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ABSTRACT

This supplement to the Chicago public schools' science curriculum, for use with Lao-speaking students in grades K-8, is designed to help students make the transition to learning science in English. English-Lao vocabulary lists, independent learning activities and teaching aids (in both languages), and study questions (in Lao) are included to permit the child to use his/her knowledge of the Lao language in the study of science and to relate the study of science in Laos to the understanding of universal scientific concepts. Concepts studied at this level are living things, the universe, and the behavior of matter and energy. Information for the teacher is also provided as background for understanding differences in the study of science that result from geographic location and culture. (CMG)

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SUPPLEMENT FOR CURRICULUM GUIDE FOR SCIENCE:
LAO-SPEAKING STUDENTS

KINDERGARTEN-GRADE 8

Working Draft

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BOARD OF EDUCATION

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PREFACE

The Curriculum Guide for Science of the Chicago public schools is designed on a continuum of concepts. Teachers of children taught in languages other than English use the scope and sequence and the continuum of concepts of the curriculum guide, making adaptations with regard to the cultural background of the students and linguistic study.

This Supplement for the Curriculum Guide for Science: Lao-Speaking Students is to be used in conjunction with the Curriculum Guide for Science. The materials within the supplement are designed to assist the child in the transition to the learning of science in English. Vocabulary, activities, and teaching aids are included to permit the child to use his/her knowledge of the Lao language in the study of science and to relate the study of science in Laos to the understanding of universal scientific concepts.

Information for the teacher is also provided as background for understanding of differences in the study of science that result from geographic location and culture.

Note

The cycle years indicated in this publication correspond to grades as follows:

<u>Cycle Year</u>	<u>Grade</u>
Kindergarten	Kindergarten
Primary One	Grade 1
Primary Two	Grade 2
Primary Three	Grade 3
Intermediate One	Grade 4
Intermediate Two	Grade 5
Intermediate Three	Grade 6
Upper One	Grade 7
Upper Two	Grade 8

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VOCABULARY

(UNIT, OTHER KEY WORDS, INDEPENDENT LEARNING ACTIVITY): KINDERGARTEN-UPPER TWO

KINDERGARTEN

UNIT I

ear	<u>ຫ</u>
eye	<u>ຕາ</u>
food	<u>ອາຫານ</u>
grow	<u>ໃຫຍ່ຂຶ້ນ</u>
hand	<u>ມື</u>

hear	<u>ໄດ້ຍິນ</u>
mouth	<u>ປາກ</u>
nose	<u>ດີ</u>
see	<u>ເຫັນ</u>
smell	<u>ໂຮມື້ນ</u>
taste	<u>ຊື່ນ</u>

Other Vocabulary

bitter	<u>ຂົນ</u>
cold	<u>ບາດ</u>
color	<u>ສີ</u>
feel	<u>ລຽບ</u>
hard	<u>ແຂງ</u>
hot	<u>ຮ້ອນ</u>
rough	<u>ຊື່ນ</u>

salty	<u>ເຂັ້ມ</u>
smooth	<u>ສົ້ນ</u>
soft	<u>ອອນ</u>
sour	<u>ສົ້ນ</u>
sweet	<u>ຫວານ</u>
tongue	<u>ລິ້ນ</u>
warm	<u>ອຸ່ນ</u>

UNIT II

cat	<u>ແມວ</u>
dog	<u>ໝາ</u>
food	<u>ອາຫານ (ຂອງກິນ)</u>
fun	<u>ກິນສຸກສຸມາມ</u>
leg	<u>ຂາ</u>

pet	<u>ສັດລູກຢູ່ໃນເຮືອນ</u>
run	<u>ແລ່ນ</u>
swim	<u>ລ່ວນນ້ຳ</u>
walk	<u>ຍ່າງ</u>
zoo	<u>ສວນສັດ</u>

Other Vocabulary

bird	<u>ນົກ</u>
crawl	<u>ຄາມ</u>
crow	<u>ກາ</u>

deer	<u>ກວາງ</u>
duck	<u>ເບັດ</u>
elephant	<u>ຊ້ຳ</u>

feathers ຖົງນົມ
 fish ປາ
 fly ຜູ້
 frog ງົ່ງ
 fur ຜົມສົມ
 hop ກະຍັດ
 horse ມ້າ

insect ແມ່ງົມ
 jump ກະຍັດ
 legs ສ່ວນ
 lion ສິງ
 rabbit ກະຕູ້
 scale ເກັດປາ
 skin ຜົມ
 wings ຖົງ

UNIT III

daytime ມື້
 earth ໂລກ
 far ໄກ
 heat ຄວາມຮ້ອນ
 light ແສງ

moon ມາສ໌
 nighttime ຄືນ
 round ມົມ
 sun ຕາວັນ

Other Vocabulary

change ປ່ຽນ
 cloudy ມື້
 dark ແດງ
 full ເຕັມ
 globe ໝວຍໂລກ
 near ໃກ້

rainy ມື້
 shape ຮູບລວມ
 snowy ມື້
 sunny ມື້
 weather ອາກາດ

UNIT IV

air ອາກາດ
 blue ສີ
 color ສີ
 gas ອາກາດເກັດຈາກໂລຫະເຈິງເຟີ
 green ສີຂຽວ
 liquid ເປັນນ້ຳ

magnet ແມ່ເຫຼັກ
 orange ສີ
 pull ຖືກ
 push ຊ່ວຍ
 red ສີແດງ
 shape ຮູບລວມ

solid ບາງແຂງ
 sun ຕາເວັນ
 sunlight ແສງແດດ

Other Vocabulary

attract ຍົດໃຈ
 indigo ຄຣາມ
 iron ເຫລັງ

UNIT V

fruit ໝາກໄມ້
 green ໝາກໄມ້ຂຽວ
 ground ດິນ
 grow ປົກ
 leaf ໃບໄມ້

Other Vocabulary

die ຕາຍ
 experiment ການທົດລອງ
 living ມີຊີວິດ

violet ລົມວົງ
 wet ປຽກ
 yellow ສີເຫລັງ
 nail ເຫລັກຕະປຸ່
 rainbow ຮຸ່ງກຳມະ
 steel ເຫລັກ

light ແຈ້ງ
 plant ຕົ້ມໄມ້ມອຍ
 seed ແກ່ມ
 vegetable ຜັກ
 water ນ້ຳ

observe ຈັດໂມ້ດ
 root ຮ່າກໄມ້
 warmth ຮຸ່ນ

PRIMARY ONE

UNIT I

animal ສັດ
 baby ລູກອ່ອນ
 eat ກິນ
 feather ຂົນນົກ

Other Vocabulary

butterflies ແມງກະແອ
 covering ປົກປິດ
 eggs ໄຂ່
 mammals ສັດທີ່ລຽງລູກກິນນົມ

food ອາຫານ
 fur ຂົນສັດ
 parent ພໍ່ແມ່
 skin ບຸນຳ
 moths ບຸງຍື່ນ
 resemble ຄ້າຍຄືກັນ
 take care of ເບິ່ງແຍງ
 worm ດົງ

UNIT II

air	<u>ອາກາດ</u>
breathe	<u>ຫ້ມໃຈ</u>
exhale	<u>ຫ້ມໃຈອອກຈາກໂຕປ່ຽດ</u>
harmful	<u>ອັນຕະລາຍ</u>
helpful	<u>ທີ່ເປັນລາຍດ່ວນເຫລືອ</u>

Other Vocabulary

bubble	<u>ຟ້ອງ ຟ້ອດ</u>
inflate	<u>ເຮັດແປ້</u>
lift	<u>ຍົກຂຶ້ນ</u>

UNIT III

animal	<u>ສັດ</u>
bird	<u>ນົກ</u>
bud	<u>ອອກມໍ່</u>
bulb	<u>ຫົວຝັກທີ່ປົກໃຫມ່ດິມ</u>
butterfly	<u>ແມງກະເບື້</u>
cold	<u>ຫມາວ</u>
fall	<u>ຮາດຝົນຕົກ</u>
farm	<u>ໃຮ້ມາ</u>
fly	<u>ແມງຈັມ</u>
food	<u>ຂອງກິນ (ສັດ)</u>
fur	<u>ຂົນສັດ</u>
migrate	<u>ຍ້າຍອອກ</u>

Other Vocabulary

ant	<u>ມົດ</u>
bear	<u>ຫມ</u>
hibernate	<u>(ຂ້າກັບສັດ)</u>

inhale	<u>ຫ້ມໃຈກູ້ເຢັມ. ຂ້າໃຫມ່ປ່ຽດ</u>
move	<u>ຍົກຍ້າຍ</u>
tornado	<u>ລົມຜບາແຮງ</u>
wind	<u>ລົມ</u>

rock	<u>ກ່ອມຫມ</u>
space	<u>ອະວະກາດ</u>
take up	<u>ຄອບຄອງ</u>

nut	<u>ຫມາກກໍ່</u>
robin	<u>ຮາດໃບໄມ້ປຶ້ງ</u>
root	<u>ຮາກໄມ້</u>
seed	<u>ແກ່ມ</u>
shed	<u>ລົ່ມ</u>
sleep	<u>ນອນ</u>
sparrow	<u>ນົກຈາກ</u>
spring	<u>ຮາດໃບໄມ້ປຶ້ງ</u>
squirrel	<u>ກະຮອກ</u>
summer	<u>ຮາດຮຽນ</u>
tree	<u>ຕົ້ນໄມ້</u>
turtle	<u>ເຕົ້າ</u>

snake	<u>?</u>
store	<u>ເກບຂອງກິນໄວ້</u>

UNIT IV

blue

สีฟ้า

color

สี

dissolve

ละลายในน้ำ

float

ลอย

green

สีเขียว

heat

ความร้อน

high

สูง

light

ไฟ

loud

ดังOther Vocabulary

disappear

หายไป

electricity

ไฟฟ้า

equal

เสมอกัน

force

กำลัง

friction

ความเสียดสี

produce

ผลิตของ

UNIT V

blossom

งอกดอกบาน

bud

งอก

bulb

หัวผักกาดปลีในดิน

flower

ดอกไม้

garden

สวน

grow

ปลูก

lawn

หญ้า

leaf

ใบไม้

migrate

ย้ายของ

low

ต่ำ

orange

ส้ม

red

สีแดง

rub

ถู

sink

จม

soft

นุ่ม

sound

เสียง

thermometer

ยาชั่งอุณหภูมิ

prove

พิสูจน์

solution

การผสมน้ำ

temperature

อุณหภูมิ

turn

กลับ

upward

สูงขึ้น

vibrate

สั่นไหว

nest

รังนก

plant

ต้นไม้

root

รากไม้

seed

เมล็ด

soil

ดิน

sprout

ต้นไม้ออก

tree

ต้นไม้

water

น้ำ

weed

หญ้าวัชพืชรบกวน

Other Vocabulary

birdseed	<u>ແລ່ນລູກນົມ</u>	grapefruit	<u>ໝາກກຸງໃຫຍ່</u>
carrot	<u>ກົວຜັກກາດແດງ</u>	stem	<u>ໝາ</u>
germinate	<u>ຈັດຕົ້ມຕອກໄມ້ປົກ</u>	sweet potato	<u>ໄມ້ແກວ</u>

UNIT VI

axle	<u>ແກມຂາລືເພົາ</u>	rough	<u>ຊາ</u>
bar	<u>ຮ່າມເຄື່ອງຄມ</u>	rub	<u>ຮາ</u>
down	<u>ລຸ່ມ</u>	scale	<u>ຊິງ</u>
easy	<u>ງ່າຍ</u>	slide	<u>ແລ່ນລູກນົມ</u>
friction	<u>ຄວາມຮົ່ວຂຸ່ມ</u>	smooth	<u>ງົບ</u>
heavy	<u>ໜັກ</u>	up	<u>ເບິ່ງ</u>
lift	<u>ຍົກຂຶ້ນ</u>	weigh	<u>ເຮັດໃຫ້ໜັກ</u>
light	<u>ໄຟ</u>	wheel	<u>ກັງວິດ</u>
roll	<u>ກົງ</u>		

Independent Learning Vocabulary

big	<u>ໃຫຍ່</u>	move	<u>ຍົກຍ້າຍ</u>
board	<u>ແພ່ມກະດາມ</u>	oil	<u>ມັນຸ້ມ</u>
buggy	<u>ວິດມາ</u>	pick	<u>ເລືອກ</u>
can	<u>ກະປຸງ</u>	pull	<u>ດຶງ</u>
car	<u>ວິດຍົມ</u>	push	<u>ຊຸກຍ້າຍ</u>
coffee	<u>ກາເຟ</u>	ramp	<u>ໄປຕໍ່ມຸ່ງ</u>
color	<u>ສີ</u>	rough	<u>ຊາ</u>
cotton	<u>ຟ້າຍ</u>	rub	<u>ຮາ</u>
hammer	<u>ຕອກມົດ</u>	sandpaper	<u>ກະດາດຊາຍ</u>
help	<u>ຊ່ວຍເຫລືອ</u>	seesaw	<u>ຊິລິ່ງ</u>
little	<u>ນ້ອຍ</u>	slant	<u>ຢູ່ງົບ</u>
machine	<u>ເຄື່ອງຈັກ</u>	slide	<u>ແລ່ນລູກນົມ</u>
marble	<u>ຫມ່ອນ</u>	smooth	<u>ງົບ</u>

tool	<u>ເຄື່ອງມື</u>	wheel	<u>ກົງຮີກ</u>
truck	<u>ຮົບຍົຫາ</u>	work	<u>ເຮັດວຽກ</u>
wagon	<u>ຮົບສັດມາໃນຍົຫາຂອງ</u>		

PRIMARY TWO

UNIT I

air	<u>ອາກາດ</u>	leaf	<u>ໃບໄມ້</u>
alike	<u>ຄືກັນ</u>	leg	<u>ເຄ</u>
animal	<u>ສັດ</u>	living	<u>ຄວາມຢູ່ມີຊີວິດຢູ່</u>
bird	<u>ນົກ</u>	move	<u>ຍ້າຍ</u>
caterpillar	<u>ຄວງ</u>	parent	<u>ແມ່ແບ</u>
claw	<u>ຄາດດ້ວຍເຈ້ຍ</u>	plant	<u>ຕົ້ມໄມ້ມຽນ</u>
cocoon	<u>ແມງກະເປື່ອງມຽນ</u>	root	<u>ຮາກໄມ້</u>
different	<u>ແຕກຕ່າງ</u>	skin	<u>ໜັງຫລັບ</u>
earthworm	<u>ຂີກຂີດອາມ</u>	spider	<u>ແມງມາມ</u>
fin	<u>ຈະໂລຍະວະຂອງປາຄືວ່າໄມ້ພາຍເຮັດ</u>	stem	<u>ກົມ</u>
fish	<u>ປາ</u>	warmth	<u>ອຸນ(ນວນ)</u>
food	<u>ອາຫານ</u>	water	<u>ນ້ຳ</u>
insect	<u>ແມງໄມ້</u>	wing	<u>ຮີກ</u>

Other Vocabulary

aquarium	<u>ບ່ອນຂອງສັດນ້ຳ</u>	seed	<u>ແກ່ນ</u>
hop	<u>ເຕມ ໃຈຸນນາ</u>	web	<u>ໄຍ</u>
moth	<u>ປ່າຍຍ</u>		

UNIT II

axis	<u>ຈຸດເພົາ</u>	direction	<u>ທິດທາງ</u>
Big Dipper	<u>ຊຸຂອງກວໝວດນັກເຮັດລ່ວມໃຫຍ່</u>	distance	<u>ທາງໄກ</u>
bigger	<u>ໃຫຍ່ກວ່າ</u>	earth	<u>ແຜ່ນດິນ</u>
constellation	<u>ດາວໝໍ້</u>	east	<u>ທິດຕາເວັນອອກ</u>
dark	<u>ມຸດ</u>	flat	<u>ພງງ</u>



full	<u>ເຕັມ</u>	sit	<u>ນຸ່ງ</u>
heat	<u>ຄວາມຮ້ອນ</u>	size	<u>ຂະໜາດ</u>
hot	<u>ຮ້ອນ</u>	smaller	<u>ນ້ອຍກວ່າ</u>
little	<u>ນ້ອຍ</u>	south	<u>ທິດໃຕ້</u>
Little Dipper	<u>ກຸ່ມດາວໜ້ອຍກວ່າກຸ່ມດາວໃຫຍ່</u>	spin	<u>ປັ່ນ</u>
moon	<u>ພຣະຈັນ</u>	spring	<u>ຮະດູໃບໄມ້ປົ່ງ</u>
north	<u>ທິດເໜືອ</u>	star	<u>ດາວ</u>
pointer	<u>ເຄື່ອງຊີ້</u>	summer	<u>ຮະດູຮ້ອນ</u>
rise	<u>ຂຶ້ນ</u>	sun	<u>ທາເວັນ</u>
rotate	<u>ປ່ຽນພາບ</u>	temperature	<u>ອຸນຫະພູມ</u>
round	<u>ມົມ</u>	warm	<u>ອຸ່ມ</u>
season	<u>ຮະດູ</u>	water	<u>ນ້ຳ</u>
shadow	<u>ເງົາ</u>	west	<u>ທິດຕາເວັນຕົກ</u>
shine	<u>ສອງແສງ</u>	winter	<u>ຮະດູໜາວ</u>

Other Vocabulary

solid	<u>ຂອງແຂງ</u>	toward	<u>ໄປທາງທິດໃຫຍ່</u>
thermometer	<u>ບາບລອດ</u>		
UNIT III			
attract	<u>ຍື່ນໃຈ</u>	matter	<u>ເຄື່ອງພາຊະນະ</u>
balance	<u>ຊັງ</u>	poles of a magnet	<u>ຂົ້ວໂລກຂອງແມ່ເຫຼັກ</u>
circuit	<u>ຂໍ້ເຄາະຂອງເອົາລວດທີ່ຟຸ້ນຟູໄປທາງກຸ່ມ</u>	pound	<u>ປອນ</u>
current		repel	<u>ຍື່ນກາ</u>
electricity	<u>ໄຟຟ້າກະແສ</u>	small	<u>ນ້ອຍ</u>
dissolve	<u>ລະລາຍໃນນ້ຳ</u>	solid	<u>ເຕັມ</u>
float	<u>ຟັ່ງ</u>	space	<u>ອາວະກາດ</u>
gas	<u>ກາຍທີ່ເວັດຈາກໂລຫະເຊິ່ງເຜີຍ</u>	switch	<u>ກົງຕັກໄຟຟ້າ</u>
large	<u>ໃຫຍ່</u>	weight	<u>ນ້ຳໜັກ</u>
liquid	<u>ເປັນນ້ຳ</u>		
magnet	<u>ແມ່ເຫຼັກ</u>		

Other Vocabulary

aluminum foil	<u>ຊັລຸມນິ້ມທອງກ</u>
label	<u>ຕິດປ້າຍ</u>
material	<u>ເຄື່ອງຈັບກອງມ</u>

stick	<u>ຕັດ</u>
wax	<u>ຂີເລງ</u>

Independent Learning Vocabulary - Concept A

balloon	<u>ປຸ່ມເຕົ້າ</u>
book	<u>ປຶ້ມ</u>
bottle	<u>ແກງ</u>
chair	<u>ຕາງ</u>
chalk	<u>ສີຂາວ</u>
chalk-box	<u>ແຊບສີຂາວ</u>
container	<u>ທັບ</u>
crayon	<u>ສີລື</u>
dress	<u>ກະຢ້າງ</u>
everything	<u>ທາກລາງ</u>
gallon	<u>ກະຣິງໃສນິ້ມນິ້ມ</u>
gas	<u>ກອຍທາເກດຈາກກິລທະເລງເລງ</u>
gasoline	<u>ນິ້ມນິ້ມ</u>
jar	<u>ໄຫ</u>
lake	<u>ທະເລລາບ</u>
liquid	<u>ເປັນນິ້ມ</u>
matter	<u>ເຄື່ອງຜາຈະມະ</u>
milk	<u>ນິ້ມນິ້ມ</u>
nothing	<u>ບໍ່ມີທັງ</u>
occupy	<u>ເຂົ້າຄອງບຸຄອງ</u>

oil	<u>ນິ້ມນິ້ມ</u>
own	<u>ຂອງຕົນເອງ</u>
pencil	<u>ສິດກິ</u>
perfume	<u>ນິ້ມທອງມ</u>
pint	<u>ເຄື່ອງລິດ</u>
pop	<u>ຮະເບິດ</u>
quart	<u>ນິ້ມຂາວ</u>
rain	<u>ຝົນ</u>
shampoo	<u>ນິ້ມຢາສະຕິນ</u>
shape	<u>ຮູບລ່ວມ</u>
shirt	<u>ເສື້ອ</u>
solid	<u>ແກມ</u>
soup	<u>ແກງ</u>
sour	<u>ສົມ</u>
space	<u>ອາວະກາດ</u>
sweet	<u>ຫວານ</u>
table	<u>ໄຕະ</u>
vinegar	<u>ນິ້ມລົມ</u>
water	<u>ນິ້ມ</u>



Independent Learning Vocabulary - Concept B

different	<u>ແຕກຕ່າງ</u>	most	<u>ຫລາຍທີ່ສຸດ</u>
heavy	<u>ໜັກ</u>	pound	<u>ປອມ</u>
large	<u>ໃຫຍ່</u>	scale	<u>ຊິ້</u>
least	<u>ນ້ອຍທີ່ສຸດ</u>	small	<u>ນ້ອຍ</u>
light	<u>ໄຟ</u>	space	<u>ອາວະກາດ</u>
little	<u>ນ້ອຍ</u>	weight	<u>ນ້ຳໜັກ</u>

Independent Learning Vocabulary - Concept D

asbestos	<u>ໄຊທາດສີເທົາທຳມະຟ້າໄດ້</u>	iron	<u>ເຫລັກ</u>
asphalt	<u>ເຄື່ອງສີເທລຽງໃຊ້ມາປາກລັງຄາ</u>	magnet	<u>ແມ່ເຫລັກ</u>
attract	<u>ຍົດະໃຈ</u>	material	<u>ເຄື່ອງປັບກວມ</u>
battery	<u>ຄຳມາໄຟ</u>	nail	<u>ເຫລັກຕະປູ</u>
brick	<u>ດມຈີ</u>	paper	<u>ເຈ້ງ</u>
broken	<u>ເຮັດແຕກ</u>	plaster	<u>ສັບຽລາດຝາ</u>
cement	<u>ປຸງຊີເມັດ</u>	repel	<u>ຍ້ອງກ</u>
chalk	<u>ສີຂາວ</u>	rock	<u>ຫີນດິນ</u>
clay	<u>ດິນໜຽວ</u>	salt	<u>ເທງ</u>
cloth	<u>ຜ້າ</u>	sand	<u>ດິນຊາຍ</u>
concrete	<u>ດິນຊີມັງ</u>	sank	<u>ຈົມ</u>
dissolve	<u>ລະລາຍໃນນ້ຳ</u>	steel	<u>ເຫລັກ</u>
electricity	<u>ໄຟຟ້າ</u>	stretch	<u>ຂົງອາກ</u>
flatten	<u>ເຮັດໃຫຍ່ງ</u>	string	<u>ເຊັງກ</u>
float	<u>ຟ</u>	sugar	<u>ນ້ຳຕານ</u>
flour	<u>ເຂົ້າແປ້ງ</u>	wax	<u>ຂີເພງ</u>
glass	<u>ແທງ</u>	wire	<u>ເຊັກລາດ</u>
hammer	<u>ຄອມຕີ</u>	wood	<u>ໄຟ</u>
heat	<u>ຄວາມຮ້ອນ</u>		

Independent Learning Vocabulary - Concepts E and F

above	<u>ທາງເທິງ</u>	north	<u>ທິດເໜືອ</u>
across	<u>ຂ້າມ</u>	nothing	<u>ບໍ່ມີຫຍັງ</u>
around	<u>ອ້ອມຮອບ</u>	notice	<u>ສັງເກດ</u>
attract	<u>ຍື່ນໃຈ</u>	observe	<u>ຈິດໂມ້ດ</u>
bar	<u>ຮາມເຄື່ອງດື່ມ</u>	over	<u>ຫຼາຍເກີນເປັ</u>
below	<u>ໂທ່ຮ້າງ</u>	paper	<u>ເຈ້ງ</u>
book	<u>ປື້ມ</u>	paste	<u>ຕັດກາວ</u>
bow	<u>ຫ້ວງເຮິງ</u>	penny	<u>ເງິນມຸ້ຍກາວ</u>
change	<u>ການປ່ຽນແປງ</u>	people	<u>ປະຊາຊົນ</u>
circle	<u>ວົງມົມ</u>	pick	<u>ເລືອກ</u>
compass	<u>ເຂັມທົດ</u>	pilot	<u>ນັກບິນ</u>
cork	<u>ຄຽມແກ້ວ</u>	pin	<u>ເຂັມກົດ</u>
cup	<u>ແກ້ວ</u>	pole	<u>ຫລັກ</u>
cylindrical	<u>ເປັ້ມກະບອກ</u>	pull	<u>ດຶງ</u>
end	<u>ສຸດທ້າຍ</u>	push	<u>ຊຸກຍ</u>
field	<u>ທ່າງ</u>	repel	<u>ຍ້ອງກ</u>
force	<u>ກຳລັງກາມ</u>	scissor	<u>ມາດຕ</u>
glass	<u>ແກ້ວ</u>	seeking	<u>ຊອກຫາ</u>
horseshoe	<u>ເຫລັກໂຄບຕິມມ້າ</u>	shape	<u>ຮູບລ່ວມ</u>
iron	<u>ເຫລັກ</u>	south	<u>ທິດໃຕ້</u>
iron filing	<u>ເຫລັກເປັ້ມປ່ຽນອຍ</u>	steel	<u>ເບ</u>
knife blade	<u>ມືດແຄງ</u>	string	<u>ເຈ້ງກ</u>
light	<u>ໄຟ</u>	table	<u>ໂຕະ</u>
magnet	<u>ແມ່ເຫລັກ</u>	toy	<u>ເຄື່ອງຫລິ້ນເດັກມວຍ</u>
magnetic	<u>ມ</u>	traveler	<u>ຄົນເດີນທາງ</u>
make	<u>ເຮັດ</u>	underline	<u>ຂຽນເສັ້ນກວາງ</u>
marble	<u>ຫມ່ອນ</u>	unlike	<u>ບໍ່ຄ້າຍຄືກັນ</u>
nail	<u>ເຫລັກຕະປຸ່</u>	water	<u>ນ້ຳ</u>
near	<u>ໃກ້</u>	wire	<u>ເຈັດລວດ</u>
needle	<u>ເຂັມ</u>	wood	<u>ໄມ້</u>
		zone	<u>ເຂດແດນ</u>

