kinds of blocks, we can build innumerable different things. Also, like blocks, nature's materials can be taken apart into their separate constituent atoms, and the atoms can then be reassembled into different materials.

[Adapted from Nebel and Wright 1998]

12. What does innumerable (appearing twice in the text) mean?
    a. too small to count b. more than 92 c. within a range d. countless, too many

13. What does constituent mean?
    a. natural b. a part as opposed to a whole
    c. countable d. be able to assemble

[D] (1)Science is based on observation and experiment—that is, on measurements. (2)Accuracy is how close a measurement is to the correct value for that measurement. (3)For example, let us say that you are measuring the length of standard computer paper. (4)The packaging in which you purchased the paper states that it is 11.0 inches long. (5)You measure the length of the paper three times and obtain the following measurements: 11.1 in., 11.2 in., and 10.9 in. (6)These measurements are quite accurate because they are very close to the correct value of 11.0 inches. (7)In contrast, if you had obtained a measurement of 12 inches, your measurement would not be very accurate.

[Adapted from OpenStax College "College Physics" 2012 (ARiSE1, p. 52)]

14. What does the pronoun it refer to?
    a. paper b. length c. computer d. packaging

15. What does the pronoun <u>they</u> refer to?
a. experiments b. inches c. papers d. measurements

16. Which of the following is the topic sentence of the paragraph?
a. sentence (1) b. sentence (2) c. sentence (6) d. sentence (7)

[E] (1)Ultimately, brain deterioration is caused due to insufficient blood flow to the neurons and reduced cell-to-cell connectivity. (2)The researchers added that these findings may help medical professionals in developing strategies to fight cognitive decline due to aging. (3)The key is to increase blood flow to the brain. (4)Exercise and being intellectually engaged can help with this, according to Boldrini. (5)She added further research is required to understand if this discovery can help improve treatments for conditions such as depression and Alzheimer's disease.

[Adapted from Bharanidharan 2018]

17. What is the topic of this paragraph?
a. strategies to fight cognitive decline b. causes of brain deterioration
c. insufficient blood flow to neurons d. treatments for depression and Alzheimer's

18. Which of the following best expresses the main idea of the paragraph?
a. There are ways to avoid losing cognitive abilities as people get older.
b. Medical professionals are developing strategies to prevent aging.
c. Brain deterioration is caused by insufficient blood flow to the neurons.
d. There are few treatments to fight depression and Alzheimer's disease.

Part III (Goal 5): Managing Academic References

Instructions: Read text **[F]** and answer the questions that follow.

[F] There are two practical strategies for stair climbing; ascending stairs one step at a time and ascending stairs two steps at a time. However, comparisons to date of the energetic costs of these two strategies are limited. While _____ compared the costs of single step ascents with double step ascents, climbing paces were prescribed to control for pace differences between climbing strategies and thus the results are not fully relevant to natural stair climbing situations.

References

[1] Aziz A, Teh K. Physiological Responses to Single versus Double Stepping Pattern of Ascending the Stairs. *Journal of Physiological Anthropology and Applied Human Science* 24: 253–257.

[Adapted from Halsey et al 2012]

19. Which of the following best fits in the blank?
a. Journal of Physiological Anthropology b. some researchers
c. Aziz and Teh [1] d. “some researchers”

20. What necessary piece of information is missing from reference [1]?
a. author(s) b. where published c. year d. title

Part IV (Goal 3): Comprehending Texts

Instructions: Read texts **[G]** – **[I]** and answer the questions that follow each.

Text **[G]** consists of the following paragraphs **[1]** – **[4]**.

[1] Machine learning is a quickly-growing field, and Google has been leading the charge for years. The company uses AI to predict flight delays, improve virtual keyboards, give names to streets, create charts from spreadsheets, recommend online articles, and much more.

[2] However, machine learning is not the precise technology that many assume it is. Ali Rahimi, a researcher at the company, received a 40-second ovation at an AI conference for calling machine learning, "a form of alchemy." He said researchers often don't know why some algorithms work while other ones don't. "Many of us feel like we're operating on an alien technology," Rahimi explained.

