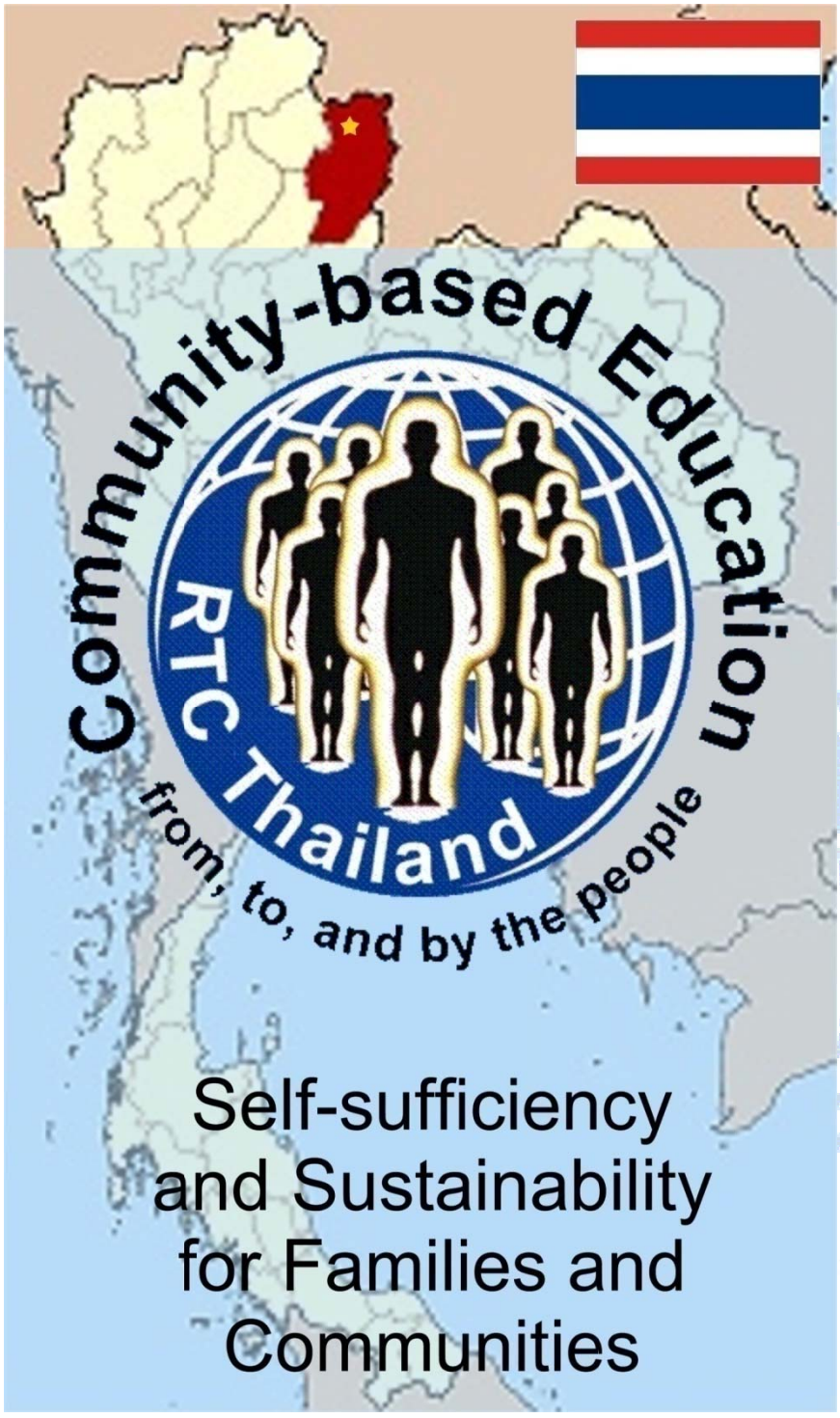


# RTC-TH P.A.L.
# Curriculum Development Process

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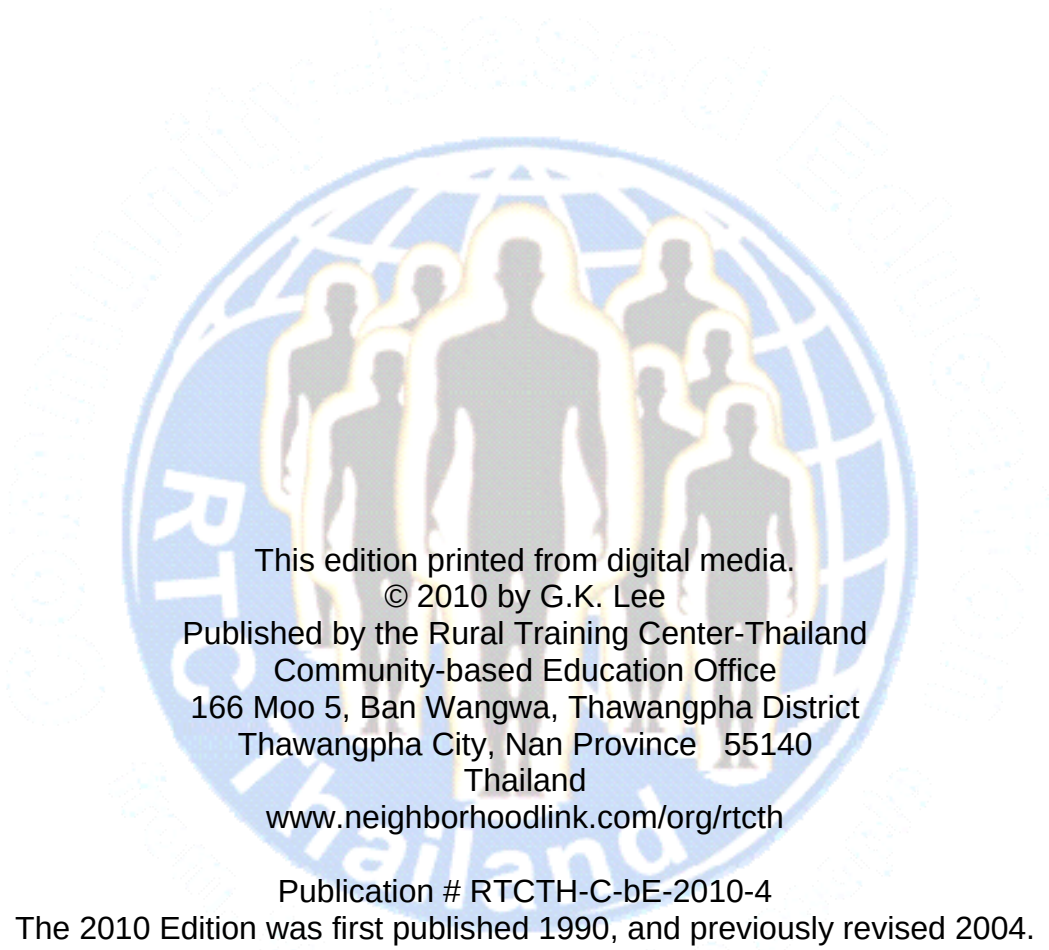

