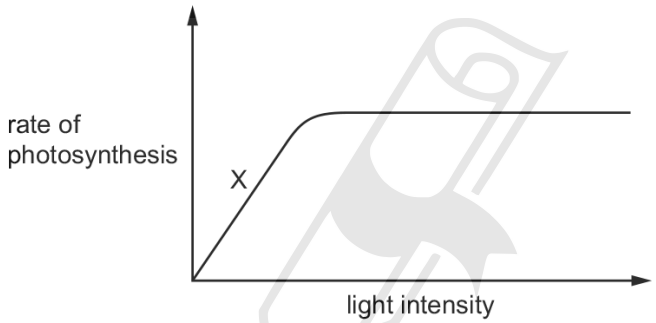
Chapter 6

Plant nutrition

6.1 Photosynthesis

01. 0610_m22_qp_22 Q: 12

The graph shows the effect of light intensity on the rate of photosynthesis.



Which environmental factor is limiting the rate of photosynthesis at X on the graph?

A carbon dioxide concentration

B light intensity

C oxygen concentration

D temperature

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02. 0610_m21_qp_22 Q: 12

In which process is oxygen a waste product?

A active transport

B aerobic respiration

C anaerobic respiration

D photosynthesis

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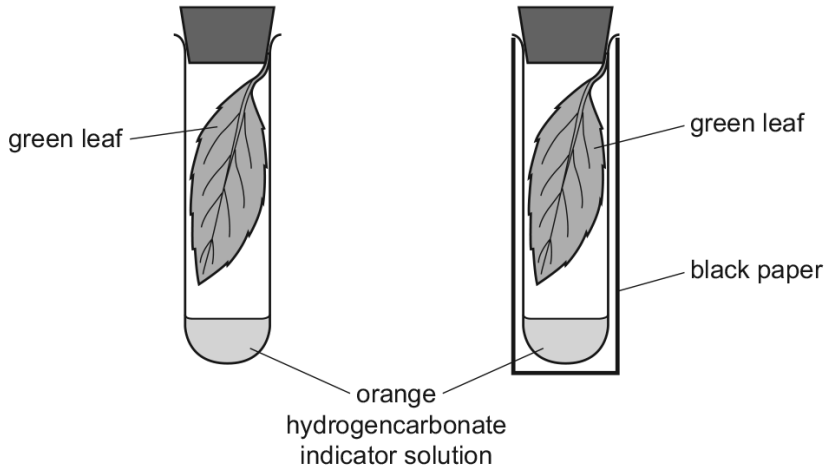
03. 0610_w21_qp_21 Q: 12

Two similar leaves are set up in test-tubes as shown. One is exposed to light, while the other is kept in the dark.



After a few hours, which colour would the hydrogencarbonate indicator solution be in each test-tube?

	light	dark
A	colourless	blue-black
B	purple	yellow
C	red	blue
D	yellow	purple

04. 0610_m20_qp_22 Q: 12

A student drew a diagram to show the substances used and produced in photosynthesis in a leaf.

1 + 2 are used by the leaf

3 + 4 are produced by the leaf

Which row shows the correct labels for the diagram?

	1	2	3	4
A	carbon dioxide	glucose	oxygen	water
B	water	carbon dioxide	glucose	oxygen
C	oxygen	water	carbon dioxide	glucose
D	glucose	oxygen	water	carbon dioxide

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05. 0610_p20_qp_20 Q: 9

The following can be used to write a word equation for photosynthesis.

1 carbon dioxide and water

2 light and chlorophyll

3 glucose and oxygen

Which shows a correct word equation for photosynthesis?

