AEL6N Unit 10b: Reports

Printer-friendly version of exercises + key to exercises

1)

Reading: A Test Report

Gap-fill exercise

Read the report on p. 75 in the coursebook (Bonamy, D. (2013). Technical English Level 4 Coursebook. Pearson Longman) and complete all the gaps below by choosing the correct option from the list. Don´t forget to check your answers after you finish.

A B C carried out D data discovered drift ductile E F fabricating fractured future G H How indicates known lateral limitations load-bearing materials mean non-brittle observed past present purpose reinforced severe shear significant Why

REPORT SECTION (in the correct order)	**WHAT QUESTIONS DO THESE SECTIONS ANSWER?**	**WHAT VERB TENSE IS USUALLY USED TO WRITE THIS SECTION?**	**LETTER OF THE SECTION FROM THE BOOK (A TO H)**
Introduction	What is _____ about the subject to be tested? _____ is the test needed?	• present simple • sometimes past simple if referring to specific previous experiments	
Objective	What was the _____ of the test?	• _____ simple	
Experimental Setup	What _____ and instruments were needed to conduct the test?	• _____ simple	
Procedure	_____ exactly was the test performed? How was it configured?	• _____ simple	
Results	What was _____?	• _____ simple	
Conclusion(s)	What do these results _____?	• _____ simple	
Further Testing	Were there any _____ in the test? Will any further tests be needed? If so, which ones?	• past simple • _____ simple	
Appendix	Where can readers find related _____ and exact results?	• _____ simple	

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Find words in the sections that mean the following:

sideways	Section A	
rigid anti-seismic wall	Section A	_____ wall
assembling	Section B	
strengthened	Section B	
wall which supports a floor or roof	Section C	_____ wall
serious	Section C	
stretchable	Section C	
unbreakable composite	Section C	_____ composite
cracked	Section C	
conducted	Section C	
considerable	Section F	
objective	Section G	
shows	Section H	
relative horizontal displacement between two adjacent floors	Section H	inter-storey _____
seen	Section H	

Key (answers are in bold and underlined)

REPORT SECTION (in the correct order)	**WHAT QUESTIONS DO THESE SECTIONS ANSWER?**	**WHAT VERB TENSE IS USUALLY USED TO WRITE THIS SECTION?**	**LETTER OF THE SECTION FROM THE BOOK (A TO H)**
Introduction	What is **known** about the subject to be tested? **Why** is the test needed?	• present simple • sometimes past simple if referring to specific previous experiments	**C**
Objective	What was the **purpose** of the test?	• **past** simple	**G**
Experimental Setup	What **materials** and instruments were needed to conduct the test?	• **past** simple	**B**
Procedure	**How** exactly was the test performed? How was it configured?	• **past** simple	**A**
Results	What was **discovered**?	• **past** simple	**H**
Conclusion(s)	What do these results **mean**?	• **present** simple	**F**
Further Testing	Were there any **limitations** in the test? Will any further tests be needed? If so, which ones?	• past simple • **future** simple	**D**
Appendix	Where can readers find related **data** and exact results?	• **past** simple	**E**

Find words in the sections that mean the following:

sideways	Section A	**lateral**
rigid anti-seismic wall	Section A	**shear** wall
assembling	Section B	**fabricating**
strengthened	Section B	**reinforced**
wall which supports a floor or roof	Section C	**load-bearing** wall
serious	Section C	**severe**
stretchable	Section C	**ductile**
unbreakable composite	Section C	**non-brittle** composite
cracked	Section C	**fractured**
conducted	Section C	**carried out**
considerable	Section F	**significant**
objective	Section G	**purpose**
shows	Section H	**indicates**
relative horizontal displacement between two adjacent floors	Section H	inter-storey **drift**
seen	Section H	**observed**

2)

Scanning: London Millennium Footbridge

Gap-fill exercise

Go to p. 117 in your book (Bonamy, D. (2013). Technical English Level 4 Coursebook. Pearson Longman) and scan the text in the bottom right-hand corner to fill in the gaps below as quickly as possible because there is a time limit set of three minutes. In order to meet this time limit, you will have to ignore any irrelevant information occurring in the text. On the other hand, the relevant information in the text is not in the same order as the gaps below. Don´t forget to check your answers.

