

Cambridge English for
Scientists

ADDITIONAL ACTIVITIES

UNIT 6**Writing up from notes**

- a** In pairs, discuss the meanings of the following abbreviations found in Units 5 and 6.

→ w/ RT @ EM CNT g ml

- b** Match the verbs (1–7) to their meanings (a–g).

1 decant	a put two or more things together so they can't be separated
2 identify	b mix by moving in a circular pattern
3 isolate	c discover or recognize what sth is
4 mix	d stay after other things have gone or been taken away
5 remain	e separate one thing from others
6 remove	f take sth away
7 stir	g to pour a liquid from one container into another

- c** Look at the notes. In pairs, describe the procedure for making Carbon Nanotubes (CNTs).

- 0.99 g potassium – remove surface → no K₂O remains
- Mix w/ 0.062 g iron dendrimer catalyst + 12 ml benzene + 2.7 ml tetrachloroethylene
- Stir 1 week @ RT
- Remove K – clean w/ t-butyl alcohol – CH₃OH – H₂O
- Isolate reaction product (spin in centrifuge + pour off liquid)
- EM to identify CNTs

- d** Complete the paragraph describing the procedure by putting the verb in brackets into the correct form.

The surface (1) _____ (remove) from 0.99g potassium so that no potassium oxide (2) _____ (remain). The potassium (3) _____ (mix) with 0.062 g of iron dendrimer catalyst, 12 ml benzene, 2.7 ml tetrachloroethylene. The mixture was stirred for one week at room temperature. The potassium (4) _____ (remove) and washed with t-butyl alcohol, then methanol, and finally water. The reaction product (5) _____ (isolate) by centrifugation and decantation of the liquid. Transmission electron microscopy (6) _____ (show) the presence of CNTs in the reaction product. The tubes had diameters around 15–20 nm.

- e** Look at the two different possible forms of sentence 2. They have the same meaning. In pairs, discuss why you think form 1 was used in the text rather than form 2.

- The potassium was mixed with 0.062 g of iron dendrimer catalyst, 12 ml benzene, 2.7 ml tetrachloroethylene.
- 0.062 g of iron dendrimer catalyst, 12 ml benzene, 2.7 ml tetrachloroethylene was mixed with the potassium.

- f** In English texts, sentences are often structured so that the focus of the text, or information which has been mentioned before, is used as the subject, with new information appearing later in the sentence.

Look at the sentences below and discuss which sentence (a or b) best follows the first sentence.

- 1 A sample of 37 galaxies was identified.
 - a These galaxies were cross-identified with SPIRE 500 μm catalogs.
 - b We then cross-identified these galaxies with SPIRE 500 μm catalogs.
- 2 A set of 13 hydrophones detects the presence of dolphins and whales.
 - a Analysis of how human-generated noise can affect these animals is made possible by this system.
 - b This system makes it possible to analyse how human-generated noise can affect these animals.
- 3 First, zinc oxide nanowires are grown around an optical fibre.
 - a Then, the nanowires are coated with the dye-sensitized solar cells, which convert light to electricity.
 - b Then, dye-sensitized solar cells, which convert light to electricity, are used to coat the nanowires.

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UNIT 6**Nouns and articles**

- a** Look at the following nouns which have appeared in units 1–5. Work in pairs to see if you can remember what they mean.

approach	device	hypothesis
application	dimension	outcome
brittleness	evidence	research
characteristic	exposure	solubility

- b** We can divide nouns into two groups. Those we can count the number of, like electrons in an atom or species in a wood, are called countable nouns. Nouns we can't count the number of, like physiology or oxygen, are called uncountable nouns.

Look at the nouns in Exercise a. Which ones are countable nouns and which are uncountable?

- c** Countable nouns have two forms; singular and plural. For example, we say 1 enzyme (singular) but 2 enzymes (plural). Uncountable nouns do not have a plural form.

Look at the countable nouns you found in Exercise b. What is the plural form of each one?

- d** Complete the sentences by choosing the correct word in *italics*.

- 1 A semi-automated *device/devices* for measuring the *solubility/solubilities* of compounds in solution volumes as low as 1 mL was developed for pharmaceutical *application/applications*.
- 2 We investigated the *brittleness/brittlenesses* and *characteristic/characteristics* of the fracture of β titanium alloys.
- 3 *Research/Researches* on a number of animal species has led us to the *hypothesis/hypotheses* that *exposure/exposures* to solvents may cause lung disease.