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# PREFACE

The RTC-TH curriculum development activities are part of S.E.E.D.S. (Supporting Environmental Education Development & Sustainability) . Lessons created are utilized in:

- R.E.E.E.P.P. (the Rural Environmental Education Enhancement Pilot Program currently implemented in Ban Na Fa Elementary School) and
- S.O.I.L. (Sustaining Our independent Lifestyle used on the RTC-TH Demonstration Farm)

The Rural Training Center-Thailand uses Geography as the core subject to teach people how to become their own best teachers for the rest of their lives. The systematic and analytical approaches used in the RTC-TH C-bE are transferrable to many other specialties. Although intended for non-traditional teaching situations, the lessons can be readily incorporated to traditional classroom settings.

The RTC-TH strives to create lessons that are low-cost, effective, and consistent with our overall goals of agricultural self-sufficiency and sustainability. Adapting technology appropriate to local conditions is essential. Rural settings are characterized by poverty and limited availability of machinery and parts. Making do with off the shelf components and parts are reality of life. Creative solutions are needed for any supporting materials and equipment for lessons.

Though our lessons are focused on local needs and concerns, the educational skills developed are fully transferrable to traditional academic classrooms. Community-based education is not a “poor people’s” alternative to education. Students are empowered to be life-long learners. They are fee to apply themselves to higher educational opportunites.

Geography integrates all academic disciplines (e.g. life, physical, and social sciences) to study, understand, and explain the distribution of phenomena on Earth. It provides a “big picture” of the world. It can provide students with a broad Liberal Arts foundation. They can build on this foundation to go on for further education.

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Rural Training Center-Thailand: Community-Based Education Technical Paper

# RTC-TH P.A.L. Curriculum Development Process

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Community-based environmental education for the self-sufficiency and sustainability of small rural family farms
ชุมชนตามสิ่งแวดล้อมศึกษาเพื่อการพึ่งตัวเองและยั่งยืนชนบทขนาดเล็กครอบครัวฟาร์ม

*You may post questions / comments to the Discussion area of our website*

## 1.0 INTRODUCTION

The Rural Training Center-Thailand. (RTC-TH) is a community-based organization providing environmental education for the self-sufficiency and sustainability of small rural family farms. We strive to reconnect rural families and students with nature to foster and develop future environmental stewards. A central theme in the RTC-TH is Y.E.S. (Youth, Environment, and Sustainability). The youth are a key to our future to protect the environment and sustain life on Earth.

This paper details the RTC-TH curriculum development process to make locally relevant environmental education activities and lessons for families. The RTC-TH P.A.L. (Practical Applied Lessons) and activities directly support Y.E.S. A P.A.L. is characterized by:

- **Practical, hands-on, locally relevant job skills** and strive to empower students for employment;
- **Good applied academics and science** pertinent to local conditions and situations for immediate relevance, and personal and family well-being;
- **Active participation of students in community service** work using knowledge and skills acquired in school;
- **Career orientation** using experienced workers from a wide variety of jobs as an integral part of the RTC-TH activities;
- **Family learning and sharing experiences** by involving families in the community service work to build and reinforce a sense of community.
- **Teach Backs** are an integral part of all P.A.L. activities. Students are expected to take lessons they learn back home to share and implement them as a means to reinforce classroom lessons;
- **Creating an Enjoyable and "Fun" Learning environment** building a more positive attitude toward learning.

The RTC-TH has an established reputation for creating effective informal learning opportunities. Frequent comments from former RTC-TH program participants exclaim surprise at how much they learned and how much fun they had while learning. This is a direct result of the RTC-TH P.A.L. curriculum development process.

## 2.0 General P.A.L. Curriculum Development Process

The RTC-TH P.A.L. curriculum development process moves through a systematic sequence that is community-based.

- **Stage 1: Review / research local community concerns and conditions** as reported in various media, public agencies, and as perceived by local residents. This can be done through a series of discussions with interest / focus groups or a public meeting. It can also be done informally through

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direct interviews. A balanced view can be readily achieved by combing both formal and informal approaches.