Independent Learning Vocabulary - Concepts G, H, I, and J

attract	<u>ດຶງດູດໃຈ</u>	light	<u>ໄຟ</u>
battery	<u>ຄຸ້ມໄຟ</u>	mixer	<u>ເຄື່ອງປະລິມສ່ຽງເຈັດ</u>
bell	<u>ປັດ</u>	negative	<u>ຄຳປະຕິເສດ</u>
bright	<u>ແສງລຽວ</u>	newspaper	<u>ໝາກໝາກ</u>
brush	<u>ຜູດລຽມ</u>	path	<u>ທາງມອຍ</u>
bulbs	<u>ທ້ວພັກທີ່ປາກໃຫຍ່</u>	pick	<u>ເລັ່ງ</u>
charge	<u>ການປັ່ນແປງ</u>	positive	<u>ຄຳແນະນຳ</u>
circle	<u>ວົງມວນ</u>	post	<u>ຕິດປະກາດ</u>
circuit	<u>ທາງໄຟຟ້າປິດ</u>	push	<u>ຊຸກຍູ້</u>
clay	<u>ຫີນແຫຼວ</u>	rapidly	<u>ວ່ອງໄວ</u>
cleaner	<u>ໄຮ່ນຳເຄື່ອງ</u>	rest	<u>ການຢຸດພັກພ້ອມ</u>
clear	<u>ໄລ່</u>	rubbing	<u>ຮັກ</u>
comb	<u>ທາງ</u>	ruler	<u>ໂພນຸມທັດ</u>
connect	<u>ຕິດຕໍ່</u>	run	<u>ແລ່ນ</u>
copper	<u>ທອງແດງ</u>	silk	<u>ໃໝ່</u>
crackle	<u>ສຽງທັກອອກ</u>	spark	<u>ໝດໄຟ</u>
current	<u>ກະແສ</u>	static	<u>ສະຖິຕິບາດ</u>
dry	<u>ແຫ້ງ</u>	switch	<u>ກັດກັດໄຟຟ້າ</u>
dry cell	<u>ຄຸ້ມໄຟແຫ້ງ</u>	table	<u>ໂຕະ</u>
electric	<u>ທ່າໄຟຟ້າ</u>	these	<u>ເຫຼົ່ານີ້</u>
electricity	<u>ໄຟຟ້າ</u>	tissue	<u>ເຈ້ຍບາດ</u>
energy	<u>ພະລັງງານ</u>	toaster	<u>ເຄື່ອງປັ້ງເຄື່ອງ</u>
fan	<u>ພັດລຽມ</u>	together	<u>ນຳກັນ</u>
force	<u>ກຳລັງງານ</u>	touching	<u>ບຸຍ</u>
fur	<u>ຂະມຸດ</u>	vacuum cleaner	<u>ເຄື່ອງດູຂີ້ຝຸນ</u>
glass bottle	<u>ຈົກແກ້ວ</u>	wall	<u>ກິ່ນແພງ</u>
glass rod	<u>ແສ້ແກ້ວ</u>	warm	<u>ອຸ່ນ</u>
heat	<u>ຄວາມຮ້ອນ</u>	wire	<u>ເຊັດລວງ</u>
iron	<u>ເຫຼັກ</u>	wool	<u>ຂະມຸດ</u>

UNIT IV

bathing	<u>อาบน้ำ</u>	plant	<u>ต้นไม้</u>
cloud	<u>เมฆ</u>	rain	<u>ฝน</u>
desert	<u>ทะเลทราย</u>	river	<u>แม่น้ำ</u>
evaporate	<u>กลายเป็นไอ</u>	snow	<u>หิมะ</u>
fog	<u>หมอก</u>	solid	<u>แข็ง</u>
gas	<u>แก๊ส: ก๊าซ</u>	stem	<u>ก้าน</u>
lake	<u>ทะเลสาบ</u>	supply	<u>แจกจ่าย</u>
land	<u>ที่</u>	use	<u>ใช้</u>
leaf	<u>ใบไม้</u>	washing	<u>ซัก</u>
ocean	<u>มหาสมุทร</u>	water	<u>น้ำ</u>
pipe	<u>ท่อน้ำ</u>	water cycle	<u>การหมุนเวียนของน้ำ</u>
		water vapor	<u>ไอน้ำ</u>

Other Vocabulary

measure	<u>ขนาด</u>	transportation	<u>การขนส่ง</u>
puddle	<u>แอ่งน้ำ</u>		

UNIT V

flower	<u>ดอกไม้</u>	seed	<u>เมล็ด</u>
leaf	<u>ใบไม้</u>	soil	<u>ดิน</u>
plant	<u>ต้นไม้</u>	stem	<u>ก้าน</u>
root	<u>รากไม้</u>	water	<u>น้ำ</u>
		weed	<u>วัชพืชรบกวน</u>

Other Vocabulary

blossom	<u>ดอกตูม</u>	halves	<u>ครึ่ง</u>
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UNIT VI

animal	<u>สัตว์</u>	chicken	<u>ไก่</u>
beak	<u>ปาก</u>	colt	<u>ม้าตัวผู้</u>
calf	<u>ลูกวัว</u>	domestic	<u>เลี้ยง</u>

duck	<u>ເບັດ</u>	kitten	<u>ລູກແມວ</u>
feather	<u>ຂົນສົ້ນ</u>	leather	<u>ໄໝ</u>
goose	<u>ນົມທຸລາຍຕົວ</u>	puppy	<u>ໝາມອຍ</u>
harvest	<u>ການກັບກຽວ</u>	silos	<u>ໄລ່</u>
hatch	<u>ຟັງໄວ້</u>	tame	<u>ຄົມ</u>
hay	<u>ຫຍ້າແທ້</u>	turkey	<u>ໄກ່ກຽວ</u>
		wild	<u>ປ່າ</u>

Other Vocabulary

bunny (rabbit)	<u>ລູກ</u>	lamb (sheep)	<u>ລູກແກ້ຍ</u>
kid (goat)	<u>ລູກເບ້</u>		

PRIMARY THREE

UNIT I

chlorophyll	<u>ຈັດຕູ້ສີຂຽວຂອງຕົ້ມໄມ້</u>	root hair	<u>ຮົ່ມໄມ້</u>
fruit	<u>ໄໝກໄມ້</u>	sprout	<u>ຕົ້ມໄມ້ງອກ</u>
green plant	<u>ຕົ້ມໄມ້ຂຽວ</u>	starch	<u>ແປ້ງສົ້ນຫລັບລົງເຄື່ອງນຸ່ງ</u>
product	<u>ຜົນທຳລາຍໄດ້</u>	vegetable	<u>ຜົກ</u>

Other Vocabulary

air	<u>ອາກາດ</u>	light	<u>ໄຟ</u>
apparatus	<u>ເຄື່ອງຈັບກວມ</u>	problem	<u>ເລກໃຈດ</u>
application	<u>ວິທະຍາ</u>	procedure	<u>ຮະບຽບ</u>
conclusions	<u>ຕອນພວ້ນທາຍ</u>	result	<u>ຜົນ</u>
diagram	<u>ຮູບແຕ້ມ</u>	warmth	<u>ອຸນ (ນວມ)</u>
experiment	<u>ການທົດລອງ</u>		

UNIT II

amphibian	<u>ກັດປ່ຽນໄລ່ນ້ຳແລະດິມ</u>	expand	<u>ຂຍາຍອອກ</u>
body of water	<u>ນ້ຳລາຍນ້ຳ</u>	fossil	<u>ສຳລັບກາຍເປັນກວມດິມ</u>
coal	<u>ຄາມທຳມ</u>	gold	<u>ຄຳ</u>
desert	<u>ທະເລຊາຍ</u>	granite	<u>ທຳມແຂງ</u>

gravel	<u>ຫຸ້ມແຫ້</u>	pebble	<u>ຫຸ້ມແຮ່</u>
igneous	<u>ເປັນລູກໄຟພາຍໃຕ້ໂຟດອັນ</u>	petrified wood	<u>ໄມ້ທີ່ກາຍເປັນດິນ</u>
jewel	<u>ເຄື່ອງເພັດ</u>	precious metal	<u>ໄຊທະມິດ</u>
land mass	<u>ຫຸ້ມດິນ</u>	precious stone	<u>ຫຸ້ມມາຍາ</u>
lava	<u>ລາວາ</u>	prehistoric	<u>ແຫ່ງປະຫວັດສາດກ່ອນ</u>
layers of rock	<u>ສູນລຳດັບຫຸ້ມ</u>	sand	<u>ດູມຈາຍ</u>
limestone	<u>ຫຸ້ມປ່ຽມ</u>	sandstone	<u>ຫຸ້ມຂັດ</u>
marble	<u>ຫຸ້ມກວມ</u>	sedimentary	<u>ເປັນເລັ່ງຈັບຢູ່ກຸ້ມ</u>
metamorphic	<u>ຈະຫຼຸດລົງເປັນແຢ່ງປ່ຽນຮູບສ່ວນ</u>	shale	<u>ຫີນເຫຼັ້ມ</u>
mining	<u>ການຂົບແຮ່</u>	silver	<u>ເງິນ</u>
mountain	<u>ພູເຂົາ</u>	slate	<u>ຫຸ້ມຢູ່</u>
oil	<u>ນ້ຳມັນ</u>	volcano	<u>ພູເຂົາໄຟ</u>

UNIT III

air pressure	<u>ຄວາມກົດດັນຂອງອາກາດ</u>	evaporate	<u>ກາຍເປັນອາຍ</u>
compressed air	<u>ເປັນອາກາດເຂົ້າໃນແກ້ວ</u>	expand	<u>ຂຍາຍອອກ</u>
condense	<u>ກາຍເປັນນ້ຳ</u>	matter	<u>ເຄື່ອງພາກະມະ</u>
contract	<u>ຫົດເຂົ້າ</u>	water vapor	<u>ອາຍນ້ຳ</u>

Other Vocabulary

bottle	<u>ແກ້ວ</u>	ink	<u>ນ້ຳມືກ</u>
cloth	<u>ຜ້າ</u>	inside	<u>ທາງໃນ</u>
cold	<u>ໜາວ</u>	liquid	<u>ເປັນນ້ຳ</u>
contract	<u>ຫົດເຂົ້າ</u>	mercury	<u>ນ້ຳບາທລອດ</u>
cooking	<u>ເຮັດກິນ</u>	room	<u>ຫອງ</u>
cool	<u>ເຢັນ</u>	sick	<u>ປ່ວຍ</u>
cord	<u>ເຊືອກ</u>	silver	<u>ເງິນ</u>
cork	<u>ດູມແກ້ວ</u>	spring	<u>ຮະດູໃບໄພ່ຢັງ</u>
degree	<u>ອັງສາ</u>	summer	<u>ຮະດູຮ້ອນ</u>
expand	<u>ຂຍາຍອອກ</u>	temperature	<u>ອຸນຫະພູມ</u>
fall	<u>ຮະດູເປັນຕົກ</u>	thermometer	<u>ບາທລອດ</u>
flask	<u>ທັບທຸລແກ້ວ (ບາກແຄບ)</u>	tube	<u>ທັບ</u>
glass	<u>ແກ້ວ</u>	warm	<u>ອຸ່ມ</u>
heat	<u>ຄວາມຮ້ອນ</u>	weather	<u>ອາກາດ</u>
hot	<u>ຮ້ອນ</u>	winter	<u>ຮະດູໜາວ</u>



UNIT IV

block and tackle	<u>ກ້ວມສົ້ວແລະເກັ່ງຮົດ</u>
characteristic	<u>ແຫຼ່ງລັກສະນະ</u>
element	<u>ທາດ</u>
energy	<u>ພະລັງງານ</u>
force	<u>ກຳລັງ</u>
force arm	<u>ແຂມໃຈກຳລັງ</u>
friction	<u>ຄວາມອັບອນ</u>
fulcrum	<u>ໄມ້ຊຸດທາມໄມ້ທລີເທລີກຸ້ດ</u>
hydrogen	<u>ໄຮໂຈຣເຈັມ</u>

Other Vocabulary

alcohol burner	<u>ທໍ່ໄຟຂອງເທລີ້</u>
clay	<u>ດິມໝາງ</u>
copper	<u>ທອງແດງ</u>

Independent Learning Vocabulary

against	<u>ກາມຕໍ່ຕາມ</u>
axle	<u>ແກມທລີເພົາ</u>
ball bearing	<u>ລາບິມລີ້ (ເຢັມເທລີກ)</u>
bump	<u>ຕົ້ງ</u>
catch	<u>ຮັບຈັບ</u>
cotton	<u>ຝ້າຍ</u>
drag	<u>ລາກ</u>
easily	<u>ໂດຍງ່າຍ</u>
floor	<u>ພູມ</u>
friction	<u>ຄວາມອັບອນ</u>
full	<u>ເຕັມ</u>
heat	<u>ຄວາມຮຽ່ມ</u>

inclined plane	<u>ກັບໄພ້</u>
lever	<u>ໄມ້ທລີເທລີກຸ້ດ</u>
mixture	<u>ເຄື່ອງປະສົມເອໂຣັດ</u>
pulley	<u>ເລກຮັດດຳ</u>
ramp	<u>ຄວາຍ</u>
simple machine	<u>ເຄື່ອງຈັກໃຈງ່າຍ</u>
screw	<u>ຕະປຳກ້ວ</u>
wedge	<u>ທລມ</u>
wheel and axle	<u>ກົງຮົດແລະແກມທລີເພົາ</u>
work arm	<u>ແຂມເຮັດງາກ</u>

iron	<u>ເທລີກ</u>
gold	<u>ເຣັດ</u>
sponge	<u>ຟ້ອງນ້ຳ</u>

hollow	<u>ໂກມ</u>
marble	<u>ທາມອນມ</u>
move	<u>ຍົກຍາຍ</u>
oil	<u>ນ້ຳມັນ</u>
reduce	<u>ລົດລົງ</u>
roller	<u>ເຄື່ອງກັງ ໄມ້ກັງ</u>
rope	<u>ເຊັ່ງກ</u>
rub	<u>ຮັກ</u>
sandpaper	<u>ກະດາດຊາຍ</u>
smooth	<u>ກຸງ</u>
wheel	<u>ກົງຮົດ</u>

UNIT V

beak	<u>ປະກາດ</u>	migratory	<u>ຍ້າຍອອກ</u>
claw	<u>ເລັບສັດ</u>	perching	<u>ງອບຄອນ</u>
climbing	<u>ຄ້າມ</u>	permanent resident	<u>ຜູ້ອາໄສ</u>
crack	<u>ຮອຍແຕກ</u>	prey	<u>ເຫຍ່ງ</u>
feather	<u>ຂົນມົ້ງ</u>	talon	<u>ເລັບສັດຂອງມົ້ງ</u>
flight	<u>ບາບພິມ</u>	warm-blooded	<u>ກັດເລືອດຮຸ່ມ</u>
grasp	<u>ກາມຈັບ</u>	webbed	<u>ຫມັງ</u>
insect	<u>ແມງໄມ້</u>		

Other Vocabulary

eagle	<u>ມົ້ງແຫລວ</u>	woodpecker	<u>ມົ້ງໄລ່</u>
sparrow	<u>ມົ້ງຈອກ</u>		

UNIT VI

alligator	<u>ແຂ້</u>	nostril	<u>ຮັດ</u>
amphibian	<u>ກັດທ້ອງໄຮຢ່າມົ້ງແລະດິມ</u>	pro t	<u>ຢ່າມ</u>
claw	<u>ເລັບສັດ</u>	roe	<u>ໄຂ່ຂອງຢ່າ</u>
cold-blooded	<u>ກັດເລືອດຫມາວ</u>	salamander	<u>ສວ່ມມອຍຂອງກັດທ້ອງໄຮຢ່າມົ້ງແລະດິມ</u>
fang	<u>ແຂວຍາວແລະຢ່າຍຄົມ</u>	salmon	<u>ຢ່າໂຮມົງ</u>
frog	<u>ກົບ</u>	scale	<u>ເກັດຢ່າ</u>
gill	<u>ຂີ້ຢ່າ</u>	sense	<u>ຄວາມຮູ້ສຶກ</u>
guppy	<u>ຢ່າລັດສີເຫລືອງ</u>	snail	<u>ຫອຍເດັງ</u>
hatch	<u>ຟັກໄຂ່</u>	snake	<u>ງ</u>
hibernate	<u>ເຂົ້າກັບສັດ</u>	spawn	<u>ໄຂ່ຂອງລູກທ້ອງກັບມົ້ງ</u>
lizard	<u>ຂີ້ໂກະ ກັບແກ້ຈິງມ</u>	tadpole	<u>ລູກຮາກ</u>
newt	<u>ກົບແວ້</u>	toad	<u>ຄົ້ມຄາກ</u>
		turtle	<u>ເຕົາ</u>

UNIT VII

artery	<u>ເລັມເລັງດ</u>	oil gland	<u>ມົມມຸດກະບົດຂອງເລັງ</u>
balanced diet	<u>ການເລັງກາທເທົ່າກາມ</u>	perspiration	<u>ເທງອອດ</u>
blood vessel	<u>ເລັມເລັງດ</u>	pore	<u>ຮີມ</u>
breathe	<u>ຫັມໃຈ</u>	pulse	<u>ຈັມ</u>
heart	<u>ໃຈ</u>	skeleton	<u>ຮາກະດູກ</u>
joint	<u>ບ່ອນຕໍ່</u>	skin	<u>ບຸນ</u>
lung	<u>ປອກ</u>	spinal column	<u>ກະດູກສັນຫລັງ</u>
		vein	<u>ເລັມເລັງດດີ</u>

Other Vocabulary

cell	<u>ຄາກມດ</u>	male	<u>ເພດຜູ້</u>
female	<u>ເພດຍິງ</u>		

INTERMEDIATE ONE

UNIT I

abdomen	<u>ບ່ອນ</u>	maggot	<u>ເລງອອດຂອງເມງ</u>
adult	<u>ຜູ້ໃຫຍ່</u>	molt	<u>ລົມລົມຫລືລົມທາງມວກ</u>
arthropod	<u>ກັດທາມບ່ອນຕໍ່ຂອງຕົນຕົວແລະແຂມຂາ</u>	pest	<u>ຜູ້ຮົບກວມ</u>
butterfly	<u>ແມງກະບຶບ</u>	pupa	<u>ໝວກທີ່ເປັນແມງໃຫຍ່ເກືອບ</u>
cell	<u>ຄາກມດ</u>	segment	<u>ສ່ວນນຸ່ງ</u>
cocoon	<u>ລູກຕົວນອ້ມນອ້ຍ</u>	simple eye	<u>ຕາບໍ່ມີມະດູ</u>
colony	<u>ກຸ່ມທຳ</u>	skeleton	<u>ຮາກະດູກ</u>
compound eye	<u>ກະອງແມງມີຕາບໍ່ມີມະດູເປັນພັນ</u>	specimen	<u>ຂອງຕົວຢ່າງ</u>
egg	<u>ໄຂ່</u>	spider	<u>ແມງມຸມ</u>
grasshopper	<u>ຕົກແຕມ</u>	spiracle	<u>ຮີບັມໃຈ</u>
insect	<u>ແມງໄມ້</u>	wing	<u>ປີກ</u>
jointed	<u>ເຮັດບ່ອນຕໍ່</u>		

UNIT II

adapt	<u>ດັດແປງ</u>	habitat	<u>ສະຖານທີ່ອາໄສ</u>
adjust	<u>ປັບປຸງ</u>	herd	<u>ກຸ່ມສັດ</u>
classification	<u>ການຈຳແນກ</u>	irrigation	<u>ການນຳນ້ຳມາລົງ</u>
climate	<u>ອາກາດ</u>	pack	<u>ກຸ່ມ</u>
cultivation	<u>ການປູກ</u>	pelt	<u>ລຽດໝ້າ</u>
domestic	<u>ພາຍໃນ</u>	spine	<u>ໂຕກລັມຫລັງ</u>
environment	<u>ສະພາບແວດລ້ອມ</u>	survival	<u>ການເປົ້າໝາຍຢູ່ອາວິກາລ</u>
extinct	<u>ມາດ</u>		

UNIT III

apparent	<u>ທີ່ເຫັນ</u>	rotation	<u>ການປ່ຽນທີ່ຕັ້ງ</u>
astronomy	<u>ທາດາລາກ</u>	solar system	<u>ປຸມແພວດທີ່ຕັດຕ່າງກັນກັບດວງອາທິດ</u>
eclipse	<u>ຄວາມຫາຍແຈງຂອງຕາເວັນຕາມລະດັບ</u>	telescope	<u>ກ້ອງເບິ່ງຫ່າງ</u>
orbit	<u>ເກີດຈາກມາ</u>	tide	<u>ມຸ້ງມາ</u>
phase	<u>ຮູບຮ່າງ</u>	universe	<u>ຈັກກະວາມ</u>
planet	<u>ດາວໂລກ</u>	"waning" moon	<u>ແຮງຈັມມືດ</u>
reflected light	<u>ແຈ້ງຈະເລີນກັບ</u>	"waxing" moon	<u>ແຮງຈັມເຕົ້າ</u>
revolution	<u>ການລະຕົວ</u>		

UNIT IV

attract	<u>ດຶກ</u>	electricity	<u>ໄຟຟ້າ</u>
charge	<u>ຄວາມປັບປຸງໃຈດີໃຜຜົນ</u>	electron	<u>ອີເລັກຕຣອນ</u>
circuit	<u>ທິມທາງຂອງໄຟຟ້າໃບ</u>	energy	<u>ພະລັງງານ</u>
conductor	<u>ເຄື່ອງທີ່ສົ່ງໄຟຟ້າໄປ</u>	equal	<u>ເທົ່າກັນ</u>
contract	<u>ຫົດເຂົ້າ</u>	evaporate	<u>ການເຜີ້ມູດາ</u>
deflate	<u>ເຮັດຫຸງ</u>	expand	<u>ຂຍາຍອອກ</u>
direct	<u>ແມ່ຂ່າຍ</u>	filament	<u>ເຊັດລອດໂລທະ</u>
dissolve	<u>ລະລາຍໃນນ້ຳ</u>	force	<u>ກຳລັງ</u>
dry cell	<u>ອາມິດແຈ້ງ</u>	fuse	<u>ທໍ່ຂອງແຮງຈູງລະເບີດ</u>

INTERMEDIATE TWO

UNIT I

atmosphere	<u>ບັນຍາກາດ</u>	hail	<u>ໝາກເທັບ</u>
condensation	<u>ກາຍເປັນນ້ຳ</u>	layer	<u>ຊັ້ນ</u>
dew	<u>ນ້ຳໝອກ</u>	pressure	<u>ຄວາມກົດດັນ</u>
evaporation	<u>ການກາຍເປັນອາຍ</u>	rain	<u>ຝົນ</u>
fog	<u>ນ້ຳໝອກ</u>	sleet	<u>ຝົນເປັນນ້ຳກວມບາງລົມ</u>
frost	<u>ນ້ຳໝອກຕ້າງ</u>	thermometer	<u>ບາຫລຽດ</u>
gas	<u>ອາຍທີ່ເກີດຈາກໄລທະເຊີອູເຟີ</u>	weather vane	<u>ສຳຫລັບເບິ່ງທາງເດີມຂອງລົມ</u>

UNIT II

affect	<u>ໄດ້ລົບລຸ້ນປະໂຫຍດ</u>	pitch	<u>ຢ່າງປ່າງ</u>
drag	<u>ລາກ</u>	resistance	<u>ຕໍ່ຕ້ານ</u>
effect	<u>ຜົນ</u>	rocket	<u>ຈັບຮວກ</u>
elevator	<u>ຈັດ</u>	rotate	<u>ໝຸນ</u>
friction	<u>ຄວາມອັບອຸ່ມ</u>	rudder	<u>ຈັກພັດທີ່ຍຸງພາຍໄດ້</u>
gravity	<u>ຄວາມຊຸ່ງດຶງ</u>	satellite	<u>ຍົນຈາມດວງດາວ ດວງທຽມ</u>
lift	<u>ຈັກຍົກ</u>	space	<u>ອາວະກາດ</u>
meteor	<u>ດາວລເດັດ</u>	thrust	<u>ຍ້ແຮງ</u>
orbit	<u>ທາງໄຫວ້ຈາກອາວະກາດ</u>	weightlessness	<u>ບໍ່ມີນ້ຳໜັກ</u>
partial vacuum	<u>ຄວາມວາງເປົ່າເປັນທາງສ່ວນ</u>		

Other Vocabulary

flat	<u>ພຽງ</u>	pilot	<u>ນັກບິນ</u>
helicopter	<u>ຍົນເຮລີກົບແຕ້</u>	vinegar	<u>ນ້ຳລົມ</u>

UNIT III

condensation	<u>ກາຍເປັນນ້ຳ</u>	evaporation	<u>ການກາຍເປັນອາຍ</u>
conduction	<u>ການເປັນທັມທາງ</u>	expansion	<u>ການຂາຍຂອງກາ</u>
contraction	<u>ການຫົດເຂົ້າ</u>	friction	<u>ຄວາມອັບອຸ່ມ</u>
energy	<u>ພະລັງງານ</u>	physical change	<u>ການປ່ຽນແປງທາງຮາກກາຍ</u>

radiation	<u>ການລັງແສງ</u>
thermometer	<u>ບາຫລອດ</u>

Other Vocabulary

flame	<u>ແປ້ງໄຟ</u>
melt	<u>ລະລາຍ</u>
mercury	<u>ນ້ຳບາຫລອດ</u>

UNIT IV

animal	<u>ກັດ</u>
aquatic	<u>ນ້ຳເທດທະມັ</u>
bird	<u>ນົກ</u>
classification	<u>ການຮະບຽບ</u>
egg	<u>ໄຂ່</u>
environment	<u>ສິ່ງແວດລ້ອມ</u>
external	<u>ຍ້ອນກາງ</u>
fish	<u>ປາ</u>
function	<u>ທຳນາຍ</u>
gills	<u>ຈະໂລຍະວະຕິປາ ໄດ້ທັມທາດໃຈກຸ້ຍ້ອນຈະມີ</u>
internal	<u>ທາງໃນ</u>
kingdom	<u>ຮາຊາຣາມາກັກ</u>

Other Vocabulary

cell	<u>ອາກມັດ</u>
rib	<u>ກະດູກຂ້າງ</u>
skull	<u>ກະດູກຫົວ</u>

UNIT V

altitude	<u>ຄວາມສູງ</u>
bill	<u>ປະກາດ</u>
characteristic	<u>ແທ້ລັກສະນະ</u>
coloration	<u>ການໃສ່ສີ</u>

switch	<u>ກົງຕັກໄຟຟ້າ</u>
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sidewalks	<u>ທາງຍາງ</u>
wire	<u>ເຊັດລວດ</u>

lung	<u>ໂອດ</u>
mammal	<u>ສັດທາງລູກກິນນົມ</u>
modified	<u>ເຮັດຢ່າງແປງ</u>
organism	<u>ສິ່ງມີຊີວິດ</u>
regeneration	<u>ຊີ້ນໃໝ່</u>
reproduction	<u>ການລູບພັນ</u>
reptile	<u>ສັດເລິ່ງຄາມ</u>
scales	<u>ເກັດປາ</u>
specimen	<u>ຂອງຕົວຢ່າງ</u>
sponges	<u>ຟອງນ້ຳ</u>
structure	<u>ຮູບຮ່າງ</u>

spine	<u>ກະດູກສັນຫລັງ</u>
zoologist	<u>ນັກຄົ້ນຄົວທາງສັດ</u>

conservation	<u>ການເຮັດຮັກສາໄວ້</u>
extinct	<u>ມາດ</u>
flapping	<u>ການຟັ່ງລະບັດ</u>
flexible	<u>ທີ່ໄຫວ້ໄດ້</u>

flight	<u>ການບິນ</u>	quill feather	<u>ຂົນສົ່ງ</u>
identify	<u>ບອກລັກສນະ</u>	soar	<u>ບິນເຈັດຂຶ້ນ</u>
migration	<u>ການ</u>	structure	<u>ຮູບຮ່າງ</u>

Other Vocabulary

grasping	<u>ການຈັບ</u>	robin	<u>ນົກກາງແຂມ</u>
owl	<u>ນົກເຄົ້າ</u>	scratching	<u>ການເກົາ</u>
perching	<u>ການຢູ່ລອນ</u>		

