G quantifiers: all / every, etc.

V science

P changing stress in word families

Eureka!

1 LISTENING & SPEAKING

a Read the first paragraph of an article about creative thinking. Do the experiment with a partner.

Eureka! Thinking outside the bath...

Master magician Harry Houdini once amazed the world by making an elephant vanish. You are now going to do the same thing.





OOK AT THE PICTURE of Houdini's head and an elephant. Now close your left eye and hold the book up at arm's length. Now slowly bring the book towards your face, but make sure that you keep looking at Houdini's head with your right eye. At some point, usually when the book is about 20 cm from your face, the elephant will suddenly disappear. This simple illusion works because each of our eyes has a 'blind spot', a small area inside the eye which cannot see.

According to Dr Richard Wiseman, professor of psychology at the University of Hertfordshire, most people have psychological 'blind spots' which cause us to miss seeing the obvious, simple solution to a problem. The few people who do not have these psychological blind spots are the people like the Greek mathematician Archimedes, who was having a bath when he suddenly realized that the volume of an object could be calculated by the amount of water it displaced and cried 'Eureka' ('I have found it'), or the English scientist Isaac Newton, who developed the notion of gravity after seeing an apple fall. Dr Wiseman has studied people who frequently experience this kind of 'eureka moment' and thinks that the difference between them and ordinary people is that they think in a different way, what he calls 'creative thinking'.

b Now look at the title of the lesson. Who said it, and why? Read the second paragraph and check your answer. What kind of people have 'Eureka moments'? Why don't most people have them?







- c 6.11 You are going to listen to a radio programme about creative thinking. First look at the photos. What do you think is happening? Then listen to the first part of the programme and answer the questions.
 - 1 Why don't most people think creatively?
 - 2 What was the gorilla experiment?
 - 3 What happened when Dr Wiseman tried the experiment on a group of top scientists?

These three photographs were first published in *Gorillas in our midst:*Sustained inattentional blindness for dynamic events – Perception, 28
(1059–1074) Simons D.J. and Chabris C.F.

- d 6.12 Before you listen to the rest of the programme, look at the photos on the right. In what way do you think these three ideas were innovative? Then listen and answer the questions.
 - 1 What does the gorilla experiment demonstrate?
 - 2 Why are the three things in the photo examples of creative thinking?
 - 3 What did Dr Wiseman recommend to the journalists? Why?
 - 4 What was Dr Wiseman's creative idea?





e Do the test below to find out if you are a creative thinker.

Are you a creative thinker?

- **1** Circle true or false.
 - a I don't consider myself an especially lucky person.

true false

b If I'm working on a problem and I'm not making progress, I usually stop for a bit and wait for a solution to present itself.

true false

 I like dealing with problems that have clear answers.

true false

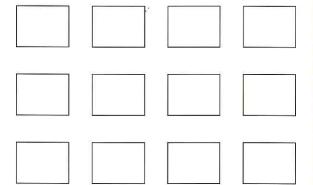
d I don't like breaking rules.

true false

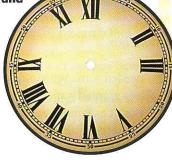
e The best part about working on a problem is solving it.

true false

- Think of a number between 1 and 50 that contains two odd digits but not the same digits.
- In three minutes, add lines to these boxes to make each one into a different object.



Look at this clock and fill in the missing numbers.



- **2 GRAMMAR** quantifiers: *all / every*, etc.
- a Read these scientific facts. Use your instinct to circle the right word or phrase.
 - 1 Deciduous trees lose their leaves every year / all years.
 - 2 All living things / All the living things have cells.
 - 3 Both / Both of insects and spiders are invertebrates.
 - 4 If something absorbs *all | every* the colours of the spectrum, it appears black.
 - 5 All / Everything is made up of atoms.
 - 6 Without oxygen, neither humans or / nor animals can survive.
- b Op.142 Grammar Bank 6C. Read the rules and do the exercises.
- c Do the science quiz with a partner.

How much do you know about science?

Do our quiz and find out.

