Community-based Education

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PREFACE to the 2013 Edition

The RTC-TH Community-based Education (C-bE) model involves a trilogy of documents:

- RTC-TH-CbE-2010-1 Community-based Education
- RTC-TH-CbE-2010-2 Basic Study Skills
- RTC-TH-CbE-2010-3 Guide to Self-Learning

There is some overlap between the documents. At the same time, some detailed supplementary information may appear in one document but the others. Appendix 1 contains a cross-reference matrix to show the links between the units of the trilogy.

I developed my ideas of Community-based Education (C-bE) during my 22.5 years of experience as a student (pre-school to post-graduate school), 12 years of private sector work in consulting engineering, and my 29 years as a teacher. I tried to find effective solutions to what I considered the short-comings of the public education system. Every job and profession has its share of good, even great people and also its share of those who really need to improve. An ugly reality of life is that some people only go to work for a paycheck and take no pride nor joy in their work.

I feel very fortunate to have been paid to do what I loved doing---teaching. This allowed me to do all the things that I love to do (e.g. travel, hiking, camping, photography, sharing experiences, knowledge, skills, etc.). In truth, I would have done all those things for no pay just because I loved doing them.

The 29 years of teaching are one part of my work experience. The difficulties of working with entrenched bureaucratic organizations presented challenges and difficulties. I felt constrained by being in the box of the classroom and the campus. I devised C-bE as an effective “work around” to overcome the log jammed bureaucratic systems and scarce to non-existent budgets.

Some of my teaching was in non-traditional settings (e.g. store front spare-time adult schools, onboard ships at sea, and in farm fields). These diverse settings presented challenges and difficulties from teaching in a classroom. But these “out of the box” experiences gave rise to the creative, innovative, practical hands-on, low tech / no tech teaching methods that are at the core of my Community-based Education (C-bE) method. Much of the time, teaching materials, equipment, and resources exist locally among the participants, are readily available off the shelf, or easily made from reclaimed materials. This greatly reduces educational costs especially in impoverished areas. I found a classroom and a school campus is not essential to the C-bE method.

The critical ingredients to C-bE are people with knowledge and skills. They could be traditional students or families who are motivated to learn by sharing and caring. Teachers are those who have knowledge, skills, experience and insight and who are willing to share them with others. Over time, I began to realize that my life was not entirely my own. Nearly all of us live and function in groups or communities. Our lives are inter-connected with others directly and indirectly. This is not a new idea. There is an old saying “No man is an island.”

Self-selection is the key action for all participants (students and teachers); they all WANT to be there to learn and share. They are all members of the community tied to local needs. The spirit of the volunteer, teaching for the love of

teaching rather than for a salary is an important contrast to the traditional education system. In this sense, C-bE is education of, by, and for the people. It is inherently relevant to the people and community needs. The vast majority of the lessons and activities are practical. Young students are empowered and encouraged to be active contributing members to the community through community service lessons / activities. The lessons can be taken home and applied to improve a family's economic condition. They can readily lead to jobs in the local area.

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. We have a saying in the RTC-TH: "Geography may not change the world, but it will change the way you see it." Using the Geographic Systems Model to see and organize your study of the natural world gives you insights to sustainability and self-sufficiency. You learn how to work with nature and maintain a viable balance suited to your local conditions.

C-bE is NOT a substitute for traditional schools. It is a supplement to the many ailing public schools found in impoverished rural areas. The educational setting in these communities is often characterized by:

- A dilapidated school building (if one still stands)
- Dilapidated school furniture or lack of furnishings (e.g. desks, chairs, chalkboard, etc.)
- A shortage or lack of books, teaching materials, and school supplies
- A shortage or lack of a full time teacher or perhaps a part-time teacher only 1 or 2 days a week
- Low or disrupted student enrollment / attendance especially when students assist their families in peak work seasons (e.g. planting or harvest)
- Remote locations so students would have to travel long distances or go away to boarding schools as they progress to higher grade levels. Most families cannot afford this, so further education is severely limited.

These conditions tend to reinforce the plight of the rural villages. The low education level is a significant barrier to their social and economic mobility. It reinforces a downward spiral widening the gap between the rural poor and the wealthier urban dwellers. History shows governments struggle with civil strife when the rural – urban economic gulf grows too wide.