A 1 → 2 in the presence of 3

B 1 → 3 in the presence of 2

C 2 → 3 in the presence of 1

D 3 → 1 in the presence of 2

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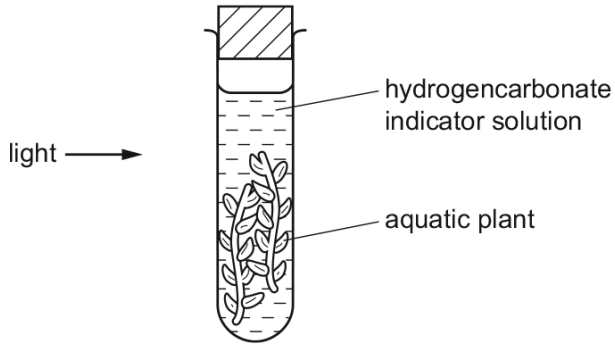
06. 0610_s20_qp_21 Q: 10

An experiment is set up to investigate gas exchange in aquatic plants.



The hydrogencarbonate indicator solution is orange at the start.

Which colour is it after three hours?

A blue-black

B orange

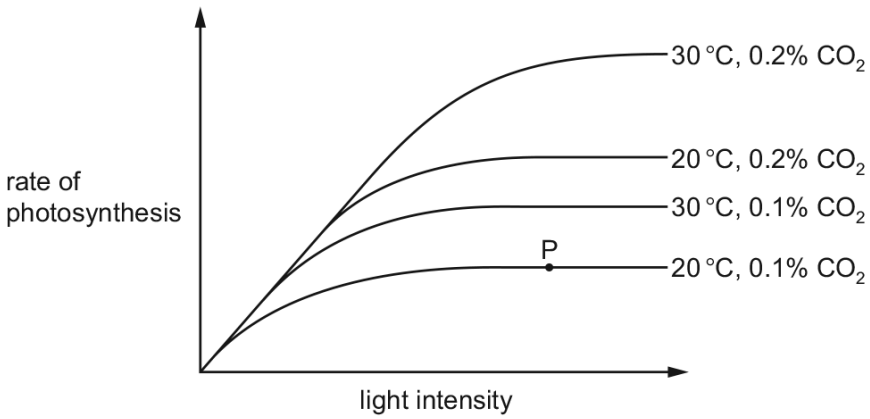
C purple

D yellow

07. 0610_s20_qp_21 Q: 11

The diagram shows how the rate of photosynthesis varies with light intensity.

The four curves show different conditions of temperature and carbon dioxide concentration.



What limits the rate of photosynthesis at point P?

	light intensity	carbon dioxide concentration	temperature
A	✓	✓	✗
B	✓	✗	✗
C	✗	✓	✓
D	✗	✗	✓

key
✓ = yes
✗ = no

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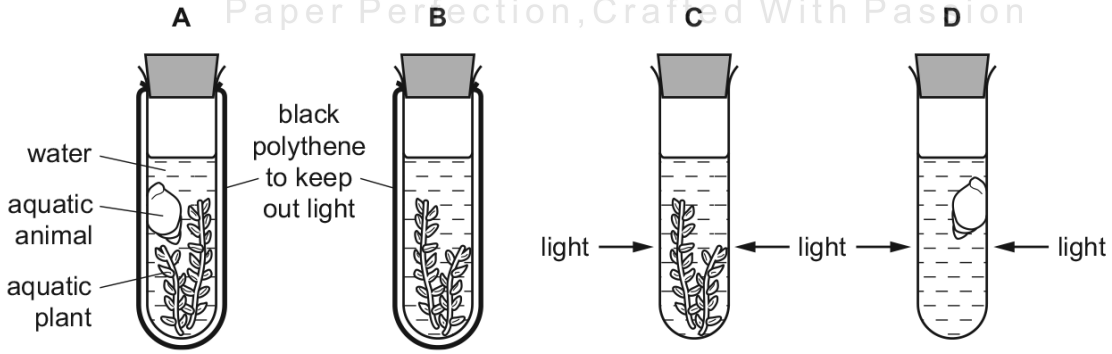
08. 0610_s20_qp_21 Q: 12

Four test-tubes are set up as shown.

Which test-tube contains the least carbon dioxide after one hour?



