Six Month Progress Report NO. 1

July 1977 - December 1977

Project RIT
Muang Mai School
Lopburi, Thailand.

พิมพ์ที่ โรงพิมพ์และทำปกเจริญผล
๑๑๐/๖๖-๖๘ ถนนพระราม ๖ (เจริญผลต่ดใหม่) กรุงเทพฯ โทร ๒๘๑๘๑๙๗
นายพินิจ พืชวณิชย์ ผู้พิมพ์ผู้โฆษณา ๒๕๒๑

F O R E W O R D

The SEAMEO Regional INNOTECH Center is pleased to present the first six-month progress report of the Reduced Instructional Time Project (RIT). The purpose of Project RIT is to test the practicability of one hypothesis advanced by INNOTECH on an economical and efficient delivery system for mass primary education in the SEAMEO Region. The activities of RIT are currently being conducted in Thailand.

Project RIT represents only one of the approaches to reduce cost of quality education being undertaken in the Region. INNOTECH is also conducting another project which represents an alternative to the approach being tried out by Project RIT. This is Project Instructional Management by Parents, Community and Teachers (IMPACT) which is now in its fourth year of implementation in both Indonesia and the Philippines.

We, in Southeast Asia, have known for some time that we do not have the economic resources to keep on imitating the approaches to educational problems used by the wealthier countries. We must find our own solutions to the problem of providing mass primary education within our resources and capabilities. I believe that Project RIT and IMPACT will make significant contributions toward finding efficient and economical delivery systems for providing mass primary education in Southeast Asia.

In conclusion, I wish to commend the Project Director and her staff for the very difficult but challenging work of launching and blazing the trails for the implementation of an innovative delivery system and the INNOTECH Staff join me in congratulating them for an auspicious beginning.

LICERIA BRILLANTES SORIANO
Acting Director

A C K N O W L E D G E M E N T S

We wish to express our deepest appreciation to the Ministry of Education of Thailand for its generous assistance in allowing us to conduct the studies of RIT in Educational Regions 6 and 11. Besides providing 12 supervisors and 5 teachers to work for RIT; and comfortable and spacious office and furniture for the Project; the Ministry also allowed the Project to borrow a Land Rover, the type-writers, a mimeograph machine and other necessary equipment while the Project was waiting for the Project's equipment to be purchased.

We are grateful to the Ministry of Interior for providing us 38 teachers to work for RIT; and for allowing us to conduct the try out and the experiment in its schools.

We would also like to express our gratitude to those schools which cooperate with us in allowing us to try out our materials in their classrooms.

We would also like to thank all of the teachers of these schools who were very helpful in giving us necessary informations needed in analysis of our try out results.

Finally we would like to express our deep appreciation to :

SEAMES Director, Mr.Tan Seng Chye, and other SEAMES staff members for their patience, their good sense of humor, and willingness in providing us endless administrative and moral support,

Dr.Kopr Kritayakirana, former SEAMES Deputy Director whose advice was very vital in getting the Project off the ground smoothly; and for his continued interest in the progress of the Project,

Mr.Rangsrit Chaosiri, Under Secretary of State for Education; and

Dr.Saiyud Champathong, Director General, Department of Educational Techniques, for their kind assistance and generous support,

Dr.Kowit Pravalpruk, Deputy Director of INNOTECH for his quality professional assistance, his tremendous amount of time, effort and worries in keeping the quality of the work of the Project up to the standard, and for giving us a very realistic direction,

Dr.Daryl G. Nichols for his valuable recommendation and support,

Dr.Liceria B. Soriano, the Acting Director of INNOTECH without whose confidence and trust the RIT Project could not be managed efficiently.

In particular, we would like to express our deep gratitude to Dr.Robert Smail of US/AID Office, Bangkok, for his endless support and unfailing assistance which were most encouraging to all of us.

The RIT Staff.

INTRODUCTION

The SEAMEO Technical Working Group (July-August 1972) gave priority to primary education in its recommendations for the SEAMEO Educational Development Programmes for the 1970's. This priority was based on the need to provide at least a basic education to all children and the desire to find some alternative approaches to the traditional ways we provide education to our children.

In translating the priorities into action, the Southeast Asian Ministers of Education Council (SEAMEC) instructed its center, INNOTECH to carry out research leading to the development of an Effective and Economical Delivery Systems for Mass Primary Education. Two major INNOTECH project IMPACT (Instruction Managed by Parents, Community and Teachers) and RIT (Reduced Instructional Time) were thus launched with the hope that they might lead to workable alternatives that will enable all children of the SEAMEO Region to have the opportunity for quality primary education.

RATIONALE

..... approximately one-half of children in Southeast Asia do not complete a primary education,

..... this condition is most prevalent in rural communities in which some 70% of the population lives,

..... educational budgets are already strained, direction of INNOTECH research should not concern ways to increase funding,

..... traditional means of education can not be simply expanded because funds are not available,

..... non-traditional alternatives must be found which are both effective and economical,

..... mass media is expensive and limited as a means for delivery of rural primary education,

..... about 80% of educational costs are those associated with teachers,

..... ways must be found to reduce the teacher-student interaction in the class-room,

..... a large part of learning may have to be through instructional materials with less teacher-student interaction.

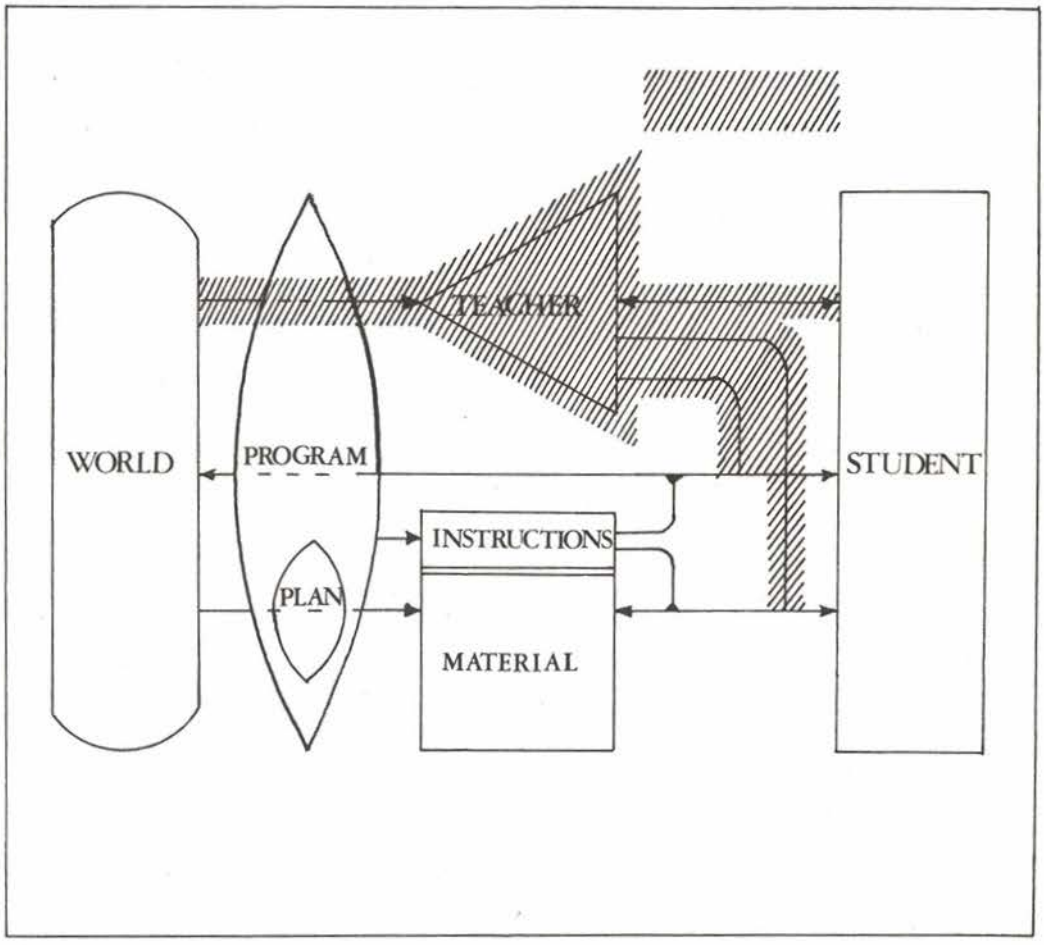
CHARACTERISTICS

It is realized that learning occurs in a wide variety of situations--even odd situations--with and without human teachers. Certain situations allow learning to be very efficient and effective, enabling students to acquire the desired knowledge in a shorter time, with a longer period of retention and at minimum cost.

Project RIT represents an alternative approach of INNOTECH to develop a means for effective and efficient mass primary education. Its thesis is that both the time required for student learning and the time that teachers must spread in support of learning can be reduced through the design and scheduling of instruction. If such Reduced Instructional Time can be achieved, more students can be accommodated by educational systems without increasing costs.

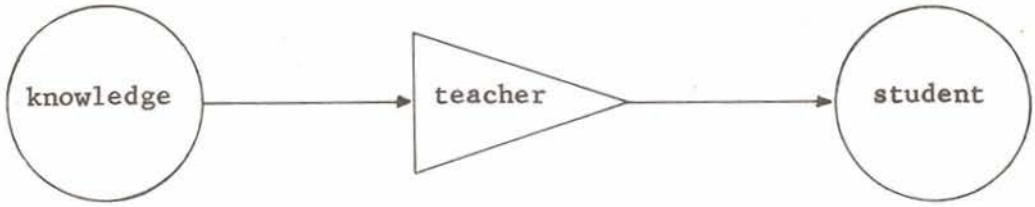
Different Institutions for Learning

The model below* illustrates the different situations where learning can take place :



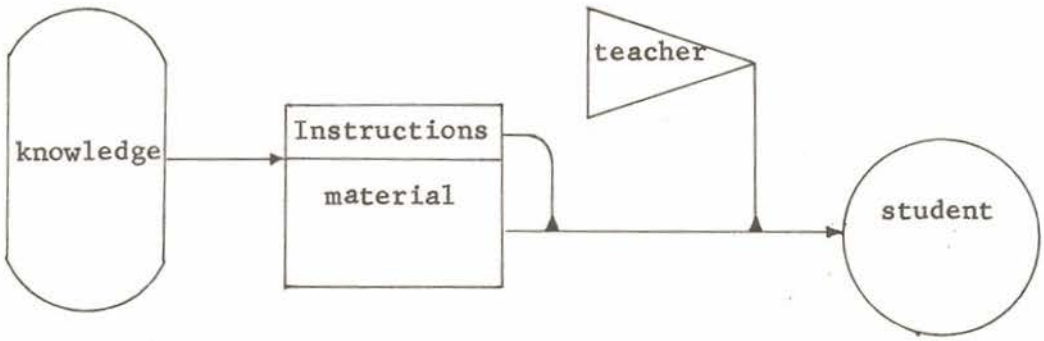
* Prepared by Dr.Douglas G. Ellson, Dept. of Psychology, Indiana University, Bloomington, Indiana, (U.S.A.)

In the first situation illustrated in the model, the student learns from a human teacher who performs as a transmitter of knowledge;



in the second instance, the student learns from the environment itself;

and in the third instance from materials with the help of either a human teacher or the instruction provided in the materials. In other words learning is controlled by a teacher or by instruction in the forms of sound, printed words, or illustrations, etc.



The first kind of learning that is learning with the teacher as the transmitter of knowledge is of course the expensive method, such that educational systems, particularly those of developing countries cannot meet the demand for basic primary education.

Per pupil costs of primary education must be reduced if educational opportunities are to be provided for all who seek primary education. In most cases this cannot be achieved without detriment to other priorities, hence, one possible solution is to develop means to increase the number of children one teacher can educate without sacrificing the quality of education.

It is found that many learning tasks can be performed by the students without the ever present guidance of the teachers. In many instances it is better for the students to perform these tasks with a little guidance from the teachers in order for the students to develop their independent learning skills as much as possible. There are many practice, memorization, and application activities which do not require the constant presence and guidance of the teachers.

Project RIT is an attempt to increase learning efficiency through the use of well prepared learning materials (which may include printed words with illustrations, programmes on audio tape, etc.). Such learning is controlled in most situations by instructions provided in the learning materials themselves. In situations where such form of control is not very effective, teachers will be employed to control learning (the third instance in Dr. D. G. Ellson's model).

Through better learning strategies and appropriate designs of the instructional programmes, the time spent on learning may be reduced. In short RIT is trying to find ways of (1) decreasing the amount of time students take to learn and (2) decreasing the amount of time that teachers need to spend with their students. These will result in a reduction of per pupil cost. RIT is concentrating more directly on means for improving the instructional processes to enable more children to benefit from existing school facilities and personnel while at the same time retaining the set-up of the conventional classrooms.

TO ILLUSTRATE :

..... suppose that a learner now requires 30 minutes in class (teacher time) and 15 minutes of home work (self time) in order to learn one unit (amount learned), and

..... suppose that through reduced learning time, the same amount of time can be used to double the amount learned (i.e. 30 minutes in class and 15 minutes of home work allows students to learn two units rather than the present one unit), and

..... suppose that learning, through reduced teacher time, will require only 15 minutes in class (teacher time) and 30 minutes of self study in order to learn one unit,

..... then, overall RIT procedures can be developed that would both reduce student-teacher interaction and increase learning rate.

..... Consequently, the procedure can reduce costs.

The example above is intended as illustrations only. In actual practice we may find some subjects in which we are able to save more than 50% of the time while in other subjects we may find that we can save less than 50%. The actual savings can only be determined after try out of the new instructional materials and approaches.

PURPOSES

The overall purpose is to increase the efficiency of present school personnel and facilities so that an increased number of children can make use of them. In order to accomplish this we will use principles of effective learning to increase student learning rates and modify the instructional process in order to reduce student-teacher interaction time.

S T A F F I N G

RECRUITMENT

PROFESSIONAL STAFF

July 1977, eleven supervisors from the Department of General Education were recruited to fill the following positions:

Project Director	:	Miss Nuanchan Potar
Deputy Director	:	Mr. Akom Chantasoontorn
Subject Specialists	:	Mr. Proong Puangnadda
	:	Mr. Prasert Tisklang
	:	Mr. Atinut Phromsiri
	:	Mr. Paisan Polawan
Curriculum Coordinator	:	Mrs. Praneat Khaoneum
	:	Mr. Sanoh Hattee
	:	Mr. Mana Sanguansook
	:	Mr. Satian Samattapapong
Research Specialist	:	Dr. Praphon Jearakul

This group of professional staff started working in July 1977 to set up the office, borrow and purchase the equipment, recruit supporting staff, and plan for the Project activities in great detail.

SUPPORTING STAFF

By the end of July the following positions of the

supporting staff had been filled:

Finance Officer	:	Miss Supaporn Pinyomit
Secretaries	:	Mrs. Sumol Sripat
	:	Miss Nittaya Sangboonshoo
Illustrator	:	Mr. Vanchai Poupornpong
Clerk Typist	:	Miss Pratuang Chimpaibool
	:	Miss Klongchit Lamaikhare
	:	Miss Malin Singharege
	:	Miss Rapeepun Boonputtanaporn
	:	Miss Surirat Dongcharern
	:	Mr. Phairoj Santawee
Driver	:	Mr. Boonchai Borisutpanich
Printer	:	Mr. Pipat Nanamcheo
Assistant Printer	:	Mr. Prasit Nuanrugsa
Collator	:	Mr. Samrerng Chin-Ong
Janitor	:	Mr. Rangsan Dongcharern

TEACHERS

Only a few teachers were recruited in August and September as almost all primary school teachers were under the Ministry of Interior and it took quite a while to obtain the approval from the Ministry of Interior to recruit the teachers. However, we were able to recruit 41 teachers whose names are listed below:

Teachers from the province of Lopburi :

Mrs. Watana Suthapanya
Miss Thongbai Sookmaitree
Miss Arunee Choomboon

Mr. Suruj Praphasawusdi
Mr. Prasit Boontanom
Mr. Bunsong Koomnguiew
Mr. Kunchon Chinprasatsak
Mrs. Rachanee Gaysorn
Mr. Sukonth Kruanamkham
Mr. Visit Onmitra
Miss Pismai Sakoopun
Mrs. Chalongrut Chartgumhang
Mr. Panya Woodtipaibulya
Mr. Chalerm Talerat
Miss Somporn Khammoen

Teachers from the province of Chaiyaphum :

Mr. Kabin Traithip
Mr. Udom Patjanasuntorn
Mr. Chaovalit Chamnan
Mr. Adool Wongyai
Mr. Sanit Siriwatanaphaiboon
Mr. Yon Wanachai
Mr. Dulyakiat Meteekraisorapong
Mr. Supo Panyadee
Mr. Tipakorn Maneenut
Mr. Cham Kadsanit

Teachers from the province of Nakhon Ratchasima

Mr. Prasert Silapa
Mr. Nikom Supanyadecha
Mr. Annop Campiranon
Mr. Soontorn Mengthaisong

Mr. Patcharin Santavichai

Mr. Chumpol Vawchimplee

Teachers from the province of Sing Buri :

Mr. Somboon Baithieng

Mr. Somrerng Tesana

Mr. Polthep Kanchanakulkich

Mr. Mana Sakulpukdee

Mr. Thanan Boonya

Mr. Chullachak Nophandhu

Mr. Smit Ubolsook

Teacher from the province of Ubon Ratchathani :

Mrs. Pilaivan Jearakul

Teacher from Bangkok :

Mrs. Laddavalaya Samattapapong

STAFF DEVELOPMENT

ORIENTATION

The subject specialists, the curriculum coordinators and the research specialist were orientated to the RIT concept and the activities of the Project at the begining of July.