UNIT VI

annual rings	<u>ວົງວັນທີ່ເປັນປະຈຳປີ</u>	moss	<u>ຂົ້ວລາງທຳມະດາທີ່ມີໄມ້</u>
bacteria	<u>ເຈືອງໂຮກ</u>	parallel	<u>ຄົ້ນໄປ</u>
bark	<u>ເບື້ອງໄມ້</u>	penicillin	<u>ປີ່ແລນ</u>
bud	<u>ຈຽງກນ</u>	Plant Kingdom	<u>ຮູບຮ່າງມາຈັກຂອງຕົ້ມໄມ້</u>
classification	<u>ການຮະບຽບ</u>	ray	<u>ແສງ</u>
conservation	<u>ການເກັບຮັກສາໄວ້</u>	shoot	<u>ບາດຍາງ</u>
cutting	<u>ການປ່າດ</u>	spore	<u>ລູກເລີ່ມໃຫຍ່ແຕກຕ່າງກັບພໍ່ແມ່</u>
fern	<u>ຕົ້ມພັກກາດ</u>	structure	<u>ຮູບຮ່າງ</u>
function	<u>ທຳນາທິ</u>	vegetative reproduction	<u>ການຮັບພູມຂອງຕົ້ມ</u>
habitat	<u>ສະຖານທີ່ຢູ່ຂອງຕົ້ມໄມ້ແລະສັດ</u>	veining	<u>ເສັ້ນໃບໄມ້</u>
mold	<u>ເບົ້າຫລໍ່</u>	yeast	<u>ຊີ້ເຫລົ້າ</u>

Other Vocabulary

characteristics	<u>ການແທງລັກສນະ</u>	similarities	<u>ຄວາມຄືກ</u>
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INTERMEDIATE THREE

UNIT I

cold-blooded	<u>ສັດເລືອດຫາງ</u>	hibernate	<u>ເຂົ້າເຈັດເລັດງ</u>
conservation	<u>ການເກັບຮັກສາໄວ້</u>	hinny	<u>ລູກສົ້ມເລືອດຂອງມ້າແລະມ້າລີ້</u>
dormant period	<u>ເວລາຢ້ຽວງາວ</u>	migrate	<u>ຍ້າຍອອກ</u>
extinct	<u>ມອດ</u>	mule	<u>ມ້າລີ້</u>
habitat	<u>ສະຖານທີ່ຢູ່ຂອງຕົ້ມໄມ້ແລະສັດ</u>	refuge	<u>ບ່ອນເພ່າ</u>



vertebrate

ສັດກມາກະດູກສັນຫຼັງ

warm-blooded

ສັດເລືອດອຸ່ມ

veterinarian

ສັດວະແພດ

wildlife

ສັດທີ່ບໍ່ມີຊີວິດຄົມ

UNIT II

acid

ເຄມີເຄາະພາຊະນະ

orbit

ທາງໂຄຈອນທາງອາວະກາດ

base

ຕົ້ນພຽງ

particle

ສ່ວນນ້ອຍ

element

ວັດຖຸ

shell

ເວຍຂອງຈາຕິມ

matter

ວັດຖຸ

symbol

ສັນຍາລັກ

UNIT III

astrology

ໂທຣະສາດ

satellite

ບໍ່ວິມດວງດາວ

astronomy

ດາຣາສາດ

solae

ກຸງກັບດວງອາທິດ

ellipse

ຄວາມຫາຍແສງຂອງຕາເວັນຕົວພະຈັນ

space

ອາວະກາດ

galaxy

ດາວເປັນຜັມລ້ານຢູ່ໃຫ້ຈັກກະວານ

sphere

ຮູບມົມ

infinite

ບໍ່ສິ້ນສຸດ

telescope

ກອງສອງທາງໂທ

radiation

ການລຳແສງ

theory

ທຳລາຍ

universe

ຈັກກະວານ

UNIT IV

amber

ນິ້ມນ້ຳຢູ່ເບື້ອງລຸ່ມຂອງດິນ

limestone

ຫີນປຸ່ມ

dissolve

ລະລາຍໃນນ້ຳ

loam

ດິນມຸດມໝຽງແລະຊຸ່ຍຢືນກັນ

dune

ນ້ຳຊຸ່ຍນອຍ (ລົມເບົາ)

mammal

ສັດທີ່ລຽງລາຮນນກິນນົມ

earthquake

ແພນດິນໄຫວ

mantle

ເລືອດອຸ່ມ

environment

ສິ່ງແວດລ້ອມ

marble

ຫີນອອມ

epoch

ເວລາໝາຍໄວ້

mineral

ໂລຫະທາດ

era

ສໄລ

neutral

ເປັນກາງ

evaporation

ການກາຍເປັນອາຍ

organic

ແທງການມີຊີວິດ

extinct

ມາດ

plate

ຈາມ

fault

ຄວາມຜິດ

resin

ພາຊະນະແທງສວມຈຳເປັນມາກາຕິມນິ້ມ

geology

ຊຸມປະຈັດສາດຂອງແຜ່ນດິນ

silt

ເຄື່ອງສວມນິ້ມທີ່ອັນທົນສວມນ້ອຍ

granite

ຫີນແຂງ

volcano

ພເຂົາໄຟ

impression

ຄວາມນັກຄິດ



UNIT V

cell	<u>ຄາມັດ</u>	reproduction	<u>ກາມລັບພມ</u>
diffuse	<u>ຂຍາບອອກ</u>	respiration	<u>ຄວາມຫມັ່ງໃຈ</u>
filament	<u>ສວມນຶ່ງຂອງດອກໄມ້</u>	seed	<u>ແກ່ມ</u>
mass selection	<u>ກອງໄຫຍ</u>	stigma	<u>ເກສອນດອກໄມ້</u>
petal	<u>ໂຍໄມ້ແຂ້ງ ກາໝາກດອກໄມ້</u>	style	<u>ແບບ</u>
pollen	<u>ເກສອນດອກໄມ້</u>		

UNIT VI

advantageous	<u>ທີ່ເປັນຄວາມໄດ້ປຸງ</u>	lever	<u>ໂມ້ຫລໍ່ເທລັງັດ</u>
centimeter	<u>ຄວາມແທກທາງຍາວ</u>	machine	<u>ເຄື່ອງຈັກ</u>
effort	<u>ຄວາມພະຍາຍາມ</u>	pull	<u>ດູງ</u>
energy	<u>ພະລັງງານ</u>	pulley	<u>ເຄາະຮູ້ດູງ</u>
exert	<u>ໃຊ້ຄວາມພະຍາຍາມ</u>	push	<u>ຊຸກຍ</u>
force	<u>ກົລັງ</u>	resistance	<u>ຕໍ່ຕ້ານ</u>
fulcrum	<u>ໂມ້ທອດໝາໂມ້ຫລໍ່ເທລັງັດ</u>	screw	<u>ຕະປຸ່ງ</u>
gram	<u>ຄວາມໜັກ ຂອງມາັກ</u>	wedge	<u>ຫລັມ</u>
gravity	<u>ຄວາມຄວຽງຄູ່</u>	wheel and axle	<u>ກົງຮົດ ແລະ ແກ່ມຫລໍ່ເທລີ</u>
inclined plane	<u>ກົບໄມ້</u>	work	<u>ວຽກ</u>

UPPER ONE

UNIT I

absolute humidity	<u>ຄວາມຊຸມຄຸ້ງຊຸມ</u>	insolation	<u>ຄວາມເປັດເພີຍຢູ່ແສງຕາເວັນ</u>
atmosphere	<u>ບັນຍາກາດ</u>	isobars	<u>ເລັມໝາຍບ່ອນໜ້າຂອງແຜ່ນດິນ (ຢູ່ໃຫຍ່ ລຸ່ມນີ້)</u>
cirrus	<u>ເຜິ້ງລືຂາວເປັນນ້ຳກອນລຽມອ້ຍ</u>	nimbostratus	<u>ເຜິ້ງຝົນຊຸ່ມນຶ່ງເປັນລືເທົາແດກ</u>
cloud seeding	<u>ວິທີທີ່ເຮັດໄດ້ຝົນຕົກ</u>	precipitate	<u>ຕົກຝົນ ຈຳນວນທີ່ມາຕົກມາໄປນອກຕົກ</u>
cyclone	<u>ລົມບ້ຳຜຸ</u>	relative humidity	<u>ອັດຕາສ່ວນ ຈຳນວນນ້ຳຢູ່ໃນອາກາດ</u>
dense	<u>ໜາແໜ້ນ</u>	saturate	<u>ເຊິ່ມອັດຕືບຊຸ່ມ</u>
displacement	<u>ຄວາມຍາຍຂອງແຕ່ລະເຈັບຮຸ່ນມາມາັກກວນເມັດ</u>	supersaturated	<u>ຕື່ມເຊິ່ມນ້ຳຢູ່ຊຸ່ມເກມ</u>
exosphere	<u>ບັນຍາກາດທາງນອກ</u>	tornadoes	<u>ລົມຜຸບ້ຳແຮງ</u>

typhoon	<u>ລົມພາຍໃຫຍ່ໃນທະເລ</u>
waterspouts	<u>ນ້ຳລຽກຂຸນລຽງ</u>
UNIT II	
area	<u>ພື້ນທີ່</u>
calibrate	<u>ປັບທາງຍາວຢ່າງໃຈກາງສູງຂອງ</u>
centripetal	<u>ປະກອບກັບທາງໃຈກາງທຸລີຈິດເພີ່າ</u>
compress	<u>ຢັບເຂົ້າ</u>
cylinder	<u>ກົວ</u>
density	<u>ໄວ້ນສ໌</u>
diminish	<u>ເຈັດໃຫ້ນ້ອຍລົງ</u>
displacement	<u>ຄວາມເຈົ້າໄວ້ແທນ</u>
gas	<u>ອາຍທີ່ເກີດຈາກໂລຫະເຊັ່ນເພັງ</u>
horizontal	<u>ທາງນອນ</u>
UNIT III	
adhesion	<u>ການຕິດກັນ</u>
alpha ray	<u>ແສງທຳມາ</u>
beta ray	<u>ແສງທຳລອງ</u>
cohesion	<u>ຄວາມຕິດເຂົ້າກັນ</u>
critical mass	<u>ຄວາມໜ້າພະຈັງກາມ</u>
density	<u>ຄວາມແໜ້ນ</u>
diffusion	<u>ການຂຽນອອກ</u>
ductility	<u>ເຄັ່ງເຮັດເປັນແໜ້ງໄດ້</u>
elasticity	<u>ການຍືດເຂົ້າອອກ</u>
electron	<u>ອີເລັກທຣອນ</u>
ergs	<u>ວຽກທີ່ເຮັດແລ້ວຢ່າງໃນເວລາສັ້ນ</u>
energy	<u>ແລະລັງກາມ</u>
evaporation	<u>ການກາຍເປັນອາຍ</u>
foot pound	<u>ວຽກທີ່ເຮັດແລ້ວຢ່າງໃນຟຸດສັ້ນ</u>

whirlwind	<u>ລົມຜິບັ້</u>
immerse	<u>ຈົມເຈົ້າທາງໃນຂອງແທລວ</u>
inversely proportional	<u>ທຳມິຈັກ ລວມຕົກມາເປັນກົງກັນຂ້າມ</u>
liquids	<u>ຂອງເປັນນ້ຳ</u>
mass	<u>ກອງໃຫຍ່</u>
solids	<u>ຂອງແຂງ</u>
sphere	<u>ຮູບມົມ</u>
submerge	<u>ຈົມ</u>
transmit	<u>ສົ່ງໄປ</u>
vertical	<u>ເປັນເລັ່ນລຽງ</u>
volume	<u>ບໍ່ລິມາດ</u>
gamma ray	<u>ແສງຮຸ່ນນ້ຳ</u>
gas	<u>ອາຍທີ່ເກີດຈາກໂລຫະເຊັ່ນເພັງ</u>
Geiger counter	<u>ທັກເຈ</u>
interaction	<u>ຄວາມຍົກຍ້າຍຈຸນກັນແລະກັນ</u>
kinetic	<u>ທຳມິຄວາມຈັບຈຸນແລະພະຈັງກາມ</u>
liquid	<u>ເປັນນ້ຳ</u>
malleability	<u>ເຄັ່ງທຳຄວາມເຮັດເປັນແໜ້ງໄດ້</u>
mass	<u>ກອງໃຫຍ່</u>
orbit	<u>ທາງໂຄຈອນທາງອາວະກາດ</u>
porous	<u>ທຳມິຮູ້ຂົມ</u>
potential	<u>ແຮງໄຟ</u>
solid	<u>ແຂງ</u>
solubility	<u>ຄວາມລະລາຍໃນນ້ຳ</u>
spontaneous	<u>ໂດຍທຳມະຊາດ</u>



sublimation	<u>ການແກະນໍາທາງຂອງແລ້ງກຽມ</u>	vapor	<u>ອາຍ (ນໍ້)</u>
transparency	<u>ການສຽງຈຽດ</u>	weight	<u>ນ້ຳໜັກ</u>
UNIT IV			
acid	<u>ເຄມີເຕົາພາກຸ່ມ</u>	explosion	<u>ການລະເບີດ</u>
analysis	<u>ການຈຳແນກ</u>	fuel	<u>ນໍ້າມັນເຊິ່ງເພີ່</u>
base	<u>ຄຸ້ມພຽມ</u>	precipitate	<u>ເຮັດອາບແຍກອອກປະສົມນໍ້</u>
combustion	<u>ວິທການຂອງເຄມີ</u>	salt	<u>ເກີດ</u>
composition	<u>ສ່ວນປະກອບ</u>	thistle tube	<u>ທໍ່ທີ່ໃຊ້ໃນການລະເບີດ</u>
compound	<u>ເຄື່ອງປະກອບ</u>	vapor	<u>ອາຍ (ນໍ້)</u>
UNIT V			
alloy	<u>ປະສົມ</u>	insulation	<u>ເຄື່ອງປ້ອງທາງໄຟຟ້າ</u>
conduction	<u>ການສົ່ງ</u>	kilogram	<u>ກິໂລ</u>
convection	<u>ຄວາມໂຈມຮ້ອນ</u>	mass	<u>ກຽງໃຫຍ່</u>
evaporation	<u>ການກາຍເປັນອາຍ</u>	radiation	<u>ການສົ່ງແສງ</u>
fluid	<u>ຂອງແຫລ່ງ</u>	temperature	<u>ອຸນຫະພູມ</u>
geyser	<u>ນໍ້າພຽງຮ້ອນ</u>	thermometry	<u>ຂະໜາດຂອງອຸນຫະພູມ</u>
heat	<u>ອຸນຫະພູມ</u>	vaporization	<u>ການເປັນອາຍ</u>
UNIT VI			
abdomen	<u>ຂ້າງ</u>	exhalation	<u>ການຫ້າມໃຈອອກຈາກໃຫຍ່ປ່ອງ</u>
artery	<u>ເສັ້ນເລັງດ</u>	forearm	<u>ເຂັມ</u>
bone	<u>ກະດກ</u>	inhalation	<u>ການຫ້າມໃຈກຽງເປັນເຂົ້າໃຫຍ່ປ່ອງ</u>
bronchus	<u>ໂຈມອ້ຍທີ່ປ່ອງໃນປ່ອງ</u>	joint	<u>ບ່ອນຕໍ່ຂອງກະດກ</u>
capillary	<u>ເສັ້ນເລັງດຢ່ອຍ</u>	lymph	<u>ນໍ້າເລັງດສີເທສອງແລະນໍ້າຄຸ້ມດຂາວ</u>
cartilage	<u>ນໍ້າຄຸ້ມອ້ຍທີ່ປ່ອງໃຫຍ່ປ່ອງ</u>	marrow	<u>ເຄື່ອງປ້ອງໃນຂອງກະດກໃນ</u>
circulation	<u>ການໄຫຼມວຽນ</u>	nerve	<u>ເສັ້ນປະສາດ</u>
connective tissue	<u>ໂພງສຽງຕໍ່ທັງແລະກະດກ</u>	plasma	<u>ນໍ້າສີເທສອງຂອງເລັງດ</u>
contraction	<u>ການສັ່ນຍາ</u>	pulse	<u>ສຽງເຕັມຂອງເສັ້ນເລັງດ</u>
diaphragm	<u>ຊຸມທີ່ປະກອບໃຫຍ່ປ່ອງແລະທັງ</u>	relation	<u>ການຄູ່ຕໍ່</u>



respiration	<u>ການທັນໃຈ</u>	valve	<u>ຮີລມລບ</u>
skull or cranium	<u>ກະດູກຫົວ</u>	vein	<u>ຜູ້ເສັ້ນເລັງດາກ</u>
spinal cord	<u>ກະດູກສັນຫລັງ</u>	ventricle	<u>ຫ້ອງໃຈ</u>
tendon	<u>ເສັ້ນເຈັມ</u>	vertebra	<u>ກະດູກສັນຫລັງ</u>
UNIT VII			
absorption	<u>ການຊຶມ - ອຸດ</u>	liver	<u>ຕານ</u>
anus	<u>ຮີ້ - ຫະວາມ</u>	minerals	<u>ແຮ່ທາດ</u>
assimilation	<u>ການອຸບທານ</u>	rectum	<u>ຮີ້ສຸດ</u>
bile	<u>ບີ</u>	response	<u>ຕອບສະໜອງ - ຮັບສັ່ງ</u>
capillary	<u>ການເຕັມຂອງເລັງ</u>	response organ	<u>ອະໄວຍະວະ ຮັບສັ່ງ</u>
coordination	<u>ລະບົບຂອງການຈັດພັນ</u>	saliva	<u>ນ້ຳລາຍ</u>
digestion	<u>ການລະລາຍອາຫານ</u>	salivary gland	<u>ຕ່ອງພນ້ຳລາຍ</u>
impulses	<u>ໄຟຟ້າທັນໃຈ</u>	stomach	<u>ພຸງ</u>
intestine	<u>ຮີ້</u>	urine	<u>ພິກທາຍຸ່ວ - ຍຸ່ວ</u>
involuntary	<u>ການແຍກຕົວຈິງ</u>	villi	<u>ລະບົບຍິ່ງອາຫານ</u>
kidneys	<u>ເລກໄຂ້ຫລັງ</u>	voluntary	<u>ການເລັ່ງສິ່ງ</u>

UPPER TWO

Unit I

absorption	<u>ການເອົາໄຂ້</u>	evaporation	<u>ການກາຍເປັນອາຍ</u>
bark	<u>ເປື່ອງກໄມ້</u>	fertile	<u>ລົມບຸນ</u>
capillarity	<u>ສະພາບເສັ້ນເລັງດາກ</u>	function	<u>ທຳນາຍ</u>
cell division	<u>ລວມກຸ່ມຂອງອາກມັດ</u>	gravity	<u>ທຳລາຍຂໍ້ກາມ</u>
cell membrane	<u>ເປື່ອງອາກມັດ</u>	guard cells	<u>ອາກມັດຢ່າກາມ</u>
cell wall	<u>ຝາອາກມັດ</u>	minerals	<u>ໄຂ້ທະທາດ</u>
circulation	<u>ການເໝາະກຸ່ມ</u>	pistil	<u>ເກສອນດອດໄມ້</u>
differences	<u>ຄວາມແຕກຕ່າງ</u>	pith	<u>ຝັງສຳຢື່ໃຫຍ່ກຸ່ມດອດໄມ້</u>
diffusion	<u>ການຂ່າຍກຸ່ມ</u>	pollen	<u>ເກສອນດອດໄມ້</u>
egg	<u>ໄຂ້</u>	reproduction	<u>ການລຸບພັນ</u>



respiration	<u>ການຫັມໃຈ</u>	starch	<u>ແປງສຳຫລັບລົງເຄື່ອງມື</u>
response	<u>ຕອບສະໜອງ</u>	stigma	<u>ເຄື່ອງໝາຍ</u>
root hairs	<u>ຂົນຮາກໄມ້</u>	structure	<u>ຮູບຮ່າງ</u>
		style	<u>ແຂບ</u>
UNIT II			
diffusion	<u>ການຂາຍອອກ</u>	inversely	<u>ທິປຽມທາລົງ</u>
focal	<u>ຈຸດສູນກາງແສງ</u>	objective lens	<u>ແວມທີ່ແສງສົ່ງຂອງ</u>
frequency	<u>ຄວາມຄື</u>	opaque	<u>ສອງບໍ່ຊຸດ</u>
incidence	<u>ເທັດກາມ</u>	perpendicular	<u>ເປັ້ນເລັມຕັ້ງ</u>
intensity	<u>ຄວາມກ້າຫລາຍ</u>	transparent	<u>ລ່ອງຊຸດ</u>
intersect	<u>ຕາມກາງກາງ</u>	virtual image	<u>ຮູບເທົ່າກັບຈິງ</u>
UNIT III			
acoustics	<u>ວິຊາກ່ຽວກັບສຽງ</u>	pitch	<u>ຮະດັບສຽງ</u>
amplify	<u>ຂາຍໃຫ້ໃຫຍ່</u>	quality	<u>ຄຸນນະພາບ</u>
compression	<u>ຄວາມກົດດັນຂອງອາກາດ</u>	receiver	<u>ເຄື່ອງຮັບ</u>
crest	<u>ຍຸງ</u>	receptor	<u>ຄວາມກົດຮັບ</u>
frequency	<u>ຄວາມຄື</u>	reflection	<u>ການສະທຽມກັບ</u>
intensity	<u>ຄວາມກ້າຫລາຍ</u>	transmitter	<u>ເຄື່ອງສົ່ງທະຍ</u>
longitudinal waves	<u>ຄຳວ່າທະຍທາດຕັ້ງທາງຍາວ</u>	vibrations	<u>ການສະເທຽມ</u>
loudness	<u>ກາມຄື</u>	wave lengths	<u>ທາງຍາວຂອງຄຳວ່າທະຍ</u>
overtones	<u>ສຳສຽງຍັງແລະສຳ</u>		
UNIT IV			
bevel gears	<u>ເກັຽດີຈັກມີຂວາມບໍ່ຕັກມໄປ</u>	fulcrum	<u>ຈຸດໝາວໄມ້ທີ່ເທລັງກັດ</u>
clutches	<u>ຕັກສຽງ</u>	gears	<u>ເກັຽດີ</u>
effective force	<u>ກຳລັງງານສາມາດ</u>	gravity	<u>ຄວາມຄວາງດີ</u>
efficiency	<u>ຄວາມສາມາດ</u>	inclined plane	<u>ກັບໄມ້</u>
energy	<u>ພະລັງງານ</u>	levers	<u>ໄມ້ທີ່ເທລັງກັດ</u>
friction	<u>ຄວາມອັບຮົມ</u>	lubricants	<u>ເຄື່ອງມຸມຳມາມັມ</u>



machines	<u>ເຄື່ອງຈັກ</u>	spur gears	<u>ເກົ້າຮັບແລະໄປໄວ</u>
mass	<u>ກອງໄຫຍ</u>	transfer	<u>ຍ້ອຍຢູ່ມຮັດເມ</u>
potential	<u>ແຮງໄຟ</u>	translatory	<u>ທ່ຽງມຸມໄວ</u>
power	<u>ແຮງ</u>	transmit	<u>ສົ່ງໄປ</u>
pulley	<u>ເຄື່ອງຮັດຈັງ</u>	wedges	<u>ຫລັມ</u>
resistance	<u>ຕໍ່ຕ້ານ</u>	wheel and axle	<u>ກົງຮັດແລະແກມຫລັມ</u>
right triangle	<u>ຮູບສາມຫລ່ຽມ</u>	work input	<u>ແຮງແລະພະລັງງານທີ່ໃຊ້ໃຫຍ່</u>
screw	<u>ຕະປຸ່ງ</u>	work output	<u>ຜົນຜັດພົມ</u>

UNIT V

alternating current	<u>ແຮງໄຟທີ່ສັບຢູ່ມຸມໄວ</u>	generator	<u>ເຄື່ອງຮັດພະລັງໄຟ</u>
conductor	<u>ເຄື່ອງທີ່ຮັດໄຟໄປ</u>	magnetic field	<u>ບ່ອນທີ່ມີການໄວ້ມຕາຍຂອງກອງ</u>
direct current	<u>ແຮງໄຟທີ່ໄປຮັດກົງ</u>	positive charge	<u>ຄວາມບໍ່ສົບຢູ່ໄດ້ດຽວກັນ</u>
electric current	<u>ແຮງໄຟທີ່ໄປຮັດ</u>	primary coil	<u>ກົງເບື້ອງຕົ້ນ</u>
electric motor	<u>ເຄື່ອງຈັກທີ່ໃຊ້ໄຟຮັດ</u>	resistance	<u>ຕໍ່ຕ້ານ</u>
electron	<u>ອີເລັກຕຣອນ</u>	secondary coil	<u>ກົງຫລັງ</u>
electronics	<u>ການຮຽນກ່ຽວກັບອີເລັກຕຣອນ</u>	simple cell	<u>ຄວາມດີທີ່ມີມະດາ</u>
fuse	<u>ບ່ອນທີ່ໃຊ້ລະເບີດ</u>	storage cell	<u>ຄວາມດີທີ່ເກັບໄວ້</u>
		transformer	<u>ເຄື່ອງຢູ່ມຸມສະພາບ</u>

UNIT VI

condense	<u>ເຮັດໃຫ້ຂັ້ນ</u>	isotope	<u>ອາຕົມລວມເລີຫລາຍກວ່າ ໑ (ເກມ)</u>
ejection	<u>ຄວາມຂ້າງອອກ</u>	luminous	<u>ທ່ຽງແຈ້ງ</u>
electron	<u>ອີເລັກຕຣອນ</u>	moderator	<u>ເຄື່ອງທີ່ຮັດເວັມຂັ້ນ</u>
emit	<u>ສົ່ງອອກ</u>	radiation	<u>ຄວາມຮັ່ງແສງ</u>
fission	<u>ຄວາມແຕກແຍກເປັນສ່ວນ</u>	saturated	<u>ເຊັ່ນທີ່ເປັນຮູບ</u>
fusion	<u>ຄວາມເຮັດເປັນມຸ້ງທີ່ສັບຢູ່</u>	subsequent	<u>ທ່ຽງຕໍ່ຕ້ານມາ</u>
ionizing	<u>ຢູ່ມຸມເຮັດລັກ</u>	vacuum	<u>ຄວາມວ່າງເປົ່າ</u>



UNIT VII

comets	<u>ດາວຫຍິບ</u>	planet	<u>ດາວພັນ: ດາວ</u>
eclipse	<u>ວາລະຄວາມສຸກ/ວາລະຄວາມມຸ້ງ</u>	reentry	<u>ການກັບຄືນສູ່ບັນຍາກາດ</u>
ellipse	<u>ຮາບມາດ</u>	relativity	<u>ພຶດຕະສາດສະໄໝໃໝ່</u>
galaxy	<u>ກຸ່ມດາວ</u>	satellite	<u>ດາວທຽມ</u>
interplanetary	<u>ລະຫວ່າງດາວ</u>	solar flares	<u>ແສງສະຫວ່າງດາວ</u>
law	<u>ກົດເກນ</u>	technology	<u>ທັກນິກ (ປຸງ)</u>
meridian	<u>ເສັ້ນສຳລັບເວລາ</u>	theory	<u>ທິດສະດີ</u>
orbit	<u>ວົງກວມ</u>	weightlessness	<u>ສະພາບໜ້າໜ້າ</u>

PROBABLY KNOWN*

air conditioner
airplane
angle

balloon
basketball
boat
boiling

can opener
car
cart
crocodile

deer
drum

electric fan
electricity
eyeball

firm
fog
form

gallon
gasoline

PROBABLY UNKNOWN*

antibiotic
aquarium
astronomy
atom
atomic plant

bacteria
battery
binocular
brass

cactus
camel
carbon dioxide
conservation
copper
crayfish

diffuse
dinosaur
dissolve
doorknob

eagle
elevator
energy
engine
engineer
environment
estimate
experiment
expose
extinguisher

float
flood
focus
fossil
formula
freeze
furnace

gas
geography
germinate
giraffe
glacier
globe
gravity
gulf

*This is an estimate of a child's familiarity with certain words used in the Curriculum Guide for Science. It is included to assist the teacher in assessing a child's background in science.