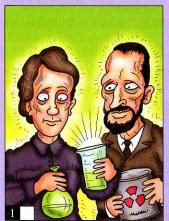
- 1 How much of human DNA is the same as chimpanzee DNA?
 - a Hardly any.
 - b Some of it.
 - Most of it.
- 2 The air we breathe contains...
 - a both nitrogen and carbon dioxide.
 - b neither nitrogen nor carbon dioxide.
 - c only carbon dioxide.
- 3 When we breathe out, how much of that air is oxygen?
 - a None of it.
 - b All of it.
 - Some of it.
- 4 While you are asleep, you are in REM sleep (or dreaming sleep) for...
 - a all of the night.
 - b some of the night.
 - c most of the night.
- 5 When does a lemon tree produce fruit?
 - a Nearly all year.
 - Nearly every year.
 - Some years.
- 6 If blue-eyed parents have one son and one daughter, who will also have blue eyes?
 - a Both of them.
 - Neither of them.
 - one of them.

3 READING

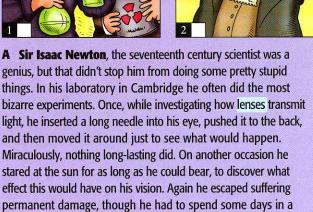
a You are going to find out about how scientists throughout history have suffered to make their discoveries. Read the extracts and label the illustrations A–D. How many of the scientists actually died as a result of their research?

Suffering for science

Throughout history scientists have risked their health and their lives in their search for the truth...







B In the 1750s the Swedish chemist **Karl Scheele** was the first person to find a way to manufacture phosphorus. He in fact discovered eight more elements including chlorine, though he didn't get the credit for any of them. He was a brilliant scientist, but his one failing was a curious insistence on tasting a little of every substance he worked with, including mercury and cyanide. This risky practice finally caught up with him, and in 1786 he was found dead in his laboratory surrounded by a large number of toxic chemicals, any of which might have been responsible for his death.

darkened room before his eyes recovered.





C In the early 1900s when **Pierre and Marie Curie** discovered radiation, nobody realized what a dangerous and deadly phenomenon it was – in fact most people thought that it was beneficial. There was even a hotel in New York which, in the 1920's, advertised 'the therapeutic effect of its radioactive waters'. Both Pierre and Marie Curie experienced radiation sickness and Marie Curie died of leukaemia in 1934. Even now, all her papers from the 1890s, even her cookbooks, are too dangerous to touch. Her laboratory books are kept in special lead boxes and people who want to see them have to wear protective clothing. Marie's husband Pierre, however, did not die from radiation – he was run over by a carriage while crossing the street in Paris.

D Eugene Shoemaker was a respected geologist. He spent a large part of his life investigating craters on the moon, and how they were formed, and later did research into the comets of the planet Jupiter. In 1997 he and his wife were in the Australian desert where they went every year to search for places where comets might have hit the earth. While driving in the Tanami desert, normally one of the emptiest places in the world, another vehicle crashed into them and Shoemaker was killed instantly. Some of his ashes were sent to the moon aboard the Lunar Prospector spacecraft and scattered there – he is the only person who has had this honour.

From A short history of nearly everything by Bill Bryson

- **b** Read the extracts again and answer the questions. Write A–D in the right box. Which scientist...?
 - 1 had a very dangerous way of working with chemicals
 - was injured twice while he / she was doing experiments
 - discovered something which slowly killed him / her
 - 4 was very unlucky to die doing his / her job

- needed some time to recover from an experiment
- was granted a special honour after his / her death
- wasn't as famous as he / she should have been
- left something behind which is still dangerous today
- c 6.13 Look at the highlighted words, which are all related to science. What do they mean? Are they similar in your language? How do you think they are pronounced? Listen and check.

4 VOCABULARY & PRONUNCIATION

science; changing stress in word families

a Match the different kinds of scientists with what they study.

a biologist	a chemist a geneticist a geologist a physicist
1	natural forces, e.g. light, sound, heat, etc.
2	living things, e.g. animals and plants
3	the structure of substances, what happens different situations, and when they are mixe with each other
4	the cells of living things (genes) that control what a person or plant is like
5	rocks and how they are formed

b In pairs, complete the table.

person	adjective	subject
1 scientist	scientific	science
2 chemist		
3 biologist		
4 physicist		
5 geneticist		
6 geologist		

A In some word 'families' the stressed syllable changes in the different parts of speech, e.g. <u>photograph</u>, <u>photographer</u>, <u>photographic</u>.