The second orientation was organized for the teachers on

- RIT concept
- plan of activities

- how to write behavioral objectives
- how to write test-items
- criterion-referenced test
- systems approach in RIT
- SEAMEO and INNOTECH
- learning hierarchies
- learning approaches (strategies) used in RIT in Vietnam
- slide-tape presentation on the implementation of the new curriculum

NEW CURRICULUM

The curriculum of primary education in Thailand is being changed. The number of years of schooling at primary level is reduced from seven years to six years. The Ministry organized series of seminars and meetings to orientate supervisors, administrators and teachers to the new curriculum. Project RIT sent representatives to attend the seminars and meetings in order to obtain latest information on the new curriculum.

All professional staff also visited schools in Educational Region 6 and 11 in which the new curriculum is being tried out to see how the new curriculum was being implemented in actual classrooms.

WORKSHOP ON COST-EFFECTIVE ANALYSIS

Two of our staff members : Mr. Akom Chantasoontorn; and Dr. Praphon Jearakul attended the workshop on cost-effective analysis held at INNOTECH Manila. These two members will be

responsible to analyse the cost-effectiveness of the RIT delivery system.

VISIT PU-MUANG SCHOOL

Having been teaching in traditional schools, and they themselves were taught and trained in traditional schools and teachers colleges, the RIT staff members had some doubt whether children would learn if the teacher was not with them in class all the time; and if there would be any disciplinary problem when children studied individually or in groups. To assure the staff members on this matter, the visit to Pu-Muang School in Petchaburi Province was organized. What we saw at Pu-Muang School was most impressive. Children were trained to discipline themselves without the teacher's presence. In lower grades teachers were still in class to give instructions. In higher grades (grades 3 and 4) children worked in groups with little supervision from teacher. Each group consisted of 4-6 members. Children took turns to be the group leader. The role of the leader was to make sure that each member was working as assigned by the teacher. In some lessons children were given a set of questions, and were told to go out to hunt for the answer. The sources of information might be in the library, community, or the teachers in school. If a student broke the rule of the school or the rule of the group, the group would hold a meeting to agree upon what punishment should be appropriate. Most of the times the punishment was to fetch water to fill up the water jars in the toilets. Personal belongings of the student was kept very neat and tidy without teacher having to check after them. On the days when all the teachers had to go to town for

a meeting, children still came to school on time and learning activities were carried out as usual. Having seen that children could be trained to discipline themselves and were able to learn without the teacher's presence, our professional staff felt that some of our instructional materials designed to be learned individually; in pairs; and in groups might work very well.

VISITS TO IMPACT

Four staff members : Mr. Akom Chantasoontorn, Dr. Praphon Jearakul, Mr. Atinut Phromsiri, and Mrs. Praneat Khaoneum visited IMPACT Cebu and Sagang Palay, the Philippines to observe peer group learning activities. Mr. Akom and Dr. Praphon went in October after attending the Cost-Effective Analysis Workshop. Mr. Atinut and Mrs. Praneat went in December.

P R O C E D U R E S

Project RIT has two phases : try out phase and experimental phase

PHASE 1 Try-Out

This phase takes representative samples of learning portions (segments) from the curriculum and redesigns the instructional procedures (learning strategies) in order to achieve both an increase in the students learning rates and a reduction of the teacher-student interaction time. The instructional material for each portion with one or more than one strategies will be tried out for selection and modification if more than one strategies are tried out; and for modification if one strategy is tried out.

PHASE 2 Experiment

The instructional materials for the whole year curriculum will be prepared based on the try out results in Phase 1. These whole year materials will be used in a number of classes in experimental schools.

TRY OUT

RESEARCH DESIGN FOR TRY OUT

Sample and Population The RIT Project in Thailand covers schools in Educational Region 6 and Educational Region 11. In order for the sample schools to be representative of all the schools in the two educational regions, they were carefully selected in pairs from five provinces in the two regions, namely, Lopburi, Singburi, Saraburi, Nakorn Ratchasima, and Chaiyaphum. Altogether, 74 schools were selected each of which provided about two classrooms at different levels (for example, Prathom 1 and Prathom 4). Since each of the 31 portions being tried out required 4 classrooms (two experimental and two controlled classes), the total number of classrooms obtained from those 74 schools was 124. By random assignment, half of that number served as experimental and the other half as controlled calsses. Each classroom contained about 30 pupils.

Data Lay Out For each portion, four intact classrooms involved in the try-out, two as experimental and the other two as controlled classes. One experimental-controlled pair usually was drawn from urban schools, and the other pair from rural schools.

Try Out Procedure A pre-test was administered to the experimental as well as the controlled classes. After that, the lesson was presented to the experimental class through the RIT learning materials and strategies, while the controlled class

took the lesson through the traditional teaching method. Total learning time and teacher-student interaction time were recorded in both classes. After the lesson was completed, both classes were post-tested.

Analysis of Data Two variables, pupils' achievement and teacher-student interaction time were the main concern for analysis of data.

For pupils' achievement, the post-test scores, after being adjusted with the ANCOVA procedure using the pre-test scores as the covariate, were compared with the t-test procedure to determine the significance of difference.

Another method of statistical analysis was the criterion-based analysis in which the pre-test and post-test scores of the experimental group were compared on the basis of the percentage of pupils that passed the 60 percent level of performance (represented by the scores).

As for teacher-student interaction time, comparison was made on the basis of the percentage of time reduction that can be achieved.

SELECTION OF LEARNING PORTIONS

Thirty-one learning portions have been selected for try out. Steps in selection of representative sample are :

1. Obtain information about the primary curricula- both currently used and the new curriculum which

will be in use in the next school year (June 1978). This includes the official schedules of subjects and general topics to be covered in each grade, the objectives for each topic, the schedule of topics to be covered each month and also the weekly schedule of each subject. The student textbooks and teacher's guides for grades 1-7 are obtained. Discussions with teachers are held to identify the actual teaching strategies being used, and the amount of time spent in teaching each learning portions.

2. List all learning portions for the whole year material in 5 subjects: Thai, Mathematics, Science, Health and Social Studies. Classify each portion into one of the following learning types:

   - knowledge
   - intellectual skill
   - attitude
   - psychomotor skill

3. Thirty-one portions are selected based on the following criteria:

   ..... The portions selected should represent learning types listed in No. 2

   ..... The learning tasks should be typical for a given grade or even typical of more than one grades if possible.

   ..... A learning portion in which a student either

increases or decreases some skill or behavior such as increased language proficiency, should be avoided (if this is possible without sacrificing a given learning type). If this is not avoided, the difficulty is that the student's initial performance must be carefully measured in order to determine the amount of change which actually takes place.

..... The learning portion should not be a part of a sequence which requires readiness skills. This will allow us to teach the portion at almost any time without disturbing a sequence. If this criterion can not be met, the portion should be one that is going to be taught at the time of the year that our material will ready for use.

..... The portion that we choose must be one which is actually taught by the teachers as opposed to ones which are listed in the curriculum but for some reason or other are omitted from teachers' own schedule.

..... The overall criterion, however, is that all sampled portions, taken together are representative of all learning types in the five subjects in the new curriculum.

The table below shows the distribution of the 31 learning portions selected for try out.

Distribution of Learning Portions Selected for Try Out

	grade 1	grade 2	grade 3	grade 4	grade 5	grade 6	Total
Thai	3	2	-	-	-	2	7
Math.	2	2	2	-	-	-	6
Science	2	2	-	-	2	-	6
Social Studies	2	2	-	2	-	-	6
Health	1	1	-	-	2	2	6
Total	10	9	2	2	4	4	31

TABLE 1

Learning Portions Assigned to Be Tried Out at Different Grade Levels in Different Provinces.

Subject	Learning Portion No.1	L.P.2	L.P.3	L.P.4	L.P.5	L.P.6	L.P.7
Thai	G.1 (L.B.& C.P.)	G.1 (S.B.& N.K.)	G.1* (S.R.)	G.2 (L.B.)	G.2 (S.B.)	G.6 (N.K.)	G.6* (L.B.)
Math.	G.1 (S.R.)	G.1* (L.B.)	G.2* (C.P.)	G.2* (S.B.)	G.3 (L.B.)	G.3 (N.K.)	
Science	G.1 (L.B.)	G.1* (S.B.)	G.2 (C.P.)	G.2 (L.B.)	G.5 (N.K.)	G.5* (S.R.)	
Social Studies	G.1 (S.B.)	G.1 (N.K.)	G.2* (L.B.)	G.2 (S.B.)	G.4 (C.P.)	G.4* (S.R.)	
Health	G.1 (S.B.)	G.2* (S.R.)	G.5 (N.K.)	G.5* (L.B.)	G.6 (S.B.)	G.6 (C.P.)	

G = Grade Level

* = Learning portions of which the try out results of

the experiment groups will be compared with the controlled groups.

L.B.	=	Lopburi	C.P.	=	Chaiyaphoom
S.B.	=	Singburi	S.R.	=	Saraburi
N.K.	=	Nakhon Rachasima			

These 31 portions represent different learning types (knowledge, intellectual skill, attitude, and psychomotor skill) in grades 1-6. Table 2 shows the learning type of each learning portion.

TABLE 2 : Showing the Topics and Learning Types of the Selected Portions

Subject	Learning Portion 1	L. P. 2	L. P. 3	L. P. 4	L. P. 5	L. P. 6	L. P. 7
Thai	Read & write words with "a,i, g,t,o,m,n" sounds. K	Words with gliding sounds P	Words with "oi" sound I	Words with "h" sound K	Words with "o" sound I	Poem reading A	The story of Pra-non I
Math	Number 0, 1 - 5 P	Addition I	Measuring the distance P	Telling time I	Weighting K	Symmetry I	
Science	Growing Plant P	The Sun I	Animal care A	Stars, the Moon, and the Sun K	Matter K	Water force I	
Social Studies	Our family P	Our Nation P	Communica-tion I	New Year's day A	Thai Culture A	Malaysia K	
Health	Cleanliness P	Exercise and Rest A	Disease K	Household Medicine I	First aid P	Nutrition I	

K = Knowledge; P = Psychomotor skill; I = Intellectual Skill; A = Attitude.

We have found that a single portion may contain more than one type of learning; and these learning portions contain some overlap of learning types. This is allowed because we are most concerned with making sure that all of the types of learning found in the curriculum are represented.

Preparation of the Instructional Materials

In developing instructional procedures to reduce learning time, it is first necessary to be sure that the children will indeed learn, that is, they will achieve the appropriate learning objectives. Achieving the objectives alone, however, is not a guarantee of efficiency. But it is necessary for efficiency and in many cases, it leads directly to more efficient learning. The INNOTECH staff, therefore, has compiled a set of learning principles which are being applied in the development of RIT learning materials and procedures.

PRINCIPLES OF EFFECTIVE LEARNING

..... CLEAR STATEMENT OF OBJECTIVES

Before trying to teach anything it is necessary to state the objectives of the instruction. The objectives should be stated in a way which allows them to be measured. They should deal with tangible, observable behaviors or products of the learners.

..... CLEAR DIRECTIONS ABOUT HOW TO LEARN

Information should be given to the student which tells him how to acquire the skills or information that he is trying to learn. These may give him directions about the best way to memorize some materials, practice an arithmetic skill, apply an algorithm, or any of the many other behaviors which will be expected of him. Instead of simply giving the student materials and telling him to learn them he should be told some of the ways to study or practice the materials.

..... WHAT PERFORMANCE IS EXPECTED OF THE STUDENTS

The students should be told what behaviors or products will be expected of them as a result of going through the lessons. This may be presented to the students in the form of questions which they will be expected to answer, problems they will have to solve, discriminations or generalizations they will have to make, etc. The point is that the students should know what will be expected of them after they complete the lessons.

..... AN OVERVIEW OF WHAT IS TO BE LEARNED

Let the students know what the general content of the lesson will be. This allows the students "to see the forest" before they begin to examine each of the different kinds of trees. Telling the students what performance will be expected of them is like telling someone the destination of a trip. Telling the students the overview is like telling someone how they are going to get to the destination and what they can expect to see along the way.

..... OPTIMUM-SIZED LEARNING TASKS

The tasks which the students are asked to perform should be designed in small enough steps for them to progress from one behavior to another as smoothly as possible. If the steps are too large many of the students will not gain the skills, where as they could have had the steps been smaller.

..... PERIODIC REVIEW, SELF-EVALUATION, CORRECTION, AND REMEDIATION

At various points in the lessons the students should be given some review of what they have been doing. Without this it becomes very easy to lose whatever skills or information have been learned. They should be allowed to evaluate what they have been learning. It is important for an individual to see the progress he is making. In order to self-evaluate, feedback must be provided to the students which allows them to see the correct performances or products they are working on and then compare what they have done with the feedback. Once this is done the students should correct any errors they may have made. It has been shown that students who correct their errors perform significantly better than students who see the correct answers but do not correct their errors. If a student is not making progress he will need some additional help. Provisions should be made for some types of remedial help from tutors, review of the same materials or the use of alternative approaches.

..... ACTIVE LEARNING

The students should be doing something which is necessary for the learning. This is different from the passive role

that is the role of most students now. Instead of spending much time listening to or watching the teacher doing something, the students should be directly involved in learning activities themselves. The important factor is what the student does rather than what is done to the student.

..... STATEMENT OF WHY THE STUDENTS ARE LEARNING THE SKILLS OR INFORMATION

The students should know the purposes of their efforts. These should be related to the possible applications of what they are learning, to further learning and to real life situations.

..... APPLICATION OR USE OF WHAT IS LEARNED

The students should be given the opportunity to practice what they have learned. It is practice which allows the students to both develop and maintain the skill they have learned.

..... INTRINSIC OR EXTRINSIC MOTIVATION (INCENTIVES) TIED TO SPECIFIC ACCOMPLISHMENTS OF THE LEARNER

Desirable consequences should be provided for performed learning tasks. These can be information given to the student on the success of his behaviors or incentives which the students can earn by correct performance. For some students the intrinsic rewards produce a great deal of motivation. Many other students however may require extrinsic rewards or incentives in order to become motivated. As long as the incentives used are in no way harmful to the students, both intrinsic and extrinsic incentives may be used.

..... TEACH OTHERS WHAT HAS BEEN LEARNED

One of the best ways to learn something is to teach it. Students should be given the opportunity of teaching other students some of the things which they have learned. The other students can be younger or of the same age.

..... THANSLATION OF WHAT HAS BEEN LEARNED INTO A NEW CONTEXT

This allows the students to generalize what they have learned. There is a danger that the students will only be able to use a skill in a limited number of situations if they are not given a chance to use it in a variety of contexts.

..... USE OF CLEAR, SIMPLE LANGUAGE

When instructions are given to the students the writers should not try to impress the students with their erudition but should make sure that the language is simple and clear enough for the students to follow the directions. If the students can not follow them the directions should be rewritten before accusing the students of being dummies.

..... USE OF VARIETY WITH BOTH THE LEARNING TASKS AND THE INCENTIVES

Variety will generate both enthusiasm and motivation just as surely as a lack of it will create boredom and disinterest. The perfect teaching procedures do not exist any more than the perfect incentives exist. It is therefore a good and safe idea to introduce a variety of teaching procedures as well

as a variety of incentives.

..... INTERACTION WITH OTHER STUDENTS

Students should interact with each other in both small and large groups. The interaction can be through games, exchange of ideas, helping sessions, critique sessions, joint projects, etc.

..... ACCOMMODATION OF INDIVIDUAL DIFFERENCES

This can be accomplished most effectively through the use of self-instructional materials which are used on an individual basis. If students are not allowed to progress at their own rates the slower ones will not master the skills and the fast ones will get bored.

..... USE OF WELL-ORGANIZED LESSONS

The lesson plans which are used should describe both student and teacher activities rather than just indicating the content which is to be covered.

..... USE OF THE PRINCIPLE OF "LEAN PROGRAMMING"

We should not take the time to teach things that the students have already learned. If they know the information or have mastered, and maintained the skill, don't teach it again. The fairly obvious way to accomplish "lean programming" is to test the students before you teach the materials. If they demonstrate their knowledge of skills don't teach the lessons again.

STEPS IN PREPARATION OF THE MATERIALS ARE :

- A number of teachers, normally 2 teachers, is assigned to write the behavioral objectives, pre and post tests for the portion.
- Test item analysis. Modification and revision of the test items.
- The members of each subject discuss some of the ideas on how the portion might best be learned. This is done, most of the times, through a brain-storming session. Then, one or two strategies are selected. One of the criteria for selection is the reduction of interaction time between the teacher and students.
- The teachers who are assigned to prepare the instructional material for the portion prepare drafts of each strategy for a critique session. While preparing the materials, mini-try out may be conducted to assure the feasibility of the management, the level of the language used, the appropriateness of the illustrations, and the practicability of equipment etc.
- Selected members of the staff participate in a critique session or sessions, discussing and modifying the drafts until all are satisfied.
- The teachers complete the material.
- Complete illustrations, typing and reproduction.

After the material is ready for try out, the Research Specialist makes arrangement with the schools to schedule the try out.