KNOWN

hammer
heart

ice
ice skates
iron

kilogram
kilometer
kite

ladder
lemon

magazine
marble
metal
meter
mosquito

noise
nylon

oil
onion

pain
powder

UNKNOWN

hail
hailstorm
heat
helicopter
horizon
hurricane

insecticide
interaction
isolation

joints

kidney

label
laboratory
latitude
lawn mower
light bulb
liquid

machine
magnet
measure
mechanic
medicine
microscope
molecular
moss
muscle

negative

ocean
octopus
odor
ounce
oxygen
oyster

palm
panda
pendulum
penguin
planetarium

KNOWN

rabbit
radio
roof

sand
science
sea
sidewalk
skeleton
slide
slideway
snake
soda
stoplight

telephone
television

wagon
water buffalo
weather
wheel
wing

zoo

UNKNOWN

pliers
pound
positive
pressure

ramp
ray
refrigerator
reverse
revolve
roller skates

sandpaper
satellite
scissor
scowl
seesaw
shovel
shrimp
sled
sleet
solution
space trips
sponge
stream
survey
switch

telescope
thermometer
tides
tissue
tornado
toxin
transfusion
transparent
triangle

urine

vaccine
vain
valve

wax
wheelbarrow
wire
wrench

x-ray

zebra
zoologist

INDEPENDENT LEARNING ACTIVITIES: PRIMARY

Note: Classroom teachers may reproduce pages from the independent learning activity section of this guide in quantities sufficient for use with their own pupils in the Chicago public schools.

Name _____

TEMPERATURE

Draw a line from the word in the first row to the word in the second row that belongs with it.

temperature ກວມພູນຸມ

silver ສີມັກເງິນ

mercury ມາໂທທລອດ

get bigger ປ່ຽນໃຫຍ່ກວ່າ

expand ຮວມຂຶ້ນ

thermometer ທາທລອດ

sun ຫາວັນ

round ມົມ

32° C ລາມສີບລອງສ່ວນໜ້ອຍ

cold ຫນາວ

winter ຮະດູຫຼາດ

degrees ອົງສາ

contract ຫົດເຂົ້າ

get smaller ປ່ຽນໜ້ອຍຂາດ

wind ລົມ

blows ເປົ່າ

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Name _____

PICTURE DICTIONARY



lever ^{ᠠᠨᠠᠨᠠᠨᠠ}



scale ^{ᠰᠠᠯᠠ}



wheel and axle ^{ᠠᠨᠠᠨᠠᠨᠠ}



lift ^{ᠯᠢᠫᠲᠤ}



ramp ^{ᠷᠠᠮᠠ}



wheelbarrow ^{ᠠᠨᠠᠨᠠᠨᠠ}



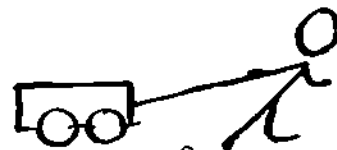
inclined plane ^{ᠠᠨᠠᠨᠠᠨᠠ}



wrench ^{ᠠᠨᠠᠨᠠᠨᠠ}



pulley ^{ᠠᠨᠠᠨᠠᠨᠠ}



pull ^{ᠠᠨᠠᠨᠠᠨᠠ}



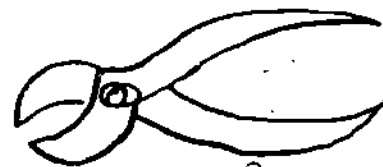
ladder ^{ᠠᠨᠠᠨᠠᠨᠠ}



cart ^{ᠠᠨᠠᠨᠠᠨᠠ}



hammer ^{ᠠᠨᠠᠨᠠᠨᠠ}



pliers ^{ᠠᠨᠠᠨᠠᠨᠠ}

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Name _____

FRICTION

Draw a line under the names of objects that are rough.

paper (၂)

sandpaper ကတုဂုယ

sidewalk ဟုဂုဂု

brick ဝံမံ

rocks ကံမတံ

pencil ဝံဂံ

painted wall မံ

wood လံ

glass မံ

cement steps ဝံမံဂုမံ

top of your desk
မံဂုဂု

trunk of a tree ဝံဂံ

Write the names of four things that are smooth.



Name _____

PICTURE DICTIONARY



rub ^ร _?



oil ^๑ ^๒ _{น้ำมัน}



sandpaper _{กระดาษทราย}



heavy box _{กล่องหนัก}



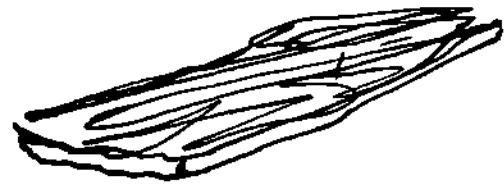
rollers ^๑ _{ลูกกลิ้ง}



marbles ^๑ ^๒ _{ลูกแก้ว}



cotton _{ฝ้าย}



rough wood _{ไม้หยาบ}

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Present the new words.
 Use words or phrases in illustrating new vocabulary.
 Samples of cotton, sandpaper, oil, and wood would be useful.

SCIENCE ACTIVITIES (STUDY QUESTIONS): INTERMEDIATE, UPPER

Note: Classroom teachers may reproduce pages from the Science Activities by Jean R. Spletzer in quantities sufficient for use with their own pupils in the Chicago public schools.

Study Questions

Insects and Spiders

- ແມງໝາຍຄວາມວ່າແມງຫຍັງ
- ແມ່ນຫຍັງນັ້ນແມງມຸມ ?
- ແມງໂຕນຶ່ງມີຂາຈັກຄູ່ ແມງມຸມມີຫລາຍປາມໃດ
- ແມງໂຕນຶ່ງມີຕີມຕົວເປັນສ່ວນແບ່ງຫລາຍປາມໃດ ແມງມຸມມີຫລາຍປາມໃດ
- ໃຫ້ສື່ເທົ່ວດີມວ່າເປັນຫຍັງແມງແຈແມ່ນຜູ້ຮັບກວມ
- ແມງຊ່ວຍເຫລືອມະນຸດຊາດເຮັດຢ່າງໃດ
- ຢູ່ໃສພວກເຮົາຈຶ່ງໄດ້ເຫັນແມງ ?
- ແມງແລະແມງມຸມທັນໃຈເປັນຢ່າງໃດ
- ແມງມຸມເລັ່ນໄຍເປັນຢ່າງໃດ
- ແມງແລະແມງມຸມກິນຫຍັງ
- ຊຸມຊົນສິ່ງຂອງແມງ ແລະແມງມຸມ
- ຈັດຈັດທາງຫລາຍທີ່ພວກເຮົາຄວນຄຸມແມງແລະແມງມຸມ ?

Plants

- ເຮັດຢ່າງໃດທີ່ມັນໄມ້ທາງເໜືອປາກເກີດໄມ້ຈະດີປະໂຫຍດເປັນສູງ ?
- ເປັນຫຍັງທີ່ມັນໄມ້ຊາວເຫມືອເປັນຄວາມສຳຄັນ ?
- ຊຸມຊົນທາງລາມຂອງທີ່ມັນໄມ້ທີ່ເປັນໃຫ້ອາຫານພວກເຮົາຕ້ອງກາຍປາກ ?
- ສະແດງຄວາມນ້ຳໄຍມາ ?
- ສະແດງຄວາມໄຍມາຂອງໂລຫະທາດ
- ມາຈາກແມ່ເຫຼັກ ກຸ້ມສອງເຄື່ອງທີ່ຕິດຕໍ່ເກສອນດອກໄມ້ ຊຸມຊົນຂອງສອງເຄື່ອງນັ້ນ ?
- ເຮັດຫຍັງທີ່ມັນກໍ່ໄມ້ປະໂຫຍດ
- ທີ່ມັນຫຍັງທີ່ພວກເຮົາກໍ່ໄມ້ ?
- ເປັນຫຍັງພວກເຮົາກໍ່ຮູ້ຈັກທີ່ມັນໄມ້ເຊິ່ງປາມໃດ ?
- ຄວາມແຕກຕ່າງຮະຫວ່າງທີ່ມັນໄມ້ແຕກໃບແລະທີ່ມັນໄມ້ໃບຂຽວທັງປີແມ່ນຫຍັງ ?

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Weather

- ບັນຍາກາດແມ່ນຫຍັງ ?
- ຊຸມນຸມສູນກາງຂອງເຜິ້ງທີ່ພວກເຮົາເຫັນຕາມປັດກະຕິ?
- ເຄື່ອງແທກຄວາມໄວຂອງລົມເອີ້ນວ່າຫຍັງ ?
- ລົມລຽບ ລົມບ້ຳພູ ແລະລົມທີ່ມີຜົມ ແລະສຽງຟ້າຮຽງມາມາກັບ ແມ່ນຫຍັງ ?
- ອະທິບາຍຄວາມໝາຍໄບມາ ?
- ໃຫ້ຊື່ຂອງອາກາດທີ່ພວກເຮົາມີຢູ່ (h. 1062 (ລື່ອງມິດ))
- ເປັນຫຍັງກໍ່ຝົນຕົກ ? ຫລືທີ່ມະຕົກ?
- ນັກອາກາດເຮັດການຫຍັງ ?
- ຊຸມນຸມເຄື່ອງທີ່ພວກເຮົາຮູ້ຈັກວ່າອາກາດ
- ຄວາມແຕກຕ່າງຂອງນ້ຳໝອກ ແລະ ບົວມິດແມ່ນຫຍັງ ?

Airplanes

- ເຮືອບິນທີ່ມີປັກມັງແມ່ນຫຍັງ ?
- ເຮືອບິນທີ່ມີປັກສອງອັນ ?
- ໃຫ້ຊື່ຂອງທັກສະວ່າສຳຄັນຂອງເຮືອບິນ ?
- ແມ່ນສິ່ງກໍ່ລົງຫຍັງທີ່ເຮັດເຮືອບິນຂົນໄດ້ ?
- ຄວາມຄຸ່ງຄົງໝາຍຄວາມວ່າຫຍັງ ?
- ໃຫ້ທັກເທັດຜົມວ່າເປັນຫຍັງຍົມເຮັດກັບແຕ່ເປັນການຊ່ວຍເຫລືອໄດ້ ?
- ເວລາໃດເຮືອບິນກໍ່ບິກແທ້ ?
- ເປັນຫຍັງນັກບິນກໍ່ວ່າຜູ້ຄວບຄຸມງານຢູ່ໃນທ່ອງຍເປັນການສຳຄັນຂອງລາວເອງ ?
- ຄວາມແຕກຕ່າງຂອງເຮືອບິນທີ່ມີຮີດຈັກ ແລະ ບໍ່ມີໂອພິມ ?
- ເປັນຫຍັງຄວາມປອດໄພຂອງເຮືອບິນກໍ່ສຳຄັນ ?

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Birds

ຂຽນຊື່ສອງຊະນິດຂອງຂົນມົກ

ໃຫ້ສອງຕົວຢ່າງທີ່ແປຄວາມດັດແປງຂອງມົກ

ມົກເກີດລູກເປັນຢ່າງໃດ ?

ມົກກັ່ມລູກຈາກຈັນຕະຈາຍເປັນຢ່າງໃດ ?

ຄວາມຍ່າຍອອກຂອງມົກໝາຍຄວາມວ່າແມ່ນຫຍັງ ?

ໃຫ້ຊື່ຫລາຍທາງທີ່ມົກໃຊ້ຢ່າກເອງເຮັດຢ່າງ

ເປັນຢ່າງໃດມົກກໍໄດ້ອາໄສຢູ່ອາກາດອຸ່ມ ແລະ ໝາກທັງສອງ ?

ເປັນຢ່າງໃດມົກແພນຄວິມຈະແຕກຕ່າງມົກອື່ນ ?

ເປັນຫຍັງມົກແຕກຕ່າງຈາກມົກອື່ນມີຕີມແຕກຕ່າງແລ້ວ ? ທີ່ລືມີຢ່າກແຕກຕ່າງ ?

ເປັນຫຍັງມົກກະຈາວກໍເຫດບໍ່ມີຄວາມສາມາດບິນ ?

Astronomy

ແຕ່ງຄວາມໝາຍຈາກ ບົກ ແລະ ບຸກ

ເບິ່ງເດີມທາງບໍ່ເນີນ ແລະ ບໍ່ເນີນ

ຂຽນຄວາມໄກຂອງແຜ່ນດິນຈາກຕາເວັນ

ຂຽນຊື່ຂອງດາວໂລກເກົ່າມັກ

ຂຽນຄວາມໄກຂອງແຜ່ນດິນໄປຖິ້ງດວງພຣະຈັນ

ເປັນຫຍັງຕາເວັນເຈັມວ່າດາວ ?

ຄວາມແຕກຕ່າງຂອງດາວລເດັດ ແລະ ມີທໍ່ເລາະແມ່ນຫຍັງ ?

ເປັນຫຍັງພຣະຈັນມີຮູບສວມແຕກຕ່າງ ?

ຂຽນສີເທັດຜົມວ່າເປັນຫຍັງບໍ່ມີຊື່ຈັດຢູ່ໃນ ພຣະຈັນ

ເປັນຫຍັງດາວກໍຄືກັມທັງໝົດ ?

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Geology

- ແມ່ນຫຍັງເຮັດນ້ຳຢືນຢັນຢູ່ແຜ່ນດິນ ?
- ເມັດແມ່ນຢູ່ແຜ່ນດິນແປງຫຍັງ ? ແຜ່ນດິນໄດ້ຢືນຢັນໃດ ?
- ແມ່ນ້ຳຢືນຢັນເຮັດທາງໂທລຂອງມັນໄດ້ຢືນຢັນໃດ ?
- ແມ່ນຫຍັງແມ່ນກວມທີ່ມີປາຍ ?
- ດິນກວມ ເປັນກວມທີ່ມີໄດ້ຢືນຢັນໃດ ?
- ແມ່ນຫຍັງເປັນຕົ້ນເທດຂອງແຜ່ນດິນໄທວ ? ພວກເຮົາແທກແຜ່ນດິນໄທວໄດ້ຢືນຢັນໃດ ?
- ນ້ຳຫຍັງພູເຂົາໄຟຈຶ່ງປະກອບຂຶ້ນໄດ້ ? ລາຝະໂພຍຄວາມວ່າແມ່ນຫຍັງ ?
- ຊຸມຊົນຂອງກວມທີ່ມີລາມຢືນຢັນທີ່ເປັນຈາກລາຝະເປັນ .
- ກວມທີ່ຍາຍຄວາມແຕກຕ່າງທຸກຊຸມກວມທີ່ມີລາມຢືນຢັນ
- ມີເຊິ່ງຫຍັງຈະເກີດຂຶ້ນໃນເວລາເປືອກແຜ່ນດິນເພັງໄວເພັງຊ້າ ຫລືລາຝະທອງກວມ ?

Chemistry

- ນັກເຄມີຊຸກເຄື່ອງປະກອບສຳຫລັບຂອງກວມຢືນຢັນໃດ ?
- ຄວາມແຕກຕ່າງຂອງເຄື່ອງປະກອບທຸກແລະເຄື່ອງປະກອບທັມມະຊາດແມ່ນຫຍັງ ?
- ຊຸມຊົນສາມລະພາບຂອງວັດຖຸ
- ວັດຖຸໝາຍຄວາມວ່າແມ່ນຫຍັງ ?
- ເປັນຢືນຢັນໃດອາດມີແຕກຕ່າງຈາກນ້ຳລືອວ ?
- ມີອາການປ່ຽນແປງຂອງວິທະຍາສາດຫຍັງ ຈາກເກີດຂຶ້ນຢູ່ໃນສາມລະພາບຂອງວັດຖຸ ?
- ສາມປະກອບໝາຍຄວາມວ່າແມ່ນຫຍັງ ?
- ເປັນຢືນຢັນໃດນັກເຄມີກໍ່ຫົດລອງໄດ້ເງິນທີ່ມີໃຊ້ໃດເຈັມ ?
- ສາມການປ່ຽນແປງຂອງເຄມີແມ່ນຫຍັງ ?
- ເປັນຫຍັງນັກເຄມີກໍ່ຕັ້ງຊື່ເປັນວັດຖຸສຳ ?

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Oceanography

- ຮຽນແບບເລື່ອນພາຍດວງມວນນ້ຳ
- ຂຽນຊື່ຂອງວິທະຍາສາດທີ່ມັກວິທະຍາສາດໃຊ້ມາຄົ້ນຄວ້າຂອງມະຫາສະໝຸດ
- ຂຽນຊື່ຂອງໂລຫະທາງທ້າຍໃໝ່ທີ່ເຫັນຢູ່ໃນມະຫາສະໝຸດ
- ຄວາມແຕ່ກຕາງຂອງຢູແຟນເທີມ ແລະ ຟິທ໌ແຟນເທີມແມ່ນຫຍັງ ?
- ຂາດໂປຣັດຕຸທັງຈະເຮັດໃຫ້ມະຫາສະໝຸດຟັມກຸ່ວດິນຊາຍ ?
- ເຮັດຢ່າງໃດມັກວິທະຍາສາດກໍລວບລວມໄດ້ຄຳຊີ້ແຈງຂອງສາມນ້ຳ ?
- ເຮັດຢ່າງໃດມັກວິທະຍາສາດກໍລວບລວມຕົວຢ່າງຂອງດິນຢູ່ໃຕ້ມະຫາສະໝຸດ ?
- ເຮັດຢ່າງໃດມັກວິທະຍາສາດກໍຮູ້ວ່າມະຫາສະໝຸດເລິກປານໃດ ?
- ໄຕ່ຂອງມະຫາສະໝຸດຄືກັບຫຍັງ ອະທິບາຍ ?
- ເຮັດຢ່າງໃດທາງເຕັກນິກເຮັດສາມະຫາສະໝຸດແລະຊີວິດຢູ່ໃຫ້ ?

Engineering

- ເປັນຫຍັງມັກວິຊາອື່ນຈະກວມຈັກຄວ້າມັກວິທະຍາສາດພິເສດ ?
- ແມ່ນຫຍັງເປັນທີ່ຈຸດປະສົງຂອງຂົວ ?
- ເປັນຫຍັງຂົວຢູ່ທາງດິນຈື່ນເປັນທາງຄວາມແລະມີປະໂຫຍດ ?
- ໃຫ້ຊື່ຂອງຂົວກຶ່ງຍາວທີ່ສຸດຢູ່ໃນອະເມຣິກາ
- ຄວາມແຕ່ກຕາງຂອງຂົວກຶ່ງ ແລະ ກົວຢູ່ດິນຈື່ນແມ່ນຫຍັງ ?
- ຂົວສັດສິເພັນຊິນແມ່ນຫຍັງ ?
- ໃຫ້ຊື່ຂົວທີ່ມີທ່ອງຍູ່ສອງທາງຂອງອະເມຣິກາ
- ຄວາມແຕ່ກຕາງຂອງຂົວແຂວມໄວ້ ແລະ ຂົວກຶ່ງແມ່ນຫຍັງ
- ແມ່ນຫຍັງຊື່ວ່າຂົວສພາມ? ຢູ່ບ່ອນໃດເຈົ້າຈະໄດ້ເຫັນຕາມທັມມະດາ ?
- ຂຽນຊື່ຂອງຂົວທາງທ້າຍໃໝ່

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Human Body

ການສຳຄັນລຳດັບຂອງເຈັບໂລເຊີເຊີລີ ຊຸດຮເທິມແມ່ນຢ່າງ ?

ເປັນຫຍັງເຈັບໂລເຊີເຊີລີ ຊຸດຮເທິມຈຶ່ງວ່າເປັນພູມວຽນ ?

ສາຍຮະໄວຍະວະສຳຄັນຂອງເຈັບໂລເຊີເຊີລີ ຊຸດຮເທິມແມ່ນຢ່າງ ?

ນະທິຍາຍການເລັ່ມປະສາດຂອງປະຊາຊົນ.

ຈະທິຍາຍການກັ່ມໃຈ ຈຸ ເປຊາຊົນ.

ຂຽນຊື່ສອງການທົບທວນໃລ້ບເອີ້ນ.

ແບ່ງມູນລວມທັງເປັນຊັ້ນຂອງວິມຊາຍ ?

ນອກຈາກເລັ່ມປະສາດ ທີ່ລື ແລະ ມີລຸສຸ ຍັງມີຫຍັງຮ່ວມຢູ່ໃນການເລັ່ມປະສາດຂອງປະຊາຊົນ ?

ບອກຄວາມແຕ່ກ່າງຮະທວ່າງເລັ່ມເລືອດ ແທວມສ ອະເຊີລີ ແລະ ແຂບເບີເລີສ

ຫົວໃຈ ແລະ ຢ່ອດຢູ່ຮ່າງກາຍຂອງຄົນບ່ອນໃດ ?

Human Body

ເປັນຫຍັງຮ່າງກາຍຂອງຄົນຄວນເຮັດວຽກ ? ໃຫ້ສອງເຫດຜົນ.

ຢູ່ບ່ອນໃດຂອງໃນໂຕເຮົາຈຶ່ງໄດ້ເຫັນກະດູກສັນຫລັງ ?

ແມ່ນຜາດສ່ວນໃດຂອງຮ່າງກາຍເຮົາເປັນຄືວ່າໝວກເຫລັກ ?

ຮ່າງກາຍຂອງຄົນ ທີ່ກັ່ມກັບ ຮ່າງກາຍຂອງ

ພວກເຮົາມີທ່າຮ່າງກາຍຂອງບ່ອນຕັ້ງໃນໂຕ. ຂຽນຊື່ໃຫ້

ຄູກມິດເລືອດມີອຸປະກອນທັງສາມຢ່າງເປັນສຳຄັນ ?

ຄູກມິດເລືອດເຮັດການຢູ່ບ່ອນໃດ ?

ແທມມັກລໍເບີມີ ແລະ ພລຣາມະໝາຍຄວາມວ່າຫຍັງ ?

ຄູກມິດເລືອດສີແດງເຮັດ ການທັງຢູ່ໃນໂຕເຮົາ ?

ຄູກມິດເລືອດສີຂາວເຮັດການທັງຢູ່ໃນໂຕເຮົາ ?

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Sounds

ເສັດທຍັງໃດຈຶ່ງມີສຽງ ?

ຄວາມແຕ່ກຕາງຂອງທ່ວ່າງ ວຽນເລີມ ແລະ ແອມເບີທິວ ແມ່ນທຍັງ ?

ເຮົາ ແທກສຽງໄດ້ຢ່າງໃດ ?

ຂຽມຈຸ້ສັມພວກຂອງ ເຄື່ອງດົມຕົວ ?

ເກັມທຍັງລັງສຽງໄດ້ດີມ ແລະ ລຽງຈີ່ມບໍ່ໄດ້ດີມ ?

ເຮັດຢ່າງໃດ ເຮົາຈຶ່ງໄດ້ທອ້ມສຽງ ເຮົາໄວ້ຈະມາຄົດໃຈ ?

ການສະເທິງມພາຍຄວາມວ່າແມ່ນທຍັງ ?

ແມ່ນສຳການສັມສະເທິງມໃດ ທີ່ຊ່ວຍເຮົາຍິ່ມສຽງ ?

ຈະທິບາຍຄວາມແຕ່ກຕາງຂອງທ່ວ່າງ ເຄື່ອງສຽງຕີ ເຄື່ອງສຽງສາຍ ແລະ ເຄື່ອງສຽງລືມ

ສູນທິກວິທີຂອງສຽງຈຶ່ງໄປໄດ້ ?

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LIVING THINGS, UNIVERSE, BEHAVIOR OF MATTER AND ENERGY

(INFORMATION FOR THE TEACHER AND SUGGESTED ACTIVITIES): KINDERGARTEN-UPPER TWO

LIVING THINGS

PLANTS

Bamboo Grass

Bamboo grows from new shoots that sprout from the base of the mature plant. Bamboo is a giant grass, growing to a height of 36 m (120 ft.) with stems 30 cm (1 ft.) in diameter. Stalks are short, unlike the leaves of other grasses. Bamboo grows naturally in tropical and subtropical climates.

Bamboo is used to make many things:

- furniture
- walls of houses (woven bamboo)
- doors
- curtains
- containers from which to eat.

Young bamboo sprouts are eaten as a vegetable.

Intermediate One

Ask pupils to locate pictures of bamboo and small bamboo. Discuss the pictures and the differences between the two plants.

Ask pupils to draw pictures of the parts of the plant used to make other items, to draw the item made, and to explain the use of the item.

Banana Tree

The banana plant usually has from eight to ten leaves. Each may be 3 m (10 ft.) long and about 60 cm (2 ft.) wide. More than 30 varieties of the banana grow in Laos.

The parts of the banana tree are used in many ways:

- to make roofs for houses
- to make papers
- to make woven baskets
- to make mats.

Bananas also are used to make banana oil which is used as flavoring.

Intermediate One

Using the "Banana Tree" in the Teaching Aids section of this guide, have the pupils make English-Lao flash cards for the parts of the plant to be used in a vocabulary game.

Ask pupils about kinds of bananas found in Laos. Have the pupils draw each banana and the plant on which it grows. Label the parts of the plant.

Ask a pupil to tell about weather in Laos and why the conic hat is important.

Bean Vine

Bean sprouts are commonly used in Laos.

Primary Three

Using the Teaching Aids section of this guide, let the pupils observe the picture labeled "Bean Sprouts Growing." Then have the children plant bean sprouts.

Soak green beans in water overnight. Spread them over one thick layer of moist, sandy soil or of sand. Cover the seeds with another layer of sand about 5-10 cm (2-4 in.) deep. Water them every four hours. Seeds will begin to sprout after two-three days.

Have a pupil tell how bean sprouts are prepared.

Betel Palm Tree

The betel nuts (areca nut), the seeds of the palms, are borne in clusters on the trunk of a palm tree. The nut, about the size of a small egg of a hen, is used in combination with the betel leaf (from the betel pepper) and red cardamom for chewing.

Intermediate One

Have pupils observe the pictures of the betel vine and the betel leaf in the Teaching Aids section of this guide. Ask pupils to describe the plant and its use.

Coconut Palm Tree

The coconut palm, one of the tallest, most graceful, and useful trees, is grown from seed and produces nuts for a long time (about 70 or 80 years). The green fruits (15 to 20) grow in clusters among the leaves and turn brown as they mature.

Other members of the same family are the areca palm and the date palm.

Intermediate One

Using the drawing of the "Coconut Palm" in the Teaching Aids section of this guide, ask each pupil to label the parts of the plant in Lao.

Let the pupils observe the pictures of the various parts of the coconut palm. Have them make English-Lao flash cards for a vocabulary game. (See Teaching Aids section.)

Ask pupils to tell about other products from the coconut tree (coconut milk, coconut oil, coconut meat). Have one pupil tell about each and the uses of each.

Coffee Tree

Beans are used to make coffee.

Jackfruit Tree

The jackfruit tree grows in the garden or near hills and mountains. A tree produces fruits up to 60 cm (2 ft.) long, weighing 18 kg (40 lb.) or more. The jackfruit's skin is rough and has many soft spines. Inside the fruit are many sections, each of which has one nut.

The smallest is twice the size of a canteloupe and the largest is larger than a large watermelon. The fruit grows individually on the tree. The skin has thorns like a rose bush. The skin is light gold; the meat, light green. The meat is in sections, each having a large, hard nut-like seed. Seeds can be roasted, broiled, or boiled. Fruit can be cooked and used before it is ripe or it can be eaten raw after it is ripe.

Primary Three

Using the drawing of the jackfruit in the Teaching Aids section of this guide, ask the pupils to describe the plant and how it grows.

Ask the pupils to find pictures of the jacknut. Draw the plant and label the spiny skin, the sections of the fruit, and the nut within each section.

PaDaYa Tree

Intermediate One

Using the Teaching Aids section of this guide, ask a pupil to describe the plant and the leaf.

Rice

Primary Three

Let the pupils observe the picture of the rice plant in the Teaching Aids section of this guide. Then let them draw a plant and label the various parts (head, leaves, stalk, root, and parts of the seed) in Lao and in English.

Ask a pupil to explain the various uses of rice, how it is prepared, and why it is an important crop in Laos.

