ENGLISH FOR TEACHING MATHEMATICS AND SCIENCE (ETEMS)

PHASE I

ENGLISH LANGUAGE TEACHING CENTRE, MALAYSIA
BAHAGIAN PENDIDIKAN GURU KEMENTERIAN
PENDIDIKAN MALAYSIA

ENGLISH FOR TEACHING MATHEMATICS AND SCIENCE (ETeMS)

PHASE 1

MODULE 1
PRIMARY

ENGLISH LANGUAGE TEACHING CENTRE, MALAYSIA

BAHAGIAN PENDIDIKAN GURU
KEMENTERIAN PENDIDIKAN MALAYSIA

Acknowledgements

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ENGLISH FOR THE TEACHING OF MATHEMATICS AND SCIENCE (ETeMS)

AIM

The overall aim of ETeMS is to enhance the English language skills of Mathematics and Science teachers to enable them to teach effectively using English as the medium of instruction.

Structure of the ETeMS Programme

ETeMS invoves 240 hours of instruction delivered through face-to-face interaction and self-instructional packages. These will be supported by a `buddy system' whereby the teachers can get further help from identified resource persons in their locality.

The ETeMS programme is conducted in 2 phases. Each phase comprises 90 hours of face-to-face interaction and 30 hours worth of self-instructional materials.

Phase 1 will be delivered through

- 5 modules spread over 5 weeks. Each module requires 2 days of face-to-face interaction (60 hours)
- 5-day Module (30 hours)
- a self-instructional package (30 hours)

Module Content

Each two-day module consists of a series of sessions covering a total of 12 hours of interaction. The duration of each session is between 1 to 3 hours. The components; for the various sessions are shown in the table below.

SESSION	COMPONENT
Text Lab	Interfacing with Text Word Explorer Connecting with Text Language in Action Springboard
Language Lab	Grammar Works Getting it Right Trying it Out
Stand and Deliver	
Back to the Future	

ENGLISH FOR TEACHING
MATHEMATICS AND SCIENCE (EteMS)

PHASE 1

MODULE 1
PRIMARY

CONTENTS

Text Lab

Cats

Language Lab 1

Asking questions

Yes/No questions

Language Lab 2

Asking questions

Wh-questions

Stand and deliver

Back to the Future

TEXT LAB

INTERFACING WITH THE TEXT

You are going to read a text on `Cats'. The text is taken from ***The Dorling Kindersley Nature Encyclopedia / The Natural History Museum.***

CHAMPIONS OF DISGUISE

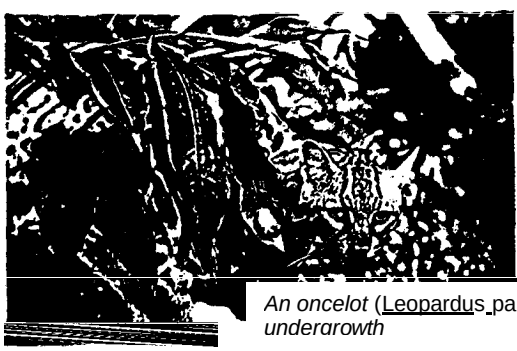
A cat's fur acts as a camouflage so that it can hide from both prey and potential enemies. The lion's sandy-coloured coat, for example, helps to conceal it in the dry grasses of the African savanna. I.ike many cats, the ocelot has a striped and spotted coat. ocelots live in forests and thick brush in Central and South America. Their patterned coats provide excellent camouflage in the dappled light of the forest, making thorn almost invisible when they keep still.

C A T S

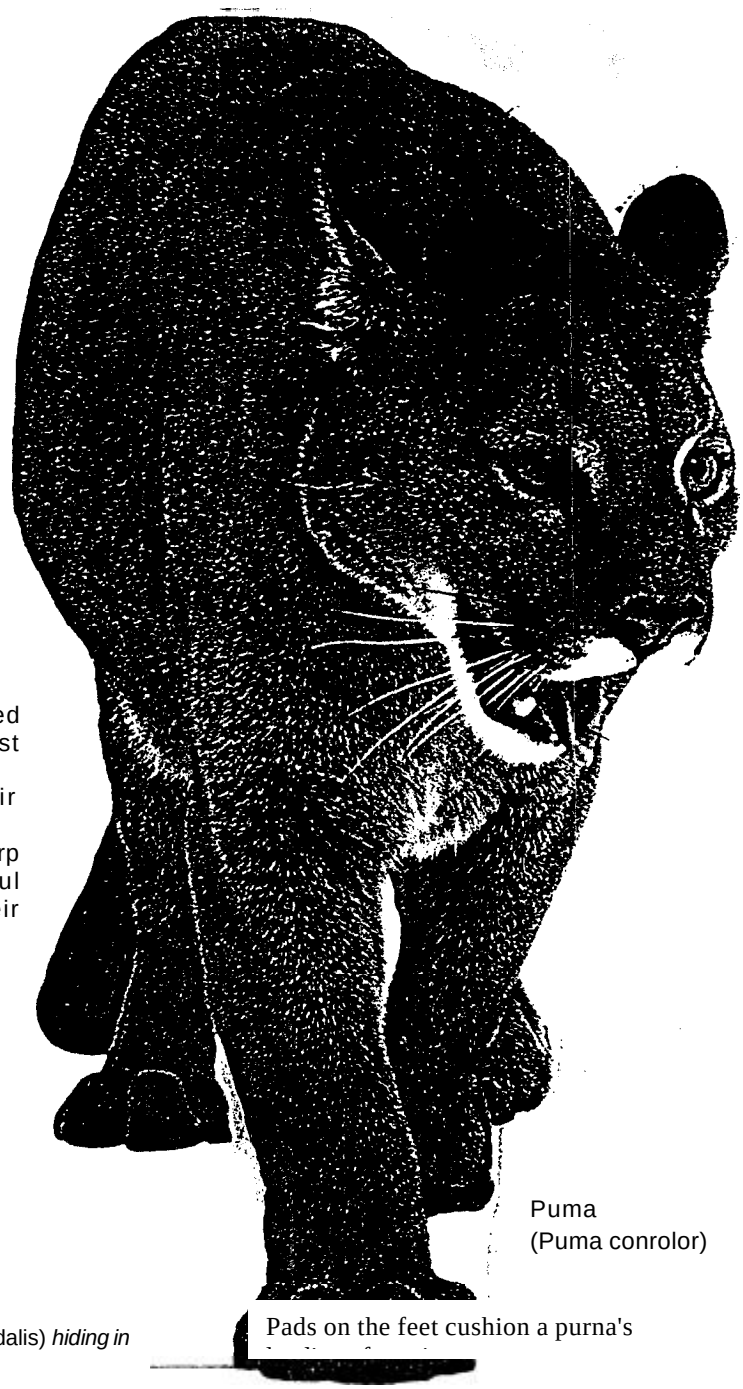
CATS ARE NATURE'S MOST efficient hunters. These carnivorous (meat-eating) animals feed almost entirely on vertebrates, and use cunning and stealth to stall: tlieir victims silently before attacking. Most wild cats are solitary and secretive. They are most active at night,and have acute hearing and vision to hunt in darkness. The 37 species in the cat family are often divided into two groups - small and big cats. Small cats crouch to eat, rest with their paws tucked under them, and can purr (but not roar). Big cats lie down to eat, rest with their paws in front, and can roar (but not purr). There are seven big cat species - the lion, tiger, jaguar, leopard, snow leopard, clouded leopard, and cheetah.