TRY OUT PROCEDURE

As regular school teachers are not familiar with our instructional materials and our teaching procedures which sometimes are completely different from what they have been trained and practised for years, we faced a lot of serious problems concerning the use of our instructional materials by the regular school teachers during the first few try out sessions. Short instruction on how to use the material before try out was not sufficient. The instruction given to the students were not clear. The teaching and learning procedures were not followed. The instructional materials were abused! There was so much confusion in class and a lot of frustration and disappointment on our part. We were puzzled with the most curious results of the first few portions. Dr. Kowit Pravalpruk was consulted; and long, serious discussions were held with Dr. Kowit. It has been agreed that the teachers who are working with the Project will be the ones to conduct the try out in schools (This explains why we have very few try out results to report because the results of a few learning portions which we tried out in October and November could not be interpreted for use!).

STEPS IN TRY OUT

Experimental Classes	Controlled Classes
- pre-test - apply RIT materials (the time students spend in learning and the time spent by the teacher to interact with the class are recorded) - post-test	- pre-test - traditional method (the times are recorded) - post-test

TRY OUT SCHOOLS

About seventy schools in five provinces are randomly assigned as try out schools. Some of the classes in these schools may be assigned to be controlled classes if necessary. However about 20 schools in these five provinces are randomly assigned as controlled schools (list attached).

DESCRIPTION OF LEARNING STRATEGIES

The five learning strategies assigned to the five learning portions that have been tried out can be briefly described as follows :

LINEAR COMIC BOOK (SELF-INSTRUCTION)

An illustrated story with questions and feedback interspersed. The students read the story, answer the questions, check their answers, correct any wrong answers, and continue with the next part of the story.

TEACHER DIRECTED PLUS GROUP PRACTICE

The teacher presents the lesson for a few minutes, then divides the class into small groups of 5-6 students. The members of the group practise using the materials provided for them. The leader of the group checks the responses.

CUE-REDUCTION (SELF-INSTRUCTION)

Cue-reduction techniques are used in the illustrated program. Students first fill in the missing letters of the names on the map, then fill in the names on the blank map provided. Immediate feedback is provided after each response. The students go through the program by themselves at their own pace.

LINEAR COMIC PROGRAM PLUS INDIVIDUAL PRACTICE AND BUDDY SYSTEM

Self-instructional linear program is used to present the content of the lesson. Questions and feedback are provided. After going through the linear program, flip-cards are used for individual practice and pair-learning (buddy system).

TRY OUT RESULTS

To date, 2 learning portions have been tried out in 8 schools. After the trying out each portion a general meeting of the professional staff was conducted to evaluate the try out results and to discuss points for modification and improvement. The try out results are reported as follows :

Health Education 3

Grade	:	Pratom 5
Topic	:	Diseases
Type of learning	:	Knowledge
RIT Approach	:	Self-instructional Comic Book

The portion is divided into three parts each of which takes about one hour learning time. For each part, a self-instructional material in form of a comic book completed with formative evaluations and feedbacks is presented to each student. The teacher spends from 5 to 10 minutes at the beginning of the period explaining to pupils how to study the material. After that, pupils are left on their own to work on the comic book.

Results : A. Pupils' Achievement

TABLE 1

Criterion - based Analysis of Pupils' Achievement

(Experimental Group Only)

Assessment	Below 60% Scores		60% up Scores		Total		80% up Scores	
	Number	%	Number	%	Number	%	Number	%
Pre-Test	53	77.94	15	22.06	68	100	0	0
Post-Test	19	27.94	49	72.06	68	100	14	20.59

TABLE 2

Analysis by Comparison with Control Group

Group	Pre - Test Scores		Post - Test Scores		Adjusted Post Test Scores		t value $(\bar{X}_{Exp.} - \bar{X}_{Con.})$
	Mean	S.D.	Mean	S.D.	Adj.Mean	Adj.S.D.	
Exp.	14.12	4.31	19.71	4.74	19.14	3.25	6.12 Significant the .01 level
Con.	12.70	4.16	14.85	5.13	15.49	3.49	

Results : B. Reduction of Teacher-Pupil Interaction Time

TABLE 3

Comparison of Instruction and Learning Time
Between Experimental and Control Groups

Group	Learning Time (periods)	Learning Time (minutes)	Instruction Time* (minutes)	Reduced I.T. (Minutes)	Reduced I.T. (percentage)
Experimental	3	148	14	166	92.2
Control	3	180	180	-	-

*Instruction time (I.T.) means teacher-pupil interaction time.

DISCUSSION

This portion was tried out in schools in Nakorn Ratchasima, a province in Educational Region 11. Two intact classrooms were employed as the experimental group, one in Tesabarn 1 School in the district town of Bua Yai, the other in Ban Nonsang Village School. For comparison, two classes were selected for the control group. They were from Tesabarn 2 School in Bua yai and Ban Non Ta Then Village School respectively. There were 68 pupils in the experimental group and 60 in the control group.

Table 2 shows the results of comparison between the achievement scores of the two groups. Both the experimental and the control group posttest means were adjusted with the ANCOVA procedure, using the pretest means as the covariates. Even after the adjustment, the experimental group's posttest mean was still significantly higher, at the .01 level, than the control group's mean. This means that the experimental group significantly out performed the control group.

The experimental group scores were also analyzed according to a pre-established criterion of the 60% level of achievement. This criterion requires that in the pre-testing not more than 30 percent of pupils in the group should score at the 60 percent level or better, whereas in the post-testing not less than 70 percent of them should pass that 60 percent level. Table 1 shows that the results of try out for this portion met this criterion. The pre-test scores show that only 22.06 percent of the experimental group could reach the 60 percent level, while 72.06 percent of the group could reach the level in the post-test. In addition, 20.59 percent could perform at the 80 percent level in the post-test as compared to none in the pre-test.

As for reduction of interaction time, Table 3 shows that teacher-pupil interaction time was reduced drastically. For the experimental group, only 14 minutes out of the total learning time of 148 minutes were interaction time whereas for the control group the teachers had to stay with their classes for the whole 180 minutes. The result was 92.2 percent of time reduction.

Table 3 also shows that total learning time was also reduced from 180 minutes in the control group to 148 minutes in the experimental group.

Thai 3

Grade	:	Pratom 1
Topic	:	Words Ending with Yaw and Waw
Type of learning	:	Intellectual Skill
RIT Approach	:	Partly Teacher-directed plus Group Practice

At the beginning of the period, pupils repeat new words after the teacher. This may go on for about 10 to 15 minutes. Then the teacher explains to pupils how to participate in different group games for practice of newly learned words. After pupils have understood the games, they form groups and play those games for word practice. Flip cards and reading materials were employed during the game. The teacher is free, yet can interrupt and supervise the game to make sure that the activities flow smoothly and profitably. A review of the lesson can either take place at the end of the period or at the beginning of the next period.

Results : A Pupils' Achievement

TABLE 1

Criterion-based Analysis of Pupils' Achievement
(Experimental Group Only)

Assessment	Below 60% Scores		60% up Scores		Total		80% up Scores	
	Number	%	Number	%	Number	%	Number	%
Pre-Test	54	91.53	5	8.47	59	100	1	1.69
Post-Test	17	28.81	42	71.19	59	100	19	32.20

TABLE 2

Analysis by Comparison with Control Group.

Group	Pre-Test Scores		Post-Test Scores		Adjusted Post-Test Scores		t value
	Mean	S.D.	Mean	S.D.	Adj.Mean	Adj.S.D.	($\bar{X}$exp.-$\bar{X}$con.)
Exp.	14.66	7.10	26.66	7.68	25.83	6.16	7.95 Significant at the .01 level
Con.	12.49	7.45	16.26	8.44	17.17	4.57	

Results : B. Reduction of Teacher-Pupil Interaction Time

TABLE 3

Comparison of Instruction and Learning Time
Between Experimental and Control Groups

Group	Learning Time (periods)	Learning Time (minutes)	Instruction Time (minutes)	Reduce I.T. (minutes)	Reduced I.T. (percentage)
Exp.	7	397	231	436	65.37
Con.	6½	667	667	-	-

Notes : 1. For each group, learning and instruction time and periods were averaged out of 2 classes.

2. Instruction time (I.T.) means teacher-pupil interaction time.

DISCUSSION

This portion was tried out in schools in Saraburi, a province in Educational Region 6. Two urban private schools in the town of Saraburi, Pichitwittaya and Ratsuksa provided classes for the first leg of experimental-control pairing, whereas two rural village schools, Ban Nong Chik and Wat Huay Kamin provided classes for the second leg of the pairing. Total numbers of pupils were 59 for the experimental group and 53 for the control group.

Table 2 shows that after the adjustment, the experimental group's post test mean was significantly greater, at the .01 level, than that of the control group, indicating that the experimental group significantly out-performed the control group.

Table 1 shows that when analyzed according to the predetermined criterion of the 60% score level, the try out results of this portion were also satisfactory. In pre-testing, only 5 out of 59 pupils in the experimental group, or 8.47 percent, or 71.19 percent, can reach that level. In addition, while only one pupil can score at the 80% level in pretesting, the number of those who can do so increased to 19, or 32.20 percent, in post-testing.

As for reduction of interaction time, Table 3 shows that the averaged learning time for the experimental group was 397 minutes as against 667 minutes for the control group. Also, the averaged instruction time for the experimental group was 231 minutes, as against 667 minutes for the control group (traditional teaching strategies do not have acceptable mechanisms for relieving teacher-pupil interaction time). The resulted reduced instruction time was 436 minutes or the reduction of 65.37 per cent.

Since both urban and rural schools were involved in this try out, it is interesting to determine if the RIT material and strategy is as effective for the rural pupils as for the urban pupils. The answer could partly be derived from the analyses shown in Table 4 and Table 5.

TABLE 4

Pre-Test and Post-Test Means of Urban and Rural Schools in the Experimental Group.

School	Type	N	Pre-Test Scores		Post-Test Scores	
			Mean	S.D.	Mean	S.D.
Pichit wittaya	urban	31	15.68	6.85	28.87	5.51
Ban Nong Chik	rural	28	13.54	7.32	24.21	9.02

TABLE 5

Comparison of Gain Percentages for Rural and Urban Experimental Classes

School	Type	Percentages of Psssing the 65% level		Gain Percentage
		Pre-Test	Post-Test	
Pichitwittaya	urban	9.68	87.10	77.42
Ban Nong Chik	rural	7.14	53.57	46.43

From Tables 4 and 5, it is obvious that the urban class steadily outscored the rural class in both the pre-test and post-test. Also, the RIT material and approach seemed to work better with the urban class as shown by the gain percentage of 77.42 as compared to the gain percentage of only 46.43 for the rural class.

CONCLUSION

Two portions, one in health education and the other in Thai language were tried out in December 1977. Try out results seem to indicate that the RIT strategies and materials employed in those two portions were successful. General staff meetings were held after the try out to evaluate the results and discuss points for improvement with the aim of conducting the experiment later.

What the Ministry of Education says about RIT

Dr. Kaw Sawasdi Panich, Deputy Ministry of Education, Thailand, in his speech delivered at the Meeting of School Administrators on December 17, 1977 refered to Project RIT as a very interesting innovation in education at Primary level.

MODES AND SYSTEMS OF LEARNING IN RIT

Peer learning will become an important mode in RIT as attempts are being made to reduce teacher time. Self-instructional modes also reduce teacher time, but their continued use leads to boredom and takes a lot of FUN out of the learning process. Self instruction, however, is an ideal form for homework. Peer learning has the dual advantage of socialization and FUN and allows a child who may not understand to be helped by peers having greater understanding.

There are two primary peer-learning modes :

- peer-group learning
- peer-pair learning (formerly termed the "buddy" system)

There also are two types of management systems which can be the ultimate outcomes of the RIT experiment :

- reduced class time (children in school but interaction with teacher is minimized).
- reduced school time (children spend less time in school).

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Both peer-group and peer-pair learning modes are appropriate for a reduced class time management system, but only peer-pair learning is appropriate for the homework of reduced school time. It would place too great a load on the management system to expect groups of children to learn together off the school grounds. Self instruction can be used in either management system. Large class instruction by the teacher can be used for short periods in the reduced class time system (RCT) and can be used for longer periods in the reduced school time system (RST).

Here are hypothetical descriptions of what the two systems might look like.

First, reduced class time :

> School facilities are relatively unchanged, although several classrooms may be combined to make a large study hall with movable partitians and there may be a number of kiosks built next to the school to accomodate peer-group learning activities. Enrolment is about the same as before, but it may be increased if there are children in the community not now in school. Facilities may have to be expanded to meet the needs of an increased enrolment (probably through the construction of inexpensive kiosks). The greatest change is in student-teacher ratios with one teacher being responsible for substantially more students. Learning activities are organized so that teachers spend most of their time in

(1) giving instructions on how to learn, (2) monitoring learning activities and (3) evaluating and remediating. Students of one class will meet as a group so that the teacher can spend a short period in giving them the learning materials, organizing them for peer-learning or self-instruction, and explaining what they are to do. The teacher then leaves the children, usually under the supervision of a student monitor, and goes to the next class to organize learning activities there.

The children may stay in their original classroom, or they may move to the study hall or to the learning kiosks. At set intervals, the teacher stops by each group of learners to determine if all is going smoothly and to give help when it is not doing so. At a predetermined time, perhaps after one hour or so, the teacher meets with the full class again, giving them a short post test (students exchange papers for scoring) and the teacher goes over test results looking for learning deficiencies which she/he then corrects (remediates). The three step procedure of (1) giving learning instructions, (2) monitoring learning and (3) evaluating and remediating is repeated in a variety of forms throughout the school day and a normal homework load via self or peer-pair learning is assigned.

Second, reduced school time :

School facilities are unchanged, and enrolment is either increased or the number of teachers is reduced. Students are divided into three streams with each stream attending school at different times for only two hours each day. The teacher usually meets with students of the normal class size and has three primary responsibilities :

(1) evaluating and reviewing homework and giving remedial help,

(2) giving class instruction and

(3) assigning and explaining homework.

Post tests of various kinds are given during the first period with children scoring each other. The teacher then uses the remainder of the period explaining those portions of the homework in which learning was most deficient, giving individual and group remediation. The second period is given over to learning activities which are inappropriate for homework, e.g., music, discussions, spoken language, etc. The third period is for giving homework assignments and explanations. Homework may at times be self-instruction, peer-pair learning or peer-group learning. This latter mode is not used frequently and mostly is applied to community learning activities such as visiting stores or interviewing local officials.

Both management systems hypothesized above are for the last three grades of primary school. Under both systems, the primary learning mode for the first three grades is programmed teaching with older students acting as the teachers. There would be no reduced school time during the first three years of school. The older students acting as programmed teachers would be scheduled to teach for one hour each day, although the scheduling would be different under the two management systems. Older students of the RST system would be scheduled for their one hour before or after their two-hour in school session, whereas older students of the RCT system would be scheduled to be away from their own learning activities for an hour each day each, much or is now being done in IMPACT.

We earlier suggested that the two types of peer learning may be the primary RIT modes because they allow non-teacher learning while at the same time allowing for more socialization and FUN and for the helping of each other better understand. Let us now look at some possible learning procedures under the two peer learning modes.

LEARNING PROCEDURES	PEER-PAIR LEARNING	PEER-GROUP LEARNING
FLIP CARDS	Very Appropriate either in School of for homework.	Appropriate, but each child will have less opportunity to respond in the same amount of time compared to peer-pairs.
RADIO	OK, but may require too many radios. More appropriate for large classes. Scheduling of radio for homework difficult if children of the RST are in three two-hour streams.	OK, but large class probably is a more efficient grouping.
PROGRAMMED INSTRUCTION	Very appropriate because working pairs is less boring and because kids can help each other.	Very appropriate, but children will have to learn peer-group procedures such as taking turns in being leaders.
DISCUSSION	Not appropriate, but RST students could meet in large or small groups during school period.	OK, but discussions usually take teacher guidance. Probably better in larger classes.

LEARNING PROCEDURES	PEER-PAIR LEARNING	PEER-GROUP LEARNING
GAMES	Competitive games not appropriate and games requiring much equipment could not be part of homework. Puzzles are quite appropriate.	Very appropriate.
TAPE RECORDING	Too expensive and hard to maintain. Should be used only to simulate radio. (See radio comments above.)	OK, for groups, but hard to keep up level of maintenance. Radio more appropriate. Can be used in the experiment to simulate radio.
COMMUNITY LEARNING	Groups are far better than pairs. RST students could be grouped for community learning homework.	Very appropriate.
etc.	etc.	etc.

DESIGN OF RIT INSTRUCTION IN RELATION TO PROBABLE TYPES OF MANAGEMENT SYSTEMS

RIT has had the rationale that if we can reduce instructional time we, then, will be able to reschedule schools so that personnel and facilities can accomodate more children. This statement is about as far in the future that we have looked, but there are some RIT learning strategies that will fit better into one type of rescheduling (one type of management systems) than they would fit into another type of management system.

The attached chart shows six possible configurations depending upon three variables :

1. Number of teachers unchanged or decreased
2. facilities unchanged or expanded
3. Number of students unchanged or increased.

In examining these configurations and their implications for design of the managenat system, however, only two types of management systems appear likely.

The first can be termed Reduced Time In School and results from rescheduling school periods so that enrolment can be at least doubled without increasing the number of teachers

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or expanding facilities. The Philippine In-School Off-School approach is an example because time in school is cut in half by having students attend school only every other week. Their week out of school is spent in learning via modular Self-Learning Kits. The most acceptable management system in Thailand for Reduced Time In School seems to be a simple deduction of the number of hours spent in school each day which would result in half day in and half day out of school.