- c 6.14 Look at the words in the chart in b above and under<u>line</u> the stressed syllable. Listen and check. In which groups does the stress change?
- d Practise saying the word families.
- e Complete the sentences with the correct form of a verb from the list. Underline the stress in the verbs and also in the **bold** words.

develop	discover	do (x3)	invent	make	prove	volunteer
1 Pierre a	nd Marie	Curie	rad	iation i	n 1900.	
2 Scientis	ts	experime	e <mark>nts</mark> in a	laborat	ory.	
3 Archim	edes	an imp	ortant d	liscover	y in his	bath.
4 Isaac N	ewton's ex	periment	s	his the	ory tha	t gravity existed
5 The tele	ephone wa	.s	in the 18	370s.		
6 Pharma illnesses	aceutical of and disea	-	s try to _	1	new dru	gs to cure
	its have to of new dri		lot of re	search	into the	possible side
	a company als to mak				have to	tests
9 People	can	_ to be g	inea pig	s in cli	nical tria	als.
6.15 Li	sten and	check. Pr	actise sa	ving th	e sente	nces.

5 SPEAKING

Answer the questions with a partner.

Which scientific subjects do / did you study at school? Which did you enjoy the most / least?

Talk about

Which ones do you think have actually taught you something useful?

Is there a scientist (living or dead) who you admire? Who?

What do you think is the most important scientific discovery of recent years?

Are there any scientific discoveries that you wish hadn't been made?

Would you ever agree to be a volunteer in a clinical trial of a new drug?

If you were ill, would you agree to be a guinea pig for a new kind of treatment?

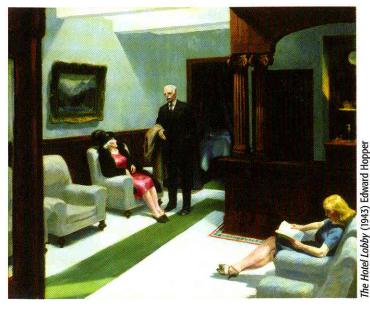
What scientific stories are in the news at the moment?

Are you worried about any of the things scientists are currently experimenting with?

What would you most like scientists to discover in the near future?

Communication

4C Two paintings Student A



- a Look carefully at your painting. Then describe it in detail to B, focusing especially on the people and their body language. Say who you think they are and what you think they're doing.
- b Show your picture to B and see if he / she agrees with you.
- c Listen to B describe another painting. Try to visualize it.
- d B will now show you the picture to see if you agree with his / her description and interpretation.

5B Sleep Students A + B

Read the results of the questionnaire and calculate your score. The higher your score the more sleep deprived you are. The maximum is 14.

		600 102	192	19690
7	a 0	b 1	c 0	d 1
6	a 0	b 1	c 2	
5	a 0	b 1	c 2	d 2
4	a 0	b 1	c 2	
3	a 1	b 0	c 0	
2	a 1	b 0	c 0	
1	a 0	b 1		

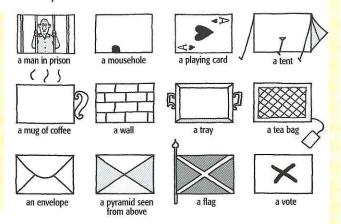
8 1 point for each one you circle

6C Are you a creative thinker? Students A + B

Check your answers to the test.

Are you a creative thinker?

- The more times you have circled false, the more creative you are and the higher your 'eureka potential'.
- The vast majority of people choose either 35 or 37. However, truly creative people usually come up with a different number, e.g. 17 or 31.
- The more boxes you were able to fill, the more creative you are. The following are some of the more creative ideas that people have come up with:



The important question concerns how you represented the number 4. In Roman numerals the number 4 is always represented as 'IV'.

However, on almost all clocks and watches except for Big Ben in London, the number is represented as 'IIII'. If you filled it in as 'IV', that means that although you have probably seen clocks and watches with Roman numerals hundreds of times, you have not really seen or remembered what is right in front of your eyes.

7C What's the word? Student A

- a Check that you know what your list of words below mean. Then define them to B, saying which language they come from.
 - 1 caravan /ˈkærəvæn/ (Persian)
 - 2 blanket /'blæŋkɪt/ (Dutch)
 - 3 embarrassed /Im'bærəst/ (French)
 - 4 tsunami /tsuːˈnɑːmi/ (Japanese)
 - 5 soprano /รอ'prɑːทอบ/ (Italian)
 - 6 massage / mæsa:3/ (Portuguese)
 - 7 mosquito /mps'ki:təu/ (Spanish)
 - 8 fog/fog/ (Danish)
- b Listen to B's definitions and say what the word is.
- c Has your language 'borrowed' any of these words?