CAT ANATOMY

Cats have lithe, muscular bodies that enable them to move with speed, strength, and flexibility. Unlike dogs, however, they are not equipped for long-distance running. Most cats live in forests, and are agile climbers thanks to their strong forelimbs and chest muscles, and their razor-sharp claws. They use their powerful hind limbs to pounce., and their long tails to balance when leaping or clirnbing.



An oncelot (Leopardus pardalis) *hiding in underarowth*



Puma
(Puma conrolor)

Pads on the feet cushion a purna's

TEETH & SKULL

TL/MI /51 /PRI/2 011

A cat's teeth and skull are adapted to give a powerful, killing bite, and to rip and cut flesh. The jaws can only move up and down, and are controlled by powerful muscles that provide a vice-like grip. The long, pointed, canine teeth

bite into the prey's neck. The smaller teeth pull flesh off bones or slice up meat with

PupdS narrowed to slits

Pupils wide open

VISION

Cats have excellent vision for hunting at night. In dim light, their eyes are six times more sensitive than human eyes. At night, a cat's pupils open wide to let in as much light as possible. During the day, they close to narrow slits to keep out dazzling sunlight.

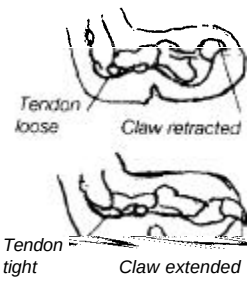
flexible, muscular body

whiskers for feeling objects in the dark

rasping tongue stripping

RETRACTABLE CLAWS

A cat's claws are usually retracted (pulled back) into protective sheaths to keep them sharp. When the cat attacks its prey, the toes spread out and special tendons tighten to extend the claws. Cats also use their claws to defend themselves and to climb.



SOCIAL CATS

Lions are social cats that live in groups called prides. The males are easily distinguished by their manes. Lions were once widespread throughout Europe, Africa, and *Asia,* but are now found only in African grassland south of the Sahara Desert, and in a small *forest* reserve in northwest India. They hunt anything they can kill, including large herbivores such as zebras and wildebeest. Lions usually hunt at night, and spend most of the day resting.

WORD EXPLORER

TASK 1 Awareness Raising

Skim through the text and complete the grid below by listing the words and phrases that you might use when teaching this topic in English,

What is the Bahasa Melayu equivalent for each of the listed words?

WORD / PHRASE	BAHASA MELAYU EQUIVALENT

Now, compare your answers with a colleague.

TASK 2 Vocabulary Extension

What are the simpler, more everyday language for the following terms?

Write them in the blanks provided:

i. Vertebrates:

ii. Stalk:

iii. Species:

iv. hind limbs:

v. Prey:

vi. conceal:

vii. Vision:

viii. Herbivores:

CONNECTING WITH TEXT

TASK 3 Making sense of the Text

A Read the text above and answer the following questions:

1. The text mentions two groups of cats.

Complete the table below to explain how these two groups of cats differ:

CATS		
Groups		
Eating Style		
Resting Style		
Sounds made		

2. How do the following qualities of the cat's anatomy enable it to be nature's most efficient hunter?

Complete the table below. The **first one has** been done for you.

PART of ANATOMY	QUALITIES	FUNCTION
ears	**acute hearing**	**to detect a prey's movement**
eyes		
teeth		
jaw		
body		
chest muscle		
fur		
fore limb		
hind limb		
claws		
tail		

B Discuss the following questions with your colleague:

1. How do cats stalk their prey?

2. How are lions similar or different from the other members of the cat family?

3. What do you think led to the disappearance of lions from Europe?

LANGUAGE IN ACTION

TASK 4 **Collocation**

The text contains noun groups made up of an adjective and a noun.

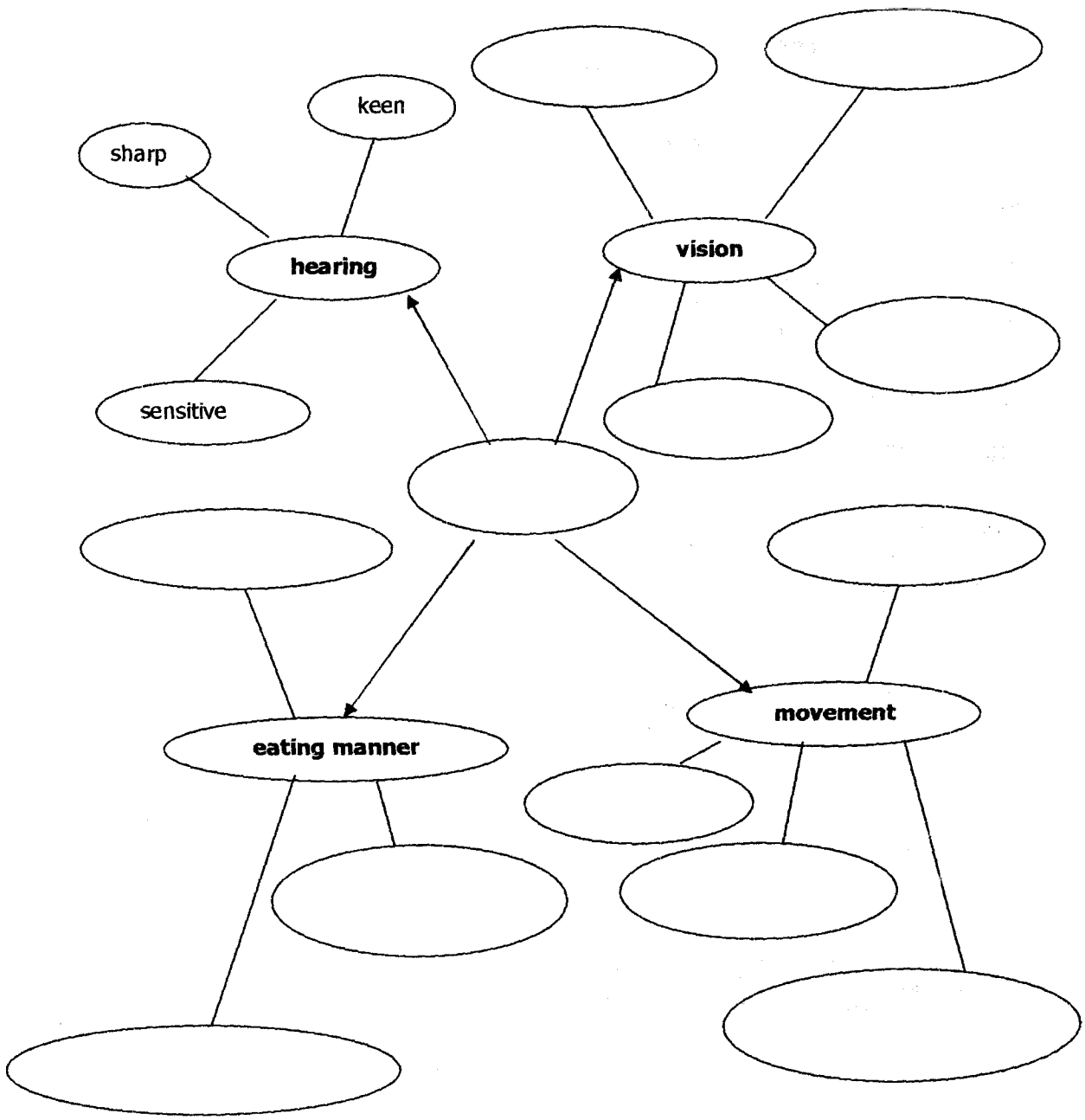
A. Quickly scan the text and look for the adjectives that pair with the nouns given below. Write *them in the table below in the column From the Text.*

