Practice Exam - Science and Innovation

Cambridge IGCSE ESL 0510/0511 | Reading practice paper

Exercise 1

Read the article about students collecting weather data then answer the questions.

A classroom weather station

A group of science teachers set up a small weather station on the roof of their school. The equipment measures temperature, rainfall, wind speed and air pressure. At first, the station was used only in science lessons, but students soon began using the data in geography, maths and even art, where they created visual displays of changing weather patterns. The project also helps students understand uncertainty. When readings from the school differ from official figures, teachers ask students to consider height, surface materials and the exact time of measurement before deciding that one set of data is wrong.

The teachers chose the roof because the instruments needed open air away from trees and buildings. However, the station could not be placed too close to the edge for safety reasons. A caretaker checks the equipment every Monday morning, especially after storms, and removes leaves that collect near the rain gauge.

Students record the data in a shared spreadsheet. In maths, they calculate weekly averages and compare them with official city figures. Differences often lead to useful discussion. For example, the school playground may become warmer than nearby parks because its dark surface absorbs heat. Students also learn that one reading can be misleading if it is not compared with a longer pattern.

The weather station has supported practical decision-making too. Sports teachers check wind and rain data before planning outdoor lessons, and the gardening club uses rainfall records to decide when plants need watering. During a particularly hot week, the school used temperature data to move a lunchtime club from a sunny room to the library.

The project has limits. The equipment is not as accurate as professional instruments, and internet connection problems sometimes leave gaps in the record. Even so, teachers say the station makes science feel local. Students are not only reading about weather in a textbook; they are measuring the air above their own school and asking why it changes. Older students now use the records for longer investigations, such as comparing windy days with the number of students who cycle to school.

Students compare their readings with an official weather website at the end of each week. When the figures are different, they discuss possible reasons, such as the position of the equipment or heat from nearby walls.

Exercise 1 questions

Answer the questions using information from the article. Write short answers.

1 Where is the weather station located? [1]

_____

2 Which subject used the data to make visual displays? [1]

_____

3 Why did the instruments need to be away from trees and buildings? [1]

_____

4 Who checks the equipment every Monday morning? [1]

_____

5 What do students calculate in maths? [1]

_____

6 Give three findings from the school weather project. [3]

_____

_____

_____

Exercise 2

Read the article about four science projects (A-D). Then answer Questions 9(a)-9(i).

A Seed germination test

Students place seeds on damp paper and compare how quickly they grow in different conditions. The project is cheap and easy to repeat, but students must label trays carefully. If water levels are not checked, results may show poor care rather than a real difference between conditions. Students photograph each tray at the same time every day, which makes growth easier to compare. They also record room temperature because a warm windowsill can affect results. Seeds are kept away from windows so heat does not affect the test.

B Air quality walk

A class uses simple sensors to compare air quality near the school gate, a park and a busy road. The readings change quickly, so students take several measurements in each place. The project helps them understand why one reading is not enough evidence for a conclusion. The class also notes traffic conditions, because a temporary road closure can change the results suddenly. Wind direction is recorded too, as pollution may move away from the road. Students record wind direction because pollution may move away from the road.

C Bridge model challenge

Students build small bridges from card and test how much weight each one can hold. The challenge is popular because it is practical, but it needs strict safety rules when weights are added. Students learn that a failed model can still provide useful information about design. Before the final test, students predict where the bridge will bend and explain their reasoning. This prevents the activity becoming only a competition for the strongest model. Bridges are tested with the same weight so results are fair.

D Sound map

A sound map records noise levels around the school at different times of day. Students use a phone app to measure decibels, then mark results on a plan of the building. The project is useful for discussing quiet study areas, although readings can be affected by sudden events such as a door slamming. The map is repeated during exam week, when quiet areas may matter more than usual. Students compare morning and lunchtime results before making recommendations for study spaces and corridor routines. The map is repeated during exam week when quiet spaces matter more.

Exercise 2 questions

For each statement, write the correct letter A, B, C or D on the line. Each letter may be used more than once.

No.	Which science project...	A-D
9(a)	can help identify places suitable for quiet work	.....
9(b)	requires careful labelling to avoid confusion	.....
9(c)	uses repeated measurements because conditions change quickly	.....
9(d)	shows that an unsuccessful design can still teach something	.....
9(e)	may be affected by an unexpected loud noise	.....
9(f)	could measure care instead of the intended condition	.....
9(g)	compares places such as a park and a busy road	.....
9(h)	needs clear rules when extra weight is used	.....
9(i)	uses a phone app to collect data	.....

Exercise 3

Read the article about preparing a school science exhibition then complete the notes.

Making science clear

A science exhibition allows students to show investigations to visitors, but a good display needs more than attractive posters. Students first decide what question their project answers. A display about plant growth, for example, should make clear whether it tested light, water or soil type. Without a clear question, visitors may enjoy the pictures but miss the science.