Ask a pupil to explain the method of planting rice in Laos. Then have the pupil read about methods of planting rice in the United States. Compare the methods.

Ask a pupil to distinguish between a grain of rice and a kernel of rice.

Sugarcane

Sugarcanes are grown from cuttings from the plant's top. Under the sheathes are many buds. In each bud, there is a sprout. Cuttings are laid flat in furrows and then covered with chaff ashes. Buds in the stem become sprouts and rise above the ground. Sprouts grow into plants with sheathes wrapped around them.

Sugarcane is used in making sugar drinks and sugarcane juice. The sugar can be eaten raw.

Primary Three

Have pupils observe the picture of sugarcane in the Teaching Aids section of this guide. Label the parts in English. Tell some uses of sugarcane juice.

Watercress Herb

The plant grows in running water, in muddy fields, or in sandy creek bottoms. People eat the smooch, green leaves and long, slender stems as vegetables.

Primary Three

Have pupils label the parts of the watercress plant on the picture in the Teaching Aids section of this guide.

Other Plants

Averrhea Carambola--star-shaped and about 15 cm (6 in.) long. The skin is yellowish-green, and the fleshy part is white. Both the skin and the fleshy part are eaten.

Custard Apple--similar to a papaw and its fruit. It grows individually on trees. Shape oval. About the size of a cantaloupe. Fleshy part, white; skin, green; many large, black seeds. Just the meat is eaten.

Durian--a fruit which a distinctive odor. Size of a cantaloupe. Grows individually on trees. Just the fleshy part is eaten. Rind is hard and prickly. Composed of five sections with many woolly seeds in each section.

Longan--a fruit about 2.5 cm (1 in.) in diameter which grows in clusters. The skin is light brown; the flesh, white; and the seed, black. It is peeled like a banana.

Manioc (cassava)--a plant with a tuberous root. A source of starch. Boiled or used to make flour. Often mixed with rice.

Mangosteen--about 7.5 cm (3 in.) in diameter. The skin is brownish-purple; the inner thick layer, pink; and the edible part, white. Sections of the edible part resemble the sections of the orange.

Persicary--a smartweed which grows in clusters on a plant. Fruits are one-seeded like a lens-shaped egg and are almost 1/8 in. long. Leaves taste mint-like and slightly hot.

Rambutan--an oval-shaped fruit. Skin which is covered with soft spines or hairs is peeled off before eating. Meat is white. No seeds inside fruit. Grows in clusters on a tree.

Tamarind--the pod of a tree, containing seeds enclosed in a juicy acid pulp that is used in beverages and food.

Water Caltrop--a spined fruit of the water lily family. The fruit is the root of the plant which grows in the mud under the water. The skin of the fruit is light purple and the fleshy inside is white.

Primary Three

Ask a pupil to tell about the camachile tree, the kapok tree, the rain tree, and the guava tree.

Let the pupils draw pictures of their family garden in Laos and identify the plants.

Ask pupils to tell about some plants that make their own food and store it in different parts of the plant. The coconut, taro, sweet potato, onion, garlic, yam-bean, tapioca, galangal, galanga, and cactus store food. The melon, cucumber, dill, corn, and rice plants make seeds and store food in them.

Ask a pupil to tell about plants that cannot live during the dry season. Their roots, stems, and leaves wither and die, but they produce seeds. If their seeds are planted in the rainy season, they will grow again. These plants include corn, melon, cucumber, and dill.

Ask a pupil to tell about plants that grow only during the rainy season. The water lily, water hyacinth, wild bamboo, reed, and arundo stop growing in the dry season because rivers, swamps, and lakes dry up. They are still alive and begin to grow again during the rainy season.

Ask the pupils to tell about fruits that grow in Laos that are not grown in the States, such as the mangosteen, avertrea carambola, longan, and custard apple. Use the drawings in the Teaching Aids section of this guide.

Have pupils locate pictures of other plants found in Laos. Mount them on a bulletin board called "Plants of Laos."

Have pupils locate pictures of other plants found in Laos. Mount them on the bulletin board.

Related Topics

Farming and Agriculture

Primary Three

Ask a pupil to tell about the life of a farmer in one of the villages. Tell about the importance of farming and agriculture.

Plants as Food

Kindergarten, Primary Two-Three, Intermediate One-Two

Have a pupil tell about common foods: unripened papaya, coconut, tomato, beans, and water caltrop.

Have a pupil tell about common fruits that are popular: the orange, lemon, mango, papaya, pineapple, banana, pomegranate, watermelon, rambutan, water caltrop, longan, mangosteen, custard apple, and taro.

Uses of Plants and Plant Parts

cotton--for clothing

oak, maple, mulberry--for furniture and flooring

tobacco--for cigarettes

ANIMALS

I. MammalsMan

Health and Care of the Body

A plumbing system is not widely used. Metal basins are used as containers for washing hands, face, and clothes. Showers are taken by pouring water over the body.

People eat with a spoon or with their hands, using their hands to make a ball of rice which they eat as we eat a piece of bread. It is important to stress washing hands before meals and to warn children to keep dirty fingers away from eyes and ears.

Kindergarten

Have a pupil report on and demonstrate proper care of the ears.

Have a student explain why washing hands is important.

Have a pupil report on proper care of the eyes.

Senses

The following are common and familiar to the students and can be used to develop the concepts related to the senses:

touch--wood, rock, a cotton ball or cylinder of cotton, a balloon, marbles
 smell--hot pepper powder, lemon, banana, orange, coffee, peanut, bean sauce
 taste--cucumber, vinegar, salty plum, sugar or candy, coffee
 sight--family photographs
 hearing--a church or school bell, a policeman's whistle, a drum.

Kindergarten

Have a student name a sense in Lao. Other students must respond by pointing to the part of the body that provides this sense and saying the name of that part in English. Then have a student name the part of the body in Lao and have other students name the sense in English.

Systems of the Body

Primary Three, Upper One-Two

Using the drawings in the Teaching Aids section of this guide, have the pupils explain the functions of the various systems of the body.

Buffalo, Water

The water buffalo is a domestic animal, usually black, which feeds on grass and likes to bathe in a muddy pond. It is a hard-working animal used for pulling plows in the rice fields.

During the harvest season, farmers reap, thresh, and carry grains home with the help of a buffalo. Cattle are released during the day to eat hay, under the supervision of a buffalo-keeper.

The water buffalo provides a source of meat to most Laotians. Its manure is commonly used for fertilizer in family gardens or rice fields.

The horn of a buffalo is long and curled.

Primary One

Ask pupils to draw the horn of a buffalo and the horn of an ox.

Cat

Cats are not treated as pets. They are used to catch mice.

Cattle (cow, ox, bull)

Oxen are used to carry people and carts filled with goods.

The horn of an ox is short and curled.

Dog

Dogs are not treated as pets. They are trained to guard houses. Some Laotians do eat dogs.

Elephant

In the suburbs, elephants are trained to serve man. They transport people and goods. The king rides a white elephant.

Mouse

Black mice live in upper stories of a house or in trees. They carry germs and destroy things in houses.

Brown mice live within walls or in the ground. They are harmful to human beings and eat crops and destroy furniture.

White mice (sometimes brown in color) are much bigger than brown or black mice. They eat rice, fruit, and vegetables and are used for experiments.

Primary One

Ask pupils about the different kinds of mice in Laos. Tell in what ways they are helpful and in what ways they are harmful.

Pig

Pigs eat banana trees sliced and mixed with bran (the outer husks of rice grains separated from the flour by sifting) and cooked.

Related Topics

Covering of Animals

Cows, water buffaloes, and wild goats lose some body hair every January and February and regain it normally about May or June.

The covering of animals is used for the following purposes:

drums are made from skins of the cow, monkey, and water buffalo
pig, cow, and water buffalo skins are used as food.

Intermediate Three

Ask pupils to tell about adaptations of animals in Laos to their environment.

II. BirdsRooster, Hen

Roosters, hens, and chicks eat grains and corn and dig in the soil to find insects to eat. They are raised to get eggs to sell. Chickens are sold live in the market and taken home and killed. The heart, intestines, and gizzards are eaten as well as the meat. Hens, roosters, and cocks peck and kick. Their sound is cuc-cu-cu. The cock fight is a very common game. The fighting cock has a high neck, the skin around the neck being red. The cock has no feathers. The chicken is kept as a pet and trained to fight.

Primary Three

Have the pupils gather pictures of a rooster, a hen, and a cock. Ask the pupils to tell how each can be identified.

Swallow

The bank swallow, which is 11-14 cm (4½-5 in.) long is the most common kind of swallow in Laos. A group of swallows flying together signals that spring is coming. Swallows eat mosquitos and other small flying insects.

Other Birds

Primary Three

Ask pupils to bring in pictures of other birds that are common in Laos-- sparrows, swallows, wrens, cranes, pigeons, orioles, parrots, doves, teals, and flamingos. Mount them on a bulletin board called "Birds of Laos."

Ask pupils to tell about birds, some of which become inactive in the dry, cool season in Laos.

Ask pupils to tell about birds, such as storks and other water fowl, which appear only in the rainy season when lakes, swamps, and fields are filled with water. In the dry season, they migrate to other areas where food can be found.

III. Reptiles

Turtle

There are two kinds of turtles in Laos: pond and marsh turtles which live in lakes, rice fields, rivers, and streams; and sea turtles (from Thailand) with hard shells with beautiful designs which are used to make fans, combs, tea trays, and jewelry. The shell is similar to the shell of a giant mother of pearl and is used to inlay furniture and small decorative items in the house.

Other Reptiles

Primary Three

Have the pupils bring in pictures of reptiles of Laos. Mount the pictures on a bulletin board called "Reptiles of Laos."

IV. Amphibians

Frog

Frogs may live underground and seal off the opening and hibernate the whole dry season by feeding on water from the damp soil.

Primary Three

Using the drawings in the Teaching Aids section of this guide, ask pupils to describe the metamorphosis of a frog in their own words.

Ask a pupil to tell how a frog hibernates.

V. Fish

Fish are kept as pets and trained to fight.

Catfish

The catfish has two or four pairs of whiskers and moves on land by wriggling its body and thrashing its tail. It can stay out of water as long as 12 hours because it has lunglike breathing organs. Catfish have no scales. They live in a pond, a stream, or a small river.

Primary Three

Ask a pupil to explain how the catfish adapts to its habitat.

Compare the breathing apparatus of a catfish with the respiratory system of a human being.

Other Fish

Many kinds of fish make a seasonal migration, going up the Mekong River and its major tributaries during the cool period of November, December, and January and going down the river around May or June.

During the dry season, eels live in the mud or holes and occasionally come out to hunt for food.

Primary Three

Ask the pupils to bring in pictures of other fish found in Laos. Mount the pictures on a bulletin board called "Fish of Laos." Include the blue gill, needlefish, globefish, and goby fish.

Ask the pupils to tell about the importance of fish in Laos.

Ask pupils to tell about migration of fish.

Ask a pupil to tell how the eel hibernates.

Related Topics

Fishing

Fish are a main part of the diet in Laos. People fish in streams, using a net during the rainy season.

Primary Three

Have pupils name some fish used for food.

Fish Sauce

Fish sauce--made of small fish, small shrimp, crab, or squid--may be used to marinate meat or vegetables, as soup, to eat raw, or to add a spicy flavor. Washed fish are placed in a wooden barrel and covered with lots of salt and heavy rocks which press the juices from the fish. After three days, the liquid is drawn off, poured back into the barrel, and kept for three months to one year. This first-class fish sauce, which is delicious, expensive, and seldom purchased, is mixed with water boiled with salt to make second-class fish sauce.

VI. Arthropods

Crustaceans

Crab

Crabs are generally soft-bodied and have five pairs of walking legs. The body is divided into three parts--a head, a thorax, and an abdomen--and is covered by a hard shell. The main kinds are the sea crab (imported from Thailand) and the freshwater crab. The small freshwater crab usually live in ponds, lakes, and rice fields.

Some catchers walk along the riverside at night and prick through the crab's body with the sharp iron bar on their hand.

Soft shell crabs are very delicious and are found before their shells have hardened after molting. Other dishes are dried, salted crab and charbroiled crab.

Intermediate One

Have the pupils compare the freshwater crab, the sea crab, and the soft-shelled crab.

Show the pupils the picture of the crab in the Teaching Aids section of this guide. Ask a pupil to describe the animal, tell where it lives, and explain how it moves and how it protects itself.

Ask a pupil to tell how the crab hibernates during the dry season.

Centipedes and Millepedes

Centipede

Centipedes live in dark, damp places and sometimes in houses. The centipede is a dangerous insect which secretes some poison on the skin of humans when the human touches the insect.

Intermediate One

Ask a pupil to bring in a picture of a centipede. Report to the class about where it lives.

Millepede

Millepede means thousand-footed, but no millepede has as many as 1,000 feet. Millepedes like to live in dark, damp places. They live in rice fields, gardens, and in homes made from clay or bamboo mixed with coconut leaves. They are not harmful.

Intermediate One

Have the pupils color and explain how a millepede moves and why it curls, using the drawings in the Teaching Aids section of this guide.

Have the pupils discuss the similarities and differences between a centipede and a millepede. Tell why one is considered harmful and the other, not harmful.

Insects

Ant

Intermediate One

Ask a pupil to tell how ants store food for the rainy season. (Usually they store rice, seeds, dead insects, and small reptiles.)

Bee

Bees live in almost every part of Laos. There are approximately 10,000 kinds.

There are three classes of honeybees:

the queen which lays the eggs

the drones which fertilize the queen

the workers which gather food and take care of the young.

Cicada

Cicadas are everywhere in the country. When you hear the "ve ve" sound of male cicadas, it announces the coming of summertime. The male produces the sound from a pair of tiny shell-like drums on the base of his abdomen. The drums are brought together by abdominal muscles and small resonators modify the vibrations.

The cicada is a big-bodied insect with four thin wings. There are many different kinds, but most are grayish-brown with a wide head and a short, bristle-like antenna.

The female lays her eggs and places them in small holes on trees. A few weeks later, they fall to the ground. They live in the soil for a long time. They hibernate underground and feed on roots. Then they come out of the ground as adult cicadas and climb on trees. They live only a few weeks in the summertime.

Intermediate One

Have the pupils observe the pictures of the cicada in the Teaching Aids section of this guide. Read about the life cycle of the cicada and report to the class.

Ask pupils to tell how cicadas hibernate during the dry season.

Dragonfly

Dragonflies are beautiful water insects and are colored either blue, red, brown, or green. They have four wings, six legs, and large eyes which look like beads. They can fly and perch on a tree, but they cannot walk. They eat water insects and other small animals. Catching dragonflies is a game for children.

The male dragonfly mates with the female on the wing. The female dragonfly drops her eggs into the water or inside the stem of a water plant. The nymph hatches from the egg within 5-15 days. It has no wings. It lives in the water from one to five years until it becomes an adult dragonfly.

Intermediate One

Using the Teaching Aids section of this guide, have pupils color the dragonflies. Ask a pupil to tell about where dragonflies live, how they move about, and what they eat.

Have a student read about how a dragonfly lays eggs and report to the class.

Grasshopper

The body of a grasshopper has three main sections: the head, the thorax, and the abdomen. The grasshopper has six legs and it can walk or fly.

A female grasshopper lays from 2-120 eggs at one time. The mass of eggs is called a pod.

Grasshoppers are almost everywhere in Laos. They are enemies of the farmers.

Intermediate One

Have the pupils color the grasshoppers in the Teaching Aids section of this guide. Ask a pupil to tell why the grasshopper is considered to be a harmful insect. Ask another pupil to read about how the grasshopper lays its eggs. Report to the class.

Silkworm (larvae stage of caterpillar)

The silkworm is used to make silk for clothing. The women of Laos wear hand-woven skirts. Cocoons are boiled and thrown against a hand-turned machine that spins the silk. Silk production is a very good business.

Intermediate One

Ask a pupil to tell what moth the cocoons grow into.

Other Insects

Intermediate One

Have pupils find pictures of other insects common in Laos. Mount the pictures on a bulletin board called "Insects of Laos."

VII. Annelids

Earthworm

The body of the earthworm is long and slender. The head and tail are round and the body is rosy. Earthworms live in wet places in the garden, along a wall, and along the river bank. Earthworms are used for fishing and are good food for ducks and chickens.

Intermediate Two

Have children color the drawing on the earthworm in the Teaching Aids section of this guide. Ask a pupil to tell about fishing in Laos and why it is important to catch fish.

VIII. Mollusks

Snail

The snail's soft body is covered with a coiled shell. The many different kinds live on land or in fresh water in places such as the lake shore, river shore, pond, and field. The slug, winkle, and coin snail are varieties. The abalone (imported) is considered the best food for good health. In the countryside, people like to catch snails and cook them with sale, pepper, and chili.

Snails may live underground and seal off the opening and hibernate the entire dry season by feeding on water from the damp soil.

Intermediate Two

Ask a pupil to explain how the snail hibernates.

Squid

Squid are imported from Thailand.

Intermediate Two

Let the pupils observe the drawing of the squid in the Teaching Aids section of this guide. Ask a pupil to describe how a squid moves and how it eats.

IX. Other Animals

Intermediate Two

Have students make a display table showing different animals in Laos in their natural environment. Include some typical animals such as the buffalo, crocodile, cricket, cicada, and frog.

Have the pupils match the animals whose pictures are put on a bulletin board with the food each animal eats.

Related Topics

Activities of Children

Most activities of children are engaged in for the purpose of gathering food to eat or gathering materials such as rattan or bamboo to sell. The activities include mountain climbing, tree climbing, and making a net to catch fish.

Animals as Food

All parts of the cow, pig, and chicken--including the digestive system--are eaten. Rabbits and field mice are eaten. Monkeys are eaten by some people. Pigeons are eaten but they are expensive because they fly away from man and are difficult to catch. Some kinds of winged ants--for example, the cicada--are eaten. Snails or frogs are often served for dinner. Fish may be eaten raw after being soaked in lemon or may be smoked or dried. White mice are sometimes eaten as food.

Pets

Pets do not receive the care in Laos that a pet in the United States receives.

Kindergarten

Ask a pupil to tell about a pet such as a parrot that he/she had in Laos.

Sculpture of Symbolic Animals

Sculpture in bronze is abundant. A variety of symbolic animals are found in pagodas, temples, public places, homes, and in salons of mandarins. The dragons symbolize long life, prosperity, happiness, and bliss. A sacred elephant is a symbol of strength. The symbolic animals are often carved on jewelry.

Zoos

Animals that children may have seen at the zoo in Laos are apes, bears, boars, cats, cows, deer, dogs, foxes, gorillas, horses, lions, monkeys, pandas, pangolins, rabbits, rhinoceroses, sheep, snakes, tigers, water buffalos, and wolves.

Fish in the zoo are carp, eels, salmon, and shark.

Birds in the zoo are crows, ducks, egrets, geese, ostriches, parrots, pigeons, swans, and turkeys.

Reptiles are crocodiles and turtles.

Primary One

Ask a pupil to tell about the animals in the zoo in Laos. Compare the zoo there with Lincoln Park or Brookfield Zoo.

UNIVERSE

Climate

Tropical

Magnets

In the unit on magnets, children will probably be familiar with the horseshoe magnet only.

Seasons - Weather

Seasons with wide temperature variations do not exist in Laos. Trees keep their leaves all year long. The coldest time of year is February, when the temperature may drop to 18-22° C (65-75° F). The hottest months are April, May, and June, during which time people can't stay home. They rest in the shade of trees or go to the forest or the bank of a river. Swimming in the river is a common way to cool off.

The rainy season--May to September--is the monsoon season when crops are planted and grow plentifully. Temperatures average about 28° C (82° F) with a normal range from 25-30° C (78-86° F).

There are four or five days of heavy rain per month, and flooding is common. Rainfall averages 25 cm (10 in.) per month. The windiest month is May, but winds seldom reach a force at which they do damage to homes or trees. Sometimes it is foggy in the mountains, but the fog does not reach the plains.

The dry season--October to March--has temperatures averaging about 21° C (70° F).

During the dry season, the rainfall averages less than 2.5 cm (1 in.) per month.

Houses are built on stilts with a resting area underneath so the people can escape the sun's rays. It is common to see a woman spinning or weaving or children playing under the house.

Intermediate Two

Have a pupil explain why it usually does not snow in Laos.

Have a pupil describe the monsoons.

Solar System

Intermediate One

In units about the earth and its rotation, have pupils mark the location of Laos, as well as the location of Chicago, on the globe.

Ask a pupil to talk about the time difference between Chicago and Laos.

Have a pupil compare the lengths of day and night on March 21, June 21, September 21, and December 21 in Laos with the lengths in Chicago.

Ask pupils to tell any legends they know about stars or other bodies in the solar system.

Ask a pupil to tell what stars or constellations are visible from Laos.

BEHAVIOR OF MATTER AND ENERGY

Heat

Common stoves are a charcoal stove and a steel table-like support under which wood is burned.

The heat from the sun is so intense at some times of the year that a leaf hat or an umbrella is used to shelter a person from the rays of the sun.

Light

In the city, electricity is generated by building embankments blocking the flow of rivers. Electric lights are common. In the country, oil lanterns are used. People also make torches, using oil gathered by drilling the trunk of a tree. These torches (lighted branches) are used to light the home and are used to attract fish.

Minerals

gold--used for ornamental jewelry. Women pan for gold in the river.

silver--used for ornamental jewelry.

bronze (an alloy)--used for sculpture. Statues are often found in temples and public places.

tin--used for joining pipes, gutters.

Machines

Machines that will be familiar to the children are--

hammer--lever

hacksaw--compound machine

screwdriver--wedge, compound machine

ax--wedge

rake--lever

spade--lever

sickle--compound machine

airplane--compound machine

bicycle--compound machine

motor bicycle--compound machine

cars--compound machine

carts (horse-drawn)--wheel and axle, compound machine

carts (tricycle-drawn) covered cart--compound machine

pulley for well--compound machine.

Primary One-Three, Intermediate Three, Upper Two

Ask a pupil to tell what simple machines are used in each of the above.

Measurement

Children will be familiar with measuring temperature in Celsius, measuring length in kilometers, measuring weight in kilograms (rice and flour come in 100 kg bins), and volume in gallons or quarts. Some items, such as oranges, lemons, bananas, and papayas, are sold by the quantity, not the weight.

Pitch and Intensity

A flute made by fastening bamboo of different lengths alongside each other is played by blowing into the instrument.

Solids, Liquids, and Gases

Liquids that will be familiar to students are iced tea, fresh water, fresh coconut juice, lemon juice, orange juice, sugarcane juice, and coffee.

Bracelets are made by melting silver under high temperature, pouring the melted silver into a selected mold, and passing the mold through a chemical to cool the silver. Patterns are carved on the bracelet.

Refrigerators are rare. Ice is purchased from ice factories.

Vibration--Sound

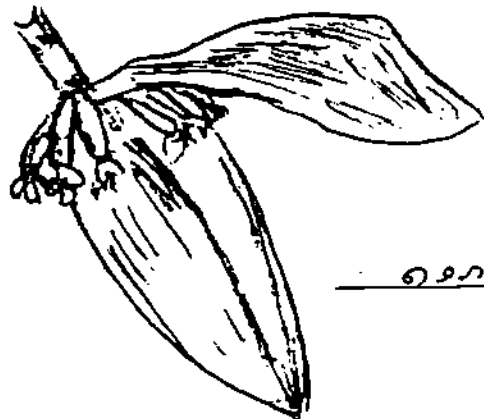
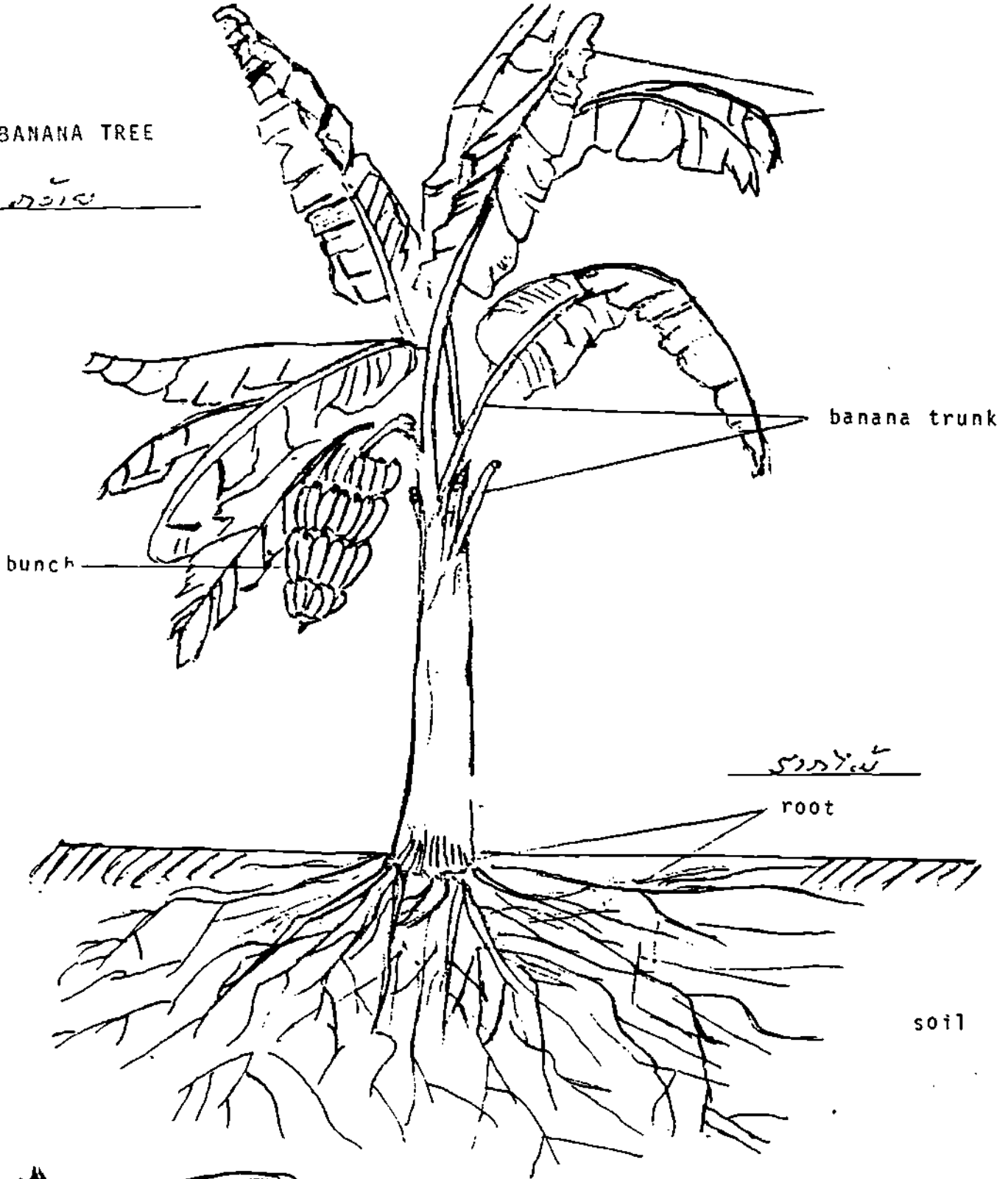
A homemade wooden guitar illustrates vibration causing sound.