- **Stage 2: Review / research relevant existing ("off the shelf") curricular materials for local adaptation** from the RTC-TH lesson archives and any other available sources. The public is notified of the lesson topics selected for local site-specific adaptation. The topics are presented in a public meeting to gather feedback and determine priorities for lesson topic development. The RTC-TH P.A.L. curriculum development decisions / priorities are a balance of qualified personnel, available time / funding, and local community environmental concerns and active community involvement. The public is informed about these decisions via announcements at meetings and notices posted to the RTC-TH website, local village public announcements, and word of mouth.
- **Stage 3: Adapt the relevant existing lessons to specific local community sites with free or ready public access.** An existing lesson is pre-viewed and a draft P.A.L. is used in a trial run at a local site. The P.A.L. education activities strive to enhance the utilization of the natural features of the local area or to address the local concerns. As families and other volunteers do the activities at the local sites, they gain better awareness and appreciation for those sites. Teachers and students in the RTC-TH Y.E.S. projects and activities collaborate on field observation exercises to compile local site-specific data to adapt existing lessons. The draft compilation of the adapted P.A.L. is sent for Academic Peer Review. Students are fully acknowledged as contributing authors as warranted by their work performance.
- **Stage 4: Academic Peer Review.** Teachers involved in the lesson development conduct a peer review of the newly drafted adaptations before approved for Beta Testing. Draft lessons failing peer review are sent back to the authors for revision and may be resubmitted for re-consideration. The community will be advised of lessons and activities under revision through announcements at meetings and notices posted to the RTC-TH website. Public input will be considered when feasible during lesson revisions. If public input cannot be accommodated due to workflow / timing issues, the comments should be kept on file for the next revision / update of that lesson, and contributor informed of the action taken.
- **Stage 5: User Beta Testing** is done for a newly developed P.A.L. as the "acid test". Local families and other community and public agency volunteers try using the materials on an RTC-TH guided activity. Lesson evaluations forms are provided for feedback. It is important that local agency representatives and funding agency representatives take part in the beta testing. They can get first-hand knowledge and experience to then critique the lesson as being relevant and accurate for the local site.
- **Stage 6: Final Review / Approval** for publication and sale of a new lesson module when at least 70% of the Beta Testers rate the lesson as "Good" (using a 3 tier scale of Good, Fair, Poor). The inclusion of the community (students and people who would use the lessons) as well as the agencies holding jurisdiction over the local site is critical to the successful development of site specific P.A.L. (Practical Applied Lessons). This curriculum process provides RTC-TH with some assurance that the lessons will be used rather than sitting on a bookshelf. Lessons failing Beta Testing are sent back for Peer Review critique (with Beta Test results). Suggestions for revision are

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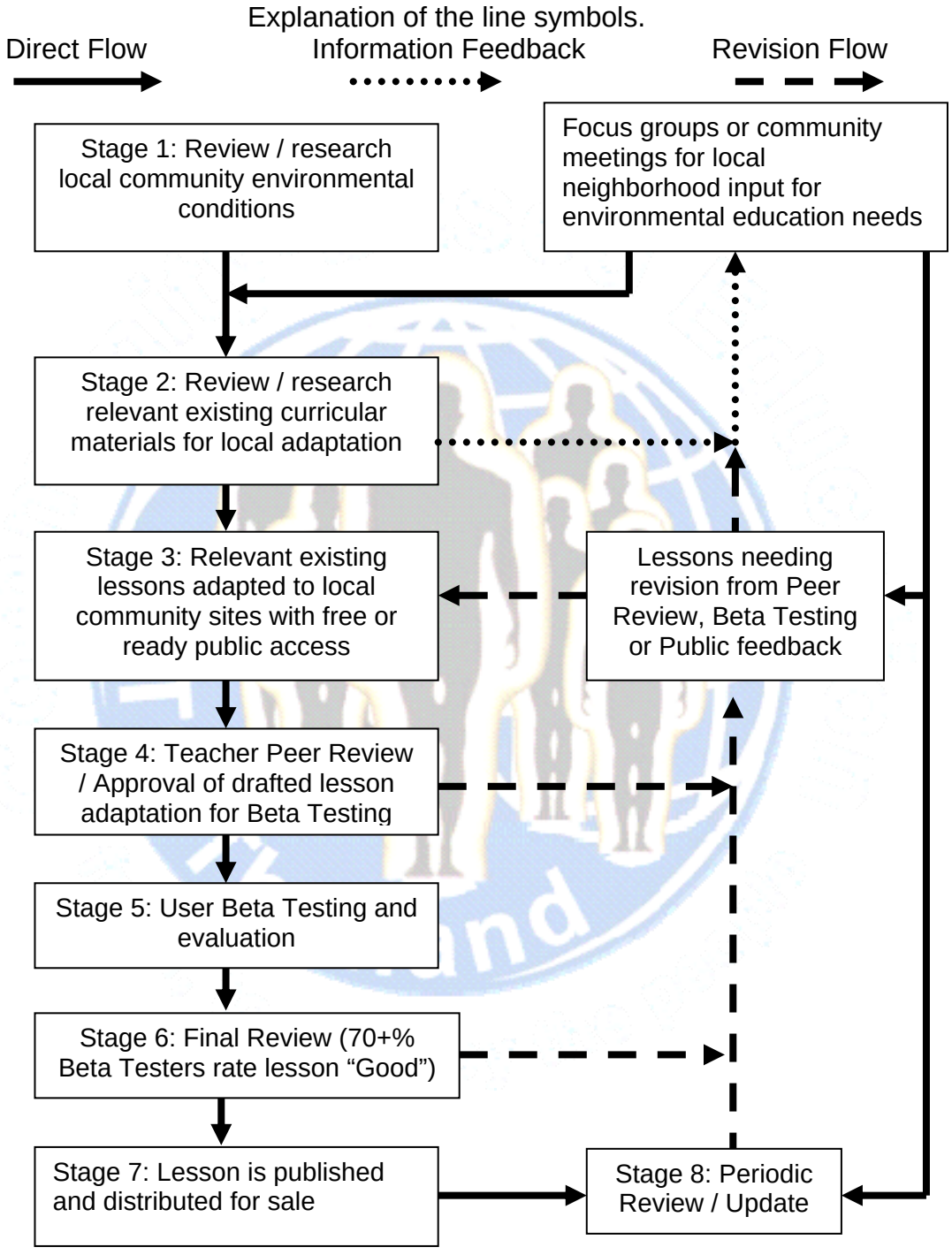
relayed to the authors for revision and may be resubmitted for re-consideration.