My first real field test of C-bE took place in Ban Tha Kho, Chiang Rai in summer 1999. Speaking no Thai, and training 5 volunteers from 3 villages who spoke no English, the lessons combined limited translation, much gesturing with hands-on demonstration to train them in soil erosion management using composting, planting grass strips, and building check dams. All materials were readily available on the farms. The results from the first summer 2-week training were tallied 4 years later. From 3 villages, the training reached a total of 23 villages and went from the original 5 Thai local volunteers to an estimated 600 people. All this was done with no government funds from Thailand or the US. It was a strictly people-to-people effort. This proved to me Community-based Education works.

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Community-based Education

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Community-based Education of, by, and for the People
You may post questions / comments to the Discussion area of our website

1.0 INTRODUCTION

The current global financial crisis adds to the problems of modern education. As government budgets are cut, education is one of the many victims. Prior to this, education reform was undertaken in many countries around the world. Yet the massive budget increases did not always produce significant results. So it seems that money is not the true solution to the problems of the education system.

Community-based education (C-bE) is not a replacement for the national education system. It supplements the existing education system from outside the classroom and schools. My name is Gregory Lee, a Rural Training Center-Thailand (RTC-TH) co-founder. I pioneered my C-bE method in community volunteer programs in the U.S., China, and Thailand. "The RTC-TH thinks and works outside the box." This innovative education method is a practical and hands-on integration of academic lessons with work directly related to jobs and the local community.

My professional education is in Geography. However, as with many things in life, it is hard to know the exact source of the knowledge, ideas, and skills that make us who we are today and who we might become in the future. Whatever the source, acknowledged or otherwise, freely sharing my knowledge, ideas, and skills is my attempt to express my gratitude to all who have contributed to making me the person I am today. This is my personal attempt to give back to "society" and humanity.

A brief summary contrasting C-bE to traditional schools is given below. [**Note**: Keep in mind, traditional school systems have more formal sequential curricular requirements and larger bureaucratic organizations. C-bE is not intended to replace them. The summary comments below show key differences how C-bE can supplement the traditional school system by presenting alternatives.]

Characteristics of Traditional Schools vs. Community-based Education		
Characteristics	Traditional Schools	Community-based Education
Organization	General "top down" authoritarian bureaucracy	Based on mutual respect, mutual benefit, self-selection, and unconditional acceptance within the group
Response to Change	Very slow due to bureaucratic controls / approvals needed to make changes.	Can be rapid if relevant qualified people step up to lead the effort to meet an immediate need for the good of the group
Basic Teaching Unit	The class in a grade	The family
Physical setting	In a school classroom	Just about anywhere
Members of the group	Usually age stratified; sometimes stratified by ability	Family members of various ages; trans-generational
	Some schools are gender segregated	Mix of genders
Teachers	Certified, salaried	People with knowledge, skills willing to share with others; all unpaid volunteers (including administrators and leaders).
Administrators	Salaried bureaucrats	

Characteristics of Traditional Schools vs. Community-based Education (cont'd)		
	Traditional Schools	Community-based Education
Subjects taught	Subject matter is segmented (e.g. separate periods / classes for math, language, science, etc.)	Various integrated topics based on work to be done (e.g. baking a cake combines language, math, science, chemistry, etc.)
	Lessons often set by a "standard" curriculum defined by the authorities in government departments. All students are often "forced" to do the same lesson together. Students are not free to work ahead; often the class pace is set by the slowest students frustrating the more advanced students.	Lessons are presented based on the needs of the individual, family, or community (e.g. what needs to be done). There is flexibility to allow advanced students to work ahead either as peer teachers or to help the trainers prepare different lessons for the group, or to teach back to students needing more help with the lesson.
Time Frame	Often pre-set periods (e.g. school term / semester, academic year, elementary, secondary, post secondary, undergraduate, graduate, post-graduate, etc.) Many have the attitude like jail inmates (i.e. can't wait to get out).	Life-long; can be continual at the choice of the learner.
	Teachers are assigned a group of students; students often have no choice of instructor.	Community members noted for their skills are recognized as "teachers" by others. Students self-select to learn from a "Master".
	Separation of academic college bound classes from vocational / technical classes.	Integration of academics with practical job skills.
Class size	Class sizes vary, but often there could be 30-40 or more students per teacher.	Usually small; less than 4-6 learners per teacher. (Five is the optimum number.)
Cost	Often a combination of taxation and tuition (the cost keeps rising which puts higher education out of reach for the poorer members of society); budgets must be approved which takes time.	Time, labor as part of a family unit (expected to do work for the good of the whole family). Since the need is local and the results stay local, it is in the vested interest of the group to meet the need with available local resources.
	Books are required and may or may not be provided by the school. At higher levels, students must purchase books (which are many times required but may not be used in the class, depending on the professor).	Books, if any, from any member's bookshelf or library. Much of the knowledge base is in the memory of the teacher. If internet access available, free downloads possible. Materials can be customized for the need.
Distance	Distance often increases as the level of learning increase. For some, the time or cost of travel to / from school becomes a significant barrier keeping many from attending school.	Often at home or on the farm; most times somewhere in the local area of the family
Learning Validation	Measure of learning is a test result or grade. Many times there is no actual tangible proof of the ability to produce a tangible product. Many students get "high marks but have low ability."	Learner is able to do the work based on the training they received; proof is based on the results they produce.
		Teach-backs provide real-time, hands-on practical "ungraded" examination / reinforcement of learning rather than passing a traditional written examination.