The second likely type of management system can be termed simply Increased Enrolment without increasing the number of teachers but with some expansion of facilities. The school day would remain unchanged, but a teacher would be responsible for the learning of a larger number of children. Project IMPACT is an example of an Increased Enrolment type of management system.

There will be some designs of RIT instruction which are more appropriate to one management system than the other. Reduced Time In School, for example, will require much more homework for learning away from the school. The most obvious design of instruction for homework will be self-instruction because only rarely will we be able to expect group learning without supervision away from the schools grounds. We also may be able to develop paired peer learning (the "buddy system") so that two friends can learn together.

The rescheduling for Increased Enrolment may be a half-hour with teacher and a half-hour away from teacher -or- fifteen minutes with and forty-five away -or- etc..

This rescheduling thus differs from Reduced Time In School in two ways : (1) students are in school even when away from the teacher and (2) contact with the teacher is more frequent with the time away from the teacher much shorter.

The Increased Enrolment management system will give greater freedom to RIT design of instruction. For example :

- large class instruction
- peer group learning
- paired peer learning, including games
- programmed teaching by student leaders
- self-instruction in study halls or in classrooms without direct teacher supervision

RIT do not, at this time, definitely settle on one or the other type of management system, even though the system for Increased Enrolment seems to fit into the Thai educational structure better than the other system.

SUMMARY OF

LIKELY MANAGEMENT SYSTEMS

1. Reduced Time In School

I. HALF DAY

OR

EVERY OTHER DAY

OR

etc.

II. INCREASED ENROLMENT

FULL DAYS WITH

a) Movement of teacher from class to class

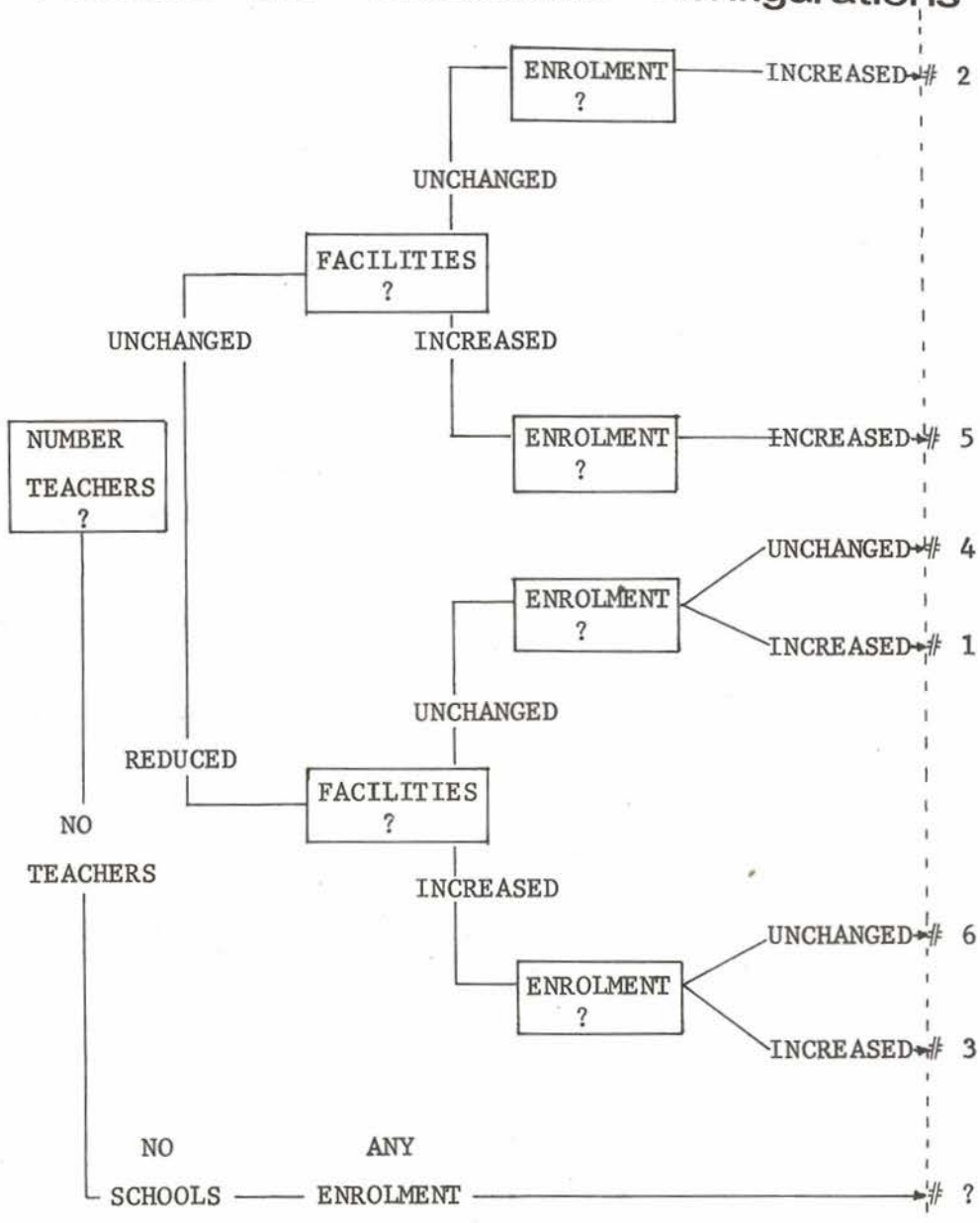
or

b) Larger classes

or

c) Movement of students to study halls or small-groups learning places (e.g., Kiosks)

Possible RIT Successful configurations



Q'S : WHAT KINDS OF MANAGEMENT SYSTEMS ?

WHAT BUDGET CONSIDERATIONS FOR MAKING DECISIONS ?

KINDS OF MANAGEMENT SYSTEMS AND BUDGETING CONSIDERATIONS OF POSSIBLE RIT CONFIGURATIONS

Configuration # 1

Teachers	:	Reduced
Facilities	:	Unchanged
Enrolment	:	Increased

This configuration is quite obviously, an optimum outcome of RIT because it would both reduce teacher costs and increase enrolment with no increase in facility costs.

Implications for the Management System :

- Teachers move from class to class, or
- Larger classes
- Children go to school for shorter periods so that the time that remains can be given over to other children. Reduced learning time, as such, may be involved; but it is more likely that much learning will have to take place away from the school, i.e., homework. These shorter periods may be :
  - half days
  - every other day
  - every other week
  - every other month
  - 6 months each year
  - reduce number of school year

of these options, the two most likely are half-days and every other day. Longer periods away from teachers' guidance probably require more maturity and self direction than the majority age children are capable of. So -

HALF DAY

EVERY OTHER DAY.

Implications for Budgeting :

- No budget increases
- Money saved from teacher reduction can be applied partially to RIT materials costs.

Configuration # 2

Teachers	:	Unchanged
Facilities	:	Unchanged
Enrolment	:	Increased

This is a very likely and very disirable configuration, i.e., use of existing personnel and facilities to provide education for more students. However, it will only apply if there are children in a school catchment area for whom there are presently no places in the schools. It does not provide funds for serving communities presently without schools.

Implications for the Management System :

- Some as for Configuration # 1, i.e.,
  HALF DAY or EVERY OTHER DAY

Implications for Budgeting :

- Some slight budgetary increases necessary to pay for RIT materials
- Willingness to increase overall budget to gain a lowered per-pupil cost.

Configuration # 3

Teachers	:	Reduced
Facilities	:	Increased
Enrolment	:	Increased

This has some of the implications of Project IMPACT, a system which can cut per-pupil costs in half even though it provides learning modules and added learning places (kiosks). The money saved on RIT could be used to put schools in communities non deprived.

Implications for the Management System :

- School periods probably unchanged, i.e., no half days or similar rescheduling.
- Teachers go from class to class

  - or -

- Teacher have larger classes

  - or -

- Students move from place to place (perhaps a time in class followed by time in a large study hall or in small group kiosks)

Implications for Budgeting :

. No need for budget increases if teacher cost reduction offsets the costs of facilities and RIT materials.

Configuration # 4

Teachers : Reduced
Facilities : Unchanged
Enrolment : Unchanged

This configuration permits the teaching of the same number of children in the same facilities by fewer teachers. Per-pupil costs would be reduced and the money saved could be used to accomodate more children in newly-constructed facilities.

Implications for the Management System :

. Some or Configuration # 3

CLASS TO CLASS

- or -

LARGER CLASSES

- or -

Students move to Study Halls or Kiosks

Implications for Budgeting :

. No budget increase required

. Need to make long-term projections so that the reduction of teachers (through attrition not firing), and the money thus saved can be applied

to strating new schools in communities not now served.

Configuration # 5

Teachers : Unchanged
Facilities : Increased
Enrolment : Increased

Per pupil cost reduction will have to be more than offset facility costs or there is no overall saving. The configuration would mainly apply to communities in which an adequate number of places are not available to accomodate all school-age children.

Implication for the Management System :

- Same as for Configurations # 3 and 4

Implications for Budgeting :

- Overall budget increases are required to fund facilities and RIT materials.
- Justification must be substantial per-pupil cost reductions.

Configuration # 6

Teachers : Reduced
Facilities : Increased
Enrolment : Unchanged

A very unlikely configuration because there would be little need for increasing facilities unless enrolment is increased.

REDUCTION OF INSTRUCTIONAL TIME :

IMPLICATIONS FOR MANAGEMENT SYSTEMS :

As indicated before that there are two types of management systems which can result from RIT :

A. 1) RST : Reduction of School Time, i.e., shortened school days, number of days each week. etc.

A. 2) RCT : Reduction of Class Time, i.e., shortened period of time each day for pupil-teacher interaction.

Also, as indicated in the original planning, document and subsequent reports, there are two kinds of reduction of instructional time :

B. 1) RLT : Reduced Learning Time, i.e., children learn the same things faster than in traditional settings.

B. 2) RTT : Reduced Teaching Time, i.e., the teacher spends less time per student to attain the same learning achievements.

We should expect the greatest reduction in B.2 (RTT) because there are many ways of learning in the absense of a teacher (RTT), and it would be unlikely to have proportionately the same reduction in the time it takes students to learn (RLT) ---- time spent in learning probably is the highest correlate

of learning achievement. But, there was a significant RLT when we were beginning RIT in Vietnam, so RLT as such will not be ignored. What, then, are the implications of RLT vs RTT as far as the two types of management systems (RST and RCT) are concerned ?

Lets look first at RLT (Reduced Learning Time). If we reduce learning time it means that children do not have to spend the same amount of time (either in or out of school) to spend the achievements of students in tradition school. Thus, we can either reschedule the schools and reduce the amount of time that kids spend in these institution or we can increase the expected levels of achievement, i.e., have them learn more. Say that RIT is able, on the overage, to cut learning time by 50%. Would we cut the number of school years from 6 to 3? Very unlikely. But we could cut the number of school days and reschedule school so that farm children could help at home during planting and harvesting period. Or, we could cut the number of hours spent each day to allow for "streaming" so that the same school facilities and personnel could serve several streams each day. All of these RIT implications are RST (Reduced School Time) leading to a rescheduling so that children spend less time in school per se. The reduced time each day implication probably is the most acceptable alternatives in many countries.

RTT (Reduced Teacher Time) leads to both management systems. It leads, as above, to RST (Reduced School Time) because schools could be rescheduled to allow less student-teacher interaction, and, even if RLT (Reduced Learning Time)

were not achieved, children could learn outside of school by a variety of non-teacher means. It also leads to RCT (Reduced Class Time) by which children learns under a variety of non-teacher modes while in school --- without reducing the time they spend in school.

What if, as is likely, both RIT and RLT are achieved? And what if, as is likely, RTT outweighs RLT? We can envision a combination of the two management systems and some change in our expectations about what children are to learn, i.e., perhaps learn more.

Let's guess :

student body at any time increased 50%.

students spend half as much time in school, but have more learning activities without interacting with teacher.

students are given enrichment types of learning allowing them to learn more and to learn somethings in greater depth.

The above triples the number of children accomodated by present facilities and personnel. Might be a good target for RIT to aim at.

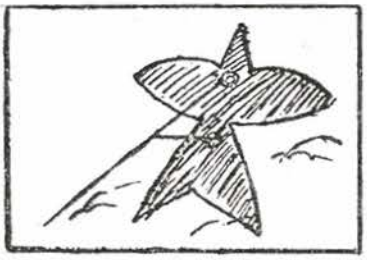
SAMPLES OF RIT. INSTRUCTIONAL MATERIALS

แบบทดสอบตอน ๑

เลือกคำที่มีความหมายตรงกับภาพ เขียนลงใต้ภาพ

ตัวอย่าง

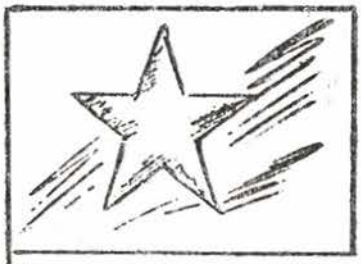
ว่าย
ว่าว



ว่าว

ขาย
ขาว

ดาย
ดาว



พาว
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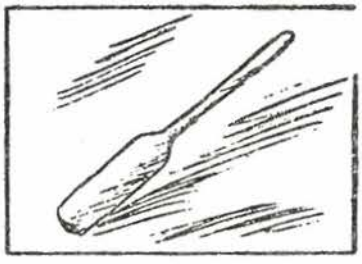
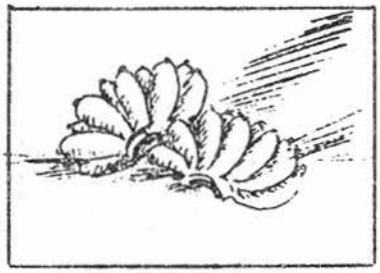


แมว
แม้ว

กล้าว
กล้วย



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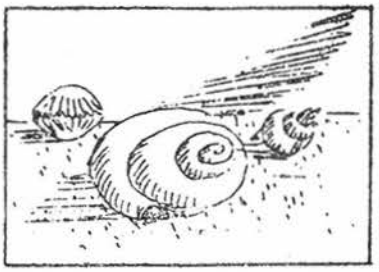

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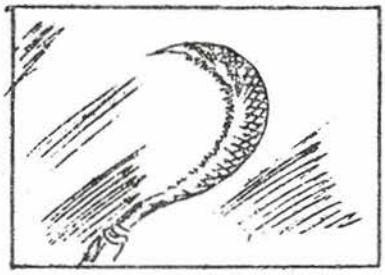
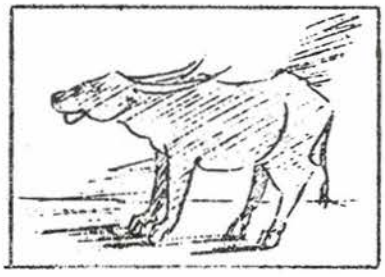
เดี้ยว



แถว
แถ้ว

ดราว
ดวาย



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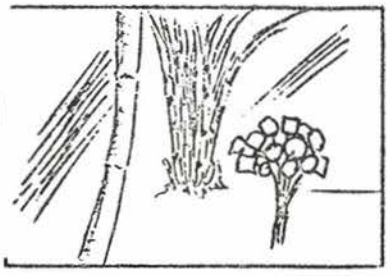

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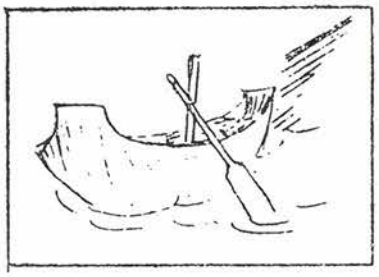
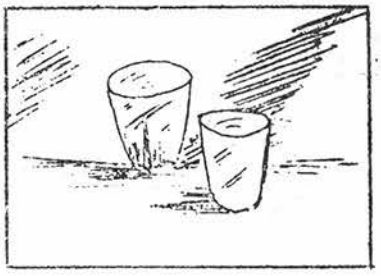


แก้ว
แกว



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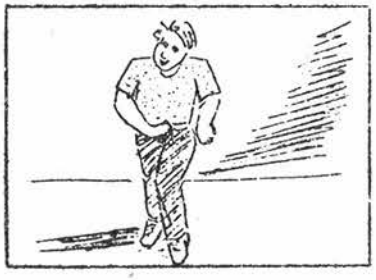
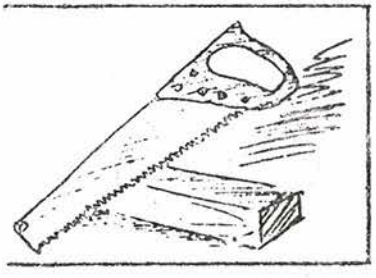
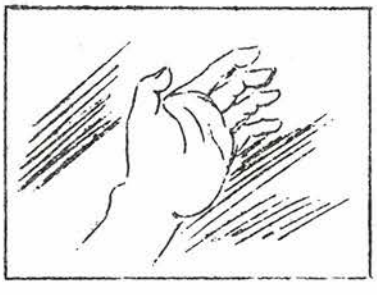


เลื้อย
เลือย



ช้าย
ช้าว



ยาย
ยาว

ตอน 2

ให้นักเรียนอ่านคำถามต่อไปนี้แล้วเขียนเครื่องหมาย √ หน้าข้อที่ถูก และเครื่องหมาย × หน้าข้อที่ผิด

ตัวอย่าง

(√) ๐ อึ่งอ่างมี 4 ขา

( ) 1 หิ่งห้อยอยู่ในกะลาหงาย

( ) 2 อึ่งอ่างมองเห็นว่าหิ่งห้อยสวย

( ) 3 หิ่งห้อยคืออาหารของกิ้งกือ

( ) 4 อึ่งอ่างทำให้กะลาคว่ำ

( ) 5 กะลาครอบ อึ่งอ่าง หิ่งห้อย และกิ้งกือไว้

( ) 6 หิ่งห้อยมีแสงสว่างส่องทั่วฟ้า

( ) 7 อึ่งอ่างพองตัวไปปะทะท้องฟ้า

( ) 8 กิ้งกือคิดว่ากะลาเป็นฝั่งฟ้า

( ) 9 กิ้งกือ อึ่งอ่าง หิ่งห้อย กลัวกะลา

( ) 10 กิ้งกือ อึ่งอ่าง หิ่งห้อย ตายเพราะกะลา

แบบทดสอบตอนที่ 3

ให้นักเรียนเขียนคำที่มีเสียงสระและตัวสะกดเหมือนคำข้างหน้ามา 8 คำ

ตัวอย่าง ◻ เกย เขย เคย เอย

---

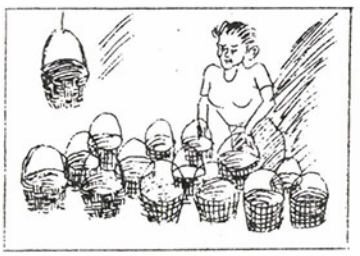
1. กาย _____
2. กุย _____
3. โกย _____
4. กอย _____
5. ฉัย _____

ชื่อ..... ชั้น.....