6A articles

basic rules: a / an / the, no article

- 1 My neighbour has just bought a dog.The dog is an Alsatian.He got into the car and drove to the Town Hall.
- 2 Men are better at parking than women. I don't like sport or classical music. I stayed at home last weekend.
- 1 Use a / an when you mention somebody / something for the first time or say who / what somebody / something is.
 Use the when it's clear who / what somebody / something is (e.g. it has been mentioned before or it's unique).
- 2 Don't use an article to speak in general with plural and uncountable nouns, or in phrases like at home / work, go home / to bed, next / last (week), etc.

institutions (church, hospital, school, etc.)

My father's in hospital. They are building a new hospital in my town.

• With *prison*, *church*, *school*, *hospital*, and *university*, etc. don't use an article when you are thinking about the institution and the normal purpose it is used it for. If you are just thinking about the building, use *a* or *the*.

geographical names

- 1 Tunisia is in North Africa.
- 2 Selfridges, one of London's biggest department stores, is in Oxford Street.
- 3 Lake Victoria and Mount Kilimanjaro are both in Africa.
- 4 The River Danube flows into the Black Sea.
- 5 The National Gallery and the British Museum are London tourist attractions.
- We don't normally use the with:
- 1 most countries, continents, regions ending with the name of a country / continent, e.g. *North America, South East Asia*, islands, states, provinces, towns, and cities (exceptions: the USA, the UK / United Kingdom, the Netherlands, the Czech Republic).
- 2 roads, streets, parks, shops, and restaurants (exceptions: motorways and numbered roads, *the M6*, *the A25*).
- 3 individual mountains and lakes.
- We **normally use** the with:
- 4 mountain ranges, rivers, seas, canals, deserts, and island groups.
- 5 the names of theatres, cinemas, hotels, galleries, and museums.

6B uncountable and plural nouns

uncountable nouns

- 1 The **weather** was terrible, but at least there wasn't much **traffic**. The **scenery** is beautiful here, but it's spoiled by all the **rubbish** people leave.
- 2 We bought some new furniture for the garden. That's a lovely piece of furniture.
- 3 Iron is used for building bridges.
- I need to buy a new iron. My old one's broken.
- 1 The following nouns are always uncountable: behaviour, traffic, weather, accommodation, health, progress, scenery, rubbish, work, politics (and other words ending in -ics, e.g. athletics, economics).
- They always need a singular verb, they don't have plurals, and they can't be used with a / an.
- 2 These nouns are also uncountable: furniture, information, advice, homework, research, news, luck, bread, toast, luggage, equipment. Use a piece of to talk about an individual item.
- 3 Some nouns can be either countable or uncountable, but the meaning changes, e.g. *iron* = the metal, *an iron* = the thing used to press clothes. Other examples: *glass, business, paper, light, time, space.*

plural and collective nouns

- 1 Your **clothes** are filthy! Put a pair of / some clean trousers on.
- 2 Our staff are very efficient.
- 1 Arms (=guns, etc.), belongings, clothes, manners, outskirts, scissors, trousers / shorts are plural nouns with no singular. They need a plural verb and can't be used with a / an.
- If they consist of two parts, e.g. scissors, trousers, shorts, they can be used with a pair of or some.
- 2 *Crew, police, staff* are collective nouns and refer to a group of people. They need a plural verb.

quantifiers: all / every, etc.

all, every, most

- 1 All animals need food. All fruit contains sugar. All (of) the animals in this zoo look sad. The animals all looked sad.
- 2 Everybody is here. Everything is very expensive.
- 3 Most people live in cities.
- Most of the people in this class are women.
- 4 **All of** us work hard and **most of** us come to class every week.
- 5 Every room has a bathroom. I work every Saturday.
- Use all or all (of) the + a plural or uncountable noun.
 All = in general, all (of) the = specific.
 All can be used before a main verb (and after be).
- 2 All can't be used without a noun. Use everything / everybody, + singular verb, e.g. Everything is very expensive.
- 3 Use *most* to say the majority. *Most* = general; *Most of* = specific.
- 4 We often use all / most of + an object pronoun, e.g. all of us, most of them, all of you, most of it.
- 5 Use every + singular countable noun to mean 'all of a group'.
 - every and all + time expressions: Every day = Monday to Sunday. All day = from morning to night.