B. *In the column Teacher's Alternatives,* write *down other adjectives that can also be used wide these nouns*
The first one has been done for you.

From the text		**Teacher's Alternatives**	
Adjective	Noun	Adjective	Noun
carnivorous	animals	**wild / proud / dynamic**	**animals**
	hearing		hearing
	bodies		bodies
	claws		claws
	grasses	-	grasses
	bite		bite
	muscles	-	muscles
	grip		grip
	vision		vision
	forest reserve		forest reserve

C. What words, aside from those found in the text, can you use to describe the cat's hearing, vision, eating manner, and movement?

Write them in the bubbles below. The first one has been done for you.



TASK 5 *Language Extension*

Read the poem below and underline the words used to describe tfie cat

THE TOM-CAT

At midnight in the alley
A tom-cat comes to wail,
And he chants the hate of a million years
As he swings his snaky tail.

Malevolent, bony, brindled,
Tiger and devil and bard,
His eyes are coals from the middle of Hell
And his heart is black and hard.

He twists and crouches and capers
And bares his curved sharp claws,
And he sings to the stars of the jungle nights, Ere cities were, or laws.

Beast from a world primeval,
He and his leaping clan,
When the blotched red moon leers over the roofs,
Give voice to the scorn of man.

He will lie on a rug to-morrow,

And lick his silky fur,

And veil the brute in his yellow eyes

And play he's tame, and purr.

But at midnight in the alley
He will crouch again and wail,
And beat the time for his demon's song
With the swing of his demon's tail.

DON MARQUIS

TASK 6 Talking About It

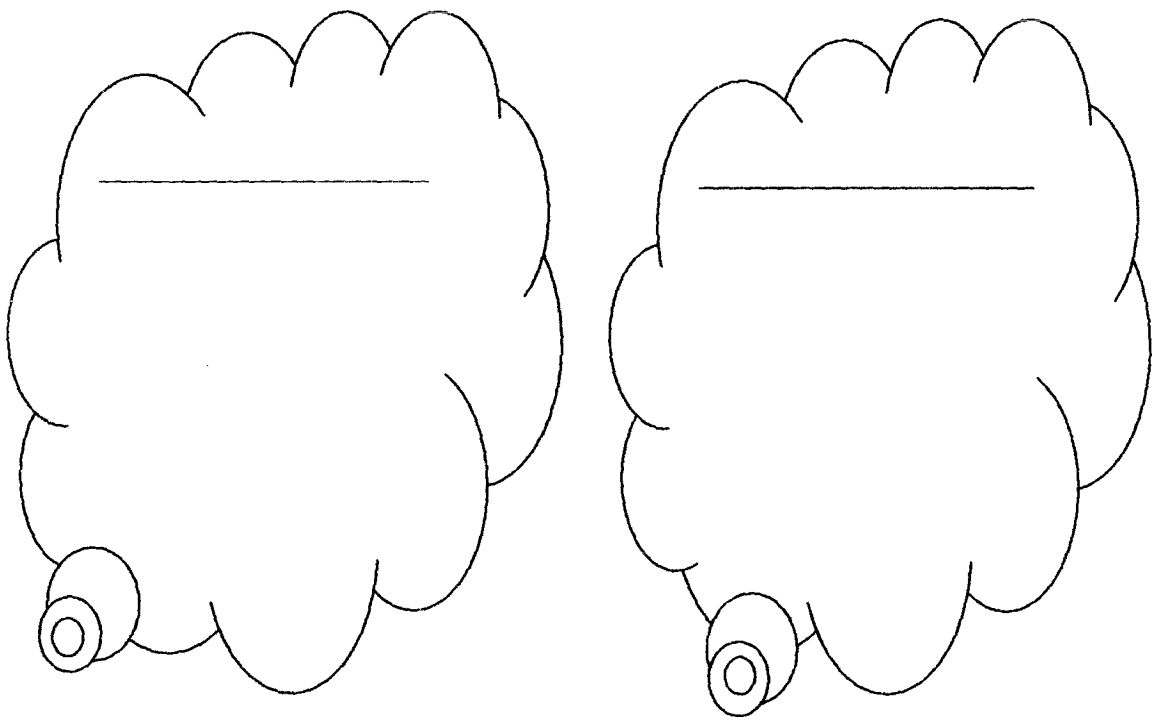
According to the poet, there seems to be two sides to the cat's personality.

A What are they?

Wifte them as the heading for each bubble below,

S Select the expressions in the poem that support each description.

Wine *them below the appropriate heading.*



C What do you think is the poet's impression of a cat? What is your opinion of the cat?

Discuss this with a colleague.

LANGUAGE LAB 1

GRAMMAR WORKS

TASK 1 Twenty Questions

Can you guess the mystery object? You are going to play a game to find out what the mystery object is by asking questions. The facilitator is player A and you are player B.