แบบทดสอบตอนที่ 4

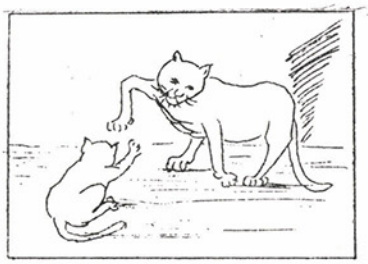
ให้นักเรียนดูภาพ แล้วเขียนคำที่ขาดไปให้ถูกต้อง

ตัวอย่าง



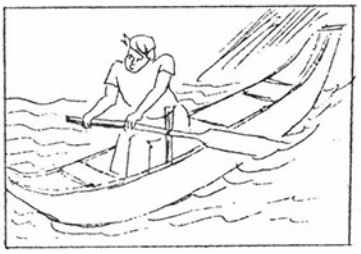
ขาย <u>ขาย</u> ตะกร้าหาย

นักเรียน เข้า_____



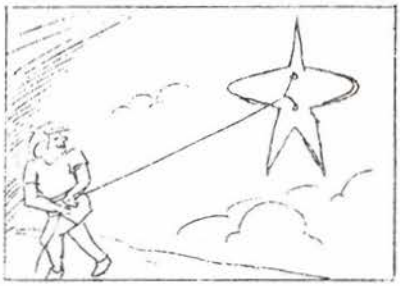
แม่แมว เล่นกับลูก_____

เด็ก ดื่ม _____



คน _____ เรือ

ชาวนา เกี่ยว _____



เด็ก เล่น _____

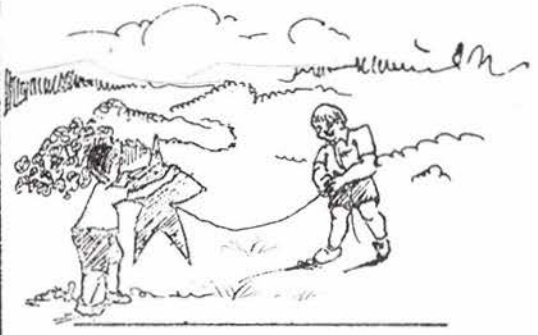
ท้อง ฟ้า มี _____

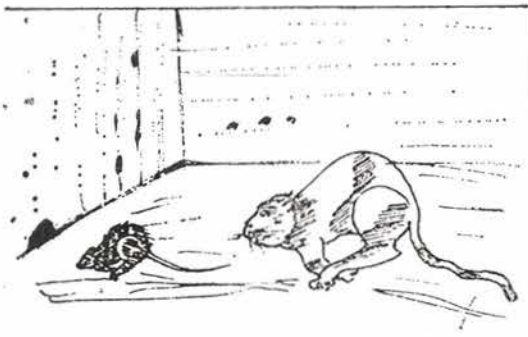
คน ดี _____

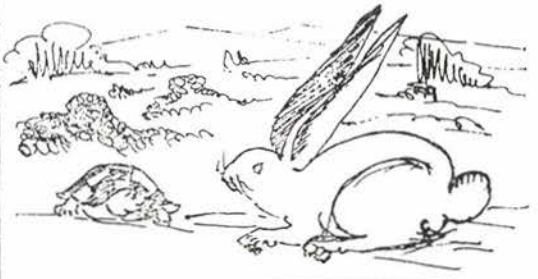
แบบฝึกหัดเสริม ตอนที่ 7

จงเขียนคำอธิบายรูปภาพ

ควายกินหญ้า







บทเรียนที่ ๐
การออกกำลังกาย
ชั้นประถมปีที่ ๓

โครงการส่งเสริมสมรรถภาพการสอน

จุดมุ่งหมาย

✸ ถ้านักเรียนอยากมีร่างกายแข็งแรง
เพื่อที่จะชนะกีฬาหลายๆ อย่าง
หรือเป็นนักมวยเอก

● ต้องอ่านเรื่องนี้ ●

แต้มกับจ๋องเป็นเพื่อนกัน แต่ ...

แต้มแข็งแรงร่างกายสมบูรณ์ดี

จ๋องผอมกะหร่องซี่โครงขาน

จ๋องไม่มีแรงเล่นกีฬาไม่ไหว

แต้มเล่นไปตื่นขาน ๆ สนุกสนาน

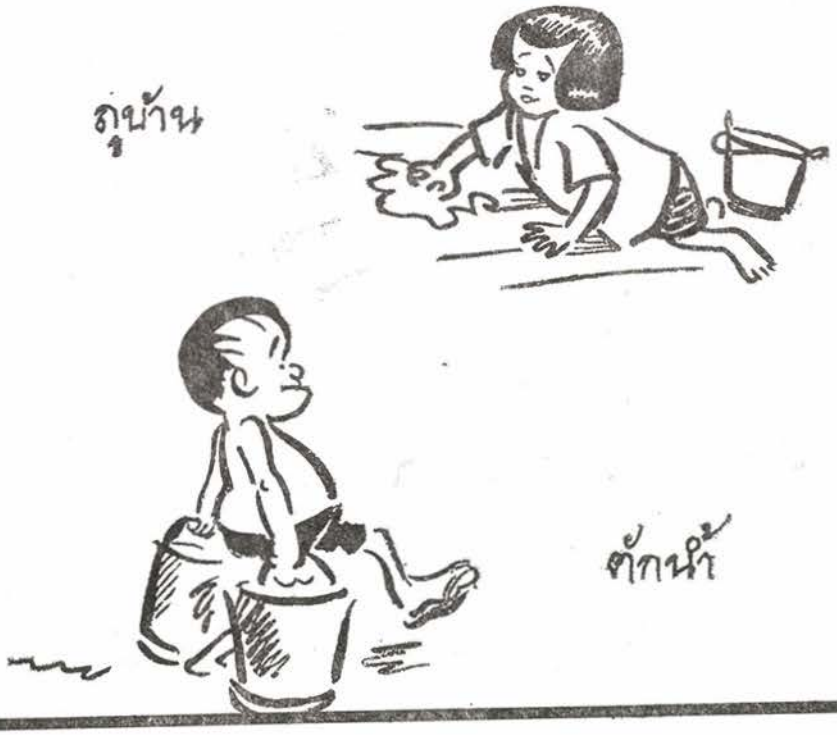
<u>ออกกำลังกาย</u> ข้อ ข. ถูกค่ะ

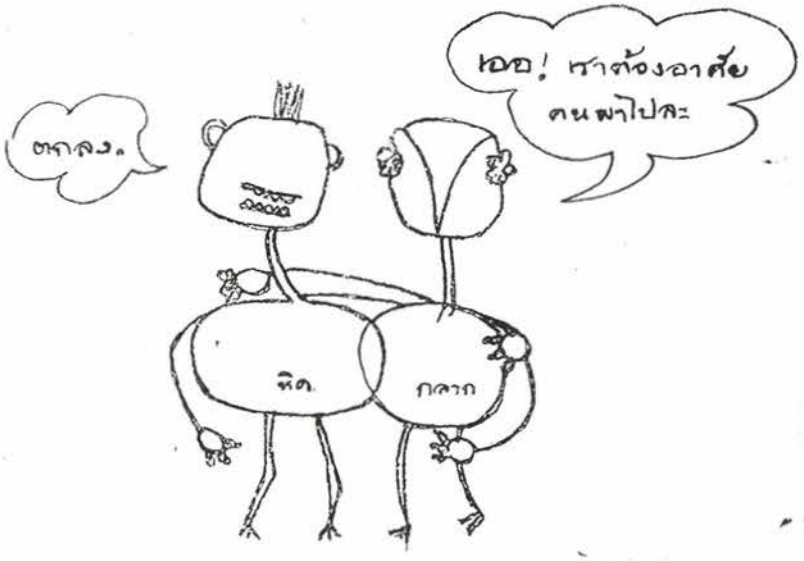
นักเรียนตอบถูก เก่งมากค่ะ

การออกกำลังกายมีอยู่หลายอย่างค่ะ

<u>ต่อไปนี้เป็นตัวอย่างของการออกกำลังกาย</u>

1. <u>การทำงานบ้าน</u> ทำให้ร่างกายเคลื่อนไหว การทำงานบ้านจึงเป็นการออกกำลังกาย



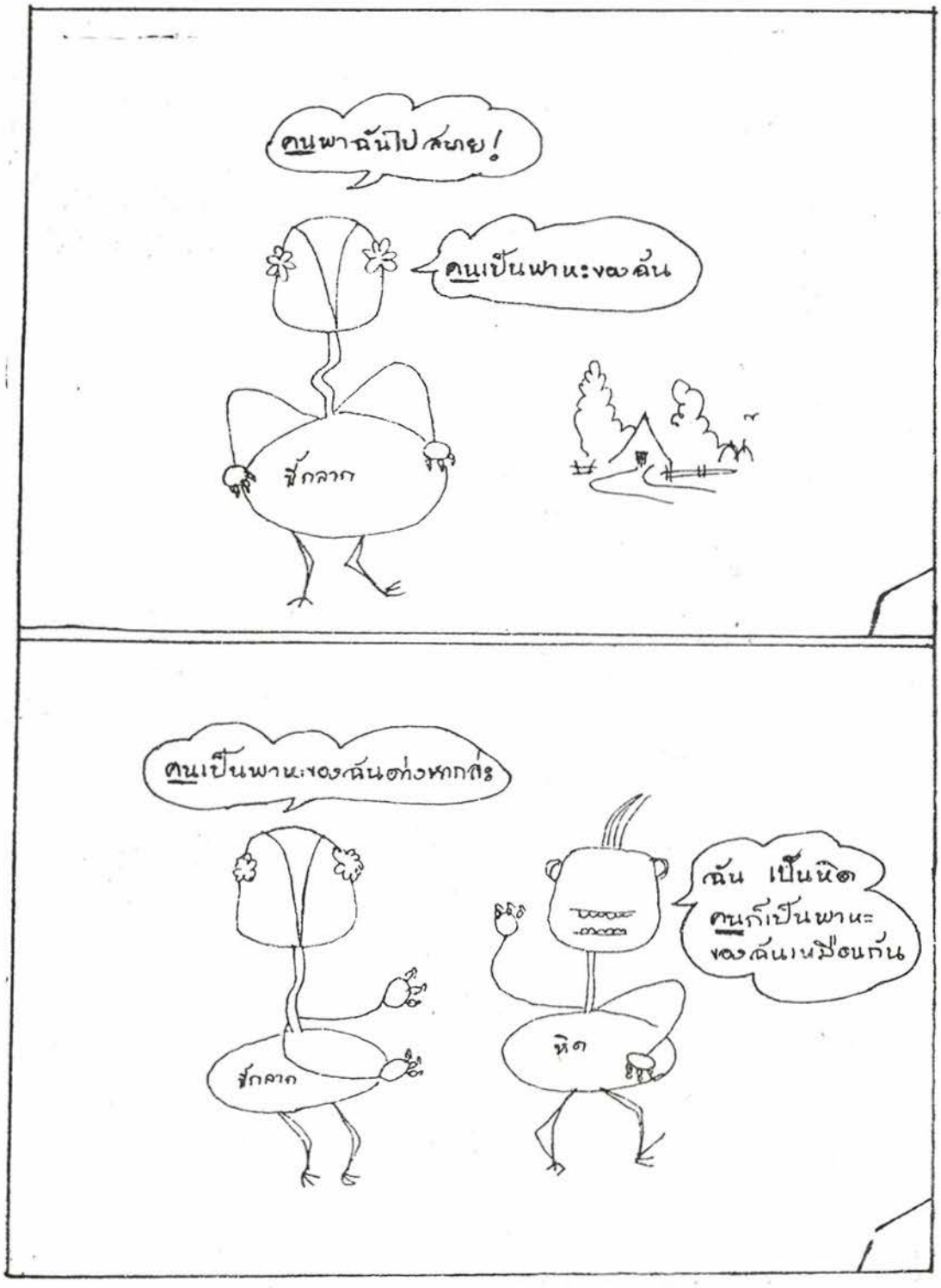


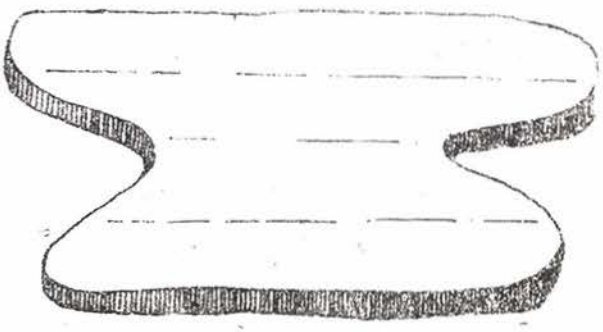
โรคกลาก โรคเกลื้อน และโรคหิด จะติดต่อคนอื่นโดย

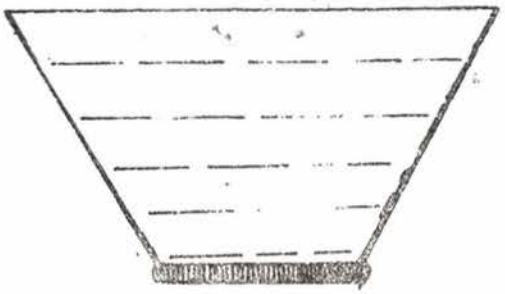
<u>คนเป็นพาหะ</u> ได้หรือไม่ (โดยกา ✓ หน้าข้อถูก)

ก. ได้ ✓

ข. ไม่ได้


คุณพาฉันไปสนาย!
คุณเป็นพาหะของฉัน
ตุ๊กลาก
คุณเป็นพาหะของฉันตั้งหากกี่ร
ตุ๊กลาก
ฉัน เป็นหิด
คุณก็เป็นพาหะ
ของฉันเหมือนกัน
หิด






ใช้เชือกรัดเหนือแผลที่ถูก
งูกัด เพื่อไม่ให้พิษ
ซึมซ่านเข้าสู่กระแสเลือด

เอาละนักเรียน ยังมีสิ่งที่เป็นก๊าซอีกมากมายที่เธอจะต้องรู้อีก แต่อย่าลืมว่าสสารที่เป็นก๊าซนั้นจะมีรูปร่างและปริมาตรไม่คงที่ แต่จะฟุ้งกระจายไปทั่ว

ให้นักเรียนอ่านรายชื่อสิ่งต่อไปนี้ แล้วเลือกสิ่งที่เป็นก๊าซเขียนลงในช่องว่างที่กำหนดให้

สิ่งที่กำหนดให้	สิ่งที่เป็นก๊าซ
แมว	.....
ก้อนหิน	.....
ก๊าซบอนไดออกไซด์	.....
น้ำตาล	.....
ตระกั่ว	.....

เปิดดูคำตอบด้านหลัง

เฉลย

ก๊าซคาร์บอนไดออกไซด์

ไชโย นักเรียนทราบแล้วว่า

ของแข็ง มีรูปร่าง และปริมาตรคงที่

ของเหลว มีรูปร่างไม่คงที่ แต่ปริมาตรคงที่

ก๊าซ มีรูปร่าง และปริมาตรไม่คงที่

ต่อไปนี้ ให้นักเรียนแยกสสารที่กำหนดให้ออกเป็นพวก ๆ โดยเขียนลงในตารางที่กำหนดให้

ชื่อสสารที่กำหนดให้

ต้นไม้	น้ำเชื่อม	ออกซิเจน	ลูกแมว	ไก่	หิน
ปรอท	น้ำมัน	ไอน้ำ	ควัน	น้ำหวาน	น้ำอัดลม
ไนโตรเจน	น้ำลาย	ไฮโดรเจน	กระดาษ	บ้าน	แอมโมเนีย

ของแข็ง	ของเหลว	ก๊าซ

เฉลย

ของแข็ง	ของเหลว	ก๊าซ
ต้นไม้	น้ำเชื่อม	ออกซิเจน
ลูกแมว	น้ำมัน	ไอน้ำ
ไก่	ปรอท	ควัน
หิน	น้ำหวาน	ไนโตรเจน
กระดาษ	น้ำอัดลม	แอมโมเนีย
บ้าน	น้ำลาย	ไฮโดรเจน

ถ้าตอบผิด ขอให้เปิดกลับไปพิจารณาตอบคำถามใหม่

เก่งมากนักเรียน ที่นี้เราก็พอจะบอกได้ว่า สสารมีอยู่ 3 พวก คือ

1. สสารพวกที่เป็น ของแข็ง

2. สสารพวกที่เป็น ของเหลว

3. สสารพวกที่เป็น ก๊าซ

สภาพของสสารที่เป็นของเหลว ของแข็ง และก๊าซ นี้เราเรียกว่า

สถานะของสสาร

นั้นคือสสารมี 3 สถานะ

1. ของแข็ง

2. ของเหลว

3. ก๊าซ

ลองบอกซิว่าสสารมีกี่สถานะ อะไรบ้าง

สสารมี.....สถานะคือ

1. .....