- e** Whenever we use a noun in English, we need to decide whether we need to use an article with it, and if we do, which article to use. The table below shows how to choose an article. Complete the space in each box (1–8) with an example from sentences 1–3 in Exercise d.

	Countable nouns		Uncountable nouns
	Singular	Plural	
General use – there are many of this noun and we don't know which one is being referred to	a/an 1 _____	no article 2 _____	no article 3 _____ 4 _____
Specific use – there are many of this noun and we know which one is being referred to OR there is only one of this noun	the 5 _____	the 6 _____	the 7 _____ 8 _____

f Complete the description of a procedure for making Carbon Nanotubes by putting the correct article (a/an, the or no article) in the gaps.

0.006g of iron dendrimer and 8ml methanol were mixed and placed in (1) _____ tube wrapped with (2) _____ copper wire. (3) _____ tube was placed in (4) _____ beaker containing 3ml carbon tetrachloride and then (5) _____ beaker was put in (6) _____ CO₂-reactor at 1200 psi, 125°C for 24 hours. After the reaction, (7) _____ tube contained (8) _____ black solid. Transmission electron microscopy revealed the presence of (9) _____ CNTs in the reaction product.

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UNIT 6 Teacher's Notes**Writing up from notes and the passive voice**

- 1 a In pairs, students discuss the meanings of the abbreviations.

Answers

leads to
with
room temperature
at

electron microscope
carbon nanotube
grams
millilitres



- b Students match the verbs to their meanings.

Answers

1 g 2 c 3 e 4 a 5 d 6 f 7 b



- c Students work in pairs to orally describe the procedure for making Carbon Nanotubes (CNTs).

- d Students complete the paragraph with the correct form of the verb.

Answers

1 was removed
2 remained
3 was mixed

4 was removed
5 was isolated
6 showed



- e Students look at the two sentences and discuss why the first was used.

Answer

As mentioned in Exercise f, in English sentences the focus of the text or information which has been mentioned before is preferred as the subject. New information usually appears later in the sentence. It is often this consideration which determines whether a structure with the active or passive voice is chosen.



- f Students choose the most appropriate sentence to continue from the first one given.

Answers

- 1 a – Using the passive voice allows the focus to be moved away from the agent *we*.
- 2 b – Using the active voice keeps the focus on the system.
- 3 a – Both options here use verbs in the passive voice (are coated and are used to coat). Point out that the focus of the first sentence (which in this case is zinc oxide nanowires, not dye-sensitized solar cells) is what determines the choice of subject in the sentence that follows.



Nouns and articles

- 2 a** Students work in pairs to review what the words mean. Direct them to the Glossary on pages 117–125 of the Student's Book to check their answers.
- b** Go through the information about countable and uncountable nouns. Provide more examples if necessary. Students divide the nouns in Exercise a into two groups.

Answers

Countable: approach, application, characteristic, device, dimension, hypothesis, outcome
 Uncountable: brittleness, evidence, exposure, research, solubility

- c** Go through the information about singular and plural forms. Students write down the plural form of each of the countable nouns in Exercise b.

Answers

approaches, applications, characteristics, devices, dimension, hypotheses, outcomes

- d** Students choose the correct word to complete the sentences.

Answers

- 1 device, solubility, applications
- 2 brittleness, characteristics
- 3 research, hypothesis, exposure

- e** Point out that whenever a noun is used, we have to decide whether to use an article with it. You could elicit what the 3 articles in English are (a/an/the) and see if the students know any rules about which to use when. Go through the table with the students. You may need to clarify the difference between 'general use' and 'specific use'. Students then complete the examples with the words in the correct sentences in Exercise d.

Answers

- | | |
|---------------------|--------------------------|
| 1 device | 5 hypothesis |
| 2 applications | 6 characteristics |
| 3 research/exposure | 7 brittleness/solubility |
| 4 exposure/research | 8 solubility/brittleness |

- f** Students complete the description with the correct article or no article.

Answers

- | | | |
|--------------|-------|--------------|
| 1 a | 4 a | 7 the |
| 2 no article | 5 the | 8 a |
| 3 The | 6 a | 9 no article |