[3] He collaborated with other researchers on a paper, presented on April 30 at the International Conference on Learning Representations in Vancouver, that goes into detail about AI's 'reproducibility problem.' To summarize, it alleges that many researchers don't understand how algorithms come to conclusions - they simply keep tweaking the program until it behaves how they want. As a result, these algorithms can't be (easily) recreated by others, because the researchers themselves can't explain them.

[4] The team also claimed that most papers on AI are focused on algorithms beating benchmarks, not about how said algorithms actually work. "The purpose of science is to generate knowledge," Rahimi said. "You want to produce something that other people can take and build on."

[Adapted from Davenport 2018]

21. Which of the following is the topic of this text?
    a. alchemy b. AI c. Google d. machine learning

22. Which of the following best expresses the main idea of this text?
    a. Alchemy is a growing part of machine learning.
    b. Google leads the field of alchemy conferences.
    c. AI can achieve various tasks which have been difficult for machine learning.
    d. Google admits that machine learning is incomprehensible.

23. What is the issue discussed in paragraph **[3]**?
    a. Researchers don't understand how algorithms work.
    b. Aliens will use machines to beat us in the future.
    c. Machines cannot outperform humans.
    d. The International Conference on Learning Representations is too influential.

24. Which of the following is the best paraphrase of the underlined sentence in paragraph **[3]**?
    a. Algorithms can't be easily recreated by others because the researchers can't explain them.
    b. Researchers don't understand how their solutions work, so others can't recreate them.
    c. Solutions cannot be recreated if other researchers explain how they work.
    d. Understanding algorithms involves researchers who know how to explain things.

[H] Ali Rahimi, a researcher at Google, received a 40-second ovation at an AI conference for

calling machine learning, "a form of alchemy." He and his collaborators allege that many researchers simply keep tweaking the program until it behaves how they want and that most papers on AI are focused on algorithms beating benchmarks, not about how said algorithms actually work.

25. Which of the following best describes Text **[H]** relative to Text **[G]**?
    a. Text **[H]** is an acceptable summary of Text **[G]** because it paraphrases the key ideas well.
    b. Text **[H]** is not a good summary of Text **[G]** because it fails to show what the topic is.
    c. Text **[H]** is not an acceptable summary of Text **[G]** because it copies the text directly.
    d. Text **[H]** is not a good summary of Text **[G]** because the details it gives are not correct.

Text **[I]** consists of the following paragraphs **[1]** – **[2]**.

[1] Rates of energy expenditure of stairway ascending reported in the current study are very similar to those provided by previous studies investigating the cost of stair climbing or similar climbing scenarios. This indicates that the use of heart rate as a proxy for rate of energy expenditure during stair climbing, where heart rate has been calibrated using an inclined treadmill, is an accurate method of estimation, despite these two activities being somewhat different. In turn, this perhaps indicates that incline treadmill walking and stairway ascending have similar energy costs and evoke similar muscle utilization.

[2] The underlying explanation for this could be that the overriding cost involved with both stair ascending and walking up an equivalent incline is that required to raise the center of mass against gravity. The power required to lift the body against gravity during stair climbing explains the greater energy expenditure per stride during two step ascents; the body is lifted twice the height per stride. However, total energy expenditure to ascend a stairway of typical height is greater during one step ascents. The greater total energy expenditure of one step ascents of stairways is presumably explained at least in part by the greater ascent duration.

[Adapted from: Halsey et al 2012]

26. Which of the following is the main idea of paragraph **[1]**?
    a. Using heart rate as a proxy for rate of energy expenditure is an accurate method of estimation.
    b. Results of the current study are very similar to those found by previous studies.
    c. Incline treadmill walking and stairway ascending have similar energy costs.
    d. None of the above.

27. According to the text, what is the likely reason that incline treadmill walking and stairway ascending have similar energy costs?
    a. Heart rate is an accurate method of estimation of energy expenditure.
    b. Both activities evoke similar muscle utilization.
    c. Heart rate has been calibrated using an inclined treadmill.
    d. The cost to raise the center of mass against gravity overrides other costs.