no, none, any

- 1 Is there any milk? Sorry, there is **no** milk. There **isn't any** (milk).
- 2 Is there any food? No, **none**. / There is **none**. But **none of us** are hungry.
- 3 Come any weekend! Anyone can come.
- 2 Use none in short answers, or with a ± verb to refer to zero quantity. You can also use none + of + pronoun / noun.
- 3 Use *any* (and *anything, anyone*, etc.) and a \pm verb to mean it doesn't matter when, who, etc.

both, neither, either

- 1 Both Pierre and Marie Curie were scientists. Neither Pierre nor Marie was / were aware of the dangers of radiation. Marie Curie wanted to study either physics or mathematics. In the end she studied both subjects at the Sorbonne in Paris.
- 2 She and her husband both won Nobel prizes.
- 3 Neither of them realized how dangerous radium was.
- Use both, either, and neither to talk about two people, things, actions, etc. both = A and B; either = A or B; neither = not A and not B.
- 1 Use a ± verb. The verb is plural with *both*, and either singular or plural with *neither*.
- 2 When both refers to the subject of a clause it can also be used before a main verb.
- 3 We often use both / either / neither + of + object pronoun, e.g. us, them, etc. or + of the + noun.

			_	
c		A	a	
m	١	Æ		ч

1	Circle the correct article.					
	James bought (a)/ the /					

James bought (a)/ the / (-) new suit at the weekend.

- 1 The weather was awful so we stayed at a / the / (-) home.
- 2 *A / The /* (–) dishwasher we bought last week has stopped working already.
- 3 I love reading \underline{a} / the / (–) historical novels.
- 4 Sarah had had an exhausting day so she went to *a | the |* (–) bed early.
- 5 My boyfriend drives a / the / (–) very cool sports car.
- 6 The teachers are on strike so the children aren't going to *a* / *the* / (–) school.
- 7 Turn left immediately after *a* / *the* / (–) church and go up the hill.
- 8 My neighbour's in a / the / (–) prison because he didn't pay his taxes.
- 9 People are complaining because the council have refused to build *a | the |* (–) new hospital.
- 10 Visitors will not be allowed to enter *a* / *the* / (–) hospital after 7.00 p.m.

b	Comp	lete with	the or	(-).
	1			200

They're going to <u>the</u> USA to visit family.

- 1 I think _____ Sicily is the largest island in _____ Mediterranean.
- 2 Cairo is on _____ River Nile.
- 3 We didn't have time to visit _____ Louvre when we were in Paris.
- 4 _____ south-west England is famous for its beautiful countryside and beaches.
- 5 _____ Mount Everest is in _____ Himalayas.
- 6 The largest inland lake is _____ Caspian Sea.
- 7 We stayed at _____ Palace Hotel while we were in Madrid.
- 8 Romeo and Juliet is on at _____ Globe Theatre.
- 9 _____ Channel Islands are situated between England and France.
- 10 I've always wanted to visit _____ India.

6B

a Right (✔) or wrong (✗)? Correct the wrong phrases.

Our accommodation isn't satisfactory.

The news are good.

The news is

- 1 We had a beautiful weather when we were on holiday.
- 2 They've got some lovely furnitures in their house.
- 3 My brother gave me a useful piece of advice.
- 4 The police has arrested two suspects.
- 5 I need to buy a new trousers for my interview tomorrow.
- 6 The staff is very unhappy about the new dress code.
- 7 Your glasses are really dirty. Can you see anything?
- 8 The homeworks were very difficult last night.

b Circle the correct form. Tick () if both are correct.

The traffic (is) / are awful during the rush hour.

- 1 Athletics is / are my favourite sport.
- 2 I bought a pair of / some jeans.
- 3 Harvey's clothes look / looks really expensive.
- 4 The flight crew work / works hard to make passengers comfortable.
- 5 I found out some / a piece of useful information at the meeting.
- 6 Is that vase made of a glass / glass?
- 7 I think I'll have a / some time after lunch to help you with that report.
- 8 I've got a / some good news for you about your job application.
- 9 We've made a lot of *progresses / progress* in the last two weeks.
- 10 My eyesight is getting worse. I need a new glasses / pair of glasses.

6C

a Circle the correct word(s).

We've eaten (all the) / all cake.