London Millennium Footbridge Facts:

Exact day it was opened to the public: _____ 2000

Bridge deck made of: _____

Design principle: _____ _____

Original construction cost: _____ pounds

Additional cost: _____ pounds

What was used to absorb the lateral and vertical oscillations of the bridge? _____ dampers

Length and width of the bridge: _____ x _____ metres

Key (answers are in bold and underlined)

London Millennium Footbridge Facts:

Exact day it was opened to the public: **10 June** 2000

Bridge deck made of: **aluminium**

Design principle: **lateral suspension**

Original construction cost: **18 million** pounds

Additional cost: **5 million** pounds

What was used to absorb the lateral and vertical oscillations of the bridge? **91** dampers

Length and width of the bridge: **330** x **4** metres

3)

Forum 2: Graph

Possible answers:

1) Controlled numbers of pedestrians were added to the crowd in increments of 10.
2) To find the critical point where the number of pedestrians causes the bridge to suddenly increase its movement.
3) The critical number is 166 pedestrians.

From: Bingham, C., Wright, L. (2013). *Technical English Level 4 Teacher´s Book*. Pearson Longman, p. 101.

4)

Report on the Millennium Bridge Test

Gap-fill exercise

This task will give you an opportunity to get more information on the test conducted on the Millennium Bridge. A student attended a lecture given by an engineer who carried out the test. On the left, you can see this student´s notes. On the right, you can see an official report on the test. Your task is to complete the report with the help of the notes. If you have problems understanding the notes, you can also listen to Recording 27, which comes with your coursebook.

NOTES	REPORT
INTRODUCTION tested Mill. Br. in Dec last yr. br. closed soon after opening «- excessive lat. mov't «- pedestrians walking engaged by engineers - test + report on results (soon)	INTRODUCTION The Millennium Bridge had to close down soon after opening as a result of the excessive _____ movement that occurred when pedestrians began walking on the bridge. We were engaged by the engineers to carry _____ a test on the Millennium Bridge and report _____ results. This is the report of the test, which was performed in December last year.

TEST OBJECTIVE 1) confirm lat. mov't «- mov't of peds - not other cause 2) discover critical/min. # peds start br. moving	TEST OBJECTIVE The first objective of the test was to [ ] that the lateral movement was caused by the movement of pedestrians and not caused by some other issue. The second objective was to [ ] the critical (or minimum) number of pedestrians that would start the bridge moving significantly
EXPERIMENTAL SETUP day of test - open br. - trained 200 peds - walk across br. for 20 mins. motion sensors on br. + video cams	EXPERIMENTAL SETUP On the day of the test, the bridge was opened up and 200 people were trained to walk [ ] the bridge for 20 minutes. Sensors were installed on the bridge to measure bridge [ ]. In addition, video cameras were set up at various points.
PROCEDURE 1) 50 peds crossed br. - diff. speeds 2) c. 10 more every few mins - gradual increase 3) br. moves significantly? -» stop test 4) during test, computers «- data fr. sensors/video 5) calculate lat. forces fr. data	PROCEDURE First of all, 50 pedestrians started crossing the bridge, [ ] different speeds. Then groups of about ten people set off every few minutes, [ ] increasing the numbers on the bridge. As soon as the bridge started moving significantly, the test was stopped. During the test, our computers received data from the sensors and the video. The lateral [ ] acting [ ] the bridge were then calculated from the data.
RESULTS graph fig. 1 (in append.) - red line = lat. mov't -» br. stable to 156 peds, then at 166 mov't accel.	RESULTS [ ] 1 in the Appendix gives the main test result. The red line on the graph represents the lateral movement of the bridge. This indicates that the bridge was stable up to 156 pedestrians, but then with just 10 more people, at 166, the lateral movement suddenly [ ].
CONCLUSIONS 1) force exerted by peds -» bridge mov't 2) incr. in mov't is sudden 3) critical # peds =166 - below? insignif. mov't - above? signif. mov't 4) 166 peds -» br. sways a little -» peds notice -» walk in step -» suddenly increases force -» br. sways signif.	CONCLUSIONS The first conclusion from this result is that the force [ ] by pedestrians walking on the bridge affected its movement. Secondly, the increase in movement was not gradual, but sudden. Thirdly, it is clear that the critical number of pedestrians is 166. Below that, any movement of the bridge is [ ]. But as soon as that number is reached, the bridge begins to sway with significant lateral movement. We believe that the [ ] for this is that when the critical number is reached, the bridge sways a little. The pedestrians notice this and as a [ ], they start walking together, in step. This suddenly increases the force on the bridge and [ ] the bridge to sway significantly

Key (answers are in bold and underlined)

REPORT

INTRODUCTION

The Millennium Bridge had to close down soon after opening as a result of the excessive **lateral** movement that occurred when pedestrians began walking on the bridge. We were engaged by the engineers to carry **out** a test on the Millennium Bridge and report **on** results. This is the report of the test, which was performed in December last year.