28. Which of the following is true according to the text?
    a. Ascending stairs and walking up an inclined treadmill evoke similar muscle utilization.
    b. Measurement of heart rate cannot be used to estimate energy expenditure.
    c. Ascending stairs uses more energy than walking up an incline treadmill.
    d. The cost for ascending stairways and walking up an incline treadmill are equivalent.

Part V (Goal 4): Using Higher-level Cognitive Skills

Instructions: Read texts **[J]** and **[K]** and answer the questions that follow each.

Text **[J]** consists of the following five paragraphs **[1]** – **[5]** which are NOT arranged in a coherent order.

[1] Once the requirements are determined, the analyst will begin the process of translating these requirements into an information-systems design. A good analyst will understand what different technological solutions will work and provide several different alternatives to the requester. Once the solution is selected, the analyst will create a detailed document describing the new system. This new document will require that the analyst understand how to speak in the technical language of systems developers. The design document created by the systems analyst provides the detail needed to create the system and is handed off to (1) to actually develop the system.

[2] Computer engineers design the computing devices that we use every day. There are many types of computer engineers, who work on a variety of different types of devices and systems. Some of the more prominent engineering jobs include hardware engineer, software engineer, systems engineer, and network engineer.

[3] The first group of people we are going to look at play a role in designing, developing, and building information systems. These people are generally very technical and have a background in programming and mathematics. Just about everyone who works in the creation of information systems has a minimum of a bachelor's degree in computer science or information systems, though that is not necessarily a requirement.

[4] The role of the systems analyst is to straddle the divide between identifying business needs and imagining a new or redesigned computer-based system to fulfill those needs. This individual will work with a person, team, or department with business requirements and identify the specific details or a system that needs to be built.

[5] Programmers spend their time writing computer code in a programming language. In the case of systems development, programmers generally attempt to fulfill the design specifications given to them by a systems analyst. A programmer needs to be able to understand complex processes and also the intricacies of one or more programming languages.

[Adapted from Bourgeois 2014 (ARiSE1, p. 56)]

29. Which of the following is the most coherent paragraph order of the text?
   a. [2]-[5]-[4]-[3]-[1]
   b. [3]-[4]-[1]-[5]-[2]
   c. [4]-[1]-[3]-[2]-[5]
   d. [5]-[4]-[2]-[1]-[3]

30. What is the best title of the text?
   a. The roles of the programmer
   b. The role of the systems analyst
   c. Computer engineers
   d. Creators of information systems

31. Which of the following words or phrases best fills blank (1) in paragraph **[1]**?
   a. systems analysts b. programmers c. computer engineers d. none of a, b, or c

32. What is the nature of the document created by the systems analyst (in paragraph **[1]**)?
   a. It is written in ordinary language so that general people would understand it well.
   b. It is written in ordinary language so that systems analysts themselves can remember it well.
   c. It is written in technical language to communicate with business people.
   d. It is written in technical language to communicate with people who develop the systems.

33. Which of the following corresponds to people who play a role in <u>designing, developing, and building information systems</u>, respectively?
   a. systems analysts, computer engineers, programmers
   b. programmers, computer engineers, systems analysts
   c. systems analysts, programmers, computer engineers
   d. programmers, systems analysts, computer engineers

[K] The present data show that climbing flights of stairs two steps at a time requires a higher rate of energy expenditure than climbing them one step at a time. A similar finding was reported by Gottschall et al. [1] for treadmill walking on a representative incline at voluntarily selected paces for one- and two-step stair climbing. However, no previous studies to our knowledge have reported that total energy expenditure is lower for ascending a stairway two steps at a time; the higher rate of energy expenditure when ascending two at a time is due to the higher preferred pace of participants in this situation (see [2]).