TEACHING AIDS

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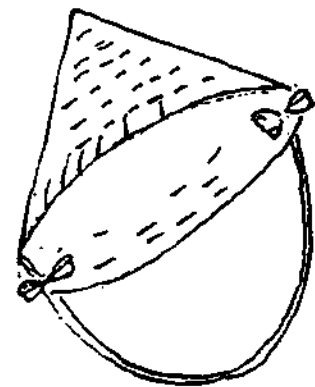
BANANA TREE

बाजारा



बाजारा

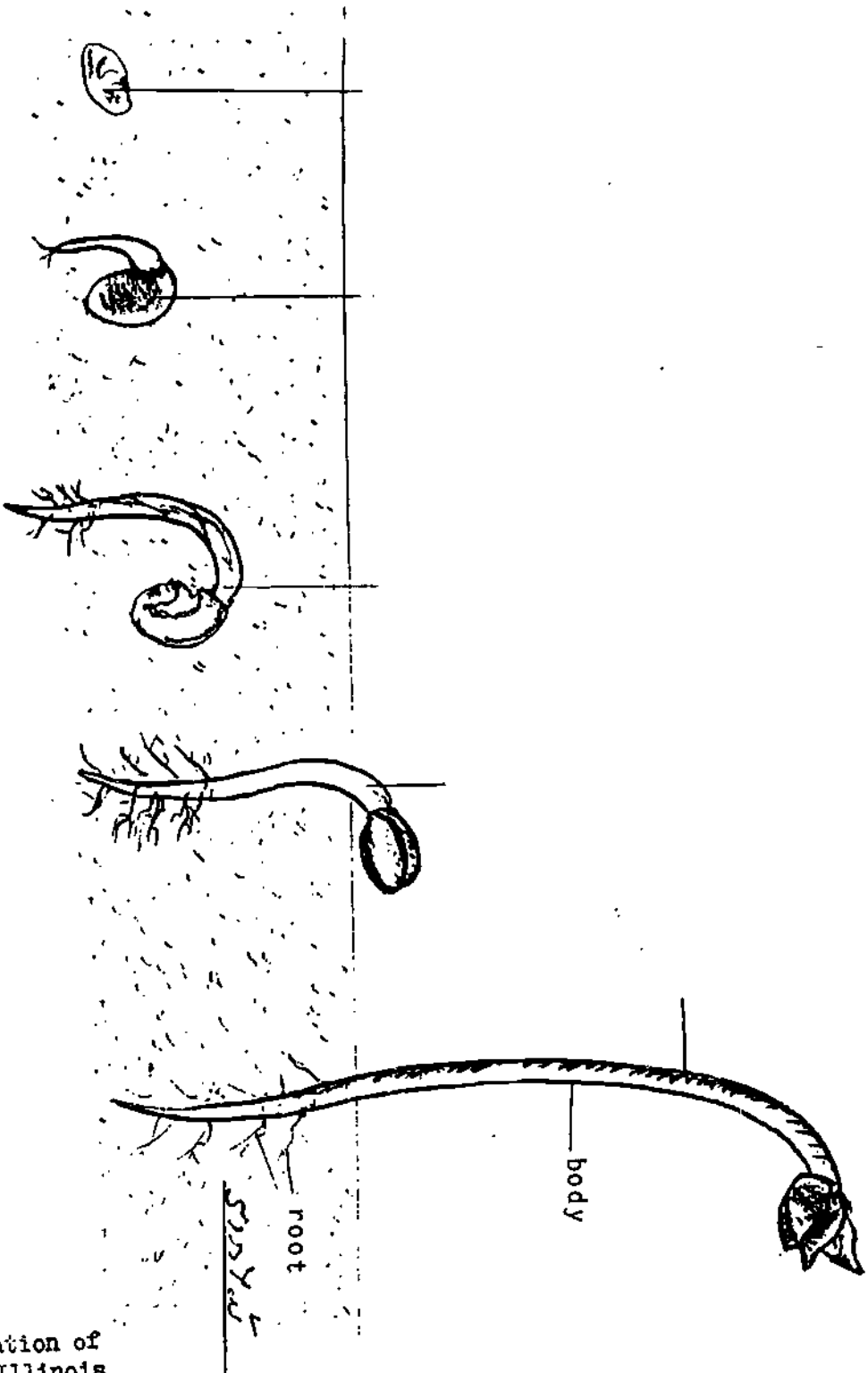
a banana flower

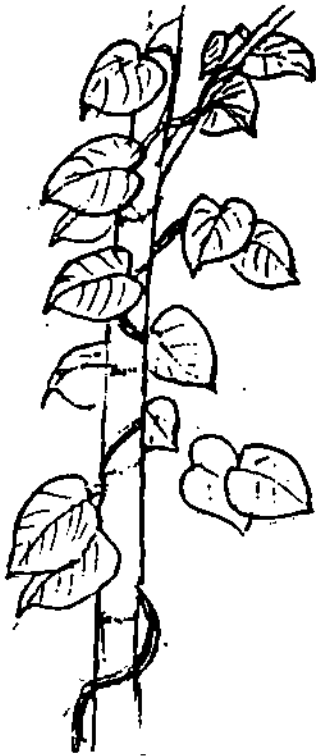


a conic hat

BEAN SPROUTS GROWING

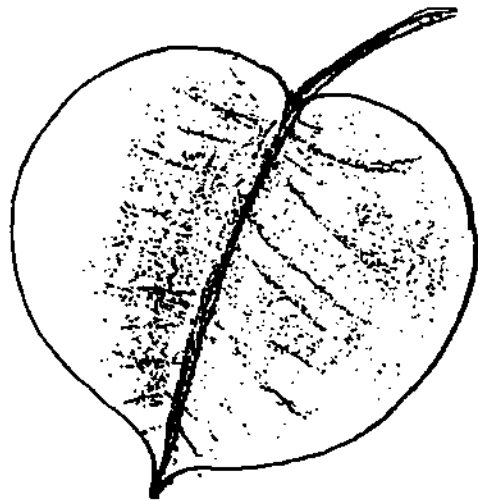
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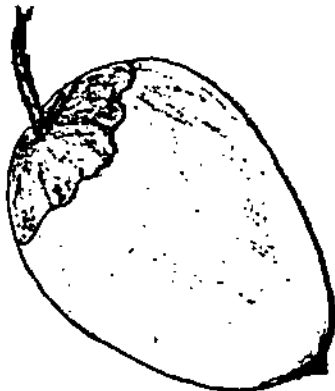


BETEL VINE

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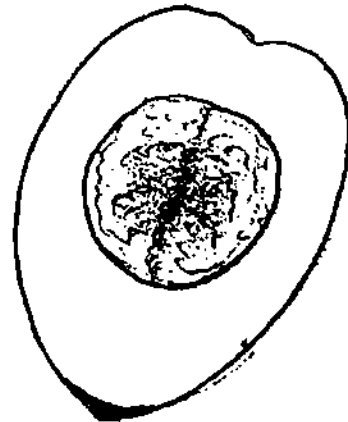


BETEL LEAF



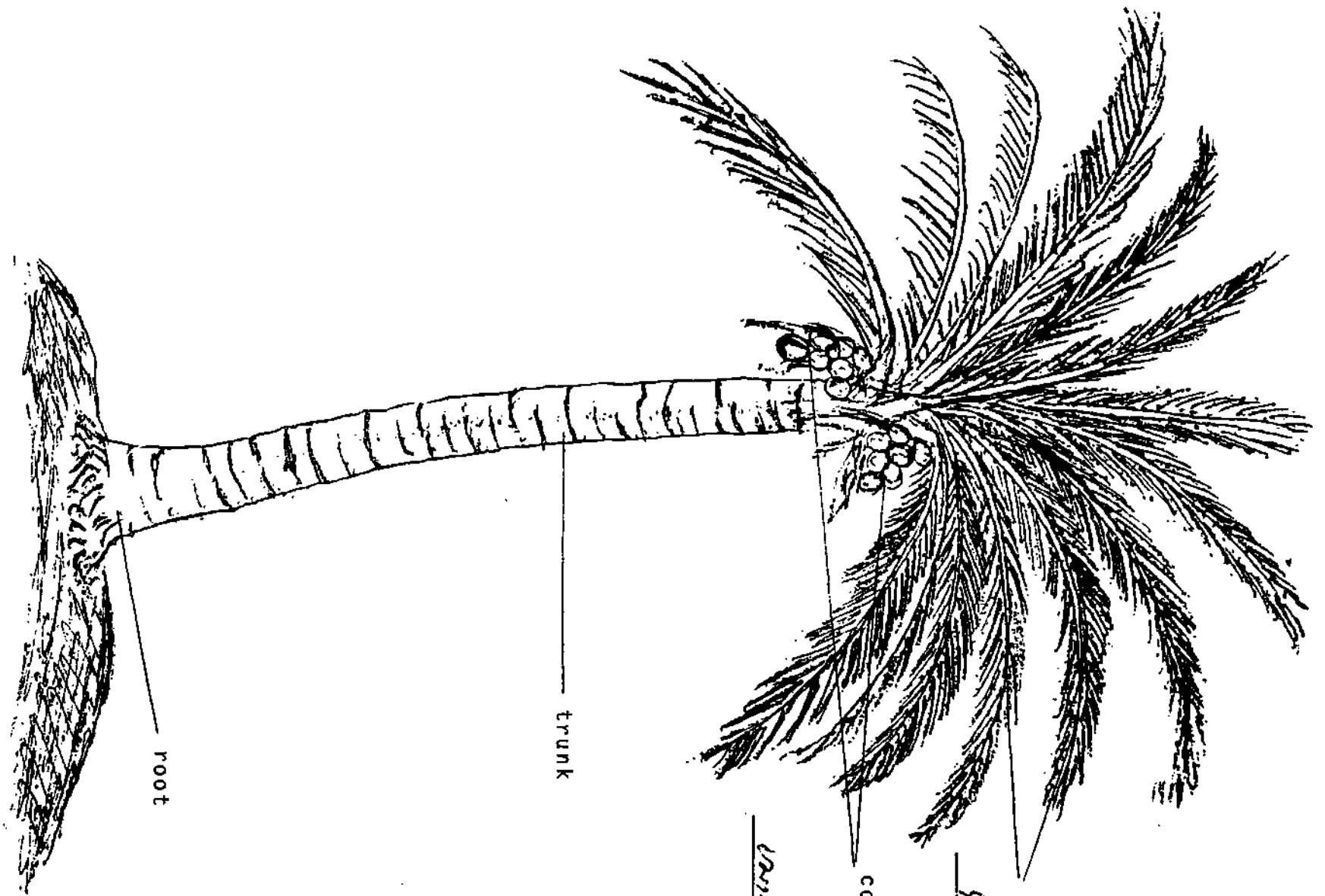
ARECA NUT

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COCONUT PALM

Coco Nut

root

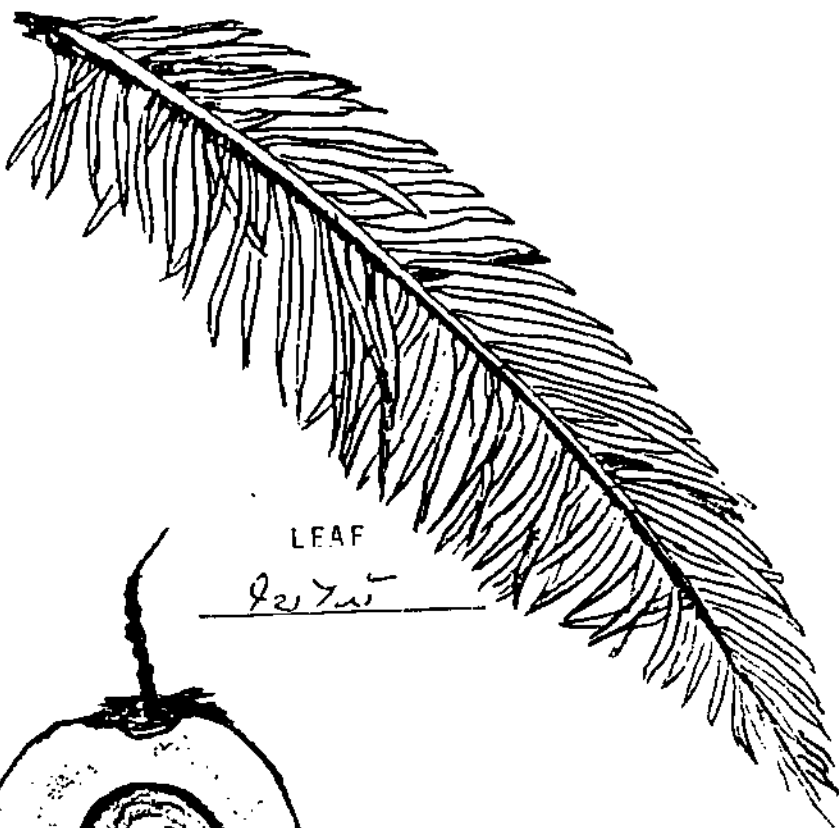
trunk

coconut fruit

leaves

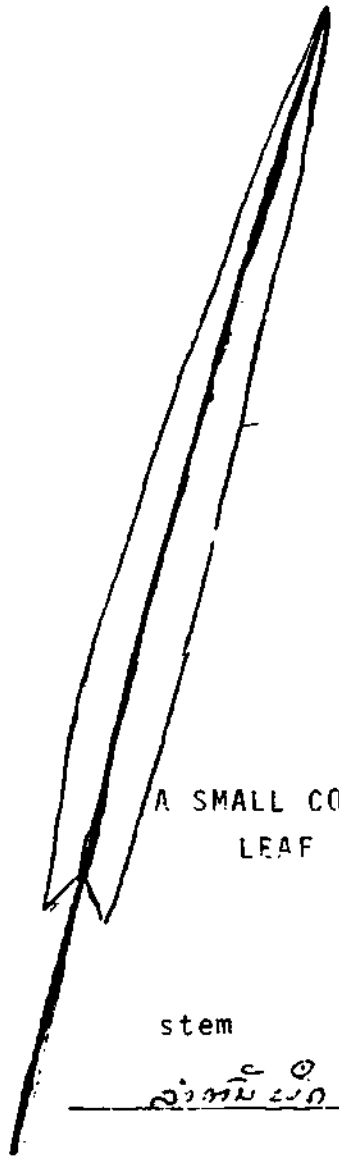
Coco Palm

Coco Nut



LEAF

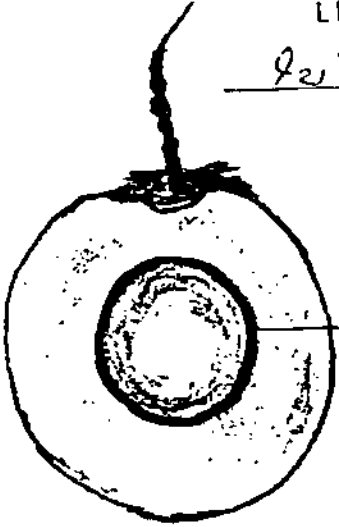
ใบปาล์ม



A SMALL COCONUT LEAF

stem

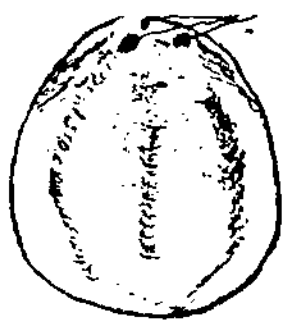
ก้านใบ



hard brown shell

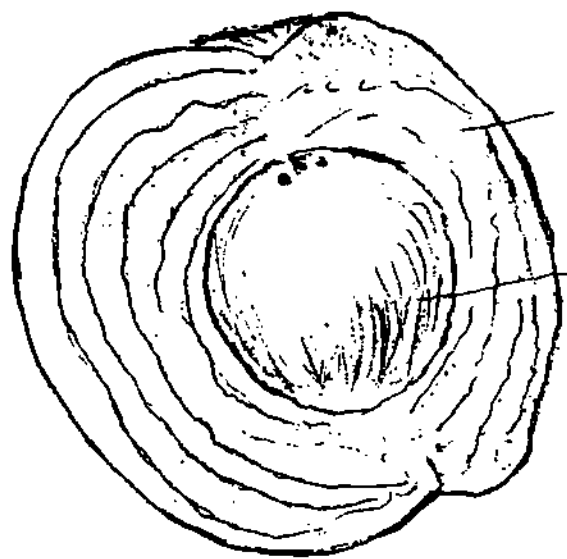
SEED

เมล็ด - หิน - หนา



eyes

COCONUT SEED (hard brown shell)



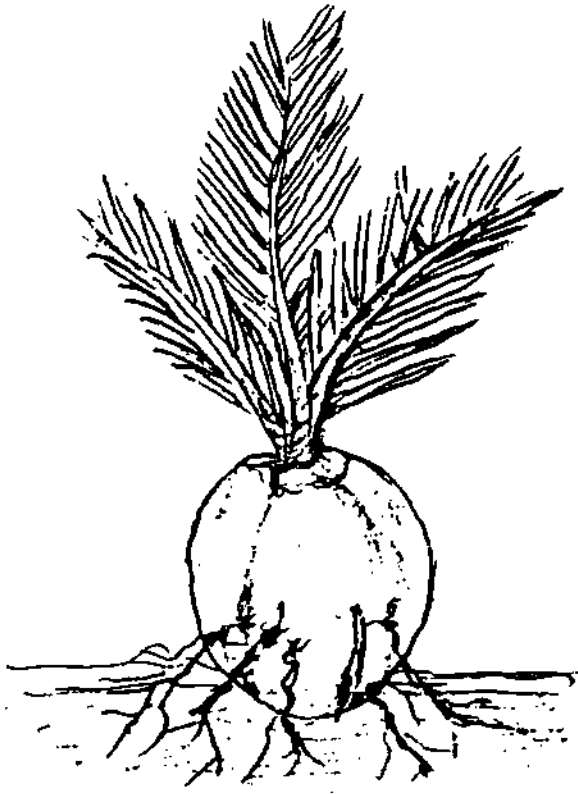
husk

seed

FRUIT

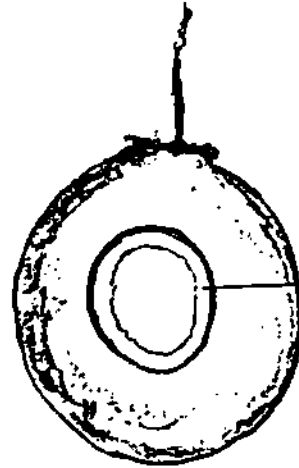
ผลปาล์ม

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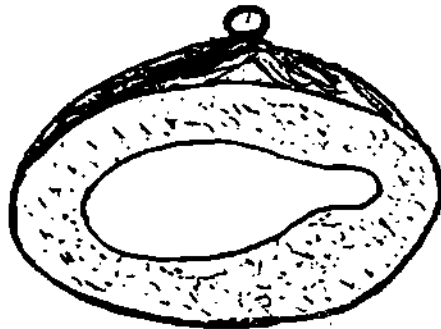
COCONUT SPROUT

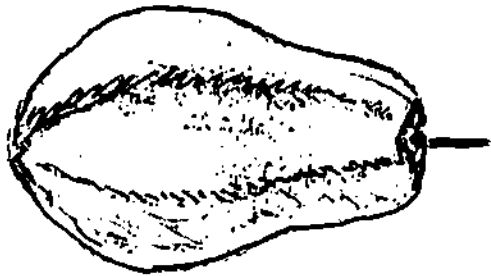
ໜີ້ ພູ່ ໜີ້ ພູ່



copra

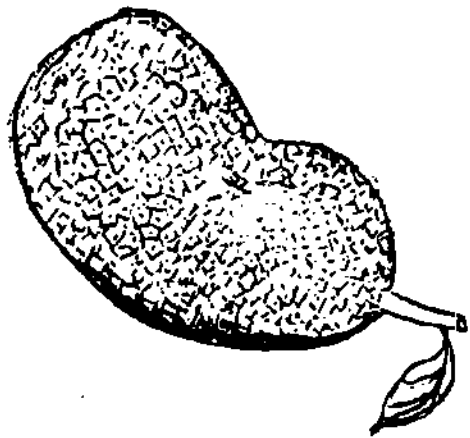
1 d





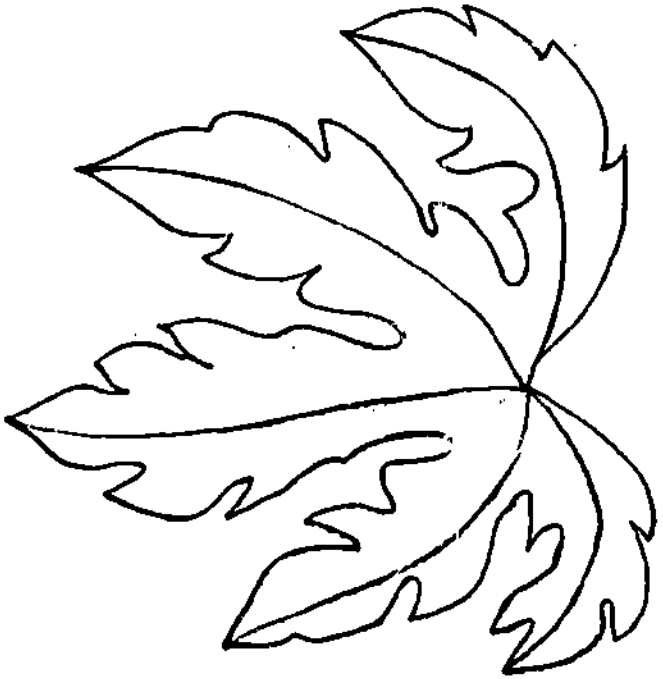
PAPAYA

papaya

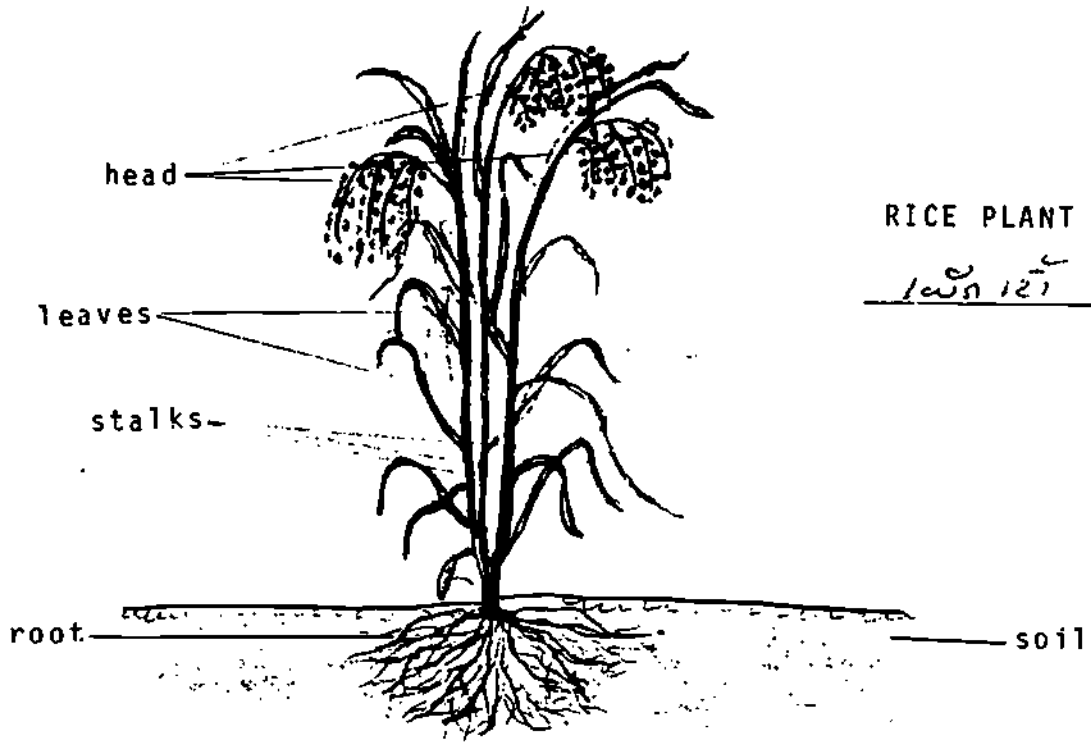


JACKFRUIT

jackfruit



PAPAYA LEAF



RICE PLANT

ข้าว 127



A HEAD OF RICE



SEED

ข้าว - 127 - 1127

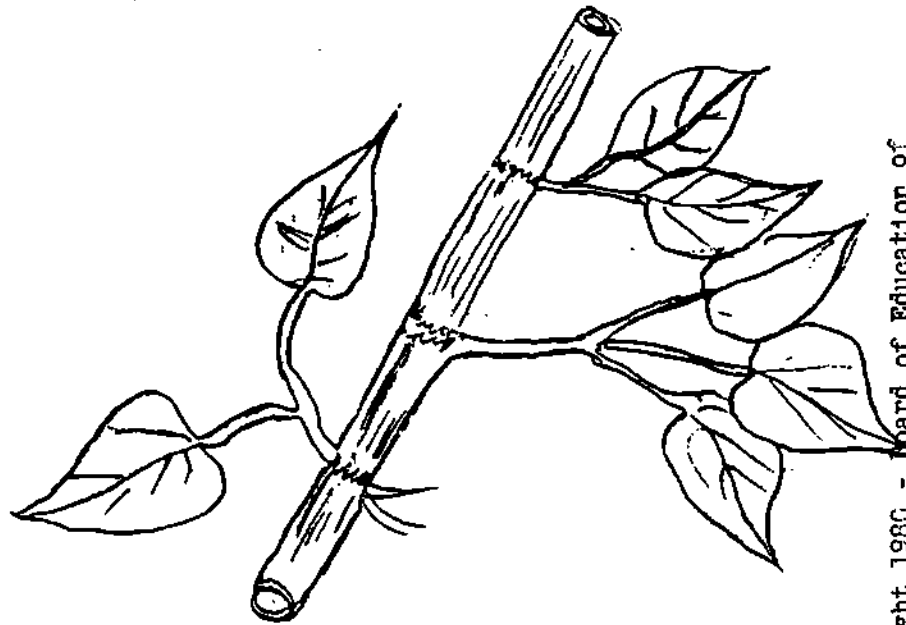
SUGARCANE

סוכה - סוכי לול



WATERCRESS
(greatly enlarged)

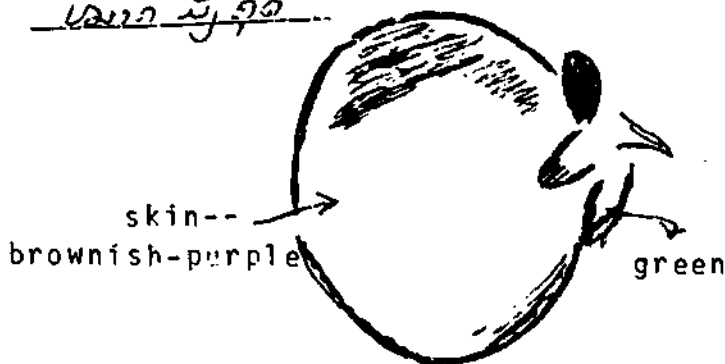
עשב: סוכי לול



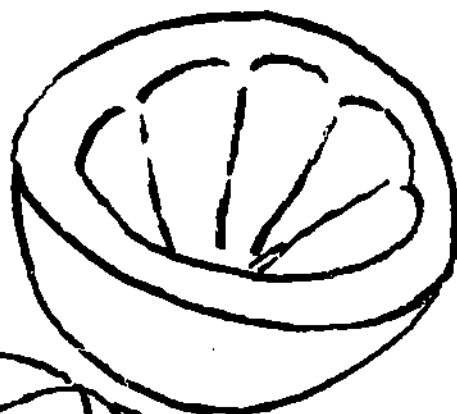
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MANGOSTEEN