## RTC-TH P.A.L. CURRICULUM DEVELOPMENT PROCESS

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- **Stage 7: Lesson Published / Distributed for Sale:** If the lessons are sold (the majority are available free for non-commercial educational use), authors (both teachers and students) of the lessons are fully cited and credited in the published lessons. For students, this credit as an author enhances their resume. [**Note:** Proceeds from sales of publications would go to support the particular RTC-TH Y.E.S. program in which the publication developed (80%; earmarked to support that particular RTC-TH Y.E.S. program, future lesson revisions, updates, etc.), royalty shared by the authors (max 10%), and to the RTC-TH Y.E.S. general fund (10%). Should the relevant Y.E.S. program terminate (cease to exist), the 80% proceed share would revert to the RTC-TH Y.E.S. general fund but earmarked for future activities at the relevant local site. Should the RTC-TH Y.E.S. program for the local site be transferred to another local community group, the 80% revenue share would be divided equally between RTC-TH and the local community group. The RTC-TH share would go to the RTC-TH Y.E.S. general fund, however funding reserves would be maintained to revise and update the local site-specific lessons. RTC-TH Y.E.S. is committed to sustainable community projects.]
- **Stage 8: Periodic Review / Update:** Environmental conditions change. So user feedback forms are included in all lesson materials and a periodic review of the lessons and the specific local sites is performed as needed to revise and update lessons. Any public comments received from other sources will be considered when reviewing lessons for revision and updates. A Peer Review is conducted and resulting suggestions forwarded to the lesson authors (or teacher curricular development team if the previous author declines or is not available).

**[Note:** The RTC-TH has the option to use sales of its curricular materials to support its environmental education activities. The RTC-TH also purchases and uses materials and services of local vendors and business that have said Y.E.S. to RTC-TH programs and activities. In other words, money coming from the community goes back to the community as a matter of helping to create and maintain sustainable communities.]

**2.1 Curriculum Development with C.A.R.E.:** In the US, the legislative mandate to of “No Child Left Behind (NCLB) has created major obstacles for public education. Many teachers feel compelled to focus only on English and Math because students must pass standard tests in these subjects before expanding their studies to other disciplines. Geography, general science (and environmental science among other fields) are often left on the side. The traditional public education institutions are not innovative or responsive to providing students a well-rounded holistic liberal arts educational foundation. In some cases, it seems that “No Child Left Behind” inadvertently becomes “Few Concentrated General Academics” (FCGA) or more critically, “No Child Gets Ahead” (NCGA). The RTC-TH Community-based Education (C-bE) lessons and activities become a more viable educational alternative to supplement traditional public schools. Families can freely choose to participate (self-select) in a local grassroots effort while enduring the heavy-handed top down ineffective traditional institutional approach. The “teach back” portion of C-bE calls for students with more proficiency to help teachers with students who need more help. The Teach Back process is an effective way for the more proficient students to gain a deeper

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mastery of the topic, to develop social responsibility to help others, and to nurture a sense of community.

RTC-TH uses considerable C.A.R.E. in the P.A.L. curriculum development process. The acronym C.A.R.E. stands for:

| | |
|---|---|
| C | Community Involvement / Cultural Diversity |
| A | Academic Integration / Rigor / Personal Development / Job Relatedness |
| R | Relevance to Local Community Concerns |
| E | Enhancing Geography and Environmental Science |

**2.1.1 Community Involvement / Cultural Diversity:** Step 1 in the curriculum development process is community involvement. Cultural diversity goes beyond ethnicity and includes age, socio-economics, philosophies / religions, learning modalities, and accessibility issues. The RTC-TH strives to provide and create "inclusive" opportunities to everyone who is interested in learning more about the environment. Self-selection is an important way for people to get involved with RTC-TH community-based environmental education programs. When people voluntarily join an activity or program, they are more likely to be ready to learn and benefit because they start with a positive attitude.

The Y.E.S.-P.A.L. seeks to engage learners by incorporating their 5 basic senses to heighten awareness of their surroundings and stimulate curiosity. From this initial input, the lesson then engages the educational process---*ex ducere*---"to lead out" from the learner prior experiences and knowledge to connect with the present situation. Thought processes are brought to bear on the present experience through the use of conceptual models and guided checklists to guide and elicit questions from the learner. From here, the Socratic process begins with the facilitators guiding further questions leading to self-discovery and understanding.

| **Using Sensory Perceptions to Engage Learners** | | | | | |
|---|---|---|---|---|---|
| Subject Area | Seeing | Hearing | Smelling | Touching | Tasting |
| Gen. Geog.<br>Atmosphere<br>Biosphere<br>Hydrosphere<br>Lithosphere | Visual recognition clues & warnings for eye protection | Auditory recognition clues & warnings for ear protection | Odor recognition clues & warnings for toxic gases | Tactile/textural recognition clues & warnings for cuts/burns, etc. | Flavor/textural recognition clues & warnings for toxic substances |

Each Y.E.S.-P.A.L. is developed at multiple levels: Basic, Intermediate, and Advanced. These can be integrated into a single document or created as separate cross-referenced documents. This enables a whole family to use a lesson at the same time and learn together. The Geographic Systems Model can be used a various learning levels to help you understand the world. For RTC-TH,

- ***Basic Level*** activities involve direct observation and description. The basic question begins with "What is…?" The description can be oral, written, sketched or photographed. There are no standard answers as each person is encouraged to answer on the basis of what they see and feel. This is true freedom of expression. Introducing basic key vocabulary terms provides guidance. Basic level lessons establish the fundamental facts about a topic.