The power required to lift the body against gravity during stair climbing explains the greater energy expenditure per stride during two step ascents; the body is lifted twice the height per stride [3]. However, total energy expenditure to ascend a stairway of typical height (15 m) is greater during one step ascents (although the present study did not find a difference in energy cost per stairway step between one and two step ascents, this is likely due to sensitivity limitations in predicting V_{O_2} from heart rate for very short periods of time). The greater total energy expenditure of one step ascents of stairways is presumably explained at least in part by the greater ascent duration. However, there may also be a biomechanical explanation as well. Since stair step rate is higher during single stepping this may result in faster rates of muscle shortening, which increases energy turnover [4], and the greater recruitment of fast twitch muscle fibres which are less economical.

The advice to those seeking to utilise stair climbing specifically as a method to control or reduce weight [5] is to ascend stairways one step at a time; more calories are burned through this form of stair climbing. For example, climbing just a 15 m high stairway five times a day represents an energy expenditure of on average 302 kcal per week using the one step strategy and 266 kcal using the two step strategy.

[Adapted from: Halsey et al 2012]

34. John lives in an apartment on the sixth floor of his building. Based on the findings, which of the following would be the most optimal exercise routine for John to lose weight?
    a. John walks down the stairs one step at a time when he leaves for work each morning.
    b. John runs up stairs two steps at a time once every day.
    c. John ascends the stairs one step at a time once each week.
    d. John walks up the stairs one step at a time when he returns home each evening.

35. Which of the following would be the most logical, relevant follow-up research question?
    a. What is the difference between the one-step and two-step strategies?
    b. How do leg muscles work while walking on a treadmill?
    c. How does the rate of stepping affect the energy expenditure?
    d. What is the optimal construction technique for stairways?

36. Which of the following relationships is consistent with the experimental findings?
    a. People use energy faster with the two-step than one-step strategy.
    b. Stair climbers use more energy to climb a set of stairs with the two-step than one-step strategy.
    c. People move their muscles more quickly during two-step than one-step climbing.
    d. People reach the top of the stairs sooner with the one-step rather than two-step strategy.

37. Imagine a follow-up experiment is to test a three-step strategy. Which of the following predictions about the experiment is most likely to be true?
    a. The three-step strategy has the lowest rate of energy expenditure of all three strategies.
    b. The three-step strategy has the lowest total energy expenditure among the three strategies.
    c. The three-step strategy has the lowest total energy expenditure per stride of all three strategies.
    d. The three-step strategy increases the overall amount of time it takes to ascend the stairs.

38. Which of the following predictions about DESCENDING stairs is most likely to be true?
    a. If dropping the body with gravity makes no energy expenditure difference between the strategies, the rate of expenditure will be the same.
    b. If step rate is constant between the strategies, then the rate of energy expenditure would be highest in the one-step strategy.
    c. If step rate is not constant between the strategies, then the rate of energy expenditure would be lowest in the one-step strategy.
    d. If the one-step strategy has a lower rate of energy expenditure but takes longer, then it will have the highest total energy expenditure.

End of Final Test

List of sources

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Day	Class Period	Teacher's Name
Student ID		**Student Name**

Academic Reading 1 (AR1)
Sample Final Test (3)
Answer Sheet

Instructions: Fill in the circle corresponding to your answer for each item below. Be sure to fill in the circle completely. Fill in only one circle for each item.