The rules are as follows:

- Player A thinks of an object.
- Player B asks Yes/No questions to find out enough information to help her/him guess what the object is.
- Player A will only answer Yes/No. No other information will be given.
- Player B has to make a guess after using the 20 questions.

TASK 2 Yes/No Question Patterns

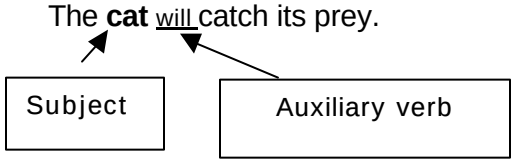
Study the patterns and examples given in the tables Formulate other YeslNo questions to complete the table.

1. If the verb group has more than one word, the first word (*auxiliary or modal) comes at the beginning of the sentence, before the subject. The rest of the verb group comes after the subject.

Example

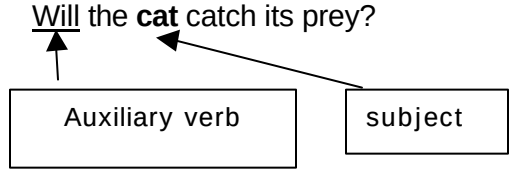
STATEMENT

The **cat** will catch its prey.



QUESTION

Will the **cat** catch its prey?



Statement	Question
1. The cats have fed on their victims.	Have the cats fed on their victims?
2. Great apes are capable of using tools and solving problems.	Are great apes capable of using tools and solving problems?
3. The wind's energy can be used to generate electricity.	
4. Some birds will migrate to warmer regions to find food.	
5. Satellites can send signals to help ships and aircrafts to find their way around earth.	
6. Oxygen is tested using a glowing splint.	

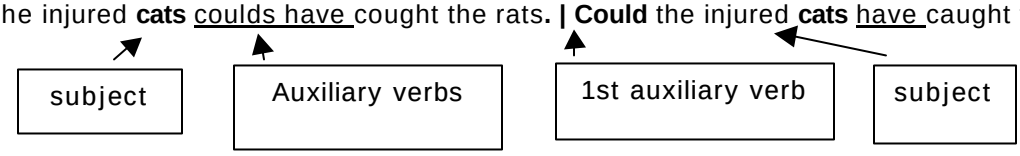
* An **auxiliary verb** is one of the verbs 'be',.have' and 'do' when they are used with a main verb to form tenses, negative questions, and so on. Modals are also auxiliary verbs. A modal is an auxiliary verb which is used with a main verb to indicate a particular attitude, such as possibility, obligation, prediction, or deduction; e.g. can, could, may might. They are also called modal auxiliaries or modal verbs. *(Collins Cobuild English Grammar, p. xviii* Harper Collins, 1990)

2. If there is **more than one auxiliary verb (e.g.** *could have)* then only the first one comes before the subject.

Example

STATEMENT **QUESTION**

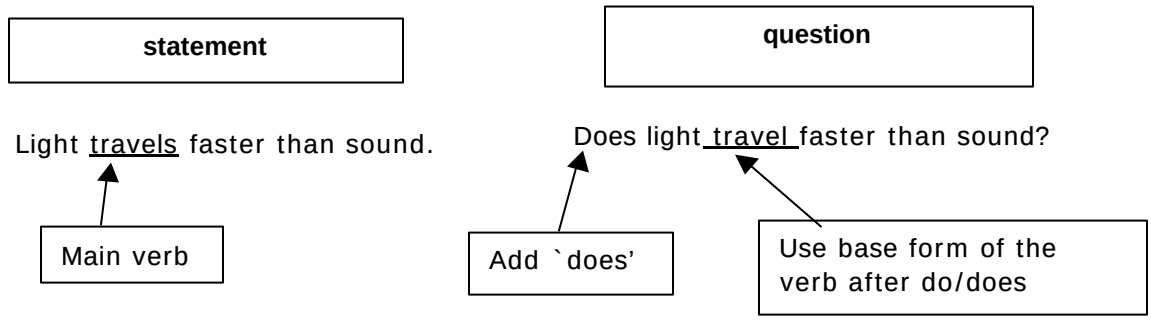
The injured **cats** coulds have cought the rats**. | Could** the injured **cats** have caught the rats?



Statement	Question
1. A pin hole camera can be made from a black box.	Can a pin hole camera be made from a black box?
2. Steel would have to be processed further to become stainless steel.	
3. The presence of an approaching human being will be detected by the alert animal.	
4. The number of instruments needed would have been recorded somewhere.	

3. If the **verb group consists of only a main verb,** you use the auxiliary 'do','does' or 'did' at the beginning of the sentence, before the subject. After the subject you use the base! form of the verb.

Example

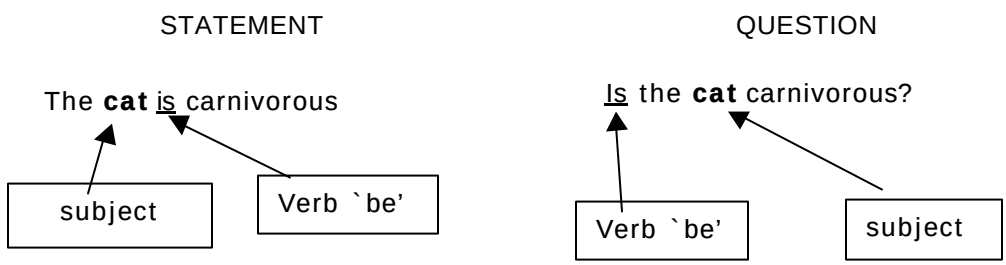


	Statement	Question
1.	Darwin stirred up a great deal of controversy.	Did Darwin stir up a great deal of controversy?
2.	Human babies inherit characteristics of both parents.	Do human babies inherit characteristics of both •parents?
3.	Mendel *did experiments on peas.	Did Mendel do experiments on peas?
4.	All magnets ***have** two poles.	Do all magnets have two poles?
5.	Most materials expand when they are heated.	
6.	A micrometer measures small distances precisely.	
7.	The dragonfly has an aquatic nymphal stage.	
8.	Galileo's work inspired Newtown to study motion.	
9.	The woodlouse has little plates called ills.	
10.	Larger vehicles have heavy-duty leaf springs and shock absorbers to cushion the ride.	

*In these examples, **'did' and have'** are main verbs and not auxiliaries.

4. If the **main verb is** the present simple or past simple of `**be**', you put the verb at the beginning of the sentence, before the subject.

Example



Statement	**Question**
1. Atoms are even smaller than molecules.	Are atoms even smaller than molecules?
2. Rubber is more elastic than nylon.	
3. The constituents of standard brass are copper and zinc.	
4. A bar code is a set of binary numbers.	
5. The first people to fly were **Chinese criminals** lifted b large kites.	