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- ***Intermediate Level*** activities add measurement, display and analysis. Intermediate level questions begins with "How is…or Why is...?" The goal is to explain and understand how something is made or works. Now, the responses need to be more readily communicated and accepted by more people. In other words, we have moved from the level of independent free expression to socialized mass communication. To work effectively, you must be able to communicate clearly with others. Standard definitions and procedures help make this happen. The end result is to use the basic facts about a topic to gain an understanding of the topic.
- ***Advanced level*** questions begin with "What if…?" and tests the full knowledge of a person's comprehension to solve real world problems. This ability is based on a mastery of the facts and an understanding of the how and why of a topic. If resources are available, the use increasing amounts of technology (esp. computers and other digital equipment).

| **Summary Table The RTC-TH Learning Level And Activities.** | | | |
|---|---|---|---|
| **Subject Area** | **Basic** | **Intermediate** | **Advanced** |
| **Geography** | General descriptions based on observations using the 5 basic senses, common vocabulary and guided basic subject specific terms | Description based on direct observations guided by checklists, making simple equipment, measurements, and summary tables | Descriptions based on direct observations, guided checklists, using more technical and digital electronic equipment. |
| **Atmosphere** | | | |
| **Biosphere** | | | |
| **Hydrosphere** | | | |
| **Lithosphere** | | | |

**2.1.2 Academic Integration / Rigor / Personal Development / Job Relatedness:** The RTC-TH applies the Geographic Systems Model to integrate subjects across traditional academic lines and departments. Geography uses all life, physical and social sciences to understand our world. This gives families a holistic and non-bureaucratic alternative learning model. The RTC-TH Y.E.S.-P.A.L. is intended to supplement and enhance traditional academics---not to replace them. The RTC-TH lessons are consistent with relevant national and state education standards. Intellectual rigor is maintained with lessons that engage students in critical thinking and applying the Geographic Systems Model, General Systems Theory, and the scientific method to study and understand local concerns. The RTC-TH activity components promote ethical, civic and social responsibility through active community service projects. The use of the US Labor Dept. Secretary's Commission on Achieving Necessary Skills checklists (S.C.A.N.S) adds the real job readiness validation component to RTC-TH lessons. [**Note:** The SCANS checklists are in Appendix 1 of this paper. Using the SCANS Checklists is explained in publication CbE 2010-3 "Guide for Self-Learning."]

- **Learn How to Learn** (Basic Study Skills)**:** RTC-TH is committed to the idea that all students must 1) learn how to learn and 2) to make learning a life long activity. The tools enabling students to reach these goals are learning how to learn, basic study skills, concept mapping (exemplified by the use of the Geographic Systems Model, the General Systems Outline, and the IT-IS Literacy Model---Information Technology-Information Systems), critical thinking, and by direct hands-on experience through

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community service activities. In the RTC-TH, we adhere to a "cyclic saying": All teachers should be students; all students should be teachers.

- **Become Your Own Best Teacher with Teach Backs & Self-Assessment:** The RTC-TH believes teaching is one of the best ways to learn. All students are given an opportunity to teach. Each student will do a Teach Back to new comers in the RTC-TH Y.E.S.-P.A.L. activities in the local community. All RTC-TH lessons include student self-assessment tools. In addition to S.C.A.N.S. RTC-TH uses the Trip Self-Interview, Journal writing, the Learning Log, and the RTC-TH Self-Evaluation form---derived from a corporate/industry employee evaluation form---when relevant to a lesson or activity. It is important for students to reflect on what they have learned and how they can put the knowledge and skills to practical use. This is summed up in another RTC-TH cyclic saying: Teach to Learn; Learn to teach.
- **Addressing Different Learning Modes:** Everyone has their unique way to learn. Educational research describe different general learning modalities: audio (listening), visual (seeing), and kinesthetic (activity, role playing, etc.) as well as "right brain" vs. "left brain". P.A.L.-Y.E.S. lesson activities should provide learning opportunities for all students and learners. It is critical that all lessons include an integration of
  - Lecture / oral presentation, question and answer, and student presentations (including teach backs) for auditory learners.
  - Reading with illustrations (e.g. photos, diagrams, charts, graphs, etc.) / chalk-and-talk graphics, film/videos for visual learners.
  - Physical / manipulation / hands-on interactive projects for kinesthetic learners.

| | | **Learning Modes Used in Traditional Lessons** | | |
|---|---|---|---|---|
| | | Auditory | Visual | Kinesthetic |
| Traditional | lecture | Listening | Note taking | |
| | Watch a film / video | Listening | Observation , note taking | |
| | homework | | Reading, note taking | |
| | demonstration | Listening | Observation | |
| | lab experiment | | Reading | Doing the experiment |