TEST OBJECTIVE

The first objective of the test was to **confirm** that the lateral movement was caused by the movement of pedestrians and not caused by some other issue.

The second objective was to **discover** the critical (or minimum) number of pedestrians that would start the bridge moving significantly.

EXPERIMENTAL SETUP

On the day of the test, the bridge was opened up and 200 people were trained to walk **across** the bridge for 20 minutes. Sensors were installed on the bridge to measure bridge **motion**. In addition, video cameras were set up at various points.

PROCEDURE

First of all, 50 pedestrians started crossing the bridge, **at** different speeds. Then groups of about ten people set off every few minutes, **gradually** increasing the numbers on the bridge. As soon as the bridge started moving significantly, the test was stopped. During the test, our computers received data from the sensors and the video. The lateral **forces** acting **on** the bridge were then calculated from the data.

RESULTS

Figure 1 in the Appendix gives the main test result. The red line on the graph represents the lateral movement of the bridge. This indicates that the bridge was stable up to 156 pedestrians, but then with just 10 more people, at 166, the lateral movement suddenly **accelerated**.

CONCLUSIONS

The first conclusion from this result is that the force **exerted** by pedestrians walking on the bridge affected its movement. Secondly, the increase in movement was not gradual, but sudden. Thirdly, it is clear that the critical number of pedestrians is 166. Below that, any movement of the bridge is **insignificant**. But as soon as that number is reached, the bridge begins to sway with significant lateral movement.

We believe that the **reason** for this is that when the critical number is reached, the bridge sways a little. The pedestrians notice this and as a **result**, they start walking together, in step. This suddenly increases the force on the bridge and **causes** the bridge to sway significantly.

From: Bingham, C., Wright, L. (2013). *Technical English Level 4 Teacher´s Book*. Pearson Longman, p. 101.

5)

Reading: Solution to Millennium Pedestrian Bridge Problem

Quiz

Read the text in Task 5 on p. 81 in the coursebook and complete this quiz.

Task adapted from: Bonamy, D. (2013). Technical English Level 4 Coursebook. Pearson Longman, p. 81.

1) What does this phrase refer to? The second (line 4): _____
2) What does this phrase refer to? Both (line 7): _____
3) What does this phrase refer to? this (line 9): _____
4) What does this phrase refer to? its (line 10): _____
5) What does this phrase refer to? This (line 13): _____
6) What does this phrase refer to? they (line 15): _____
7) What does this phrase refer to? types (line 16): _____
8) What does this phrase refer to? both of which (lines 17-18): _____
9) Which of the three proposals aimed to limit access and use of the bridge?
    a) the first (major structural reinforcement)
    b) the second (pedestrian volume reduction)
    c) the third (inserting dampers below the deck)
10) Which of the three proposals aimed to dissipate the kinetic energy of the bridge deck?
    a) the first (major structural reinforcement)
    b) the second (pedestrian volume reduction)
    c) the third (inserting dampers below the deck)
11) Which of the three proposals aimed to strengthen the bridge and make it more rigid?
    a) the first (major structural reinforcement)
    b) the second (pedestrian volume reduction)
    c) the third (inserting dampers below the deck)
12) What condition was stipulated before the final proposal was created? – The dampers must be _____
13) Fig. 1 shows:
    a) a viscous damper
    b) a tuned mass damper
14) Look at the first sentence in paragraph 3 and choose the best option to complete this sentence: The cables _____ the arms, which _____ the deck.
    a) are supported by/are supported by
    b) support/are supported by
    c) support/support
    d) are supported by/support
15) According to the text, which of the dampers resemble weights on springs?
    a) viscous dampers
    b) tuned mass dampers

Key:

1) proposal 2) proposals 3) rejection of proposals 4) the deck's 5) the third proposal (along with its explanation) 6) the dampers 7) of damper 8) both types of damper	9) the second (pedestrian volume reduction) 10) the third (inserting dampers below the deck) 11) the first (major structural reinforcement) 12) invisible to the general public 13) a viscous damper 14) support, support 15) tuned mass dampers

6)

Solution to Millennium Pedestrian Bridge Problem: Follow-up Task

Gap-fill exercise

Look at the two figures on p. 81 in the coursebook. Without re-reading the accompanying text, complete all the gaps in the texts below. Sometimes, there is no hint, sometimes the initial letter is given and sometimes, a verb is given in brackets and you just need to use its correct form. This correct form may sometimes consist of more than one word. Don´t forget to check your answers after you finish.