GETTING IT RIGHT

TASK 3 Auxiliaries

Below are a set of statements Form YesINo questions by changing the position of the auxiliary verbs.

1. Cast iron is heavier than copper.
2. The unit used to measure force is called a Newton.
3. All secondary colours are formed by mixing other colours.
4. Compasses were used by the ancient Greeks.
5. The world was considered flat for many generations.

TASK 4 Double auxiliaries

Below are a set of statements containing double auxiliaries. Change the statements to Yes/No questions

1. Some of the carbon will be removed in the Bessemer Converter.
2. 1 would have used manganese as a catalyst.
3. The cat could have stolen the bait from the trap.
4. The blacksmith will have heated the metal by now.
5. The crystals should have grown bigger after a few days.

TASK 5 Yes/No questions

Below are a set of statements Formulate YeslNo questions. Use the notes in the previous section to help you.

1. A toad has eaten the insect.

2. Mendel discovered that the colour red is dominant and the colour white is recessive.

3. Radiant energy comes in the form of sunlight, x-rays, or gamma rays.

4. The properties of silver resemble those of gold and copper.

5. Bugs have piercing and sucking mouth parts.

6. The **near extinction of elephants had received little world attention.**

7. Levers can be divided into three groups or orders.

8. Hardness is the ability to withstand scratching or indentation. 9. Acid will turn blue litmus paper red.
10. The pump was invented by the British engineer Richard Newsham.

TRYING IT OUT

TASK 6 Checking understanding 1

a. Read the text below on tadpoles.

b. Formulate YeslNo questions according to the functions used in the classroom. c. Practise asking your questions with a partner.

Tadpole

A tadpole is the young of a frog which hatches out from the eggs.

Frog eggs are laid in the water, suspended in a jelly-like substance called frogspawn. The young tadpoles that hatch out are able to eat, breathe through gills and move in the water just like fish.

After a short period, the tadpole develops hind legs, followed by forelegs. Then its tail disappears and a skeleton develops. **It begins to breathe by** means of lungs instead of gills and the mature frog will eventually be able to live on both land and water.

(Source: Junior Science Encyclopedia)

Function	Question form
1. To define	Is a tadpole the young of a frog?
2. To check pupil's previous knowledge	
3. To identify parts of an animal	
4. To specify place	
5. To specify time	
6. To compare	
7. To check understanding	

Reflections

How successful were you in performing the various functions using the Yes/No Question forms? Is there another way of asking questions that you would prefer? What are some of the limitations of this type of question form?

TASK 7 Checking understanding

Study the table given below on the properties and uses of important metals form suitable YeslNo questions that you would use to check your students' understanding about the information found in the table.

Metal	Properties	Uses
aluminum	lightweight strength; resists corrosion	building claddings and fittings; light transport; car engines; foil; cooking utensils
sapper	good conductor of heat and electricity: easil bent and shaped.	electric wiring and fittings: printed circuits water-pipes; pots and pans
gold	soft; does not corrode; good conductor of heat	jewellery; dentistry; electronic circuits; spacecraft reflectors
lead	**soft** and heavy; low melting point; resists corrosion; absorbs radiation	weights; printing type; roofing; car batteries; radiation shields
iron	strong; cheap	chains and bolts
mercury	heavy, liquid metal	thermometers; dentistry
nickel	alloys of nickel resist corrosion and heat stress low expansion	coins; stainless steel; aircraft engines
silver	good conductor of heat and electricity; tarnishes in air; reflects light	jewellery; electrical contacts; mirrors; silver plating; photographic film
tin	soft; resists corrosion	tin plate for cans; used in many alloys
magnesium	ultra-light but strong; burns easily	car and aircraft parts and engines; cameras; sports equipment; flares; bombs

LANGUAGE LAB 2

GRAMMAR WORKS

TASK 1 `wh' words

To elicit information we use a variety of questions beginning with 'wh' words. There are nine 'wh' words : ***who, whom, what, which, whose, where, when, why*** and ***how***.

Fill in the appropriate 'wh' words to complete Me explanation on the function of 'wh' words The explanations will help you to decide which 'wh' word to use when formulatvng questions in the first column.

'Wh' question	Answer	Function
1. _____do cats eat?	Cats eat small animals.	Use _____for questions about things
2. _____is that boy?	That boy is Alex.	Use _____for questions about people (subject and object).
3. _____did I speak to?	I spoke to James.	Use _____for questions about people (object only) in formal situations.
4. _____does the cat live?	The cat lives in the jungle.	Use _____for questions on location
5. _____is steel used making knives?	Steel is used for making knives because it is hard.	Use _____for questions on reasons

`Wh' question	Answer	Function
6. _____do cats hunt for food?	Cats hunt at night.	Use _____for questions on time
7. _____cat is white in colour?	Sharon's cat is white in colour.	Use _____for questions on possession.
8. _____is the social bee, the Honey Bee or the Carpenter Bee?	The Honey Bee	Use _____for questions about spegifc person or thing out of a number of people or things.
9. _____does the cat catch its prey?	The cat catches its prey by pouncing on it.	Use _____for questions about processes, differences and measurements.

TASK2 Patterns

A question word can be a subject, object, complement or adverbial. Compare the positive statements (in brackets).

Subject:	**Which** animal has stripes? **(The tiger** has stripes.)
Object:	**What** did the bird catch? (The bird caught a **worm.)**
Complement:	**Whose** cub is this? (This cub is the **lion's.)**
Adverbial:	**When** do bats hunt for food? (Bats hunt for food **at night.)**

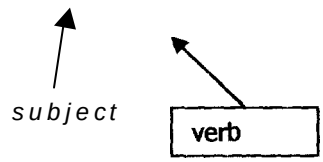
How do we formulate 'wh'questfons? Study the pattems and examples given in the following tables Formulate other 'wh'questions to complete each table, The words in bold should answer the questions.

Pattern 1

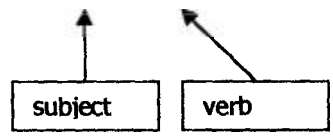
When **the question word is the subject** there is no inversion of the subject and verb. The word order is the same as the statement.

Example

STATEMENT
The shark ate the fish.



QUESTION
What ate the fish?



STATEMENT	QUESTION
1. A **spider** uses poison to subdue its preys.	Which animal uses poison to subdue its prey?
2. **Cardano's** work marks the start of modern mathematics.	
3. A **paradox is** a strange statement that appears to contradict itself.	
4. **Bertrand Russell** was a British philosopher and logician who also won the Nobel Prize for Literature.	