2.0 P.L.A.N.T. (Personal Learning and Natural Teaching).

At the core of the C-bE model is P.L.A.N.T. It goes back to the days before schools, diplomas, colleges, teaching certificates, and departments of education existed. Inherent in PLANT is the idea of LIFE-LONG learning. People need to continuing learning throughout their lives. C-bE teaches people to become their own best teacher. Beyond the individual, the teaching unit is the family.

P.L.A.N.T. evolved out of an earlier community-based education effort I began in 1999. My approach to community-based education came from:

- my personal learning and education experiences starting from public schools in Hawaii,
- college training in various universities,
- my work experiences in the private sector which involved on-the-job training of new hires,
- professional teaching
- my volunteer experiences in various communities and countries over the years.

Here are some key points that have shaped my thinking about PLANT and community-based education:

2.1 Education Defined: Generally, an educational system involves teachers and students. This can occur both in and out of formal schools. In fact, most parents are the first teachers most of us have in life. And most parents do not have formal teaching credentials and certificates. Education is derived from two Latin words: ***Ex*** meaning "out of" and ***ducere*** meaning "to lead." Ironically, traditional teaching seems more of a "pouring in" process rather than a "leading out". Teachers (as fountains of knowledge) fill up students (empty containers) with knowledge. Exams try to determine if the containers were adequately filled.

I prefer to think of educators "leading (themselves and others) out" from ignorance and toward enlightenment. [**Note:** I feel ignorance can be "cured" by learning. This is reinforced by Thomas Dewar's quote: "Minds are like parachutes; they only function when open." Education is a life-long endeavor. As a reminder of this idea, I created the "cyclic saying": "Learn to live, live to learn." This way the cycle of suggests learning is perpetual.

2.2 Education is holistic. The Geographic Systems Model, General Systems Theory, and Yin-Yang are the guiding conceptual models to perceive and identify connections and interrelations in our world. I have another cyclic saying: "Connect to learn; learn to connect."

Teachers and learners, while attempting to be "objective" are immersed in the subject / object being studied. Thus, they must always be wary of personal biases affecting their studies. Integrity can be readily maintained by transparency; openly declaring your biases and potential or apparent conflicts of interests and taking steps to safe guard against them. Peer review is a common reality check. This is obviously an optimistic and positive view.

2.3 Self-Selection: I see education as an individual's free choice. The learning can be self-initiated or guided by others. In C-bE model, self-selection is a key factor. Teachers and learners self-select to get involved in the education process. This also involves personal responsibility for their actions and decisions. In the end, learning is best facilitated when the learner wants to learn. My cyclic saying for this is "Learn to choose, choose to learn."

2.4 Teachers as Examples and Facilitators: For a teacher to be credible, they must be knowledgeable and skilled (competent) in their subject. Other personal qualities include integrity, consistency, and thoroughness (among others). Teaching by example is far better than "do as I say, not as I do." Effective C-bE teachers care to share. They care about people. They freely share their knowledge and skills expecting nothing in return. Effective learners are the key reward for dedicated C-bE teachers. I created the "cyclic saying": "Teachers should be students, students should be teachers". Consider this cyclic saying: "Learn to care; Care to learn."