TWO EMAILS INTRODUCING THE INDIVIDUAL PROPOSALS

1)

Our team would like to submit two proposals for _____ (reduce) the chances of **l**_____ motion in the bridge. Our first proposal is that the structure of the bridge should _____ (reinforce) to make it more **r**_____. Alternatively, we would propose reducing the number of **p**_____ on the bridge by installing barriers along it. We look _____ to your response to these proposals.

2)

As our first proposals _____ (reject) because the modifications _____ result _____ major changes _____ the appearance and function of the bridge, we would like to submit a third proposal. This involves _____ (insert) viscous and tuned mass dampers between the bridge deck and its supports, with the **o**_____ of absorbing and dissipating lateral and vertical kinetic energy from the deck. We look forward _____ your response to this new proposal.

DEFINITIONS

A viscous damper is a hydraulic device consisting of a **p**_____ moving inside a _____ **cylinder** (cylinder which is filled with viscous fluid), which absorbs and dissipates kinetic energy.

A tuned mass damper is a device consisting of two heavy plates separated _____ powerful specially tuned (out-of-phase) **s**_____, which is used for absorbing and dissipating kinetic energy.

HOW A VISCOUS DAMPER WORKS

When the deck _____ (sway) laterally, that is, from side to side, the energy from the motion _____ (transfer) from the deck into plates, which then transfer the energy to the piston and fluid-filled cylinder. As the piston passes back and _____ through the viscous fluid, the fluid provides some **f**_____, in _____ words, resistance, and the kinetic energy is then dissipated.

HOW A TUNED MASS DAMPER WORKS

When the deck moves _____ (vertical), that is, _____ and down, the kinetic energy is transferred from the deck into the heavy plate attached _____ the deck. The motion is then transferred into the powerful spring, which is specially _____ (tune) to move out of phase with the motion of the deck. The spring absorbs the kinetic energy, which is then dissipated.

Texts adapted from: Bingham, C., Wright, L. (2013). *Technical English Level 4 Teacher´s Book*. Pearson Longman, p. 104.

Key:

TWO EMAILS INTRODUCING THE INDIVIDUAL PROPOSALS

1)

Our team would like to submit two proposals for **reducing** (reduce) the chances of **lateral** motion in the bridge. Our first proposal is that the structure of the bridge should **be reinforced** (reinforce) to make it more **rigid**. Alternatively, we would propose reducing the number of **pedestrians** on the bridge by installing barriers along it. We look **forward** to your response to these proposals.

2)

As our first proposals **have been rejected** (reject) because the modifications **would** result **in** major changes **to** the appearance and function of the bridge, we would like to submit a third proposal. This involves **inserting** (insert) viscous and tuned mass dampers between the bridge deck and its supports, with the **objective** of absorbing and dissipating lateral and vertical kinetic energy from the deck. We look forward **to** your response to this new proposal.

DEFINITIONS

A viscous damper is a hydraulic device consisting of a **piston** moving inside a **viscous-fluid-filled cylinder** (cylinder which is filled with viscous fluid), which absorbs and dissipates kinetic energy.

A tuned mass damper is a device consisting of two heavy plates separated **by** powerful specially tuned (out-of-phase) **springs**, which is used for absorbing and dissipating kinetic energy.

HOW A VISCOUS DAMPER WORKS

When the deck **sways** (sway) laterally, that is, from side to side, the energy from the motion **is transferred** (transfer) from the deck into plates, which then transfer the energy to the piston and fluid-filled cylinder. As the piston passes back and **forth** through the viscous fluid, the fluid provides some **friction**, in **other** words, resistance, and the kinetic energy is then dissipated.

HOW A TUNED MASS DAMPER WORKS

When the deck moves **vertically** (vertical), that is, **up** and down, the kinetic energy is transferred from the deck into the heavy plate attached **to** the deck. The motion is then transferred into the powerful spring, which is specially **tuned** (tune) to move out of phase with the motion of the deck. The spring absorbs the kinetic energy, which is then dissipated.

Texts adapted from: Bingham, C., Wright, L. (2013). *Technical English Level 4 Teacher´s Book*. Pearson Longman, p. 104.

7)

Listening: Oersted's Discovery

Gap-fill exercise

Watch the video and fill in all the gaps. Then press "Check" to check your answers. Use the "Hint" button to get a free letter if an answer is giving you trouble. Note that you will lose points if you ask for hints!

https://www.youtube.com/watch?v=8uSorA251fg

TRUE OR FALSE (T or F)?

The voltaic pile made new scientific discoveries and inventions possible. – _____

ANSWER THE QUESTIONS:

When did Oersted perform his experiment? – In _____

Who helped Oersted with his discovery? – _____ _____

FILL IN THE GAPS:

"… a magnetic field must circle a _____-bearing _____. This led to _____ or support that magnetic fields are created by _____ in _____."