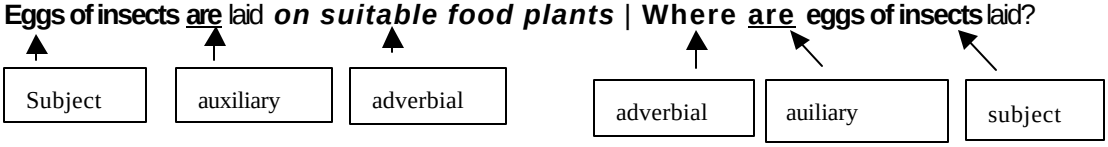
Pattern 2

When **the question word is the object, complement or adverbial** (not the subject) there is inversion of the subject and auxiliary.

Example 1

STATEMENT **QUESTION**

Eggs of insects **are** laid ***on suitable food plants*** | **Where** **are** **eggs of insects** laid?



Example 2

STATEMENT **QUESTION**

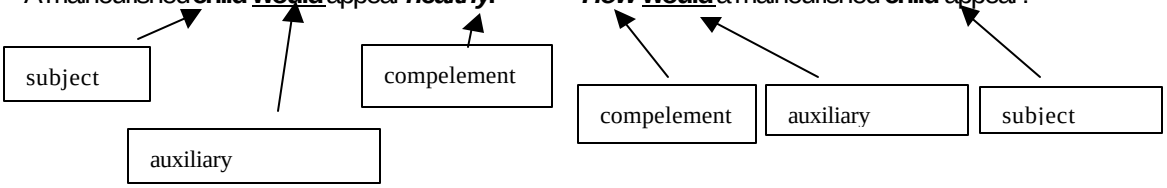
An alkali **can** neutralize ***an acid*.**

What **can** **an alkali** neutralize?

Example 3

STATEMENT **QUESTION**

A malnourished **child** **would** appear ***healthy*.**



How **would** a malnourished **child** appear?

subject auxiliary complement complement auxiliary subject

STATEMENT	QUESTION
1. An animal can conceal itself **by camoufla or disguise.**	How can an animal conceal itself?
2. The tadpole will turn into a frog **after a week.**	
3. The tiger has fed on **its prey.**	
4. 1 am going to use the **pie chart.**	

Pattern 3

Put 'do', 'does' or 'did' in front of the subject when you use the simple present tense or simple past tense of **any verb except `be'**.

Example

STATEMENT

The **spider** **used** its web to catch prey.

subject

main verb not be

QUESTION

What **did** the **spider** **use** to catch prey?

`did' added in front of subject

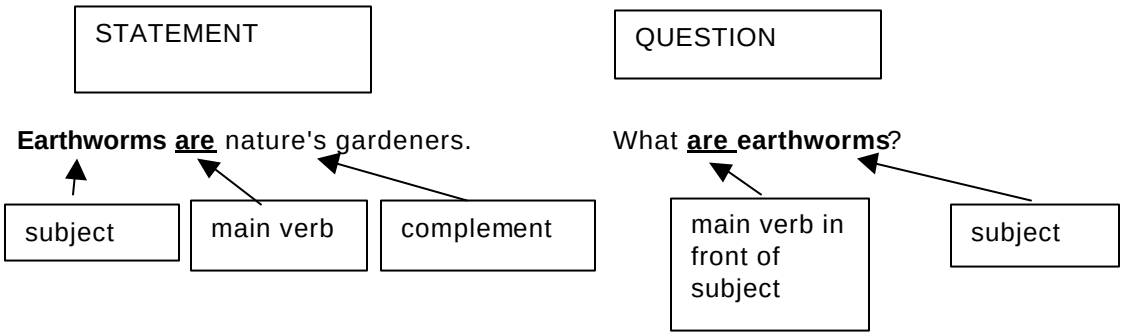
base form

subject

STATEMENT	QUESTION
1. Nestlings rely entirely on their parents because they cannot fly.	Why do nestlings rely entirely on their parents?
2. The orchid makes its own food by photosynthesis.	
3. Sailors used the stars to navigate.	
4. Athletes use a lot of statistical information during training.	
5. A puzzle tests your skill with logic.	

Pattern 4

When you use the simple present tense or simple past tense of **'be'**, the main verb goes in front of the subject. You do not use 'do', 'does, or'did'.
Example



STATEMENT	QUESTION
1. A genus is **a group of very similar species.**	**What** is a genus?
2. **The ancient Greeks** were great mathematicians.	
3. Volume is **the space taken up by a three-dimensional object.**	
4. **The Chinese** were the first to use paper money.	

Adapted from: Collins *Cobuild English Grammar. 1990.* Collins Birmingham University International Language Database.

Pattern 5

What and **how** often combine with other words to form question phrases.

1. **What + noun**

Example:

What time does the lab session *end?*

What ***kind of animal*** *can live both on land and in water?*

2. How + adverb or adjective

Example:

How ***often*** *must we feed the fish?*

How ***long*** *did the whole experiment take?*

2. **How + many or much**

Example:

How many sides does a pentagon have? How much electricity do you use in a month?

STATEMENT	QUESTION
1. **A calculator which cannot be programmed** is allowed in the exam hall.	What type of calculator is allowed in the exam hall?
2. The marble travelled 3 **metres**.	How far did the marble travel?
3. There are **1,000 grammes** in one kilogramme.	How many grammes are there in one in kilogramme?
4. **An isosceles triangle** has 2 equal sides	
5. A durian tree takes **about 5 years** to bear fruit.	_
6. There are **206** bones in the body of an adult human being.	
7. You should water the seedlings **twice everyday**.	
8. **28.5 cm^3** of sulphuric acid neutralized the solution.	

Getting it Right

TASK 3 -Formulating 'wh' questions

Change the following statements into 'wh' questions. Replace the words/phrases underlined with the 'wh' word given in brackets. The words underlined should answer the questions. The first one is done for you.

1. Lead plumbing caused severe poisoning. (***what***)

What did lead plumbing cause?

2. Porcupines have strong teeth for cracking openbones (***why***)
3. The orang utan sleeps in a nest at night. (***where***)
4. The snail crawls very slowly. (***how***)
5. Man is often blamed for the extinction of animals. (***what***)
6. Electrons are negatively charged particles. (***what***)
7. Mercury is a unique metal because it is liquid at ordinary temperatures. (***why***)
8. During the Renaissance algebra was popular among the Germans. (***when***)
9. John Napier was the inventor of logarithms. (***who***)
10. Spores are dispersed by air. (***how***)

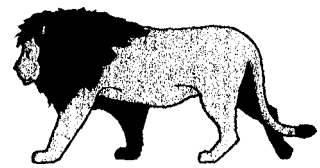
TASK 4 - ***Forms and Functions***

Look at the text on ***Cat Anatomy*** *below. Formulate 'wh' questions according to the functions listed in the table below the text.*

Cat Anatomy

Cats have lithe, muscular bodies that enable them to move with speed, strength, and flexibility. Unlike dogs, however, they are not equipped for long-distance running. Most cats live in forests, and are agile climbers thanks to their strong

forelimbs and chest muscles, and their razor-sharp claws. They use their powerful hind limbs to pounce, and their long tails to balance when leaping or climbing.