2. .....

3. .....

⇨

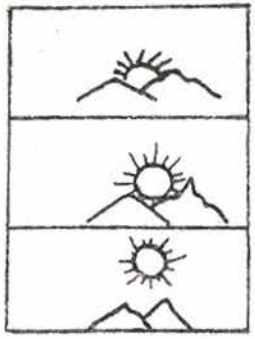
เฉลย

สสารมี 3 สถานะคือ

1. ของแข็ง
2. ของเหลว
3. ก๊าซ

จงตอบคำถามต่อไปนี้

๔. ภาพใดคือเวลาสาย ?



☐ ก

☐ ข

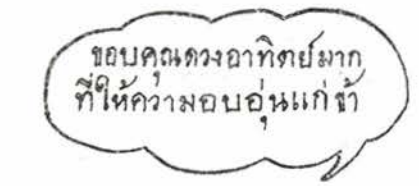
☐ ค

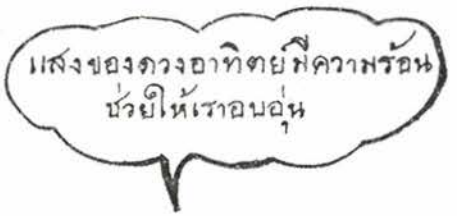
ดูเฉลยด้านหลัง

เฉลยข้อ 5

√ ค.

ตอบถูกจงยิ้มให้กับตัวเอง เธอเก่งจริงๆ





ช่วยตอบคำถามต่อไปนี้

๒. ข้อใดคือประโยชน์ของดวงอาทิตย์ ?

☐ ก. ทำให้หนาว

☐ ข. ทำให้เย็น

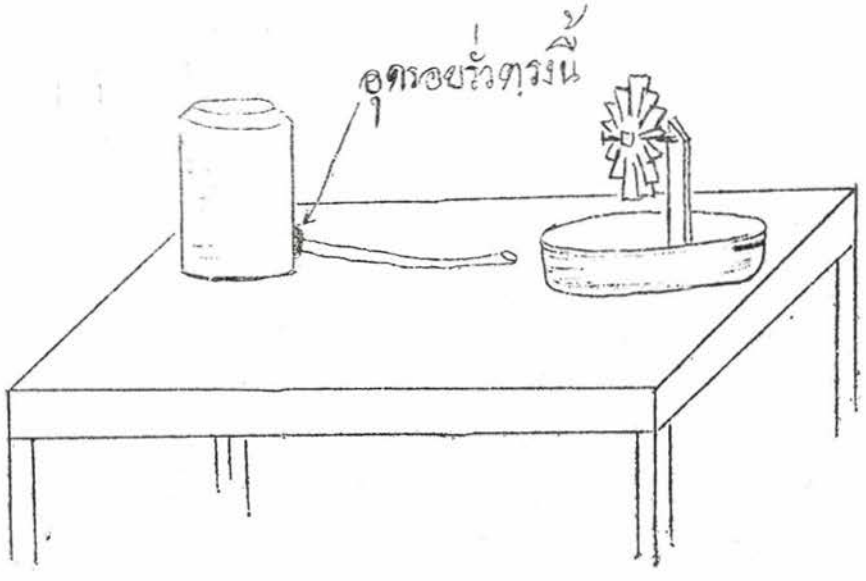
☑ ค. ☐ ค. ทำให้อบอุ่น

เธอช่างน่ารักจริง ๆ อ่านต่อไปได้แล้ว

ปฏิบัติการทดลอง

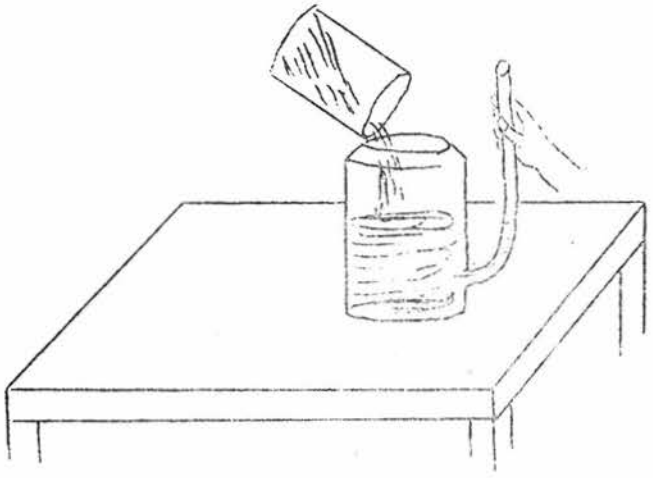
1. คนหนึ่งเอากระป๋องที่ไม่เจาะรูไปตักน้ำที่ครูเตรียมไว้ให้หน้าชั้นมา 1 กระป๋อง

2. อีกคนหนึ่งประกอบเครื่องมือให้เป็นตามภาพ อย่าลืม ใช้ดินน้ำมันอุดรอยรั่วให้เรียบร้อย

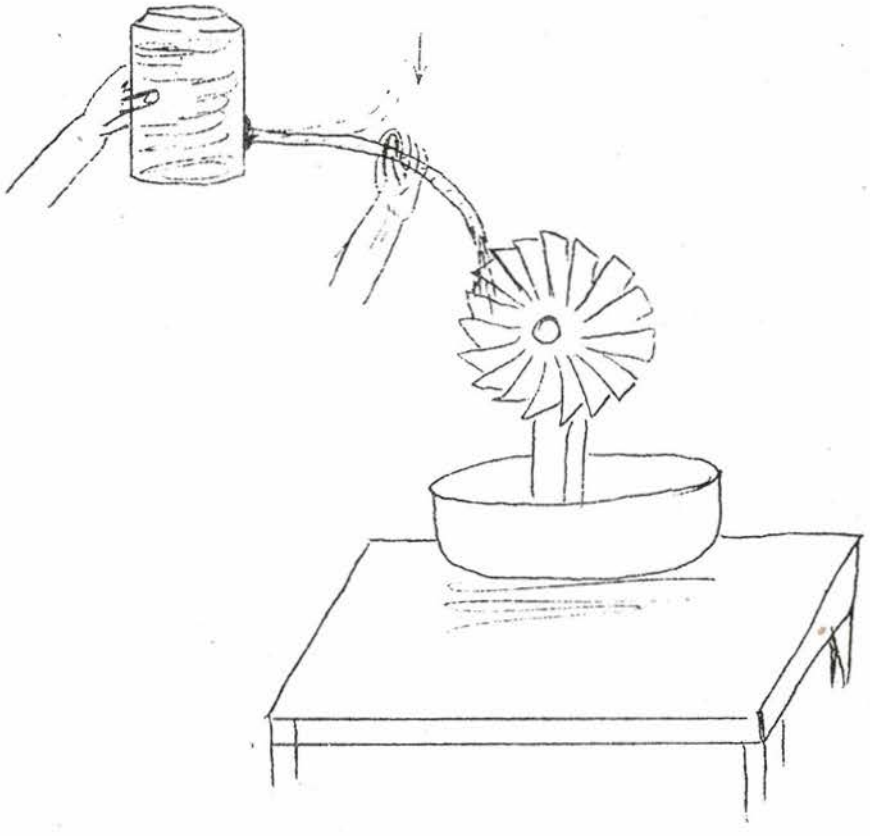


ทดลองต่อไป

3. เทน้ำในกระป๋องที่เตรียมไว้ ลงในกระป๋องที่ต่อกับสายยางจนเต็ม ยกปลายสายยางไว้ด้วย เพื่อกันน้ำไหลออกทางปลายสายยาง (ตามภาพ)



4. ยกกระป๋องที่ต่อกับสายยางให้สูงขึ้นจากพื้นโต๊ะ แล้วลดปลายสายยางลงน้ำจะไหลออกทางปลายสาย ให้ปลายสายยางอยู่เหนือใบพัด (ตามภาพ)



สังเกตการทดลองโดยตลอดและจดจำไว้ แล้วเทน้ำในขันและกระป๋องทั้งหมดลงในกระป๋องที่ใช้ตักน้ำมา

วางอุปกรณ์แล้วตอบคำถามหน้าต่อไป ⇨

จงกาเครื่องหมาย √ ลงหน้าข้อความที่สังเกตเห็นจากการทดลอง และกาเครื่องหมาย × ลงหน้าข้อความที่ไม่เห็นจากการทดลองนี้

1. O น้ำไหลออกทางปลายท่อยาง
2. O น้ำในกระป๋องลดลงเรื่อย ๆ
3. O น้ำไหลกระทบใบพัด
4. O ขณะน้ำไหลกระทบใบพัด ใบพัดจะหมุนทันที
5. O น้ำในกระป๋องมีมาก น้ำจะไหลแรงมาก
6. O น้ำไหลแรงใบพัดก็จะหมุนเร็ว
7. O น้ำในกระป๋องมีน้อย น้ำก็จะไหลช้า
8. O น้ำไหลช้าใบพัดจะหมุนช้า
9. O น้ำไหลออกไปจนถึงระดับที่พอดีกับรูที่เสียบท่อยาง
10. O เมื่อน้ำหยุดไหล ใบพัดก็หยุดหมุน

ข้อความทั้ง 10 ข้อข้างบนสามารถสังเกตเห็นได้ทั้งสิ้น

ถ้านักเรียนไม่สามารถสังเกตเห็น ให้กลับไปปฏิบัติการทดลองใหม่ และคอยสังเกตให้ดี ๆ

คนเก่งย่อมไม่ย่อท้อต่อความยากลำบาก

นั่นคือ น้ำไหลทำให้เกิดแรง ใช่หรือไม่ ?

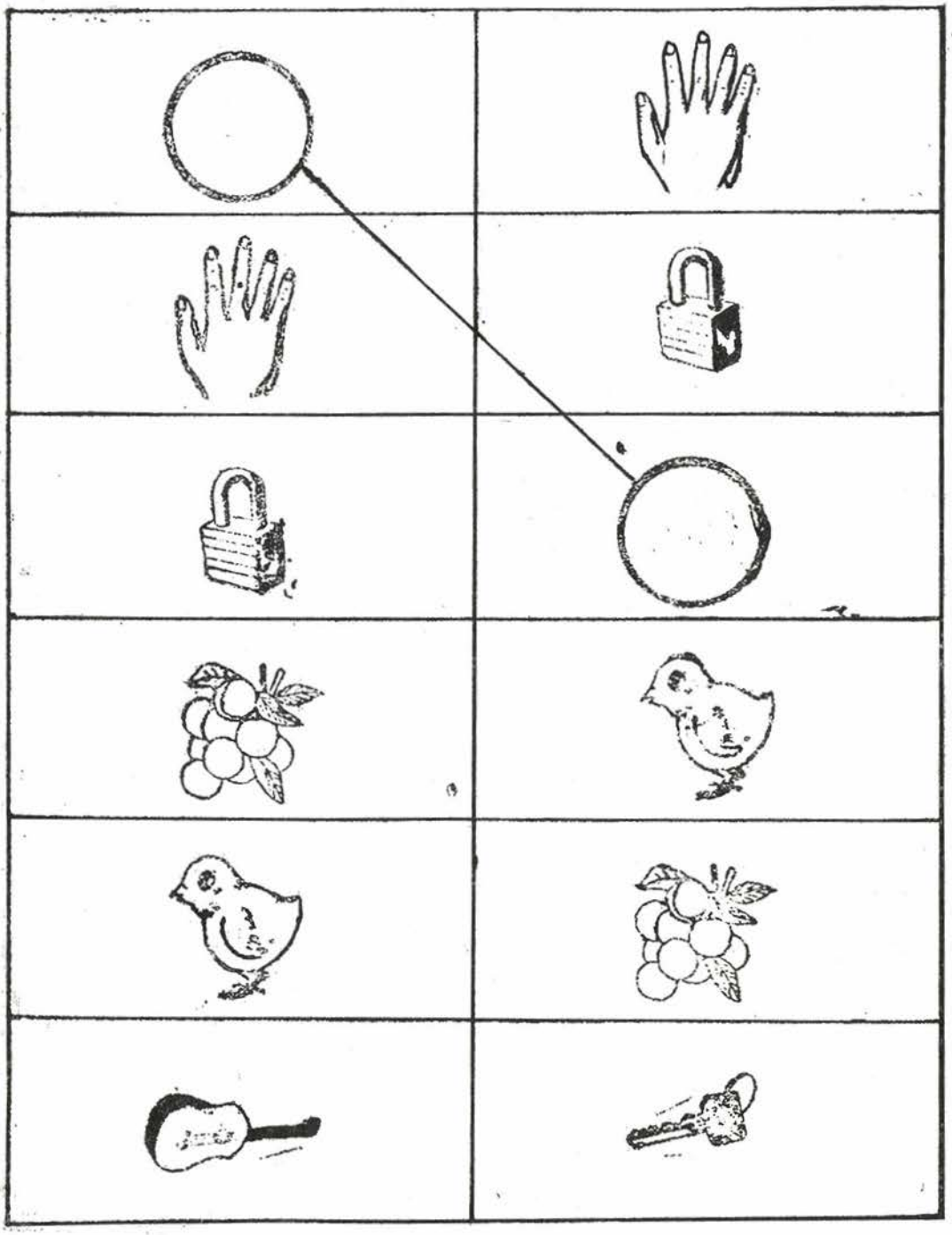
ตอบ ....

คำตอบที่ถูกต้อง

ใช่, น้ำไหลทำให้เกิดแรง

เมื่อเห็นจริงแล้วศึกษาต่อไป

ให้นักเรียนโยงภาพที่เหมือนกัน



แบบฝึกหัดคำพยัญชนะเสียงคู่

ข - ค

ขอ คอ	ค้าขาย ไข่เค็ม	เคี้ยวข้าว ของคาว	คุ้ยเขี่ย ขุดคุ้ย
คุกเข่า ขบคิด	ขุ่นแค้น ขุ่นเคือง	ขังคุก คับขัน	

ส - ซ

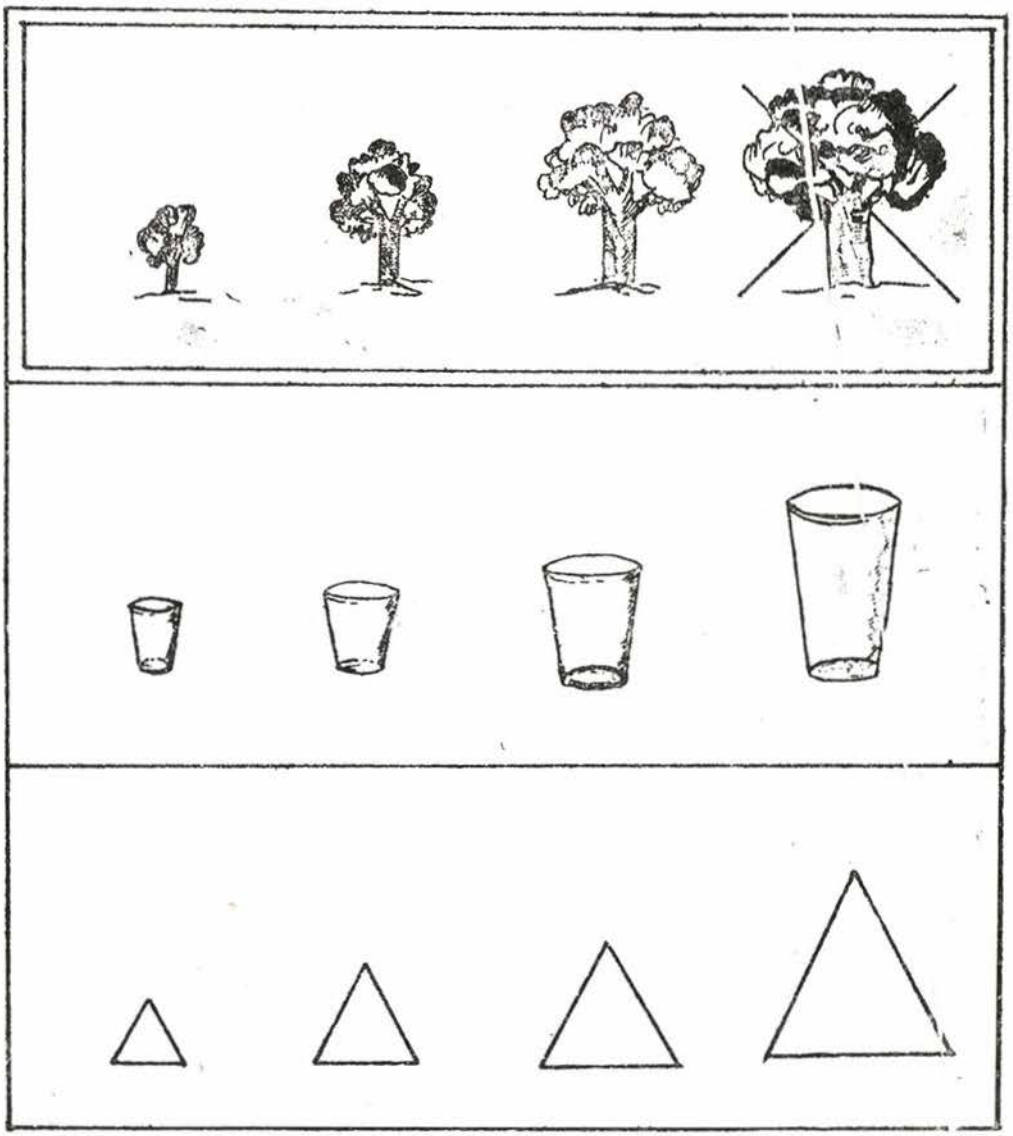
สอ ซอ	ซื่อสัตย์ แสนซื่อ	แสนซน ใส่โซ่	สีซอ เสียงซึม
ซุ่มเสียง สุดซึ้ง	ซ่อมเสริม ส้วมซึม	ซุ่มซ่อเสือ สีแสด	สดใส ซาบซ่า
โซเซ ซึมเซา			