Teachers facilitate learning by providing opportunities for students to explore and learn according to the interests of the student. Self-selection is the free choice of the student and should be respected. Education should be guided by "mutual respect, mutual benefit" between teachers and students. This is consistent with the cyclic saying "Teachers should be students, students should be teachers." The learning environment should encourage sharing of knowledge and information to promote synergy to take place to advance understanding.

We encourage using the Socratic Method (where the self-critical reflection on the nature of our concepts and our reasoning are used to separate truth from error). Our relevant cyclic saying is "Learn to reflect, reflect to learn. (See more about this in Section 4.18.) Both teachers and students should be mindful of the Kalama Sutta. (See the side bar.)

The Kalama Sutta

- *"Rely not on the teacher/person, but on the teaching.*
- *Rely not on the words of the teaching, but on the spirit of the words.*
- *Rely not on theory, but on experience.*
- *Do not believe in anything simply because you have heard it.*
- *Do not believe in traditions because they have been handed down for many generations.*
- *Do not believe anything because it is spoken and rumored by many.*
- *Do not believe in anything because it is written in your religious books.*
- *Do not believe in anything merely on the authority of your teachers and elders.*
- *But after observation and analysis, when you find that anything agrees with reason and is conducive to the good and the benefit of one and all, then accept it and live up to it."*

-----as taught by Shakyamuni Buddha

[Note: It is said Shakyamuni Buddha cautioned his students not to believe even his words JUST because he spoke them.]

2.5 Students as Learners: Learning is a personal endeavor and experience. It is most successful when it:

- stems from natural curiosity
- is free from value judgment
- is interactive and engaging
- is relevant to the situations and the experiences of the students
- is free of prejudice and open to consider all points of view. The idea is to promote free discussion and exchange of ideas. Arguing is NOT acceptable. Discussions should be constructive and attempt to result in understanding. This may or may not mean agreement or consensus.
- is repetitively applied in meaningful ways to help reinforce the lesson without being rote memorization
- occurs in natural and familiar settings (e.g. in families, peer groups, in or out of formal institutional facilities, etc.) which tend to be comfortable for the students.
- is presented using a wide variety of learning modes and styles.

2.6 Students as Teachers: The "teach back" is an opportunity for students to share their knowledge and skills with others. One way to improve your learning is to try to teach a lesson to others. Teaching is a true test of your knowledge and ability. You tend to check and re-check your statements and the examples you use. When students ask questions, your ability to clarify and explain to increase their understanding does the same for your own understanding. This is also consistent with the cyclic say of "Teach to learn; learn to teach."

2.7 Ethics and Integrity: As we entered the 21st century, it seems ethics and integrity have been entered on the "endangered species" list for planet Earth. The loss of credibility by national and political leaders leaves many people wondering which way to go and where to turn. We regard religion as a personal

matter. However, there are common threads among many world religions and philosophies.

Thailand is predominantly Buddhist. Interestingly enough, RTC-TH lessons and operations tend to be wholly consistent with the both the Kalama Sutta and the Five Precepts.

The RTC-TH doesn't advocate one religion or philosophy over another. These are personal matters best left to individual choice. However, as Buddhism is the cultural backdrop for Thailand; we also abide by the Five Precepts or *pañca-sila.* This creates a receptive learning environment for many of our prospective students.

The Five Precepts (*pañca-sila)*

1. *Panatipata veramani sikkhapadam samadiyami*
   I undertake the precept to refrain from destroying living creatures.
2. *Adinnadana veramani sikkhapadam samadiyami*
   I undertake the precept to refrain from taking that which is not given.
3. *Kamesu micchacara veramani sikkhapadam samadiyami*
   I undertake the precept to refrain from sexual misconduct.
4. *Musavada veramani sikkhapadam samadiyami*
   I undertake the precept to refrain from incorrect speech.
5. *Suramerayamajja pamadatthana veramani sikkhapadam samadiyami.*
   I undertake the precept to refrain from intoxicating drinks and drugs which lead to carelessness.