Ex.	ⓐ	●	ⓒ	ⓓ
1	ⓐ	ⓑ	ⓒ	ⓓ
2	ⓐ	ⓑ	ⓒ	ⓓ
3	ⓐ	ⓑ	ⓒ	ⓓ
4	ⓐ	ⓑ	ⓒ	ⓓ
5	ⓐ	ⓑ	ⓒ	ⓓ
6	ⓐ	ⓑ	ⓒ	ⓓ
7	ⓐ	ⓑ	ⓒ	ⓓ
8	ⓐ	ⓑ	ⓒ	ⓓ
9	ⓐ	ⓑ	ⓒ	ⓓ
10	ⓐ	ⓑ	ⓒ	ⓓ
11	ⓐ	ⓑ	ⓒ	ⓓ
12	ⓐ	ⓑ	ⓒ	ⓓ
13	ⓐ	ⓑ	ⓒ	ⓓ
14	ⓐ	ⓑ	ⓒ	ⓓ
15	ⓐ	ⓑ	ⓒ	ⓓ
16	ⓐ	ⓑ	ⓒ	ⓓ
17	ⓐ	ⓑ	ⓒ	ⓓ
18	ⓐ	ⓑ	ⓒ	ⓓ
19	ⓐ	ⓑ	ⓒ	ⓓ
20	ⓐ	ⓑ	ⓒ	ⓓ
21	ⓐ	ⓑ	ⓒ	ⓓ
22	ⓐ	ⓑ	ⓒ	ⓓ
23	ⓐ	ⓑ	ⓒ	ⓓ
24	ⓐ	ⓑ	ⓒ	ⓓ
25	ⓐ	ⓑ	ⓒ	ⓓ
26	ⓐ	ⓑ	ⓒ	ⓓ
27	ⓐ	ⓑ	ⓒ	ⓓ
28	ⓐ	ⓑ	ⓒ	ⓓ
29	ⓐ	ⓑ	ⓒ	ⓓ
30	ⓐ	ⓑ	ⓒ	ⓓ
31	ⓐ	ⓑ	ⓒ	ⓓ
32	ⓐ	ⓑ	ⓒ	ⓓ
33	ⓐ	ⓑ	ⓒ	ⓓ
34	ⓐ	ⓑ	ⓒ	ⓓ
35	ⓐ	ⓑ	ⓒ	ⓓ
36	ⓐ	ⓑ	ⓒ	ⓓ
37	ⓐ	ⓑ	ⓒ	ⓓ
38	ⓐ	ⓑ	ⓒ	ⓓ

Day	Class Period	Teacher's Name
Student ID		**Student Name**

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Answer Sheet

Instructions: Fill in the circle corresponding to your answer for each item below. Be sure to fill in the circle completely. Fill in only one circle for each item.

Ex.	ⓐ	●	ⓒ	ⓓ	19	ⓐ	ⓑ	●	ⓓ
1	●	ⓑ	ⓒ	ⓓ	20	ⓐ	ⓑ	●	ⓓ
2	ⓐ	ⓑ	●	ⓓ	21	ⓐ	ⓑ	ⓒ	●
3	ⓐ	●	ⓒ	ⓓ	22	ⓐ	ⓑ	ⓒ	●
4	ⓐ	ⓑ	●	ⓓ	23	●	ⓑ	ⓒ	ⓓ
5	ⓐ	●	ⓒ	ⓓ	24	ⓐ	●	ⓒ	ⓓ
6	ⓐ	ⓑ	●	ⓓ	25	ⓐ	ⓑ	●	ⓓ
7	ⓐ	●	ⓒ	ⓓ	26	●	ⓑ	ⓒ	ⓓ
8	ⓐ	ⓑ	ⓒ	●	27	ⓐ	ⓑ	ⓒ	●
9	ⓐ	ⓑ	●	ⓓ	28	●	ⓑ	ⓒ	ⓓ
10	ⓐ	ⓑ	●	ⓓ	29	ⓐ	●	ⓒ	ⓓ
11	●	ⓑ	ⓒ	ⓓ	30	ⓐ	ⓑ	ⓒ	●
12	ⓐ	ⓑ	ⓒ	●	31	ⓐ	●	ⓒ	ⓓ
13	ⓐ	●	ⓒ	ⓓ	32	ⓐ	ⓑ	ⓒ	●
14	●	ⓑ	ⓒ	ⓓ	33	ⓐ	ⓑ	●	ⓓ
15	ⓐ	ⓑ	ⓒ	●	34	ⓐ	ⓑ	ⓒ	●
16	ⓐ	●	ⓒ	ⓓ	35	ⓐ	ⓑ	●	ⓓ
17	●	ⓑ	ⓒ	ⓓ	36	●	ⓑ	ⓒ	ⓓ
18	●	ⓑ	ⓒ	ⓓ	37	ⓐ	●	ⓒ	ⓓ
					38	●	ⓑ	ⓒ	ⓓ