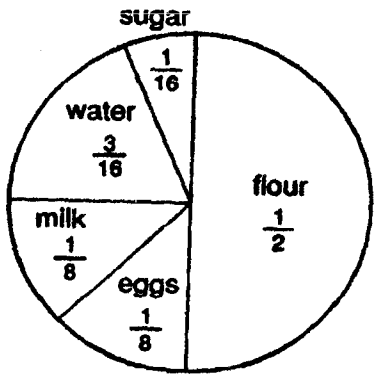


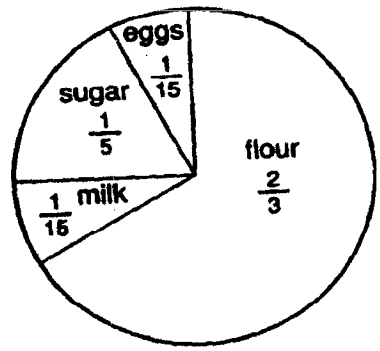
FUNCTION	**QUESTION**
1.To obtain information	
2. To give reason	
3.To compare	
4. To specify	

TASK 5 ***Asking questions*** 5.

You plan to use the two pie charts below in class to teach fractions.

For each pie chart below formulate Yes/No and 'wh'questions which you could use in the classroom to elicit the information to teach fractions.





The pie chart above shows the ingredients in a cake. There are five ingredients: sugar, water, milk, eggs, and flour.

This pie chart shows the same ingredients in a muffin.

1.

2.

3.

4.

5

1.

2.

3.

4.

5.

TASK 6 EdtIng information

1. Read the text and accompanying tree diagram.

2. Underline words and **phrases** *that* ***are*** *unfamiliar. Discuss them with your partner.*

3. Imagine you are using this tree diagram to explain how living things are classified. Write down the questions and statements you would use. List them in the order you would use to eliat information from your pupils in class when you introduce the tree diagram.

Classifying living things

Finding a method of classifying animals has not been easy. There is so much variation in sizes, colours and structures that the ancient Greek method of categorising animals as living in water or on land or in the air has proved inadequate.

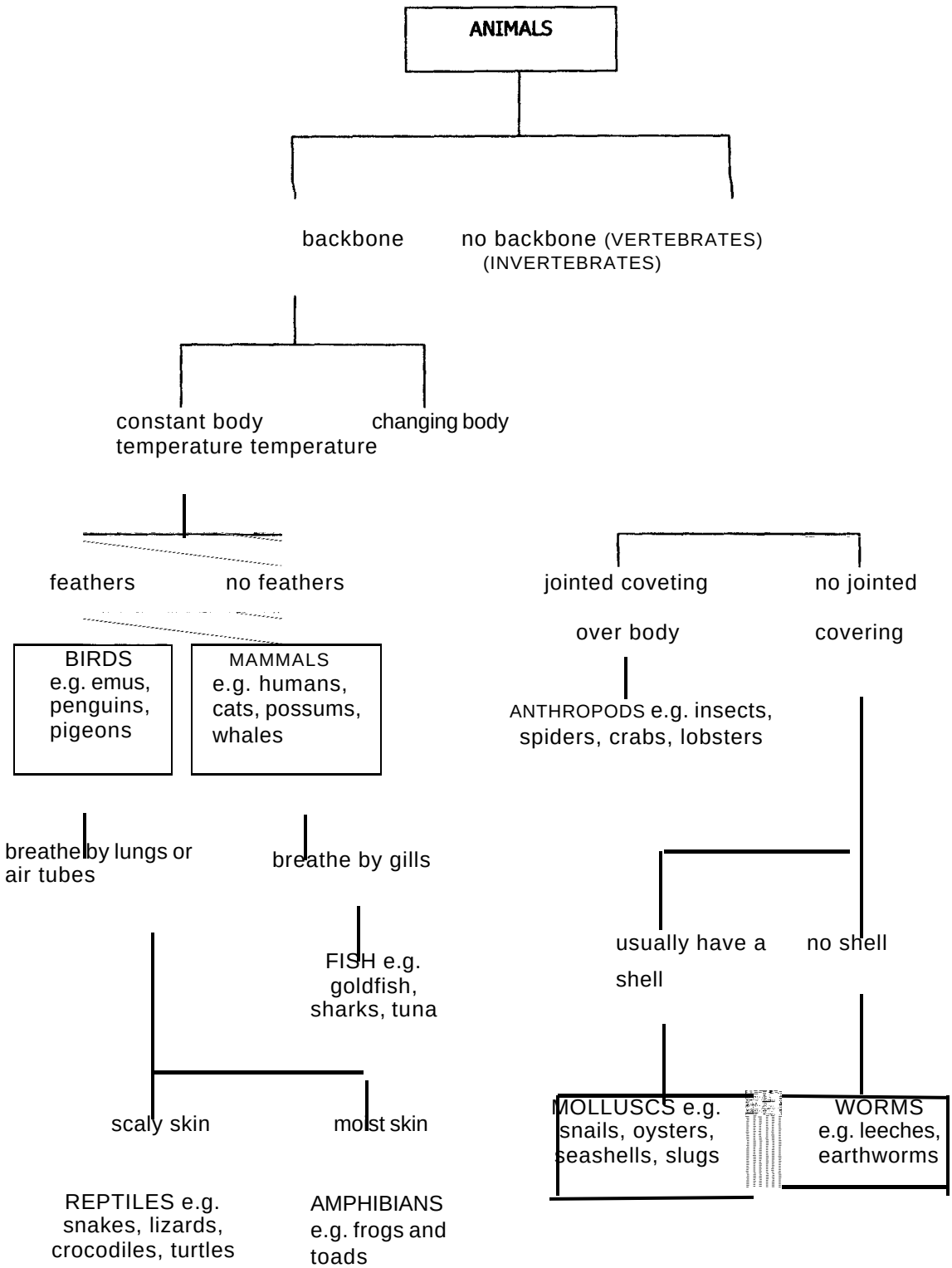
Over the last 200 years or so, biologists throughout the world have developed a better method of classifying living things. For instance, the dolphin, platypus, fish and frog have a number of common characteristics. One of these is the presence of bones, including a backbone. Animals that have backbones are called vertebrates (VER-tebrates). This word comes from vertebra which is one of the bones in the backbone. Animals without backbones are called invertebrates.