3.0 GUIDING PRINCIPLES OF RTC-TH COMMUNITY-BASED EDUCATION

The RTC-TH was founded on the spirit of volunteering. No one gets a salary or a stipend. This is not a job. We are not wage slaves. The idea is to care about others and to share what we have (especially our knowledge and skills) to help make the world a better place. We have found that by giving, we get back much more in return. This seems counter-intuitive. But the proof will be obvious and self-evident if you get over your doubts and just try it.

Participants in the RTC-TH C-bE programs are encouraged to be guided by these principles. Many of these ideas can be found in many different religions, creeds, or codes. It is not so important what your individual personal beliefs are. What is most important is that you conduct yourself respectfully and consistently when dealing with others.

3.1 Self-Selection / Unconditional Acceptance: People tend to learn best when they are comfortable (i.e. feel safe, unthreatened) and can trust those around them. They also are more willing to learn when they feel the lesson is useful to them (i.e. it solves a problem they have, or it meets their needs).

Participation in RTC-TH programs is based on self-selection. Self-selection is fundamental to successful training. If the timing is "right" for them, a person is free to join the activity. If the timing is not quite right, or if there are lingering doubts, we don't persuade people to join. Traditional schools require students to be present; the students have no choice. RTC-TH activities are open to anyone willing to learn when they want to join. [**Note:** *There are limits to training group size which could lead to a person not being included. We set this limit based on our experience to get effective training. We are always open to creating new training groups as long as there is a need or demand. People need only to make a request.*]

Unconditional acceptance in the C-bE training means no pre-judgment of participants. Everyone has different experiences and knowledge to contribute. No one knows everything. We ask participants to put aside their personal beliefs and prejudices and to help create an open and enjoyable learning environment for all. We are strong adherents to the idea the "Minds are like parachutes; they both work best when they are open." [**Note:** *See next section on Mutual Respect, Mutual Benefit and the Thumper Rule.*]

3.2 Mutual Respect, Mutual Benefit / Thumper's Dad's Rule: Unconditional acceptance is reinforced by mutual respect, mutual benefit. We are all individuals. So it follows that no two people are alike. To promote a positive, friendly learning environment, we treat people fairly. This is accomplished by giving mutual respect to all, and striving to create opportunities for all participants to share mutually in the benefits of the activity. There are two sayings for this to remember: Learn to respect; Respect to learn. This means teachers respect students; students respect teachers. Toward this end, we ask all participants to follow Thumper's Dad's rule: "If you don't got nothin' nice to say, don't say nothin' at all."

3.3 Networking: "No man is an island" leads us to believe in cooperation and teamwork. Gandhi once said "Interdependence is and ought to be as much the ideal of man as self-sufficiency. Man is a social being." Thus, in the RTC-TH we coined the slogan "It is better to network than to not work." Effective communication is critical to networking. You must avoid assuming others don't know. It is better to assume that someone may know someone who can help solve a problem. This is how effective networking begins.

3.4 There Are No Dumb Questions: Many students don't speak up in class to ask questions. Two fears lead their list of concerns: 1) I don't want to appear to ask a dumb question; 2) I don't want others to laugh at me. In the RTC-TH, we feel that no question is a "dumb" one, except the question you don't ask when you don't know the answer. As for other people laughing at you…well, by the time most people are studying to learn something, they pretty well already know how to laugh. So by the end of the training session, their laughing won't have improved very much. But if you ask and thus learn, by the end of the training, you will have improved your understanding. [**Note:** *Laughter is not so bad a price to pay. My personal belief is that too many people take themselves too seriously. This is a major obstacle preventing them from fully enjoying life. I consider it a danger sign when you cannot laugh at yourself. When you can make fun of yourself and share the laughter with others, you are making good progress in becoming a good person. This gave rise to another of my cyclic sayings: Learn to laugh; laugh to learn.*]

Another less obvious reason many students don't ask questions after a lesson is they may actually believe they understood the lesson. Often, the veracity or the fallacy of this belief is revealed when they see their exam scores. Finding out what you don't know AFTER an exam is not the best way to succeed academically. Asking questions and learning the lessons BEFORE an exam is a better strategy. [**Note:** The RTC-TH C-bE method does not use written exams to assess learning proficiency. Instead, we use Teach-Back and actual projects to see if the learners can apply the knowledge and skills to produce tangible results. More on this topic later in this paper.]