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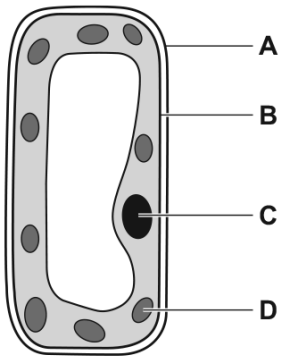
09. 0610_s20_qp_22 Q: 12

The diagram shows a plant cell.

In which part of the cell does photosynthesis occur?



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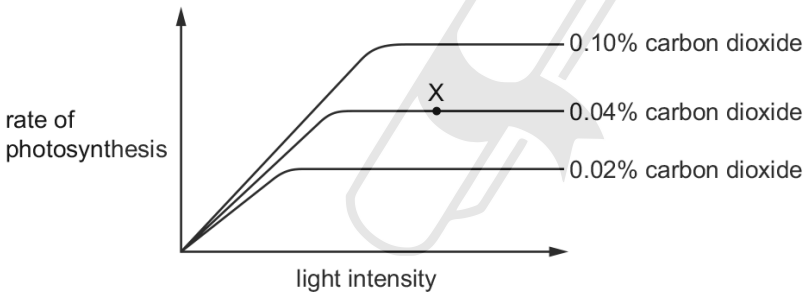
10. 0610_w20_qp_21 Q: 11

The graph shows how the rate of photosynthesis of a plant changes with light intensity, at three different carbon dioxide concentrations. In each case the temperature is 15 °C.



What is the limiting factor for the rate of photosynthesis at point X on the graph?

A carbon dioxide concentration

B light intensity

C surface area of the plant

D temperature

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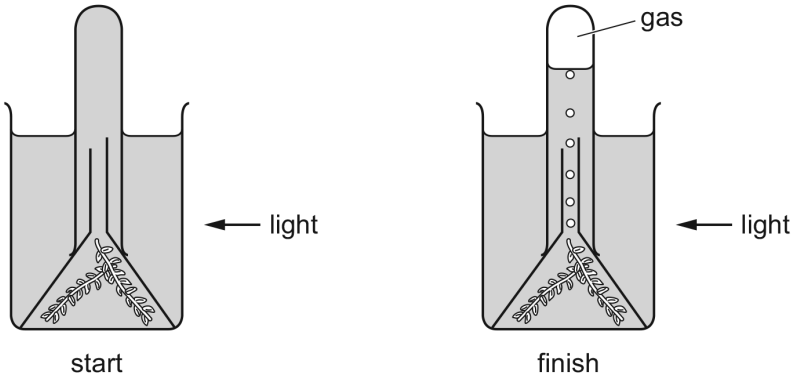
11. 0610_m19_qp_22 Q: 12

The diagram shows an experiment to investigate photosynthesis.



What is the most abundant gas present at the top of the tube at the end of the experiment?

A carbon dioxide

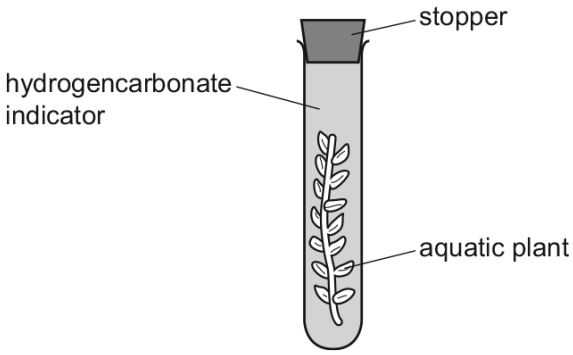
B methane

C sulfur dioxide

D oxygen

12. 0610_w19_qp_21 Q: 10

Two sealed test-tubes containing aquatic plants and hydrogencarbonate indicator were set up.



The indicator in the sealed test-tubes shows the concentration of dissolved carbon dioxide present.

concentration of carbon dioxide	colour of indicator
low	red
medium	orange
high	yellow

One of the sealed test-tubes was kept in the light for 24 hours and one of the sealed test-tubes was kept in the dark for 24 hours.

The results are shown in the table.

test-tube kept in	start colour	end colour
light	orange	red
dark	orange	yellow

What is the correct explanation of what has taken place?