It is interesting to see that in traditional teaching methods, some methods appear to use 3 learning modes simultaneously (e.g. lecture and watching films / videos). Most seem to use only 2 modes simultaneously. But in general, the majority of traditional teaching is considered a passive activity for the student.

| | | **Learning Modes in RTC-TH P.A.L.** | | |
|---|---|---|---|---|
| | | Auditory | Visual | Kinesthetic |
| Interactive P.A.L. | Narrated demonstration with kit | Listening | Handling kit parts | |
| | Read along references to diagrams, text, worksheets | Following instructions, observing, writing | | |
| | Interactive worksheets with interactive Question / Answers | Listening/speaking, observing, writing | | |
| | Hands on Practicum | Following instructions, observing, writing | | |
| | Teach back | Speaking | observing | demonstrating |

P.A.L. curricular development makes student interaction an integral part of the lesson. For example, the construction of a compost bin begins with a sample plan of known dimensions. For a specific project, the dimensions may be modified due to the site, availability of materials, or any number of other reasons. The worksheets

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for the activity may require students to take measurements and to make calculations in the field. The activity involves simultaneous activities of speaking, listening, seeing, measuring, calculating, etc. This is an actual work project to make a compost bin.

- The key goals are to teach students:
  - to learn how to learn interactively and developing interpersonal communication skills in groups (The guiding cyclic say for this is: "Study to learn; Learn to study.")
  - to more fully develop their abilities to learn in as many modalities as possible (The cyclic saying to use: "Learn to think; Think to Learn."
  - to become life-long learners. (The cyclic say for this is "Learn to live; Live to Learn.")
  - to care and share their knowledge, skills, and abilities as socially responsible citizens thus perpetuating sustainable communities

[**Note:** Mr. Lee has taught in North Dakota, New Jersey, and California in both public and private institutions; onboard U.S. Navy ships deployed in Australia, British Indian Ocean Territories, Guam, Oman, Japan, Philippines, S. Korea; and in P.R. China and Thailand. He is an honorary Visiting Professor at Qufu Normal University, Shandong Province, P.R. China, and a Visiting Professor and Honorary Board Member of Aurora College, Shanghai, P.R. China. Basic Study Skills are presented in RTC-TH publication Cbe 2010-4.]

**2.1.3 Relevance to Local Community Concerns:** A student spends more time outside of school each day than in school. RTC-TH favors teaching outdoors, literally outside the box of the classroom. The conditions are closer to the complexities and diversity of life rather than the sometimes structured and simplistic approaches of classroom textbooks and standardized tests. Connecting academics to the local environment and conditions bring reality to the lessons. When students can actually see and experience the lesson in their lives, the lessons "come alive" and have more meaning. RTC-TH uses the Geographic Systems Model to conceptually and systematically guide students in viewing themselves in their neighborhood (local scale), community-city-county-state (regional scale) and the world (global scale). By integrating local site-specific lessons to active community service, students simultaneously learn and contribute constructively toward a sustainable neighborhood. They become more responsible citizens at an early age. [**Note:** The Geographic Systems Model diagram is presented in Appendix 2a. For more information about the Geographic Systems Model see RTC-TH publication AG 2010-1 "Introduction to Geography."]

**2.1.4 Enhancing Geography and Environmental Science:** Geography and Environmental Science are at the very heart of RTC-TH. Geography is the full integration of all life, physical, and social sciences used to describe and explain the distribution of phenomena on Earth. Environmental science is the study of the interaction of living and non-living phenomena on Earth. These two fields are natural partners for teaching people how to protect their communities and how to strive for creating and maintaining sustainable villages, neighborhoods, and family farms. RTC-TH strives to raise local awareness about the environment, and to expose and encourage youth to careers in Geography, Environmental Science, and to become environmental stewards as well as sustainable farmers.

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Although the RTC-TH operates in a low-tech / no tech environment, it is important that lessons include technology awareness. This is especially true for learners striving to enter higher education institutions. Thus, lesson development is guided by the IT-IS Literacy (Information Technology – Information Systems) model created by G.K. Lee. The model was originally created to guide US college students to prepare themselves with practical skills to become viable Information Age workers. Many US colleges lacked sufficient resources or courses to train students in information technologies as users. Rather than wait for the colleges to create the courses, students were urged to take the initiative and apply the IT-IS Literacy model to their major disciplines. The IT-IS Literacy model is now integrated with the RTC-TH Community-based Education methods. [**Note:** The IT-IS Literacy model diagram is found in Appendix 2b of this paper. It is fully described in RTC-TH publication CbE 2010-2 "Basic Study Skills".]

**2.2 Community Network for Environmental & Energy Educational Continuity (CNEEEC):** The normal sequence of pre-school, K-6 (elementary), 7-8 (Jr. High), 9-12 (Sr. High) is segmented with students going from one level to another is a superficially connected process.

In reality, there is little meaningful continuity in the learning process. Traditional schools are segmented institutions. Subjects are compartmentalized and separated by departments and budgets. Structured age grade levels separate students from one another in direct contrast to the integrated generational family unit. Budget cuts and potential litigation fears force the elimination of field trips. This effectively disconnects the school experience from the real world.

RTC-TH strives to build bridges for academic continuity in its lesson activities and programs. It achieves this working with families and community organizations with effective networking.

The RTC-TH suggests the following integration model of community and schools through **CNEEEC** using the RTC-TH Y.E.S-P.A.L. curriculum development process. The key components in CEEENC are:

- Elementary Schools
- Middle Schools
- High Schools
- Universities / Colleges (especially teacher training, technical-engineering, agriculture, and business colleges)
- Village Councils
- Sub-district Offices (especially program coordinators in education, emergency services, energy, agriculture, and economic development)
- District Offices (especially program coordinators in education, emergency services, energy, agriculture, and economic development)
- Provincial Education Department
- Provincial Energy Department
- Provincial Emergency services.