3.5 Privileges & Responsibilities: Whenever you think you have "rights", consider them to be "privileges". Remember you have full responsibility for the consequences for exercising your privileges. For example, when you go to sleep at night, there is no rule or guarantee that you have the right to awake the next day. So when you awake, consider it a privilege to be alive for another day. Then take full responsibility for what you do with that one more day on Earth. Start the day with a smile, and give a smile to at least one other person each day.

It takes so little effort and can make a big difference. [**Note:** *There is more on the topic of responsibilities in the section on Decision Making.*]

3.6 Teach By Example; Live and Be the Example: Many people have experienced authoritarian rule or situations. All too often, the rule makers can be seen contradicting their own rules. In the extreme, this is an abuse of power. The RTC-TH firmly believes consistent action is a key factor in setting a good example. Teachers should strive to teach by example. We are not out to convince others to do and think as we do. We strive to create opportunities for people to learn and to choose to use the lessons to find a better balance in their lives. If they choose to follow our example, that's their free choice. This is why self-selection is fundamental to C-bE. We are not out seeking converts or followers. This is wholly consistent with the Kalama Sutta.

3.7 Seeking the Facts & Finding the Truth Using "Filchers": The first line of defense is self-discipline and self-regulation. In addition to maintaining high levels of personal and professional integrity and ethics, you can also employ FiLCHeRS. Prof. James Lett developed six rules of evidential reasoning based on a simplified scientific method. [**Note:** The Scientific Method is discussed in a separate section of this paper.] You can use these critical thinking rules to avoid self-deception and to keep from being misled by others.

FiLCHeRS: The Rules of Evidential Reasoning Based on Logic and Pragmatism		
F	Falsifiability	It must be possible to conceive of evidence that would prove the claim false.
L	Logic	Any argument offered as evidence in support of any claim must be sound.
C	Comprehensiveness	The evidence offered in support of any claim must be exhaustive---that is, all of the available evidence must be considered.
H	Honesty	The evidence offered in support of any claim must be evaluated without self-deception.
R	Replicability	If the evidence of any claim is based upon an experimental result, or if the evidence offered in support of any claim could logically be explained as coincidental, then it is necessary for the evidence to be repeated in subsequent experiments or trials.
S	Sufficiency	The evidence offered in support of any claim must be adequate to establish the truth of that claim, with these stipulations: The burden of proof for any claim rests on the claimant; Extraordinary claims require extraordinary evidence; Evidence based upon authority and / or testimony is always inadequate for any paranormal claim.

[**Note:** For more about this topic, see the paper "FiLCHeRS: The Rules of Falsifiability, Logic, Comprehensiveness, Honesty, Replicability, and Sufficiency" in this guide.]

3.8 Caring and Sharing (Including Teach-Backs) / Synergy: Initially, the teachers in the RTC-TH C-bE program are any people who have knowledge and skills and who are willing to share them with those who want to learn. The learners demonstrate their learning by teaching back to others. This creates a sustainability system to groom more teachers. If you can recall some of the best teachers in your life, you begin to realize that teaching was not just a "job" for them. They shared their knowledge and skills because of a greater love of caring and sharing with others. This is also the way to implement on of Greg Lee's cyclic sayings: "Teachers should be students; Students should be teachers."

Anyone who has tried to teach, even as a peer tutor, realizes that they learn more by trying to teach than they learned as a pupil in the classroom. The RTC-TH uses Teach-backs as the ultimate test of learning. Once a lesson is learned, the learner should try to share the knowledge by teaching the lesson to others. We encourage teaching back to at least 4 others. This puts into practice the cyclic saying: "Learn to teach; teach to learn."

The Teach-back is also based on the simple fact that the true power of knowledge is only realized when knowledge is shared. This often leads to synergy---where the whole is greater than the sum of the parts. Synergy can be easily seen by taking a box full of all the parts needed to make a clock and putting it next to a fully assembled and working clock. Essentially the mass (weight) of the two is equal. But the fully assembled clock can indicate the time, thus is greater than the mere "sum" of its parts. During a Teach-Back, it is not so important that the "teacher" got it all "right". It is more important that people work as a team to fill in the gaps to get the lesson done as completely as possible. Right and wrong are relative. It is more important for people to realize individual contributions to the effort make for a more complete result. As individuals, we each see things differently. Combining different insights to the same facts adds to the completeness of the learning and understanding.