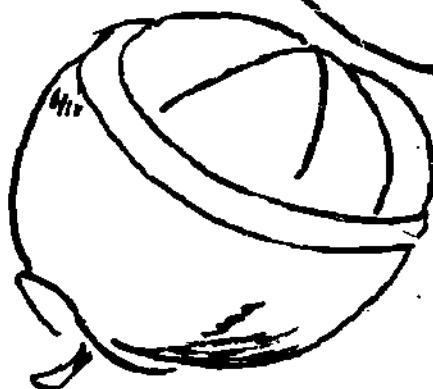
मंगोस्टीन



green



flesh--white, sweet



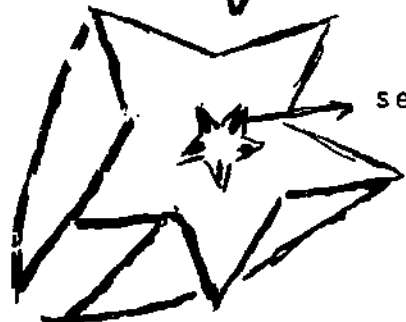
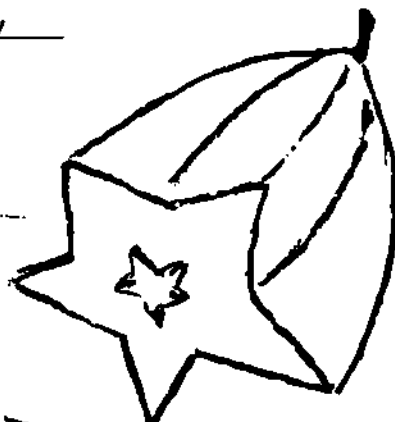
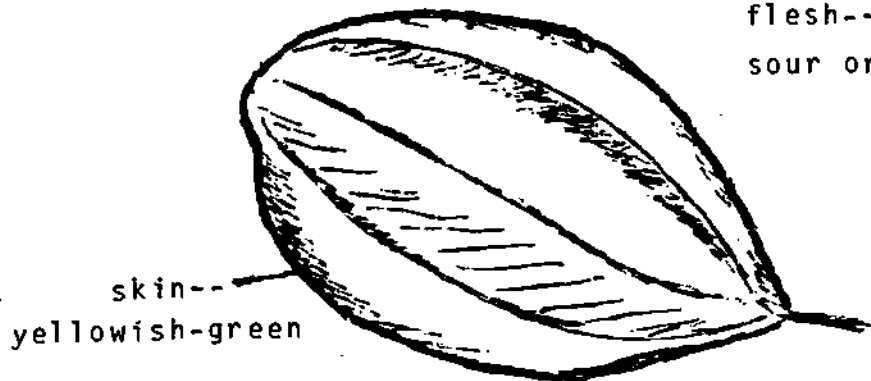
thick layer--pink

green

AVERRHEA CARAMBODA

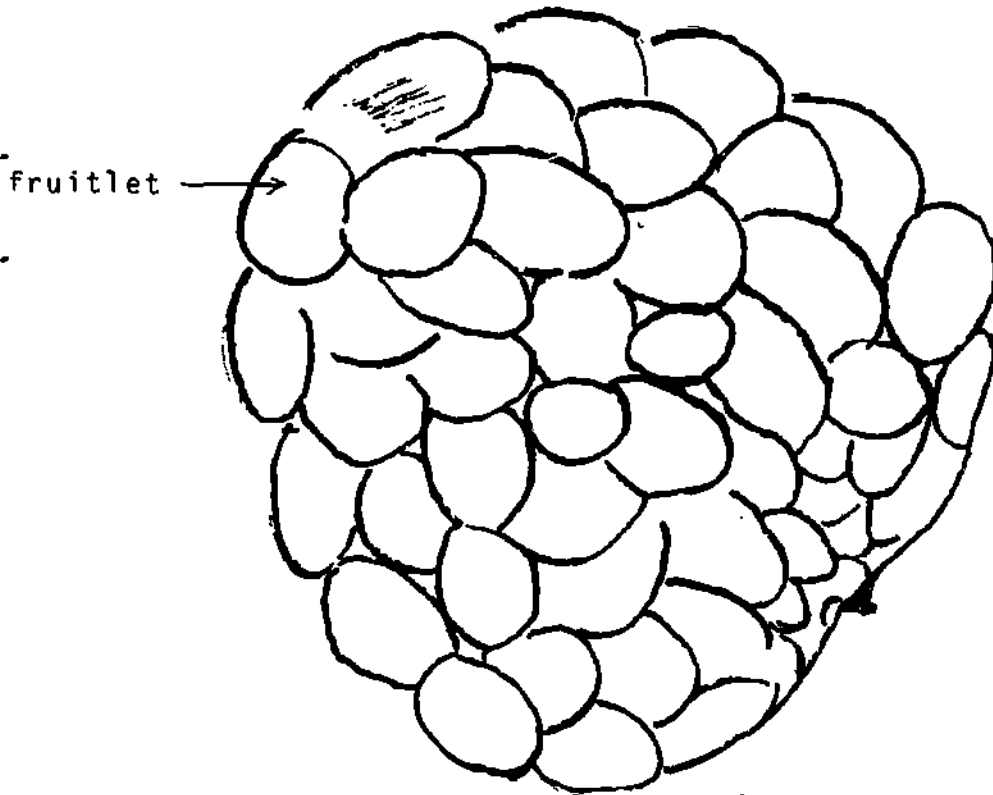
अवरी

flesh--white,
sour or sweet



seed

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CUSTARD APPLE

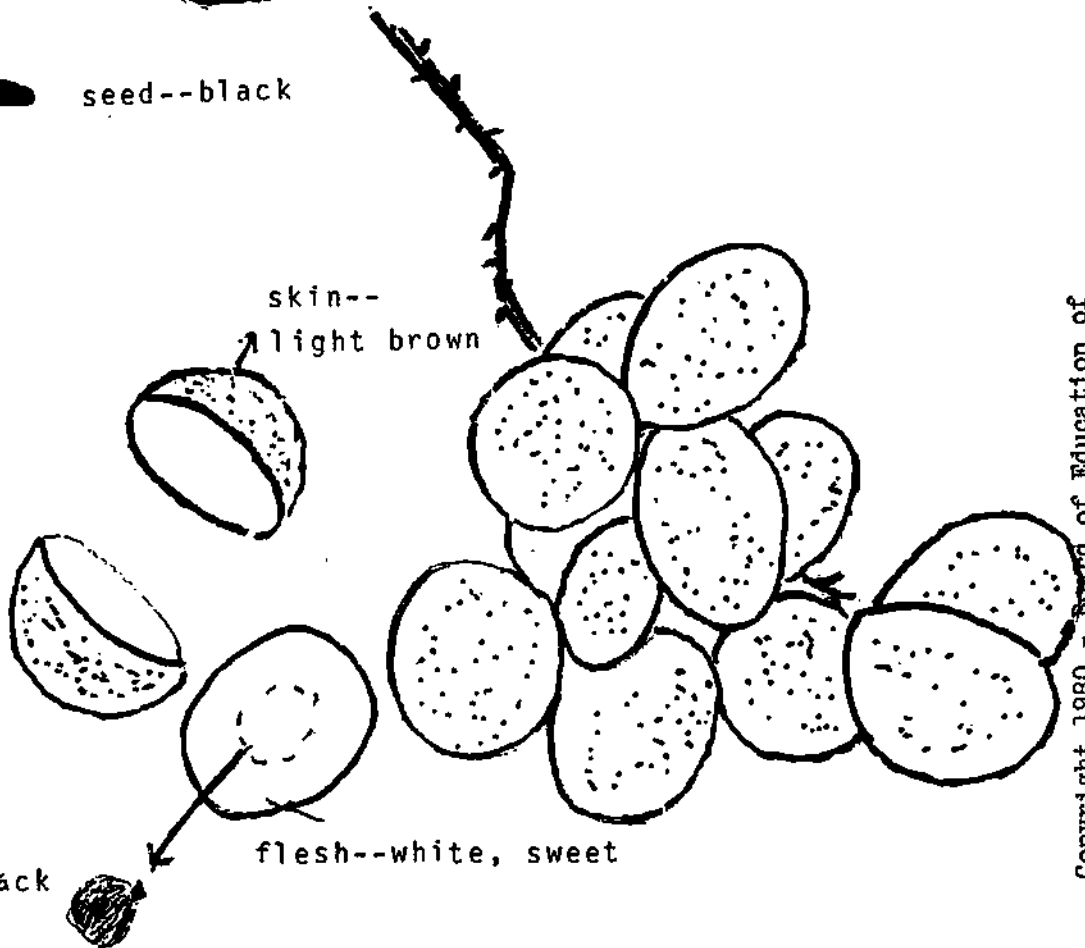
1.92.721590707

seed--black

skin--
light brown

LONGAN

1.92.721590707

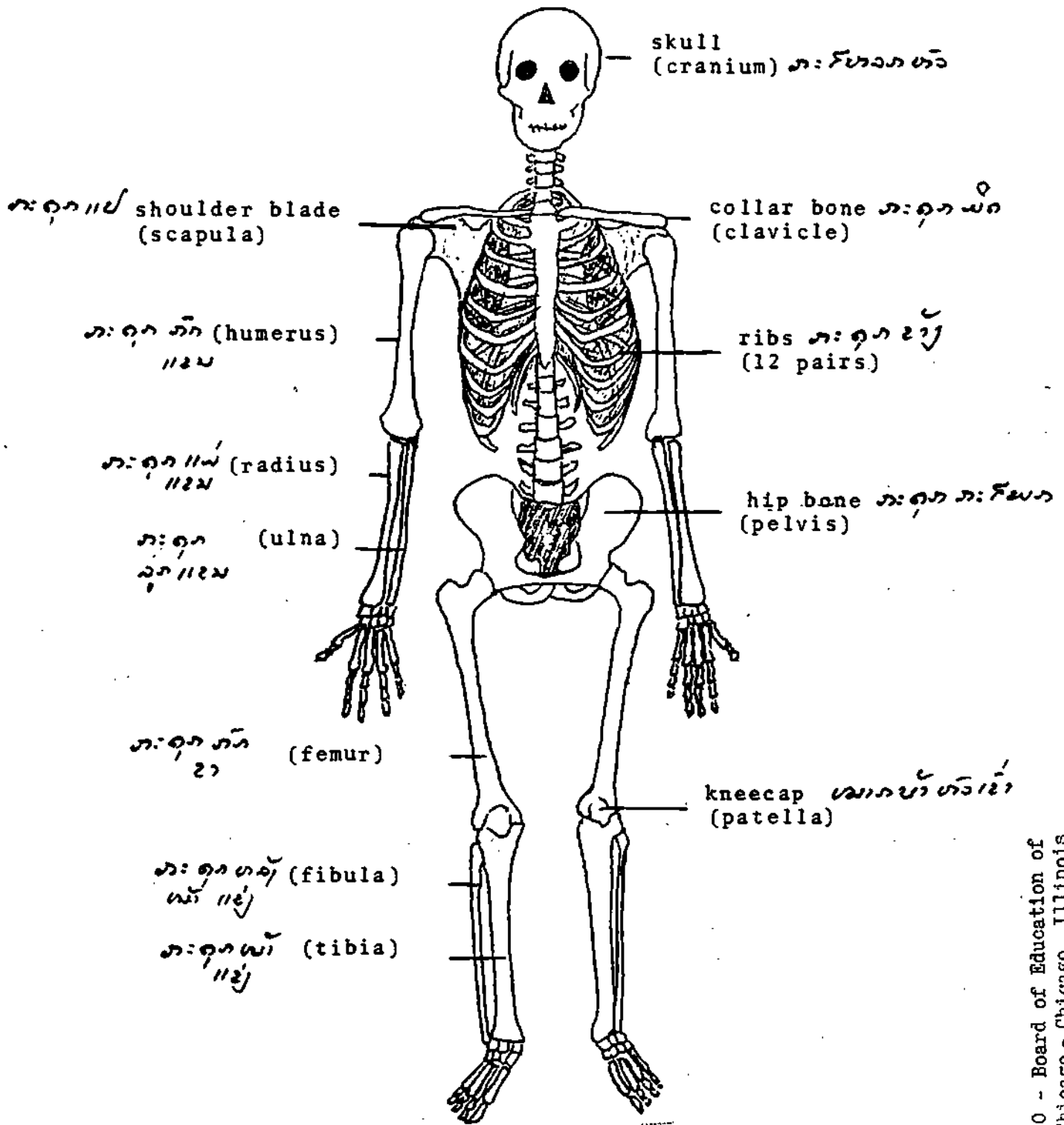


seed--black

flesh--white, sweet

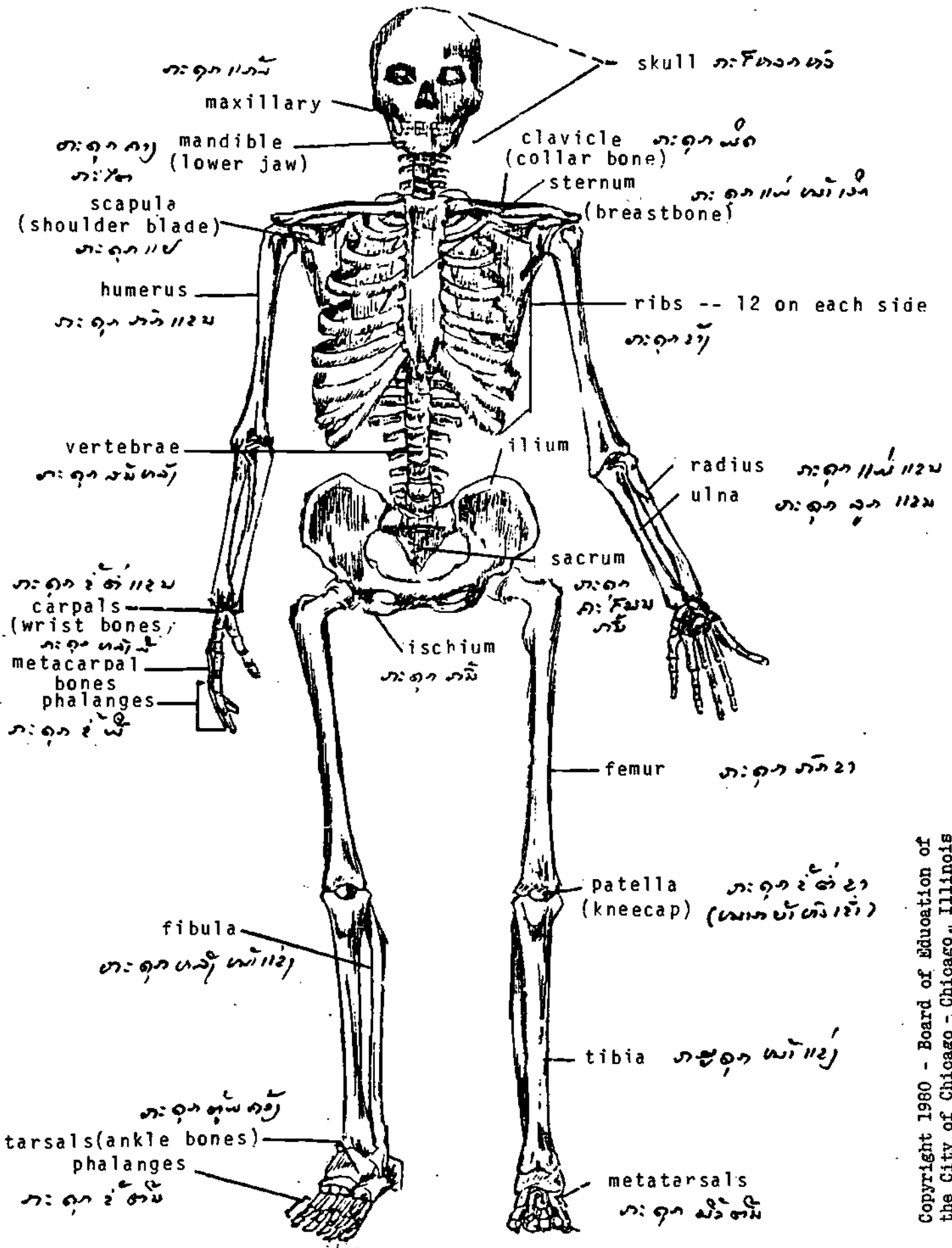
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THE SKELETAL SYSTEM



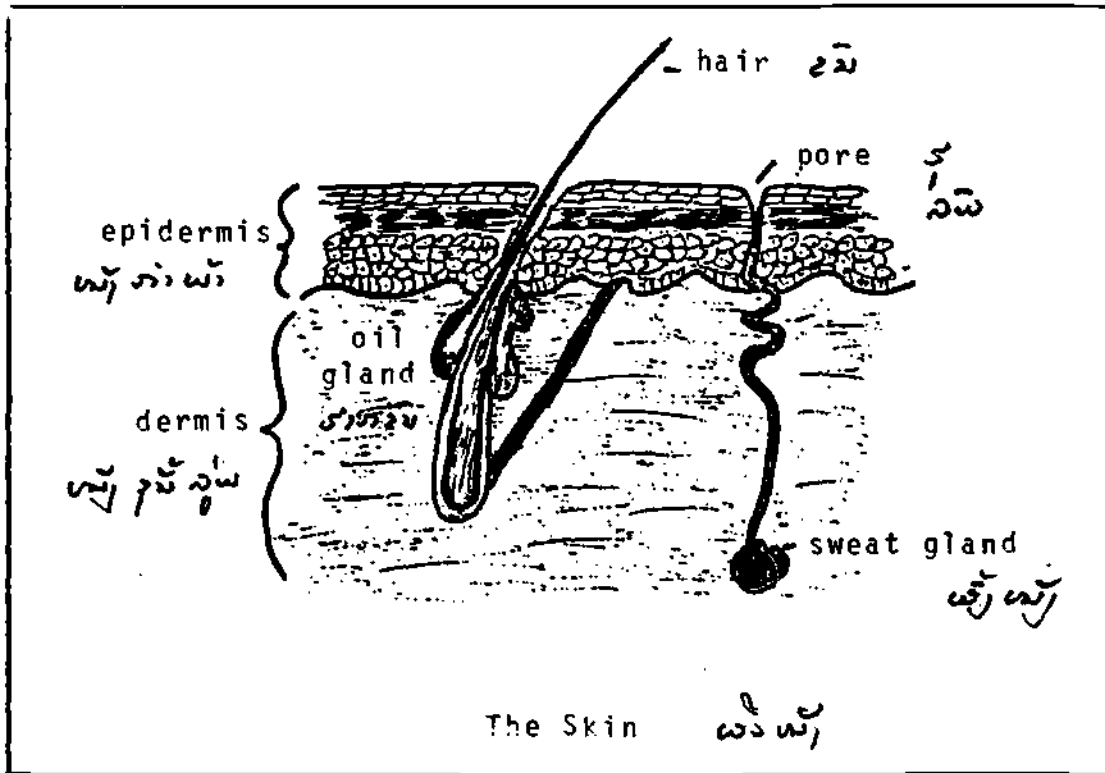
The Skeleton ת: תב תב

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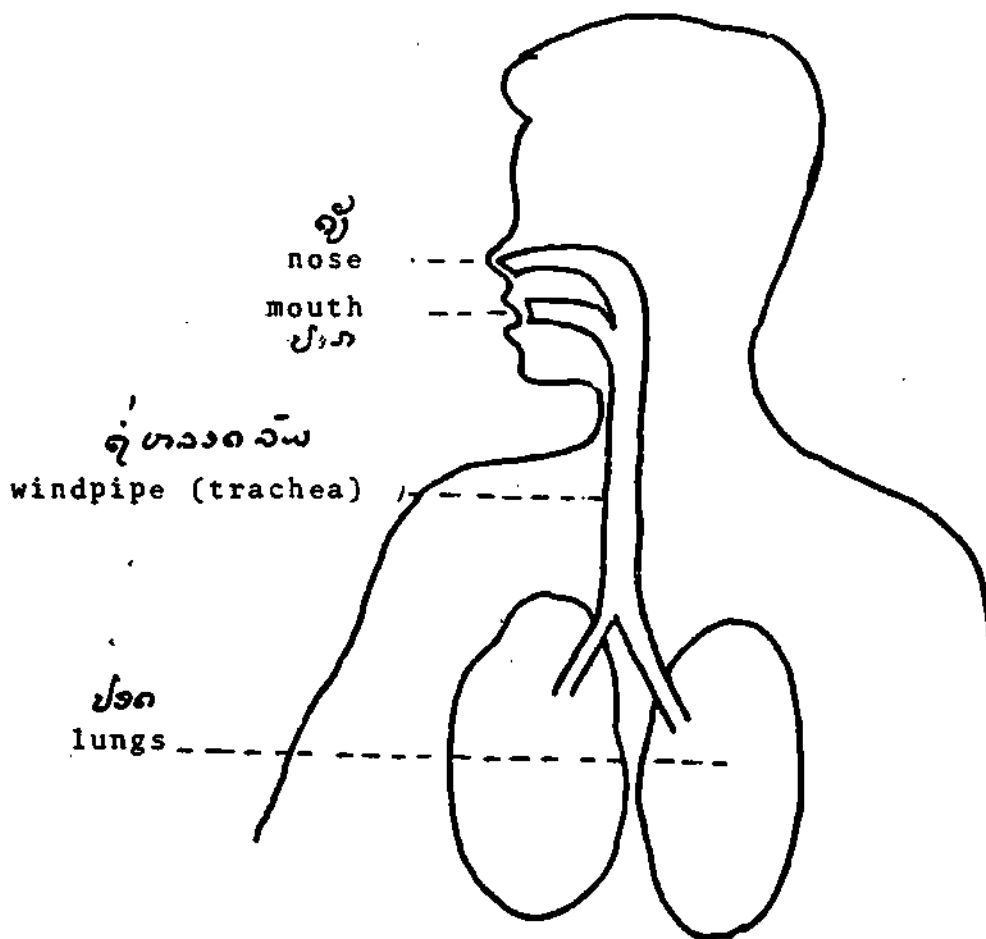