ฝ - ฟ

ฝอ ฟอ	ฝนฟุ้ง ฝนฟ้า	ผ้าพื้น ผันเฟือง	พื้นไฟ ไฝฝ้า
ไฟฟ้า ฟุ่มเฟือย	ฟุ้งเฟ้อ ฟูมฟาย	ใผ่ผัน ผึ้งฟ้า	

กระต่าย

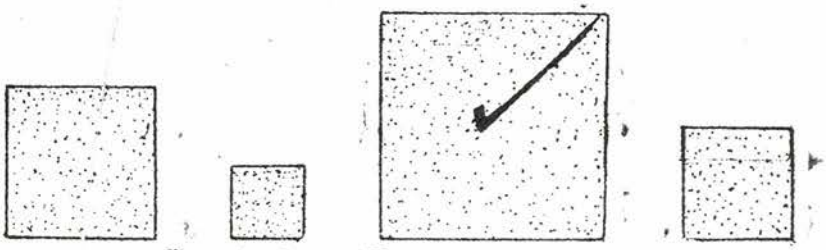
ให้นักเรียนดูภาพทีละชุด จากเล็กที่สุดไปหาใหญ่ที่สุด
แล้วเขียน × ทับภาพที่ใหญ่ที่สุด ของภาพแต่ละชุด

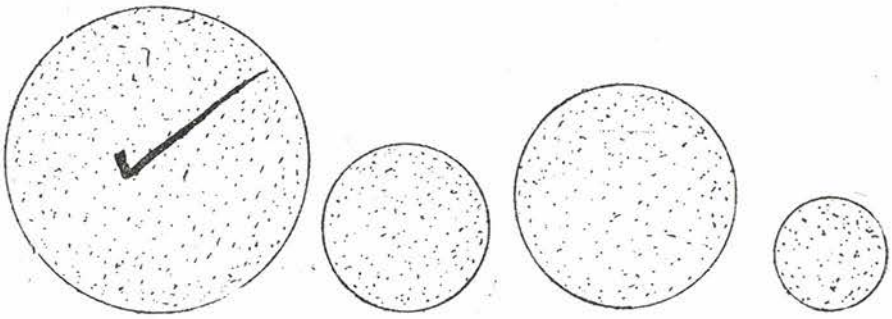


ตอน ก.

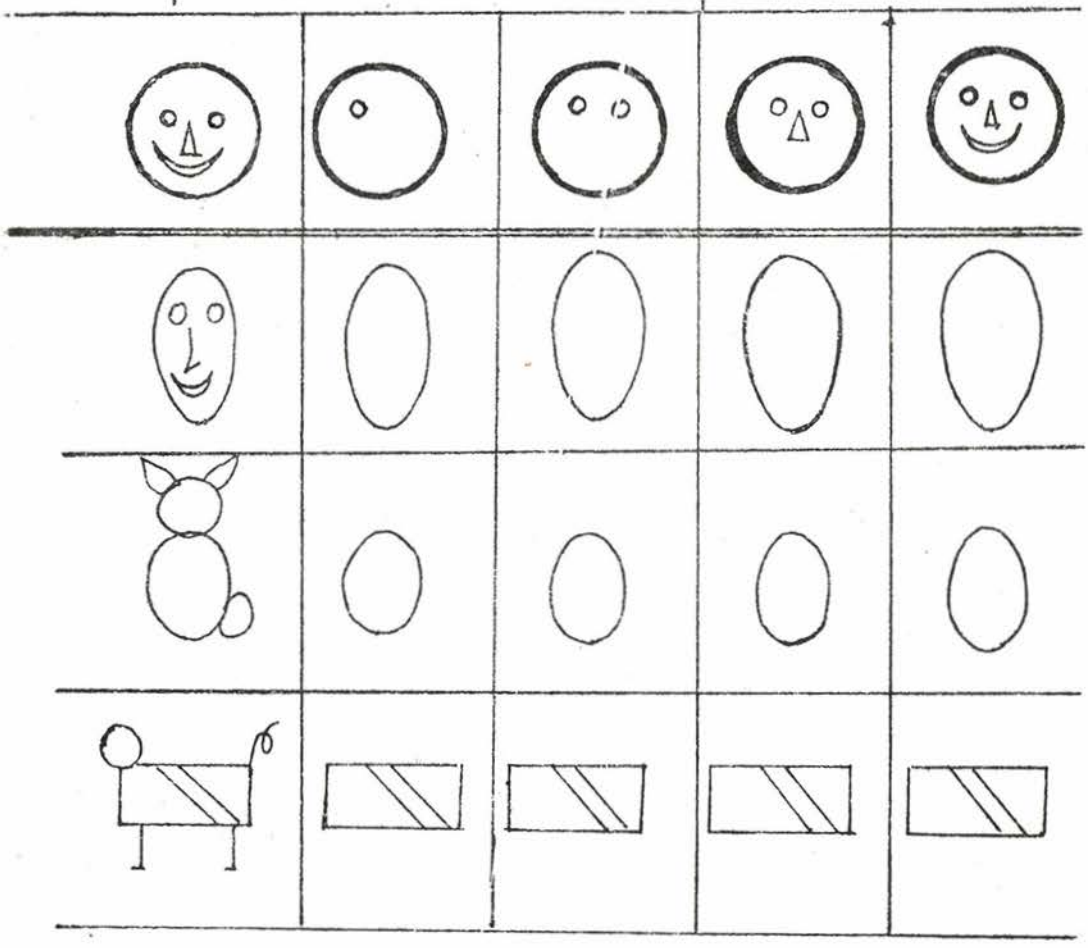
กา ✓ ทับภาพที่ใหญ่ที่สุด

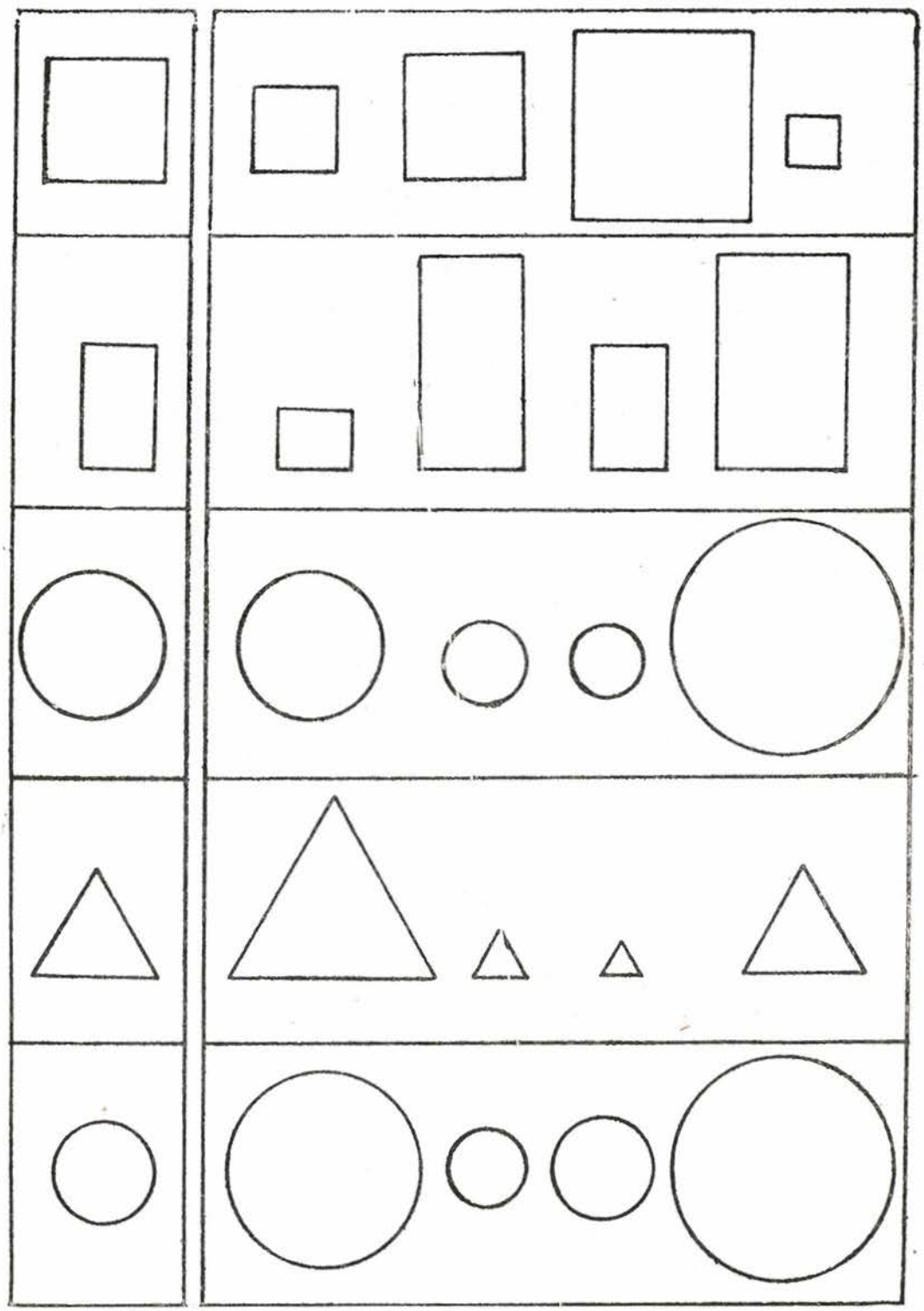
ตัวอย่าง





ให้นักเรียนเติมภาพให้เหมือนกับภาพซ้ายมือ โดยเติมภาพละ 1 ส่วนไปตามลำดับ จนถึงภาพสุดท้าย จึงจะได้ภาพที่ครบทุกส่วน



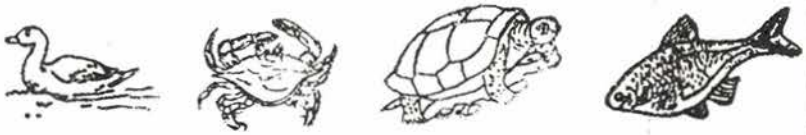


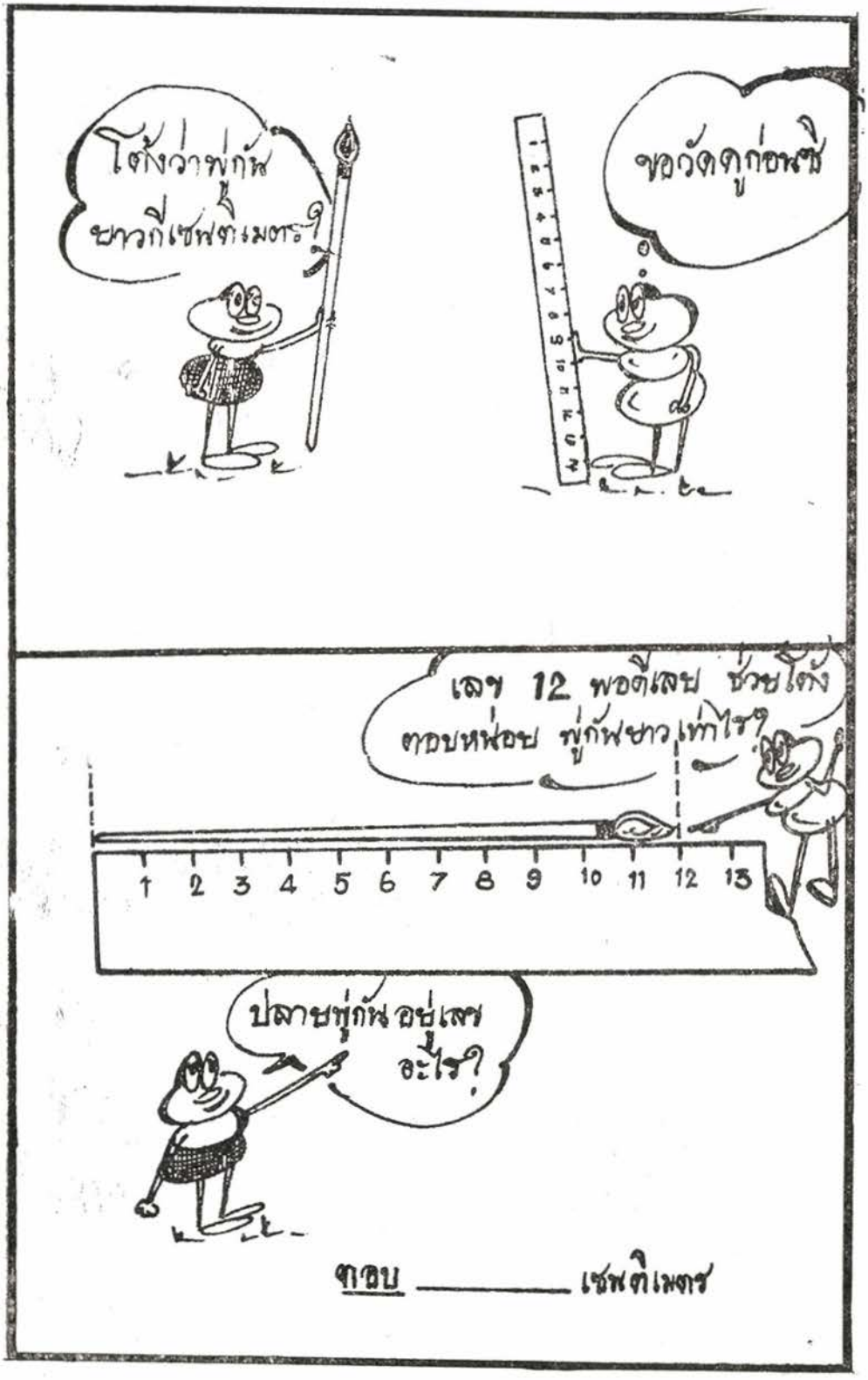
กา ✓ ทับภาพตามที่กำหนดให้

ตัวอย่าง

แมว	

ครูสอนทำ

ปลา	
สับปะรด	

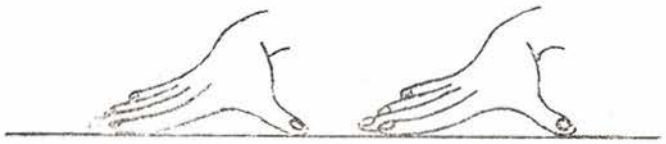


ตอบ _____ เซนติเมตร


1 คืบ
ช่วยวัดให้ดู
หน่อยซิ
เราเริ่มนับ 1 คืน
ตรงนี้ก่อน
ผู้อยู่ข้างมือต่อกัน
คืบไปเรื่อยๆ
1, 2, 3
4, 5
5 คืบ
4
3
2
1
5
ไก่วัดได้ 5 คืบ

อย่างนี้ผิดเพราะนิ้วมือทับกัน

อย่างนี้ก็ผิดเพราะวางห่างกัน

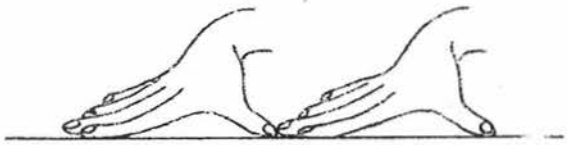


จงใส่ ✓ ใน ( ) หน้าข้อที่เห็นว่าถูก

และใส่ × ใน ( ) หน้าข้อที่เห็นว่าผิด

ก. ( )

ข. ( )

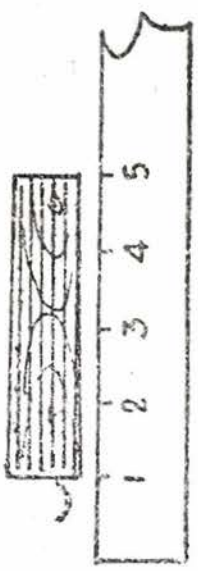


ค. ( )