- 1 Most of / Most my closest friends live near me.
- 2 I'm afraid there's no / none room for you in the car.
- 3 *All | Everything* is ready for the party. We're just waiting for the guests to arrive.
- 4 *Most / Most of* people enjoy the summer, but for some it's too hot.
- 5 She goes dancing all / every Friday night.
- 6 We haven't got any / no onions for the soup.
- 7 Any / None of us want to go out tonight. We're all broke.
- 8 Nobody / Anybody can go to the festival. It's free.

b	Complete the second sentence so that it means the same as the
	first. Use the bold word.

I like meat. I like fish too. I like both meat and fish. both

1 We could go to Greece. We could go to Italy. either

We could go ______.

2 I didn't stay very long. You didn't stay very long.

t stay very long. **neither**_ stayed very long.

3 I think her birthday is on the 6th of May – but perhaps it's the 7th.

Her birthday is on _

either

4 One of my children could read when he was four. So could the other one.

both_ when they were four.

5 My brothers don't smoke. My sisters don't smoke.

neither

Phrasal verbs in context

FILE 1

Complete the phrasal verbs from File 1 with the correct particle.

b	ack	down (x2)	up (x3)		
1	My	brother and l	nis girlfriend brok	e l	ast month.
2	I car	n't talk now, I'	m driving. I'll call	you	_ in fifteen minutes.
3	This	s club isn't a v oo loud.	ery good place to	chat	girls. The music
					e cup of coffee a day.
5	Don	ı't give	If you keep tryin	ıg, I'm sure	find a good job soon
6	Slov	w! Th	ere are speed cam	eras on th	is road.

FILE 2

Complete the phrasal verbs from File 2 with a verb in the correct form.

burst	knock	leave	put	turn
a lar	ge, white	hat.		ing when Jimmy arrived wearing
shou	iting in th	ie kitche	en.	? I can't hear it with the children
3 Don	't	anythir	ng beh	ind when you get off the plane.
4 Wha and	it a pity! ' build a ca	They're ar park.	going	to down our local cinema
	ou take an ve finishe			s, please them back when

FILE 3

Match the phrasal verbs from File 3 with a definition A-E.

- 1 Watch out, there are often pickpockets on this station.
- 2 The company has been going through a bad period recently.
- 3 The police told us to get out because the building wasn't safe.
- 4 If we carry on polluting the planet, we're going to destroy it.
- The restaurant wasn't popular and it closed down last year

- A continue
- B leave
- C stop operating
- D be careful
- E experience or suffer

FILE 4

Complete the phrasal verbs from File 4 with the correct particle.

_		off (x2)	on	out	
	as fa	st as they	can.		passengers must get of the plane
2	It wa	s an eight-	hour j	ourne	y so we set early in the morning
3	Jessic	a was gettir	ıg reall	y angr	with Tom so I told her to calm
4	Hold	l to m	e. It's v	ery sli	ppery and you might fall.
5	The t	teacher tol	d me_	b	ecause I hadn't done my homework.

FILE 5

Complete the phrasal verbs from File 5 with the correct particle.

Ca	atch	eat	fall	fill	lie	put		
1	I'm e an h		sted. I'	m go	ing to		_ down fo	or half
2			ry goo st twe			iting. I	always	
3	We s	100	d at a	petro	l stati	on to _	ир	with
4			for lur news.	nch ne	ext we	ek and	we can	up
5			isy to ies a v		_ on	weight	if you	out

FILE 6

Match the phrasal verbs from File 6 with a definition A-E.

- 1 The teacher hurried through the last part of the class.
- 2 I'll only call you if something interesting comes up in the meeting
- 3 James has thought up a brilliant new idea for our new product.
- 4 An old man was run over on the pedestrian crossing.
- 5 A lorry crashed into my car when it was parked outside my house.

niale

- A collide with
- B hit and knocked to the ground by a vehicle
- C invent
- D complete quickly
- E occurs or appears unexpectedly

FILE 7

--- J

Complete the phrasal verbs with the correct form of the verb.

talra

e	na	go	pick	take	
1	I don't know what's on. Can anyone te me what's happening?				
2	We got completely lost and we up miles away from where we wanted to go.				
	I'll wh	at tin	you ne your	up at t	the station if you tell me arrives.
4	I've goi	e deci	ded to learn t	o danc	_ up a new hobby – I'm e salsa.