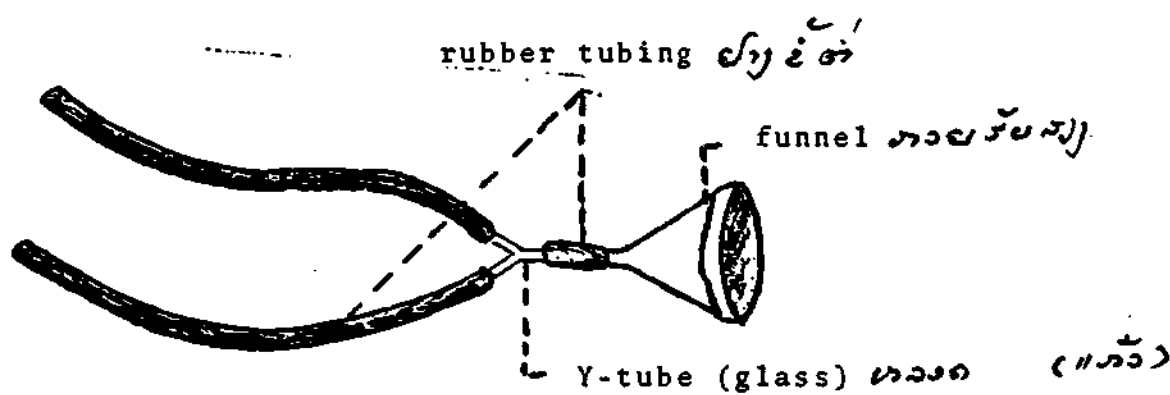
THE SKELETAL SYSTEM

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THE RESPIRATORY SYSTEM

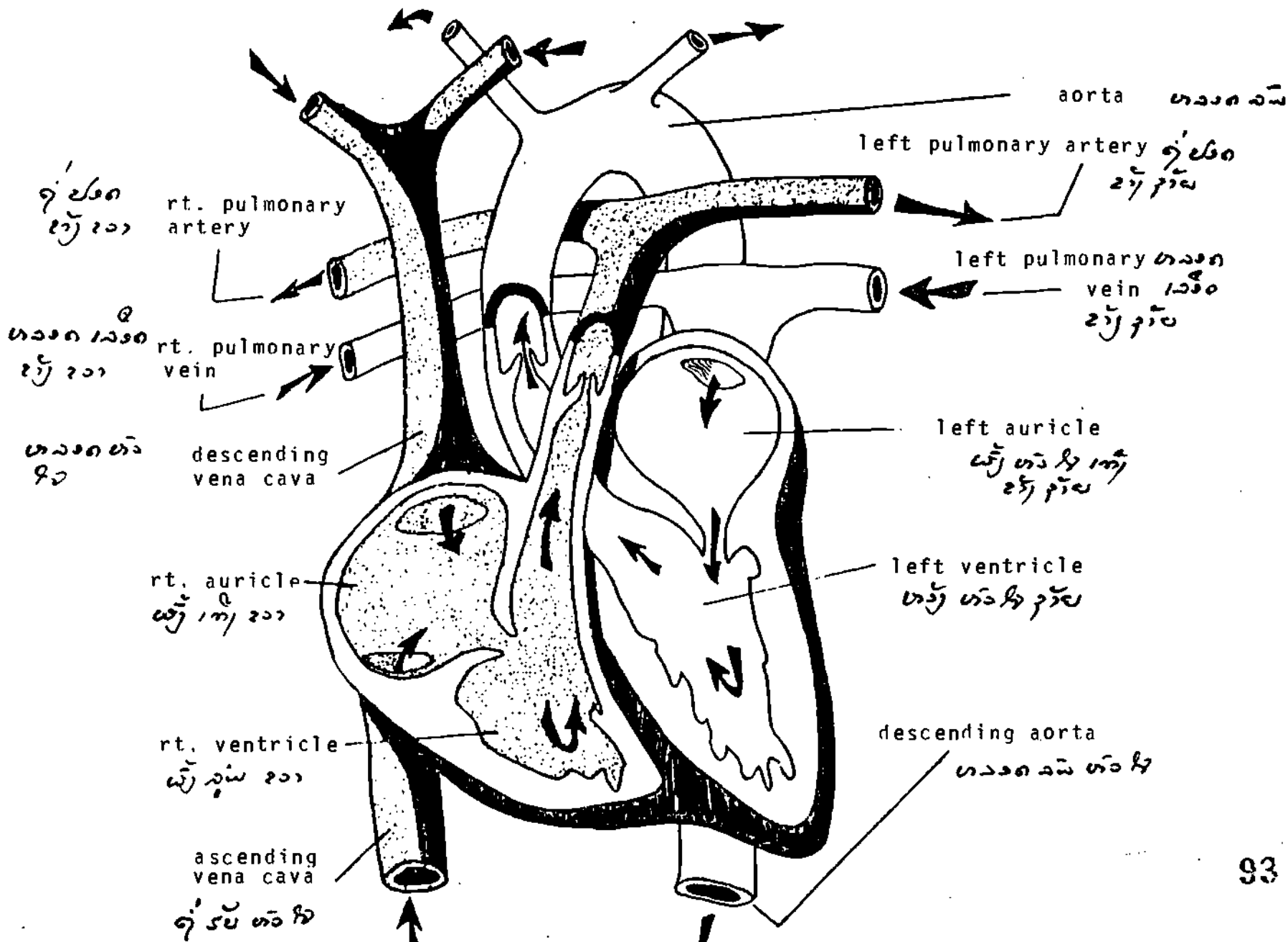


Respiratory System
စနစ် ပါး တာလဝဂ်သီပ

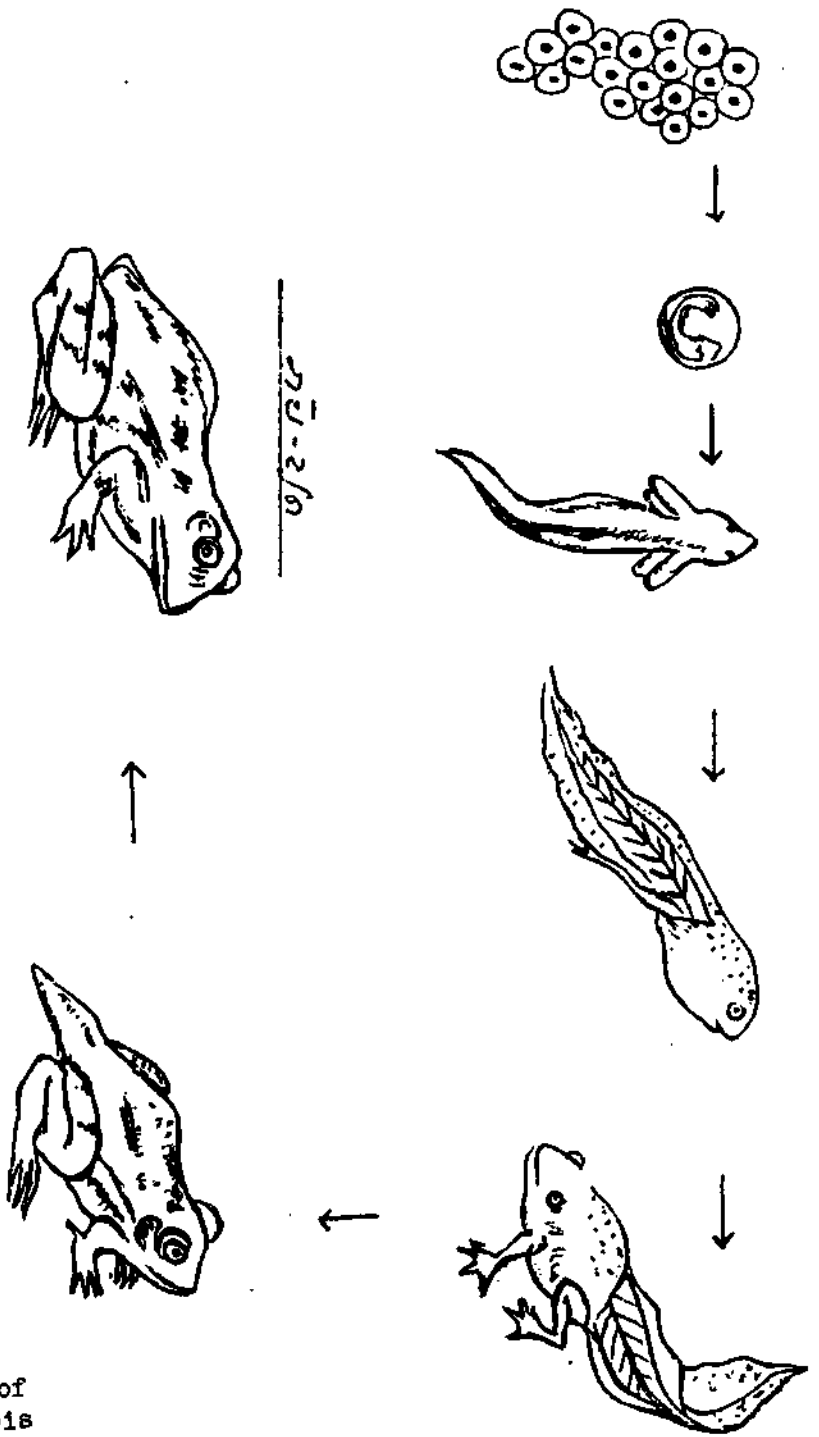


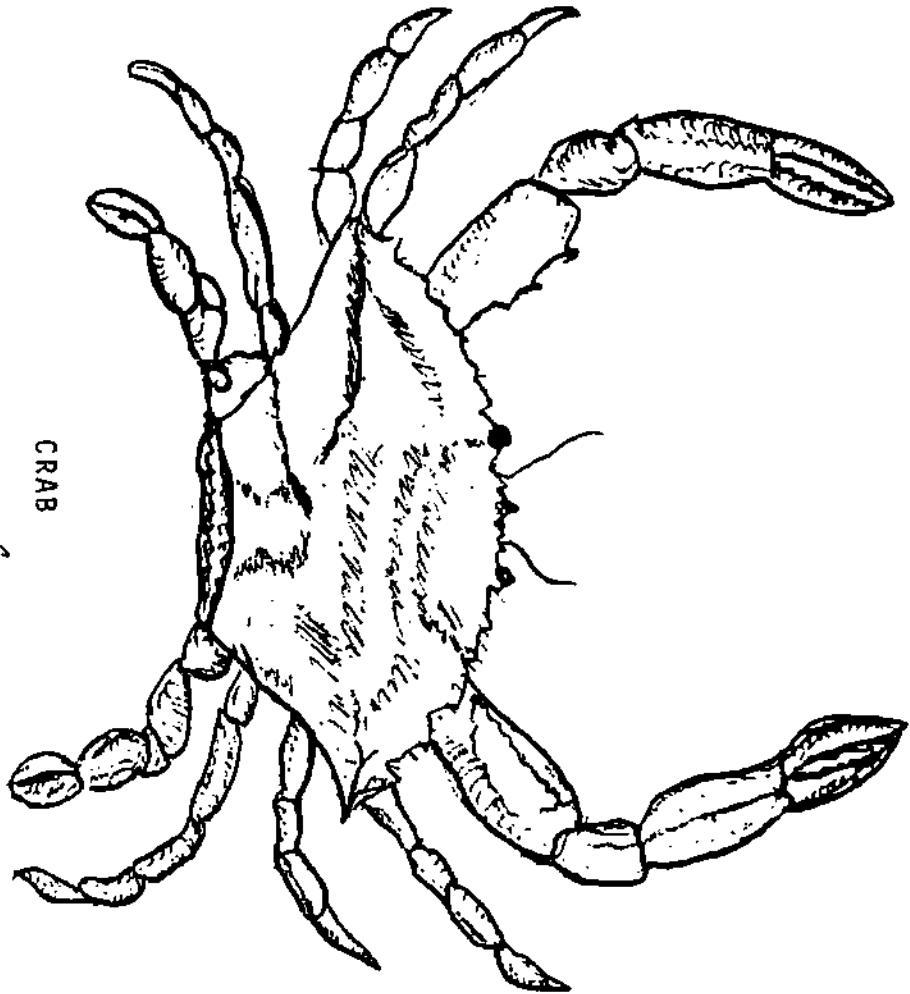
Stethoscope

စနစ် ပါး တာလဝဂ်သီပ (ကရံ) တလဝဂ်သီပ (ကရံ) တလဝဂ်သီပ (ကရံ)



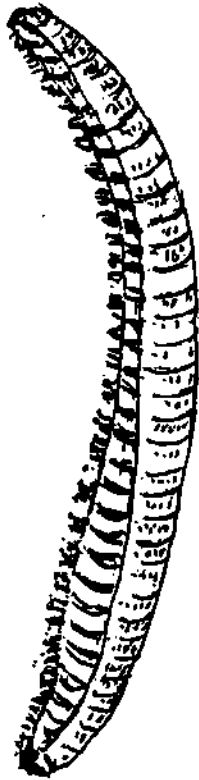
FROG METAMORPHOSIS





CRAB

21-22



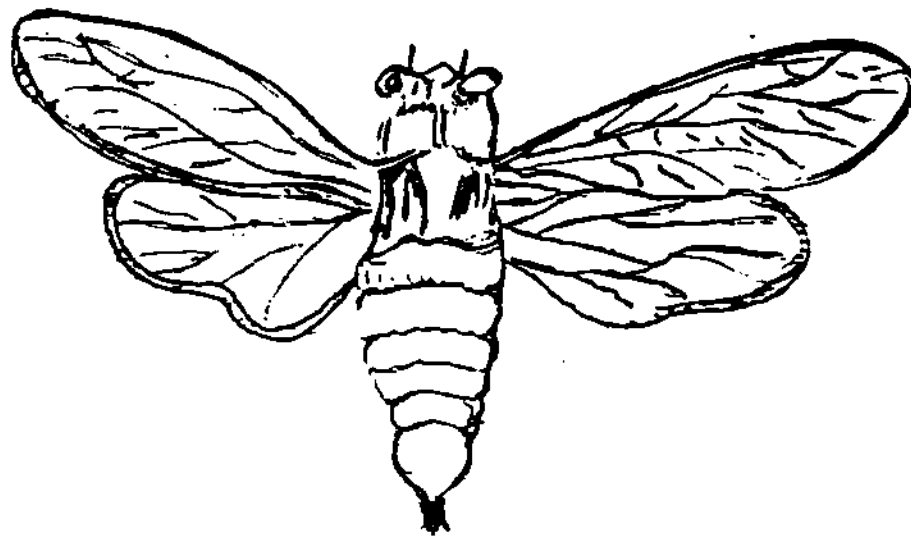
MILLEPEDE

21-22



CURLING MILLEPEDE

95



CICADA

ليلى الحمار

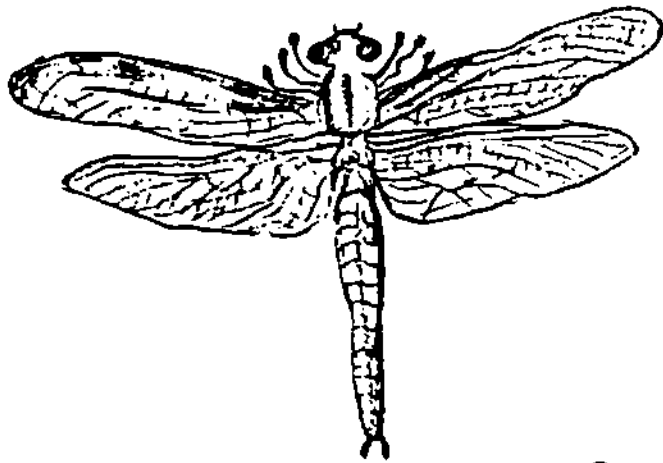


EGGS

بيضة

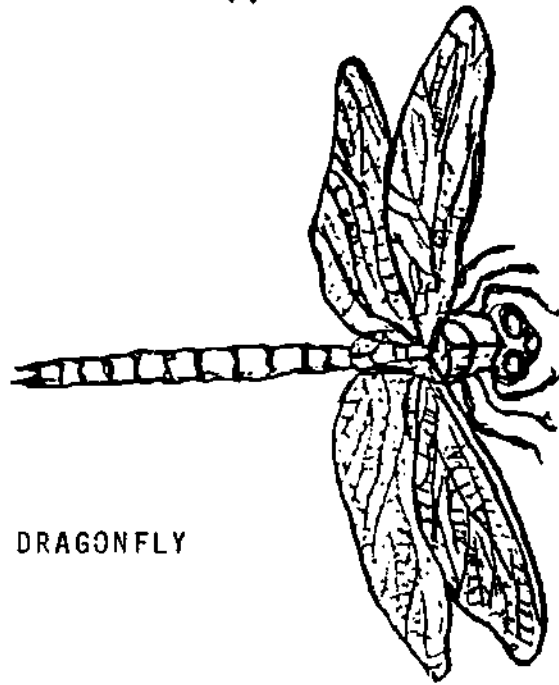


YOUNG CICADA COMING OUT OF THE GROUND

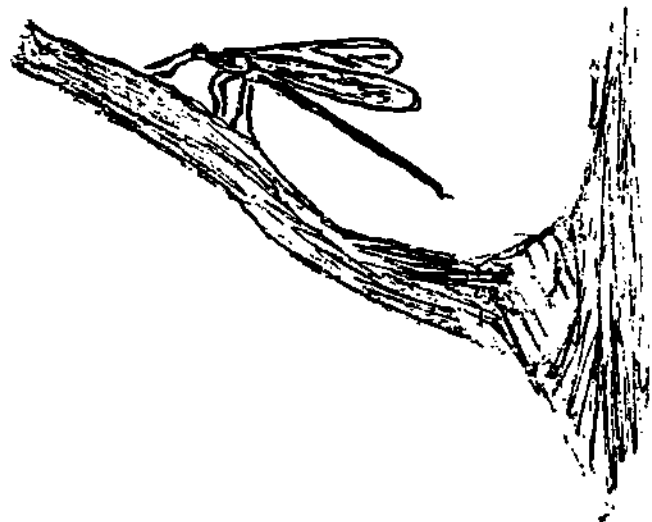


DRAGONFLY

1127 J



QUEEN DRAGONFLY

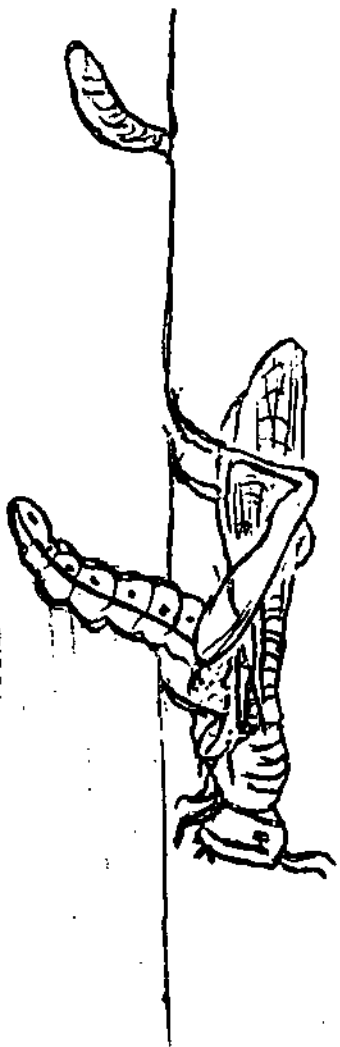


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GRASSHOPPER

515 11974



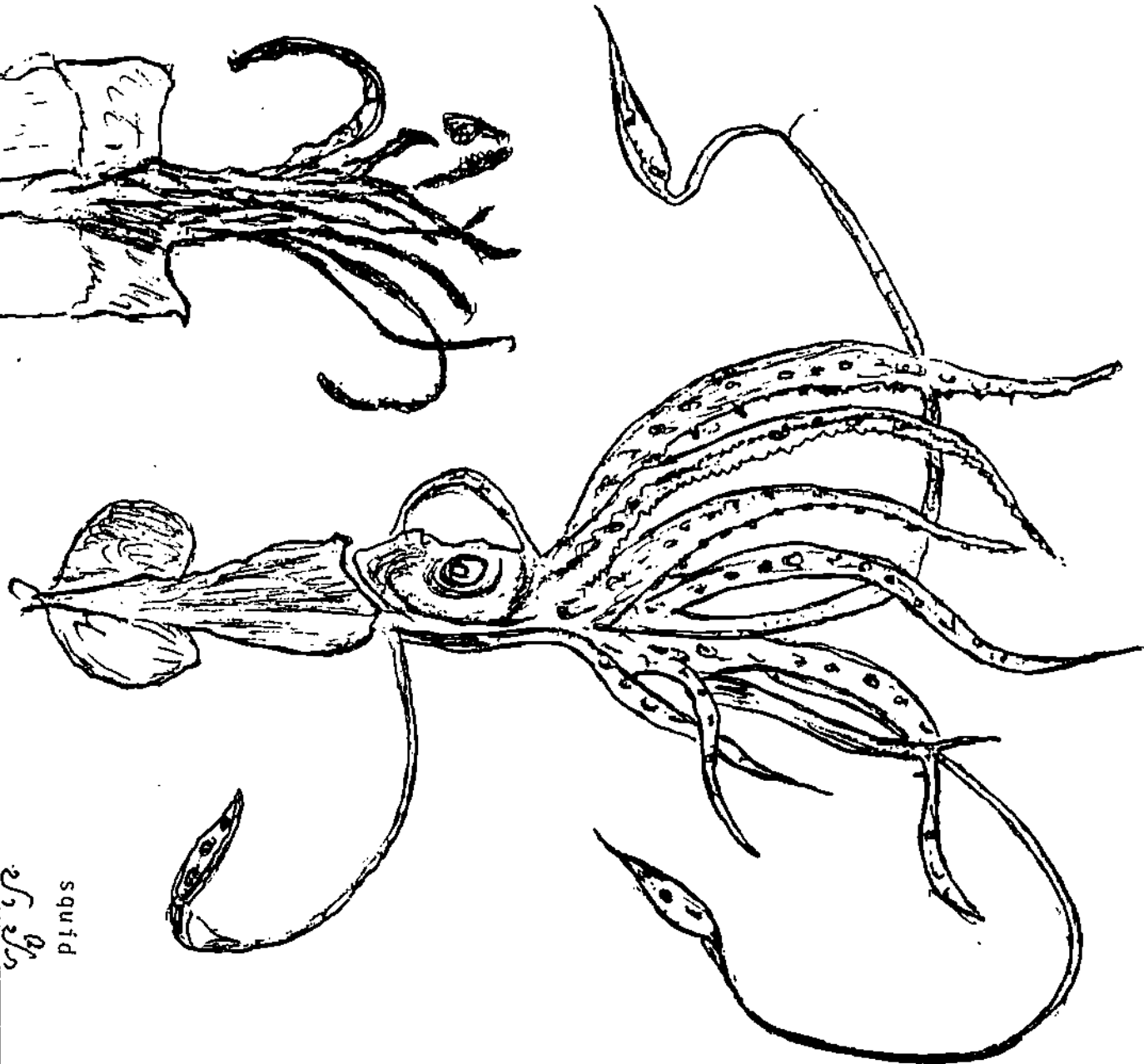
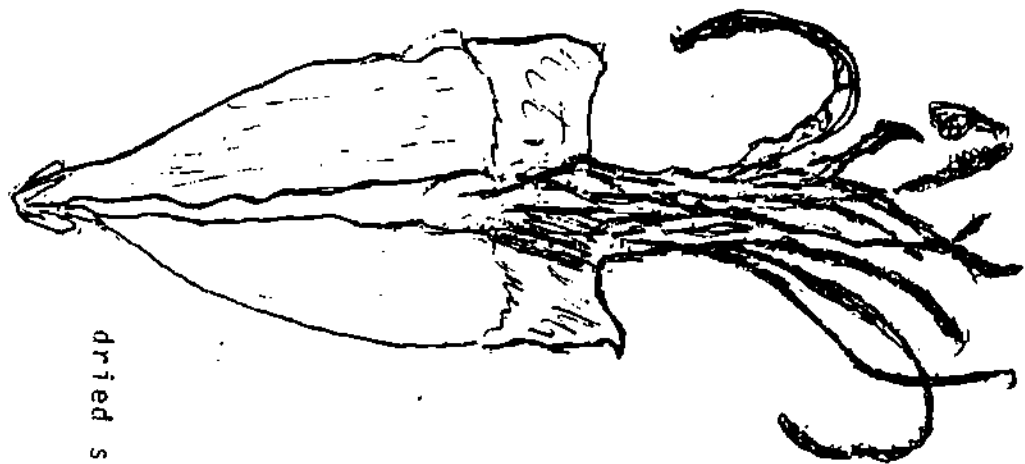
A GRASSHOPPER LAYS EGGS



EARTHWORM

2-2-1022

dried squid

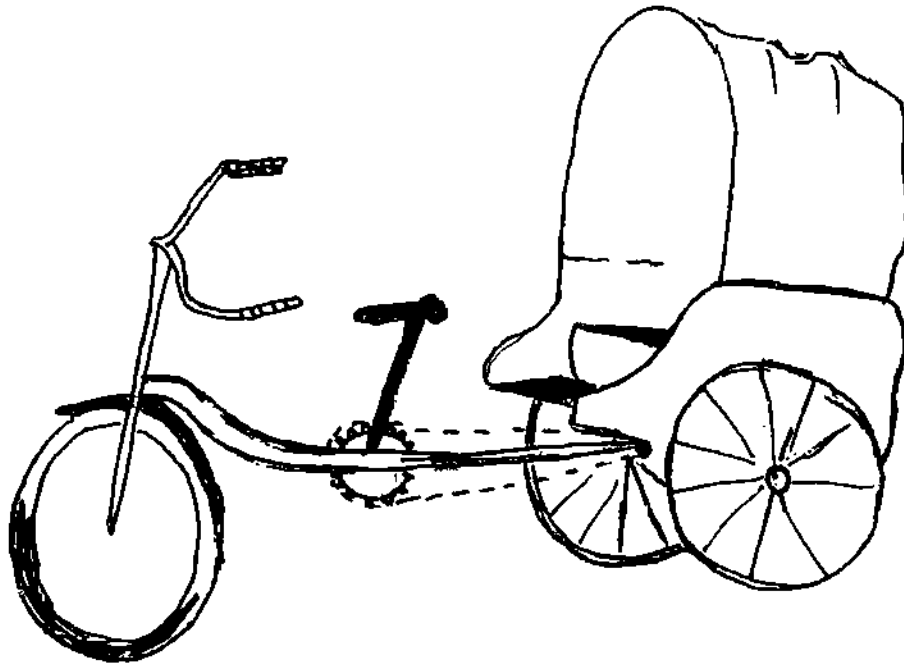


squid

2/5 2/5

Legend on the Sun and the Moon

A long time ago, people believed that there was a greedy, gigantic fog in the heaven which was occasionally trying to eat the moon or the sun. As the lunar or solar eclipse occurred, people would use their guns, firecrackers, or anything that would make noise to scare the greedy fog away. They would play and make noise until the fog spit out the moon or sometimes the sun.



MACHINES

<p>Solid 1121</p>	<p>Liquid 11211</p>	<p>Gas 911110</p>
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MATTER APPEARS IN THREE STATES

GLOSSARY

abalone	<u>סלמנדה</u>	cicadas	<u>מפיק</u>
animal	<u>חיה</u>	coconut	<u>קוקוס</u>
ant	<u>חמיל</u>	cod	<u>קוד</u>
areca	<u>קוקוס</u>	coffee plant	<u>קפה</u>
areca nut	<u>קוקוס</u>	comet	<u>כוכב לכת</u>
cluster of areca nuts	<u>קוקוס</u>	constellation	<u>כוכבים</u>
averrhoa caramboda	<u>קוקוס</u>	corn	<u>קמח</u>
bamboo	<u>קנה</u>	cow	<u>בקר</u>
banana	<u>פירות</u>	crab	<u>סרטן</u>
bean	<u>קטניות</u>	cricket	<u>קריקט</u>
bean sprouts	<u>קטניות</u>	black cricket	<u>קריקט שחור</u>
bee	<u>דבורה</u>	red cricket	<u>קריקט אדום</u>
queen bee	<u>דבורה</u>	white cricket	<u>קריקט לבן</u>
beet	<u>קטניות</u>	crocodile	<u>קרוקודיל</u>
betel	<u>קטניות</u>	cucumber	<u>קדחת</u>
bindweed	<u>קטניות</u>	custard apple	<u>קדחת</u>
bird	<u>חיה</u>	dog	<u>כלב</u>
buffalo	<u>קטניות</u>	dragon fish	<u>קדחת</u>
bush	<u>קטניות</u>	dragonfly	<u>קדחת</u>
carp	<u>קדחת</u>	duck	<u>קדחת</u>
cat	<u>קטניות</u>	durian	<u>קדחת</u>
black cat	<u>קטניות</u>	earthworm	<u>קדחת</u>
three-color cat	<u>קטניות</u>	eel	<u>קדחת</u>
two-color cat	<u>קטניות</u>	egg	<u>קדחת</u>
catfish	<u>קדחת</u>	elephant	<u>קדחת</u>
chicken	<u>קדחת</u>	evening star	<u>קדחת</u>

fish	<u>ປາ</u>	manioc	<u>ມັດຣາມາ</u>
dried fish	<u>ປາແກ້ງ</u>	mango	<u>ນົມໂກນລາ</u>
fresh water fish	<u>ປາໃນນ້ຳ</u>	mangosteen	<u>ນົມໂກນລາ</u>
saltwater fish	<u>ປາໃນນ້ຳເໜືອ (ນ້ຳເໜືອ)</u>	maple tree	<u>ໜ້າໝ້າໜ້າໝ້າ</u>
field mouse	<u>ໝູ່ໝູ່</u>	millepede	<u>ໝູ່ໝູ່</u>
flower	<u>ໝູ່ໝູ່</u>	mint leaf	<u>ໝູ່ໝູ່</u>
fly	<u>ໝູ່ໝູ່</u>	mole	<u>ໝູ່ໝູ່</u>
frog	<u>ໝູ່ໝູ່</u>	monkey	<u>ໝູ່ໝູ່</u>
fruit	<u>ໝູ່ໝູ່</u>	morning star	<u>ໝູ່ໝູ່</u>
glob fish	<u>ໝູ່ໝູ່</u>	mosquito	<u>ໝູ່ໝູ່</u>
grasshopper	<u>ໝູ່ໝູ່</u>	mouse	<u>ໝູ່ໝູ່</u>
Great Bear or Dipper	<u>ໝູ່ໝູ່</u>	black mouse	<u>ໝູ່ໝູ່</u>
green peas	<u>ໝູ່ໝູ່</u>	brown mouse	<u>ໝູ່ໝູ່</u>
guinea pig	<u>ໝູ່ໝູ່</u>	white mouse	<u>ໝູ່ໝູ່</u>
hemp	<u>ໝູ່ໝູ່</u>	mulberry	<u>ໝູ່ໝູ່</u>
hippopotamus	<u>ໝູ່ໝູ່</u>	musk rat	<u>ໝູ່ໝູ່</u>
horse	<u>ໝູ່ໝູ່</u>	mustard green	<u>ໝູ່ໝູ່</u>
jackfruit	<u>ໝູ່ໝູ່</u>	oak tree	<u>ໝູ່ໝູ່</u>
jute	<u>ໝູ່ໝູ່</u>	orange	<u>ໝູ່ໝູ່</u>
kingfisher	<u>ໝູ່ໝູ່</u>	oyster	<u>ໝູ່ໝູ່</u>
leaf	<u>ໝູ່ໝູ່</u>	ox	<u>ໝູ່ໝູ່</u>
lemon	<u>ໝູ່ໝູ່</u>	pig	<u>ໝູ່ໝູ່</u>
lettuce	<u>ໝູ່ໝູ່</u>	pumpkin	<u>ໝູ່ໝູ່</u>
lobster	<u>ໝູ່ໝູ່</u>	peach	<u>ໝູ່ໝູ່</u>
longan	<u>ໝູ່ໝູ່</u>	papaya	<u>ໝູ່ໝູ່</u>
lungfish	<u>ໝູ່ໝູ່</u>	parrot	<u>ໝູ່ໝູ່</u>
mackerel	<u>ໝູ່ໝູ່</u>	peanut	<u>ໝູ່ໝູ່</u>

perch	פיש קרני	snail, seashore	סלמנול
pigeon	תור	sole	זאב
pine tree	קנין	sparrow	תור
planet	כוכב	sprout	קצח
plant	צמח	squid	קצח
plum, salty	תאנה	star	כוכב
pomegranate	תאנה	stem	קצה
rabbit	זאב	sugarcane	סוכר
rambutan	תאנה	sun	שמש
rat	זאב	swallow	תור
ray	קצה	sweet potato	קצה
rice	קצה	tamarind	תאנה
rice plant	קצה	taro	קצה
rubber plant	קצה	tiger	קצה
root	קצה	tobacco	קצה
salamander	קצה	tomato	קצה
salmon	קצה	tree	קצה
sardine	קצה	trout	קצה
scallop	קצה	turtle	קצה
seed	קצה	vegetable	קצה
sesame	קצה	vine	קצה
sewer rat	קצה	wasp	קצה
shark	קצה	watercress plant	קצה
shrimp	קצה	watercress	קצה
silure	קצה	watermelon	קצה
snail	קצה	water caltrop	קצה
		whale	קצה

TEACHER COMMENT FORM

Name _____
(optional)

Supplement for Curriculum
Guide for Science: Lao-Speaking
Students

School _____

Kindergarten-Upper Two

Please complete and mail this Teacher Comment Form as soon as you finish using this material. Your comments and suggestions will be used in the completion of the program.

1. Was the format easy to use?
2. Did the activities serve pupils at all levels of ability?
3. Did you find the teacher information helpful? Do you think that more or less information should be given?
4. Which activities did you use? Which particular ones did you find most interesting and helpful?
5. What use did you make of the Teaching Aids?
6. Additional comments, criticisms, and suggestions will be welcomed by the committee.

Return to--

Miss Mary Nalbandian, Director, Bureau of Science,
Department of Curriculum, Room 814, Mail Run 84.

NOTE: If necessary, please use back of this sheet or another page for comments.