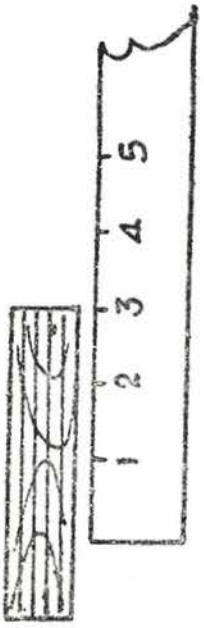

กุ้งวัดได้เท่าไร
1,2,3,4,5
6 ได้ 6 คืบ
ครับ
5 4 3 2 1
6
กุ้งวัดได้ 6 คืบ
ทำไมเราวัดได้ไม่เท่ากัน
อ้อ จริงซิ
เพราะนิ้วมือเรายาว
ไม่เท่ากัน

การวัดความสูง

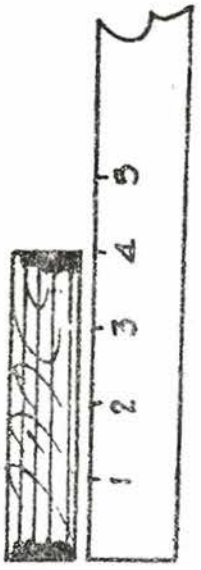
จงใส่ ✓ ลงใน ( ) ข้อที่แสดงวิธีการวัดถูกต้อง
และ × ลงใน ( ) ข้อที่แสดงวิธีการวัดผิด



ก ( )



ข ( )

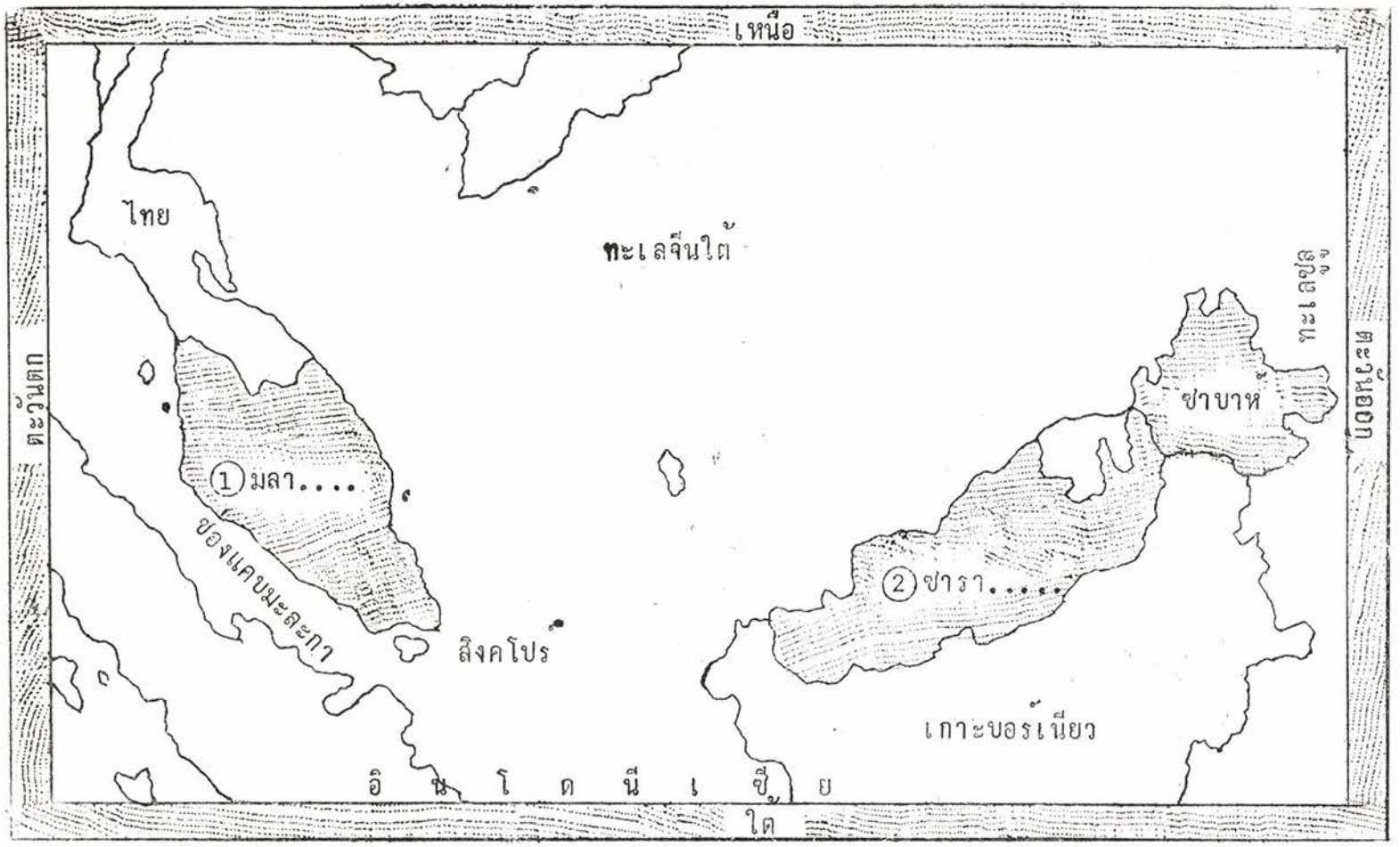


ค ( )

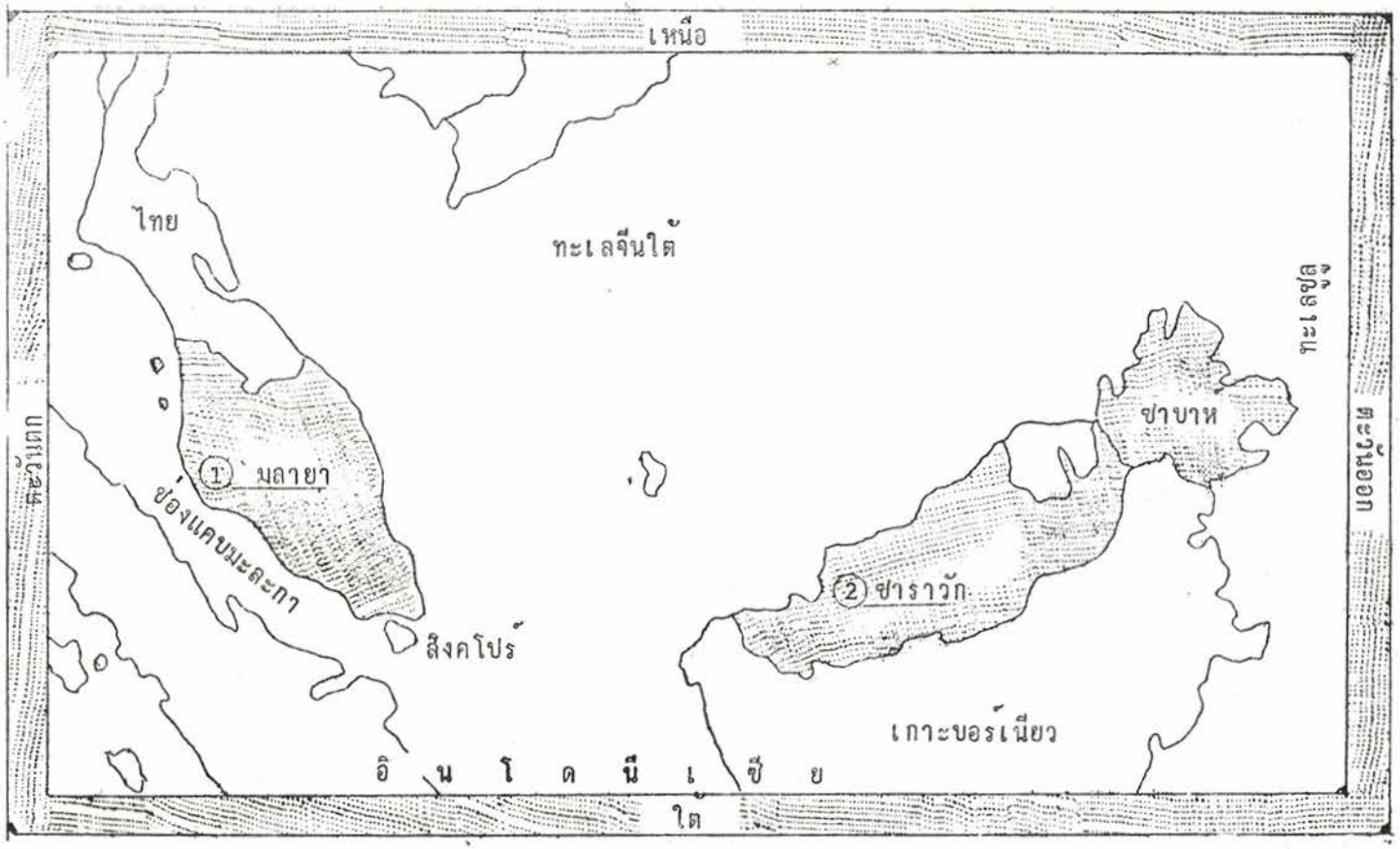
ตอบแล้ว เปิดดูเฉลย หน้าต่อไป

บัตรงาน

สิ่งของที่วัด	วัดได้
โต๊ะนักเรียนยาว	_____ คืบ
โต๊ะนักเรียนยาว	_____ ศอก
เทปสีขาวยาว	_____ คืบ
เทปสีขาวยาว	_____ ศอก
ชื่อ.....ผู้วัด	



เสร็จแล้วเปิดหน้าต่อไป

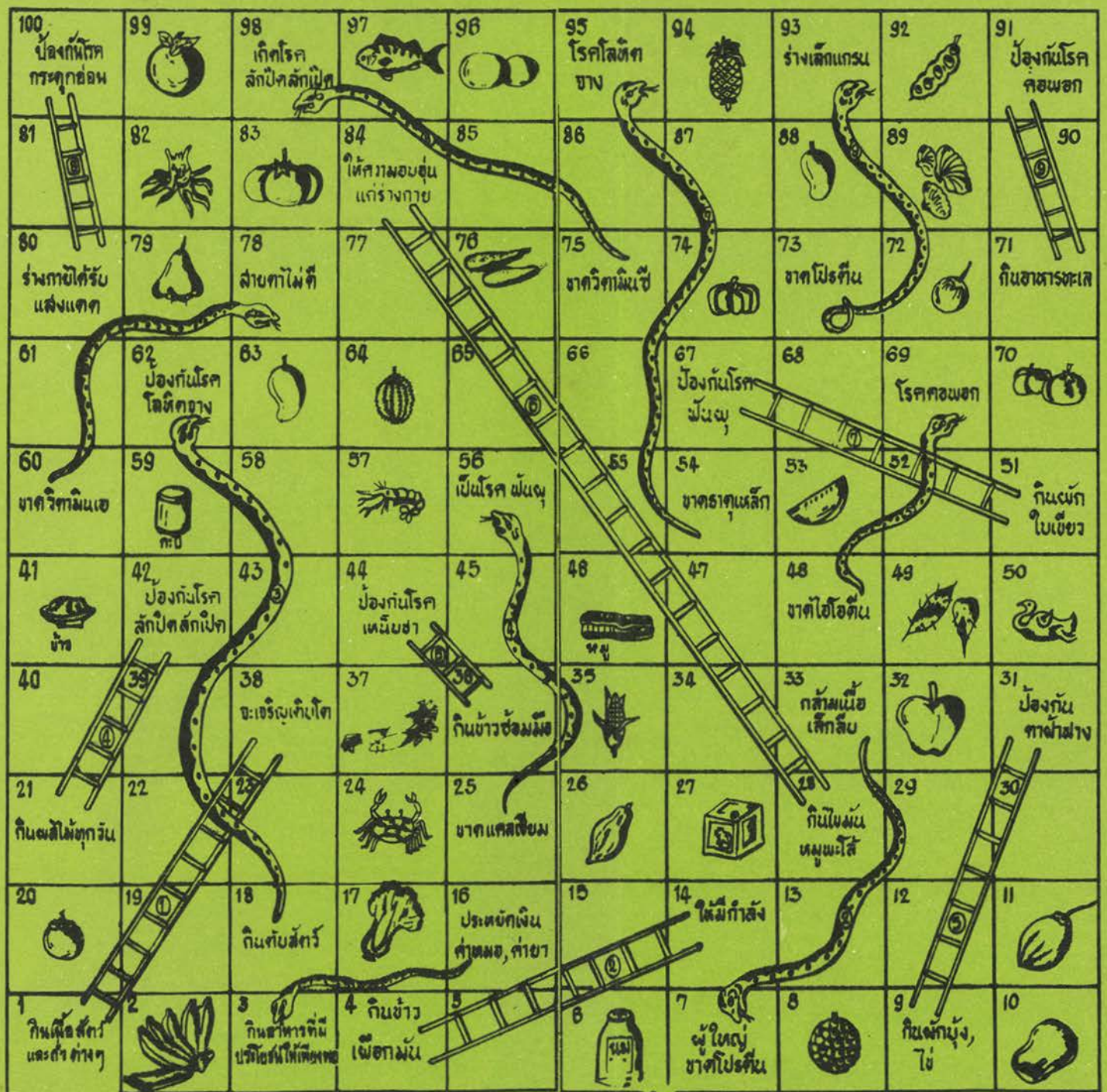


<u>คำตอบคือ</u> 1. มลายา

2. ซาราวัก

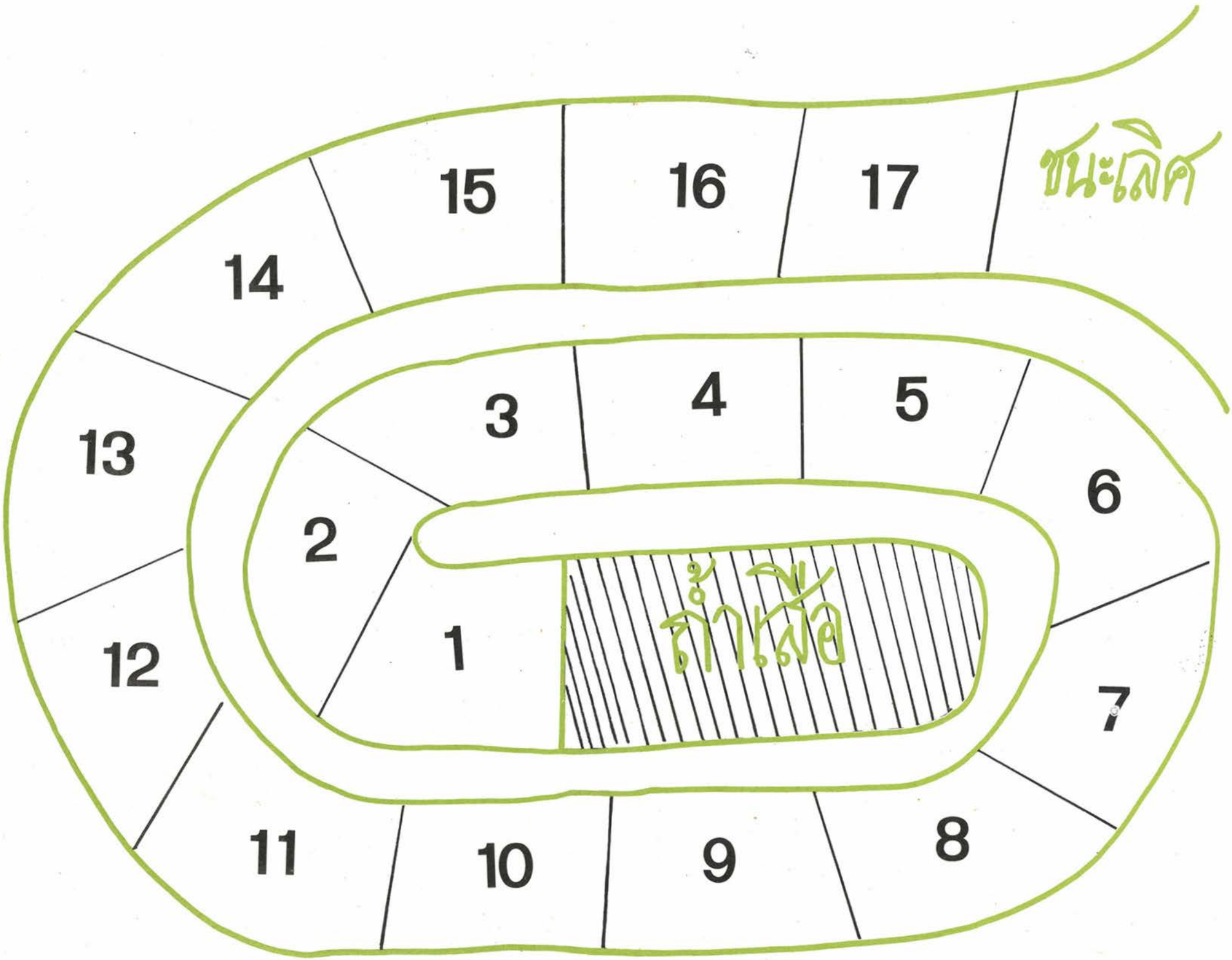
>เปิดหน้าต่อไป.

99 โภชนา



วิชาสุขศึกษา

SEAMEO Regional INNOTECH Project R.I.T.
Muang Mai School, Lopburi Thailand


ชนะเลิศ
15
16
17
14
3
4
5
13
6
2
ถ้ำเสือ
1
12
7
11
10
9
8