**2.3 Bridges from School to Work:** ESSI lessons and activities also strive to build bridges from school to work. Extending the ESSI community network to the world of work makes this happen

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- **Community Service Volunteer Projects:** Community Service projects are opportunities for students to become actively engaged in using their knowledge and skills for the benefit of their communities. Participating adults from local businesses and private individuals are an untapped source of knowledge not fully utilized by schools. In many cases, budget shortages means certain community facilities or activities are neglected. This could be solved integrating across administrative boundaries and combing funds and resources from multiple sources. Using volunteers from schools and the community as labor brings the community together to share knowledge, skills, and abilities. This "out of the box" innovative educational event provides students with practical experience not available on campus. And, the students can now become active contributors to their communities.
- **Integrated School to Village Educational Programs:** Combining classroom lessons with community service is also an opportunity to conduct outreach education. This can serve as teach backs for the students to demonstrate their knowledge, skills, and understanding. At the same time, they do something constructive for the community. For example, students and community volunteers could construct home composting bins for elderly villagers to process kitchen vegetable wastes. The compost could be used in vegetable gardens for the elderly. Students and volunteers can assist in the elderly in tending the gardens. In this way, the students develop social responsibility and strengthen the sense of community in the village.

  This approach can also be combined with government programs in alternate energy. For example, the Energy Department funded the materials for the construction of a biogas digester. Energy Department specialists train the students and teachers. They teach back to the villagers. At the same time the students and villagers build the biogas digester (e.g. at the village market so all the organic market wastes are processed to make cooking gas for the market or village). In this way, the Energy Department funds create a working biogas digester; the village market is set up with a waste disposal system that produces energy; and the student, teachers, and villagers are educated about alternate energy; and the environment is protected.

**3.0 Summary**

The curriculum development process for Y.E.S.-P.A.L. is wholly consistent with the community-based education model. It is lesson development from the people, to the people, by the people. Making lessons that are relevant and directly applicable to the locale makes the lessons more consistent with the reality of the learner. This meaningful connection is another learning option to ***supplement*** the detached and abstract learning common in most traditional classrooms.

It is our experience that most program participants come with some education, knowledge, and skills. We don't advocate community-based education as a replacement for existing education systems. In life, there are many tools and options. Education is not the exclusive domain of any one person, group, or organization. Community-based education can be another aspect of those educational tools and options for people.

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# Appendix 1: SCANS Checklists

| Foundation Skills | | |
|---|---|---|
| **A. Reading** | Before | After |
| 1. Locate written information. | | |
| 2. Understand information. | | |
| 3. Interpret information. | | |
| **B. Writing** | Before | After |
| 1. Communicate thought in writing. | | |
| 2. Communicate idea in writing. | | |
| 3. Communicate information in writing. | | |
| 4. Create a letter. | | |
| 5. Create directions. | | |
| 6. Create a manual. | | |
| 7. Create a report. | | |
| 8. Create a graph. | | |
| 9. Create a flow chart. | | |
| **C. Arithmetic/Mathematics** | Before | After |
| 1. Perform basic computations. | | |
| 2. Approach a practical problem. | | |
| 3. Choose the appropriate mathematical technique. | | |
| **D. Listening** | Before | After |
| 1. Receive a verbal message/cue. | | |
| 2. Attend to verbal message/cue. | | |
| 3. Interpret a verbal message/cue. | | |
| 4. Respond to a verbal message/cue. | | |
| **E. Speaking** | Before | After |
| 1. Organize ideas. | | |
| 2. Communicate orally. | | |

| Thinking Skills | | |
|---|---|---|
| **A. Creative Thinking** | Before | After |
| 1. Locate written information. | | |
| **B. Decision Making** | Before | After |
| 1. Specify goals and constraints. | | |
| 2. Generate alternatives. | | |
| 3. Consider risks. | | |
| 4. Evaluate alternatives. | | |
| **C. Problem Solving** | Before | After |
| 1. Recognizing problems. | | |
| 2. Implement a plan of action. | | |
| **D. Seeing Things in the Mind's Eye** | Before | After |
| 1. Mentally organize symbols, pictures, graphs, objects, other information. | | |
| 2. Mentally process symbols, pictures, graphs, objects, other information. | | |
| **E. Knowing How to Learn** | Before | After |
| 1. Use rules, principles and underlying relationships between two or more objects. | | |
| 2. Apply rules, principles when solving a problem. | | |

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| **Personal Skills** | | |
|---|---|---|
| **A. Responsibility** | Before | After |
| 1. Exert a high level of effort. | | |
| 2. Persevere toward goal attainment. | | |
| **B. Self-Esteem** | Before | After |
| 1. Believe in own self-worth. | | |
| 2. Maintain positive view of self. | | |
| **C. Sociability** | Before | After |
| 1. Demonstrate understanding. | | |
| 2. Demonstrate friendliness. | | |
| 3. Demonstrate adaptability. | | |
| 4. Demonstrate empathy. | | |
| 5. Demonstrate politeness in group settings. | | |
| **D. Self-Management** | Before | After |
| 1. Assess self accurately. | | |
| 2. Set personal goals. | | |
| 3. Monitor progress. | | |
| 4. Exhibit self-control. | | |
| **E. Integrity/Honesty** | Before | After |
| 1. Choose ethical course of action. | | |