A Photosynthesis and respiration both occur in the light, but the rate of photosynthesis is higher.

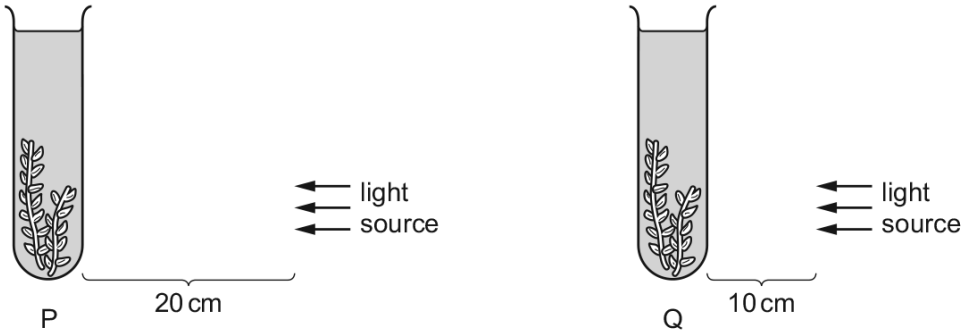
B Photosynthesis occurs in the light, but respiration does not.

C Respiration can only occur when photosynthesis is not taking place.

D The amount of carbon dioxide used and produced in the light is equal.

13. 0610_w19_qp_22 Q: 10

The diagram shows an experiment investigating the effect of light intensity on an aquatic plant.



Photosynthesis occurred in both test-tube P and test-tube Q. Both test-tubes were kept at the same temperature. The number of bubbles produced in test-tube P was 12 bubbles per minute.

What is the most likely number of bubbles produced in one minute in test-tube Q?

A 0 **B** 3 **C** 12 **D** 48

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14. 0610_w19_qp_23 Q: 10

Which substance is used up in photosynthesis?

A chlorophyll

B light

C oxygen

D water

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15. 0610_s18_qp_21 Q: 11

The equation for photosynthesis is shown.

.....1..... + ...2..... → glucose + ...3.....

Which words correctly complete gaps 1, 2 and 3?

	1	2	3
A	carbon dioxide	light	oxygen
B	carbon dioxide	water	oxygen
C	oxygen	light	carbon dioxide
D	oxygen	water	carbon dioxide

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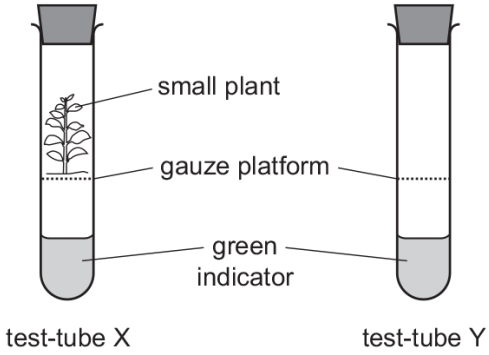
16. 0610_s18_qp_22 Q: 11

An experiment is set up as shown.



The green indicator turns yellow when the concentration of carbon dioxide increases. The green indicator turns blue when the concentration of carbon dioxide decreases.

After several hours, the indicator in test-tube X turned blue. The indicator in test-tube Y remained green.

Which process caused the colour change?

A germination

B photosynthesis

C respiration

D transpiration

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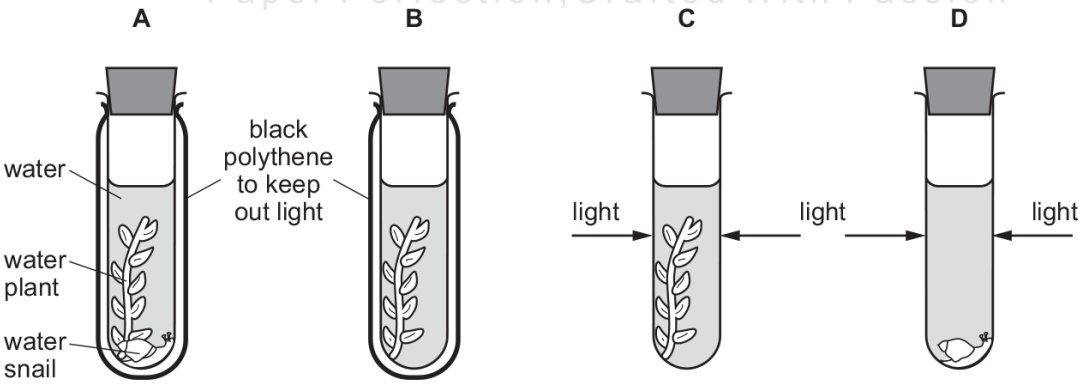
17. 0610_w18_qp_21 Q: 11