The method section should be short and precise. Students include the equipment used, the number of tests and anything they kept the same. They do not need to describe every moment of the lesson. Teachers encourage them to use diagrams when a process is easier to see than read, especially for experiments with several stages.

Results must be presented honestly. If a result is unexpected, students should not hide it. They can explain possible reasons, such as a measurement error, a broken thermometer or not enough repeated tests. This helps visitors understand that science is not only about getting the answer you hoped for. Students are also asked to separate results from conclusions. A graph may show what happened, but the conclusion should explain what the result suggests and how reliable it is.

The best exhibitions include a short explanation of why the investigation matters. A project about insulation can connect to saving energy at home, while a water-filter project can lead to discussion about clean water. Students also prepare two spoken sentences for visitors: one sentence about what they found out and one about what they would improve next time. Teachers sometimes invite younger students to walk around the exhibition first. If they cannot understand the display without help, the group knows that the explanation needs to be clearer. This trial audience is useful because visitors at exhibitions rarely read every sentence carefully or follow complex diagrams without guidance from presenters.

Students test explanations on a younger class before the exhibition opens. If visitors cannot explain the main idea back in their own words, the display is simplified or an extra example is added.

Labels are written as questions when possible. A question such as 'Why did this bridge collapse?' encourages visitors to look closely before reading the explanation.

Exercise 3 questions

Complete the notes using information from the article. Write short words or phrases.

Notes	Write short answers
10 What a clear science display should include	- ..... - ..... - .....
11 What students should explain to visitors	- ..... - ..... - ..... - .....

Exercise 4

Read the article about a student invention competition then answer the questions.

The useful failure

Our design club entered a student invention competition with a device that reminded people to water houseplants. We thought the idea was clever because many people forget indoor plants until the leaves have already gone brown. The first version used a sensor in the soil and a small light that flashed when the plant needed water. We were confident because the device worked perfectly on the first day.

The trouble began after a weekend. The light flashed even though the soil was still wet. Then it stopped flashing when the soil dried out. We blamed the sensor at first, but our teacher asked us to test the device in different pots. That was when we discovered that soil type affected the readings. Our invention had solved one problem but created another.

I wanted to start again with a completely new idea. My partner disagreed. She said the failure was useful because it showed exactly what we had not understood. We changed the project from a finished product into a demonstration of why simple sensors need calibration. That sounded less exciting, but it was more honest.

At the competition, other teams had more polished inventions. One group had built a neat automatic feeder for pets, and another had designed a bag with lights for cyclists. Our table looked less impressive. However, the judges spent a long time asking about our tests. They seemed interested in the way our results changed with different soil samples. The competition rules allowed teams to explain problems in their design, but the writer had assumed judges wanted only successful products.

We did not win first prize, but we received a special mention for investigation. I learned that innovation is not only about presenting a successful object. Sometimes it is about finding the weakness in an idea and explaining it clearly. A failure can be useful if it leads to better questions. By the end, the team had a better project because they could show the path from mistake to investigation instead of pretending the first version had worked.

The broken version stayed on our table during the exhibition. At first I wanted to hide it, but several visitors asked about it, and explaining the failure made the final design easier to understand.

Exercise 4 questions

For each question, choose the correct answer, A, B or C.

12 Why did the club first feel confident? [1]

A The judges had praised it already.

B The device worked well at the start.

C The device had won another prize.

13 What caused problems with the readings? [1]

A different soil types

B too much light in the room

C forgetting to water the plant

14 How did the writer's partner view the failure? [1]

A as a reason to leave the competition

B as proof that sensors were useless

C as information they could learn from

15 Why did the judges spend time at their table? [1]

A They wanted to repair the device.

B They thought the table looked the most impressive.

C They were interested in the testing process.

16 What did the team receive? [1]

A a special mention

B first prize

C a new sensor

17 What is the writer's main lesson? [1]

A Only polished inventions matter.

B A weakness can lead to better questions.

C Competitions should avoid failed ideas.

ANSWER KEY

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Exercise 1

1. on the roof
2. art
3. they needed open air
4. a caretaker
5. weekly averages
6. the playground may be warmer because its dark surface absorbs heat; a lunchtime club was moved to the library; internet connection problems sometimes leave gaps

Exercise 2

9(a) D; 9(b) A; 9(c) B; 9(d) C; 9(e) D; 9(f) A; 9(g) B; 9(h) C; 9(i) D

Exercise 3

10 What a clear science display should include

- what question their project answers
- equipment used
- the number of tests

11 What students should explain to visitors

- possible reasons for unexpected results
- why the investigation matters
- what they found out
- what they would improve next time

Exercise 4

12 B; 13 A; 14 C; 15 C; 16 A; 17 B

12 B - It worked perfectly on the first day.

13 A - They discovered soil type affected the readings.

14 C - She said it showed what they had not understood.

15 C - They asked about tests and changing results.

16 A - They received a special mention for investigation.

17 B - He says failure can be useful if it leads to better questions.