| **Work Place Competencies** | | |
|---|---|---|
| **A. Resources** | Before | After |
| 1. Know how to allocate time. | | |
| 2. Know how to allocate money. | | |
| 3. Know how to allocate materials. | | |
| 4. Know how to allocate space. | | |
| 5. Know how to allocate staff. | | |
| **B. Interpersonal Skills** | Before | After |
| 1. Work on a team. | | |
| 2. Teach others. | | |
| 3. Serve customers/others. | | |
| 4. Lead | | |
| 5. Negotiate. | | |
| 6. Work with people from culturally diverse backgrounds. | | |
| **C. Information** | Before | After |
| 1. Acquire data. | | |
| 2. Evaluate data. | | |
| 3. Organize/maintain files. | | |
| 4. Interpret information. | | |
| 5. Communicate information. | | |
| 6. Use a computer to process data/information. | | |
| **D. Systems** | Before | After |
| 1. Understand social, organizational, technological systems. | | |
| 2. Monitor and correct performance. | | |
| 3. Design and improve systems. | | |
| **E. Technology** | Before | After |
| 1. Select equipment and tools. | | |
| 2. Apply technology to the task. | | |
| 3. Maintain and troubleshoot equipment. | | |

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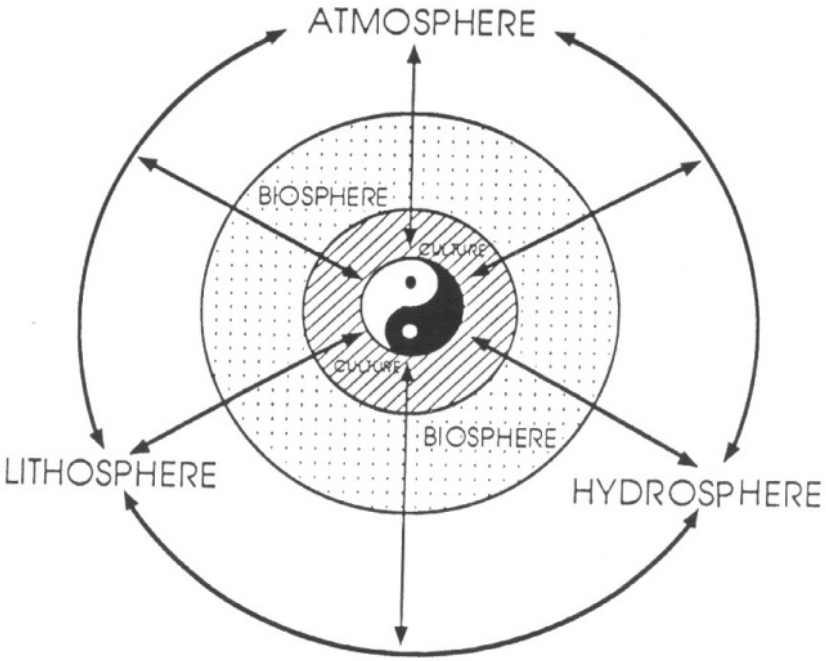
# Appendix 2: Model Diagrams

## 2a: The Geographic Systems Model

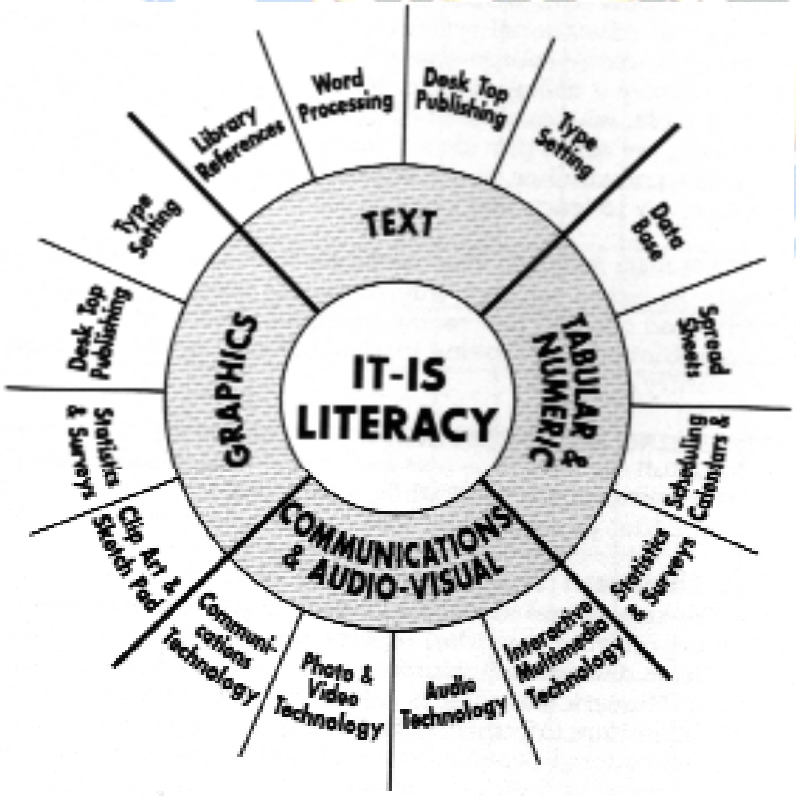
Location Scale Time




This is a general systems model showing the relationships of the 4 environmental spheres to each other. It is the core method to systematically approach and solve local environmental problems affecting community self-sufficiency and sustainability.

It is fully explained in RTC-TH publication AG 2010-1 "Introduction to Geography."

## 2b: The IT-IS Literacy Model




This is a general systems model showing the relationships of the 4 segments of a typical report / presentation. It is the core method to systematically approach the Information Technology-Information Systems education needed to be an effective Information Age worker.

It is fully explained in RTC-TH publication CbE 2010-2 "Basic Study Skills."

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