An experiment was carried out using the apparatus shown.

The carbon dioxide content of the water in each test-tube was measured at the start and again three hours later.

In which test-tube would there be a decrease in carbon dioxide content?



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18. 0610_m17_qp_22 Q: 10

Which term is defined as the taking of substances into the body through the mouth?

A absorption

B assimilation

C digestion

D ingestion

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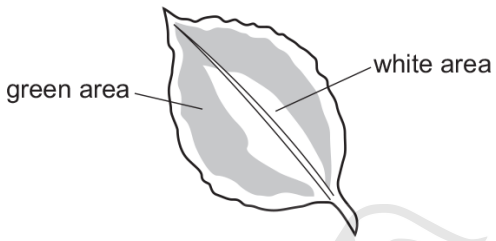
19. 0610_s17_qp_22 Q: 3

A plant has leaves that have white areas and green areas.



Which cell structures are **not** present in the white areas?

A cell membranes

B cell walls

C chloroplasts

D vacuoles

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20. 0610_s17_qp_22 Q: 36

In which processes is light energy converted to chemical energy?

	photosynthesis	plant respiration
A	✓	✓
B	✓	✗
C	✗	✓
D	✗	✗

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21. 0610_s17_qp_23 Q: 11

Which is the equation for photosynthesis?

A $C_6H_{12}O_6 \rightarrow 2C_2H_5OH + 2CO_2$

B $C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + H_2O$

C $2C_2H_5OH + 2CO_2 \rightarrow C_6H_{12}O_6$

D $6CO_2 + 6H_2O \rightarrow C_6H_{12}O_6 + 6O_2$

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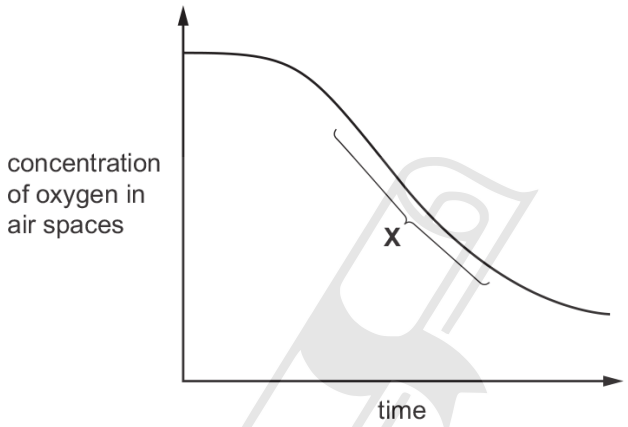
22. 0610_w17_qp_21 Q: 15

The graph shows the concentration of oxygen in the air spaces of a green leaf of a plant during a 12-hour period.



Which statement about carbon dioxide in the air spaces during time **X** is correct?

A Carbon dioxide is being produced because the rate of photosynthesis is greater than the rate of respiration.

B Carbon dioxide is being produced because the rate of respiration is greater than the rate of photosynthesis.

C Carbon dioxide is being used because the rate of photosynthesis is greater than the rate of respiration.

D Carbon dioxide is being used because the rate of respiration is greater than the rate of photosynthesis.

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23. 0610_w17_qp_23 Q: 22

Two pieces of an aquatic plant were placed into two different test-tubes, P and Q.