The presence of the backbone is part of an animal's structure. The use of structural characteristics is one way in which biologists classify organisms. The number of legs, the presence or absence of lungs or gills, feathers, a scaly skin, are all structural characteristics.

The way an organism *functions is* also used to classify living things. For example, mammals and birds have a fairly constant body temperature, while all other animals have a body temperature that changes with the outside temperature. Body temperature is a functional characteristic.

Source: *Science* World 8. Peter Stannard & Ken Williams. MacMillan 2000

The following tree-diagram can be used to classify animals.



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STAND & DELIVER

REVIEW

Try to recall and list the language that you learnt in this module. Discuss with your partner how you could use this language for teaching mathematics / science.

SYLLABUS STUDY

Identify one syllabus item / curriculum specification that would require you to use these language forms when teaching in the classroom.

PLAN

Script the lesson phase as you would carry it out in the classroom. Include the actual language that you would use in the classroom in your lesson notes.

DELIVER

Teach the lesson phase that you have prepared.

CHECKLIST FOR PEER FEEDBACK

Language Focus of Module:

Name of Teacher:

Subject /topic: : Class.

Items				
1. The teacher's language is clear and easy to understand	1	2	3	4
2. The teacher links the different steps with appropriate language.	1	2	3	4
3. Teacher asks questions to elicit students' understanding	1	2	3	4
4. The language used is accurate,	1	2	3	4
5. Correct technical terms are used.	1	2	3	4
6. The teacher Is fluent.	1	2	3	4
7. The teacher hardly uses Bahasa Melayu,	1	2	3	4
8. Language used in the teaching aids Is accurate,	1	2	3	4
9. Teacher is able to use appropriate language to respond to students.	1	2	3	4

Interesting expressions used:

Alternative expressions that could vahe been used:

General comments:

CHECKLIST FOR PEER FEEDBACK

Language Focus of Module:

Name of Teacher:

Subject / topic: Class:

Use this scale: 1 strongly agree 2 agree

3. disagree 4. strongly disagree

Items				
10. The teacher's language is clear and easy to understand,	1	2	3	4
11. The teacher links the different steps with appropriate language.	1	2	3	4
12. Teacher asks questions to elicit students' understanding	1	2	3	4
13. The language used is accurate.	1	-	3	4
14. Correct technical terms are used.	1	2	3	4
15. The teacher is fluent,	1	2	3	4
16. The teacher hardly uses Bahasa Melayu,	1	2	3	4
17. Language used in the teaching aids is accurate.	1	2	3	4
18. Teacher is able to use appropriate language to respond to students.	1	2	3	4

Interesting expressions

Alternative expressions that could have been used

General comments

CHECKLIST FOR PEER FEEDBACK

Language Focus of Module:

Name of Teacher:

Subject / topic: Class:

Use this scale: 1 strongly agree 2 agree

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Interesting expressions

Alternative expressions that could have been used

General comments

BACK TO THE FUTURE

LOOKING IN

Where Am I?

The change of the medium of instruction from Bahasa Melayu to English for the teaching of Mathematics and Science brings with it new challenges and opportunities.

1. List the challenges and opportunities you face.

2. Select one of the challenges and suggest solutions to meet the challenge.

Challenges / Opportunities	Solutions

.

HOW do you feel?

.

Please mark the spot between the two faces below to represent how you feel about the training programme you are here for

At the end of each day, mark the spot between the two faces that represents your feelings about the sessions. Consider the speed of the process, the enjoyment, satisfaction or other feelings you have with the programme

Use different letters of the alphabet to indicate the spot for the different times as follows:

X for beginning of the module

Adapted from: *Using Evaluation in Training and Development. p 105* Leslie Rae. Kogan Page. 1999

STEPPING OUT

There are five language sessions in this module. Reflect on the tasks carried out after each session. How useful were they in preparing you to teach Mathematics and Science in English? Rate how useful the sessions have been on a scale between 1 and 5. If you do not find the task(s) useful please indicate the reasons in the comments column.

Scale: 1 not useful 2 partly useful 3 useful 4 very useful

Areas	1	2	3	4	Comments
TEXT LAB					
Word Explorer					
Task					
Task					
Connecting with text Task					
Task					
Task					
Language in Action Task					
Task					
Springboard					
LANGUAGE LAB 1					
Grammar Works Task					
Task					
Getting it right Task					
Task					
Trying it out Task					
Task					
Task					
LANGUAGE LAB 2					
Grammar Works					
Task					
Task					
Getting it right Task					
Task					
Trying it out Task					
Task					
STAND AND DELIVER					
Task					

HELPING MYSELF

Based on the module that you have just completed or your own language needs, identify an area that you feel requires attention to enable you to teach Mathematics and Science in English effectively.

Write out what you plan to do before the next session. Your action plan should contain

- **Time frame** (duration of your plan)
- **Things to work on** (your objectives)
- **Things to do** (activities I proposed to carry out to achieve my objectives)
- **Things I tried (** what I managed to do)

( ) Area/s that need attention	Action plan
Speaking ( ) Reading ( ) Vocabulary ( ) Grammar ( )	Time frame Things to work on Things to do Things I tried

HELPING MYSELF

Based on the module that you have just completed or your own language needs, identify an area that you feel requires attention to enable you to teach Mathematics and Science in English effectively.

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- **Things I tried (** what I managed to do)

( ) Area/s that need attention	Action plan
Speaking ( ) Reading ( ) Vocabulary ( ) Grammar ( )	**Time frame** **Things to work on** To be able to use the auxiliaries - ***`is', `are', `was', `were'*** to construct `Wh' questions accurately.  **Things to do** 1. Refer to one Grammar reference book 2. Read up on rules to construct `Wh' questions. 3. Complete practice exercise(s) given in the book. **Things I tried** 1. Read Collins Cobuild Students Grammar. Harper Collins 1991. 2. Practised Exercise B, p 59: Score: 67/100

HELPING MYSELF

Based on the module that you have just completed or your own language needs, identify an area that you feel requires attention to enable you to teach Mathematics and Science in English effectively.

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- **Things I tried (** what I managed to do)

( ) Area/s that need attention	Action plan
Speaking ( ) Reading ( ) Vocabulary ( ) Grammar ( )	Time frame Things to work on To be able to talk in English for 10 minutes to the English teacher/ a friend at least 3 times. Things to do 1. Identify someone who will colllaborate with me. 2. Select a topic to talk e.g. newspaper item 3. Identify and practice useful phrases to be used for conversation. 4. Ask for feedback on pronounciation. Things I tried Talked to the colleague 2 times. Learned to pronounce 5 new words. Learned 4 new useful phrases.