TRUE OR FALSE (T or F)?

It is hard to replicate Oersted´s experiment. – _____

ANSWER THE QUESTIONS:

What is needed for the experiment? – Three compasses, six dry _____ connected in _____, giving about nine _____, two insulated conductors and one _____ _____ without insulation, and a _____.

What does the man use to hold the copper wire in place? – Some _____.

TRUE OR FALSE (T or F)?

When he closes the switch, the circuit is complete and current goes through the copper wire. – _____

ANSWER THE QUESTIONS:

What happened to the needles in all three compasses when the circuit was closed? – They deflected towards the _____.

When the current was off, why did the needles face north again? – Due to the _____ _____ _____.

TRUE OR FALSE (T or F)?

When current passes through the circuit, the compass needles deflect to the west no matter how the compasses are placed. – _____

FILL IN THE GAPS:

"This _____ paved the way for the _____ of _____, the _____, and the _____ motor."

Key (answers are in bold)

TRUE OR FALSE (T or F)?

The voltaic pile made new scientific discoveries and inventions possible. – **True**

ANSWER THE QUESTIONS:

When did Oersted perform his experiment? – In **1820**

Who helped Oersted with his discovery? – **Michael Faraday**

FILL IN THE GAPS:

"… a magnetic field must circle a **current**-bearing **wire**. This led to **evidence** or support that magnetic fields are created by **charge** in **motion**."

TRUE OR FALSE (T or F)?

It is hard to replicate Oersted´s experiment. – **False**

ANSWER THE QUESTIONS:

What is needed for the experiment? – Three compasses, six dry **cells** connected in **series**, giving about nine **volts**, two insulated conductors and one **copper wire** without insulation, and a **switch**.

What does the man use to hold the copper wire in place? – Some **tape**.

TRUE OR FALSE (T or F)?

When he closes the switch, the circuit is complete and current goes through the copper wire. – **True**

ANSWER THE QUESTIONS:

What happened to the needles in all three compasses when the circuit was closed? – They deflected towards the **east**.

When the current was off, why did the needles face north again? – Due to the **Earth´s magnetic field**.

TRUE OR FALSE (T or F)?

When current passes through the circuit, the compass needles deflect to the west no matter how the compasses are placed. – **False**

FILL IN THE GAPS:

"This **discovery** paved the way for the **invention** of **electromagnets**, the **telegraph**, and the **DC** motor."

Transcript:

The development of the voltaic pile, which was the first electrochemical battery capable of producing continuous current, assured a new era of scientific discovery and inventions. In 1820, Danish physicist and chemist Hans Christian Oersted noticed that whenever current from his voltaic pile was switched on and off, a compass needle placed near the wire deflected from true magnetic north. Whenever the current was turned off, the compass needle returned to its original orientation.

With the help of Michael Faraday, Oersted figured out that a magnetic field must circle current-bearing wire. This led to evidence or support that magnetic fields are created by charge in motion.

It´s pretty easy to replicate Oersted´s original discovery. In this video clip, I have six dry cells connected in series that should give us about nine volts. My circuit goes: a wire to a copper wire through another wire, through the switch and back to the battery.

Now, notice all three compass needles are facing north the way they normally do. If I take this wire in place above the compass needles and in line with them, and I´m going to use some tape to hold it down, so now the compass needles are all facing north, the wire above them runs north-south. When I close the switch, I´m going to create current that goes through this copper wire and through our complete circuit. Notice what happens to the needle when the switch is closed. All three compass needles deflected towards the east, so the magnetic field went from pointing to the north to pointing to the east. When I open the switch and turn the current off, the magnetic field goes back to its original orientation, so the compass needles face north again due to the Earth´s magnetic field. Now, if we place the compasses above the wire instead of below and we close the switch and run current through the wire, notice what happens. This time, the compass needles deflected to the west, so the magnetic field above the wire faces one direction and the magnetic field below the wire faces the other; so above the wire, it was to the west and below the wire, it was to the east. This is how Michael Faraday and Hans Christian Oersted determined that the magnetic field circles the wire, because if it circles the wire, it points one direction below and one direction above.

This discovery paved the way for the invention of electromagnets, the telegraph, and the DC motor. Common bar magnets or permanent magnets don´t have an on/off switch. These magnetic fields have an on/off switch (*the speaker is pointing at the electrical circuit*). We turn on the current, we turn on the magnetic field. Turn off the current, we turn off the magnetic field.

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