Each test-tube contained hydrogencarbonate indicator and was sealed and kept at 20 °C.

Test-tube P was kept in the light and test-tube Q was kept in the dark.

The table shows the effect of carbon dioxide on the colour of the hydrogencarbonate indicator.

less carbon dioxide	more carbon dioxide
dark red	orange

What would the colour of the indicator be after 12 hours?

	P	Q
A	dark red	orange
B	dark red	dark red
C	orange	dark red
D	orange	orange

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24. 0610_p16_qp_20 Q: 9

The following can be used to write a word equation for photosynthesis.

1 carbon dioxide and water

2 light and chlorophyll

3 glucose and oxygen

Which shows a correct word equation for photosynthesis?

A 1 → 2 in the presence of 3

B 1 → 3 in the presence of 2

C 2 → 3 in the presence of 1

D 3 → 1 in the presence of 2

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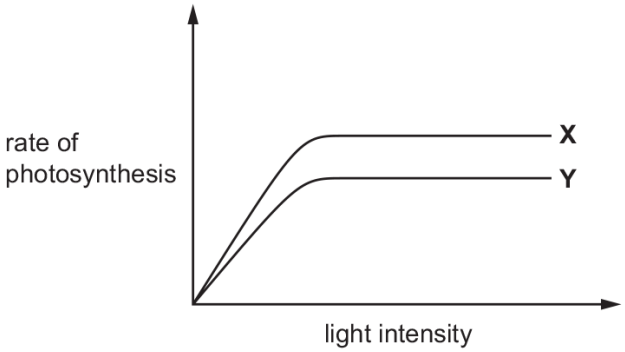
25. 0610_w16_qp_22 Q: 9

Curve **X** on the graph shows the effect of light intensity on the rate of photosynthesis.



How have the conditions changed to produce curve **Y**?

A decreased concentration of carbon dioxide

B decreased light intensity

C increased concentration of carbon dioxide

D increased light intensity

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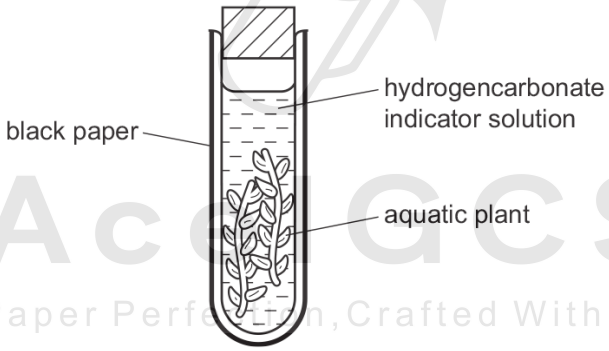
26. 0610_w16_qp_22 Q: 10

An experiment is set up to investigate gas exchange in aquatic plants.



The hydrogencarbonate indicator solution is orange at the start.

Which colour is it after three hours?

A blue-black

B orange

C purple

D yellow

SN	Paper	Q. No.	Answer
01	0610_m22_qp_22	12	B
02	0610_m21_qp_22	12	D
03	0610_w21_qp_21	12	B
04	0610_m20_qp_22	12	B
05	0610_p20_qp_20	9	B
06	0610_s20_qp_21	10	C
07	0610_s20_qp_21	11	C
08	0610_s20_qp_21	12	C
09	0610_s20_qp_22	12	D
10	0610_w20_qp_21	11	A
11	0610_m19_qp_22	12	D
12	0610_w19_qp_21	10	A
13	0610_w19_qp_22	10	D
14	0610_w19_qp_23	10	D
15	0610_s18_qp_21	11	B
16	0610_s18_qp_22	11	B
17	0610_w18_qp_21	11	C
18	0610_m17_qp_22	10	B
19	0610_s17_qp_22	3	C
20	0610_s17_qp_22	36	B
21	0610_s17_qp_23	11	D
22	0610_w17_qp_21	15	B
23	0610_w17_qp_23	22	A
24	0610_p16_qp_20	9	B
25	0610_w16_qp_22	9	A
26	0610_w16_qp_22	10	D