3.9 Stay Close to the People; Serve the People with All Your Heart: As a community-based grassroots organization, the RTC-TH must stay close to the people and in tune with the local conditions. With family as the basic education unit, we must be ever mindful of not growing too big so as to lose touch with the people. We realize we cannot save the entire world. So we dedicate our focus to our local area and dedicate ourselves to serve those people. By empowering them and encouraging them to follow our example, we hope to have many more who are capable of doing good for others. Those who have volunteered know the synergy that is released. By freely giving of yourself, you tend to get back more than you initially gave. It is a counterintuitive fact that you must feel and experience to understand and believe. Teach backs serve both as a means to reinforce the learning AND to help spread the learning through sharing. Other cyclic sayings are "Learn to Care; Care to learn"; "Learn to share; Share to learn."

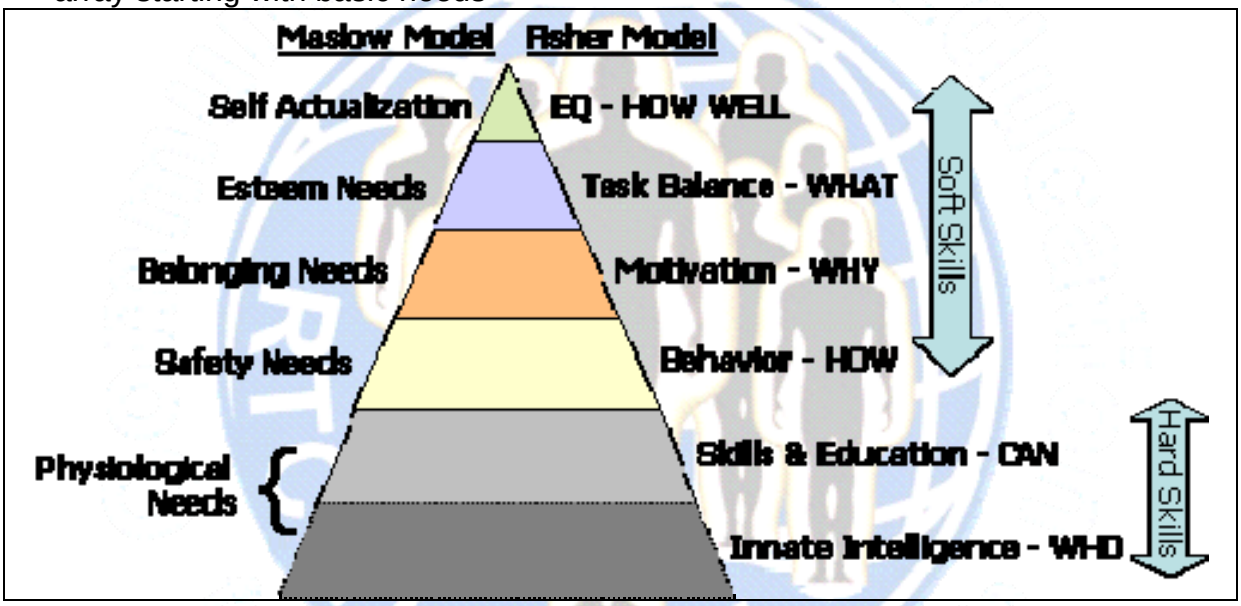
3.10 Learning is a Life-Long Activity: If you talk with students in traditional school settings, they may sound like prisoners in jail. They all think about the time when they can be "free" and not have to come to school. What many fail to realize is that learning is a life-long activity. Research shows the first 3 years of formal schooling often sets the tone for the way students learn for the rest of their lives. Traditionally this means grades K-2. In the US, it was found that about 80% of K-2 public school teachers graduated in the bottom 20% of their college classes.

Talk with many college graduates who are working, and you will find that employers spend a fair amount of time, effort, and money on training. The world is changing at an ever faster pace. While formal education may help you to get a job, further training after graduation helps you to keep that job. You should try to learn something new each day. The day you stop learning is the day you may not remain qualified to your present job. It most certainly means you won't be getting promotions and higher pay. And ultimately, the day you stop learning is the day you die. The operative cyclic saying is "Live to learn, learn to live."

4.0 OTHER EDUCATIONAL CONCEPTS

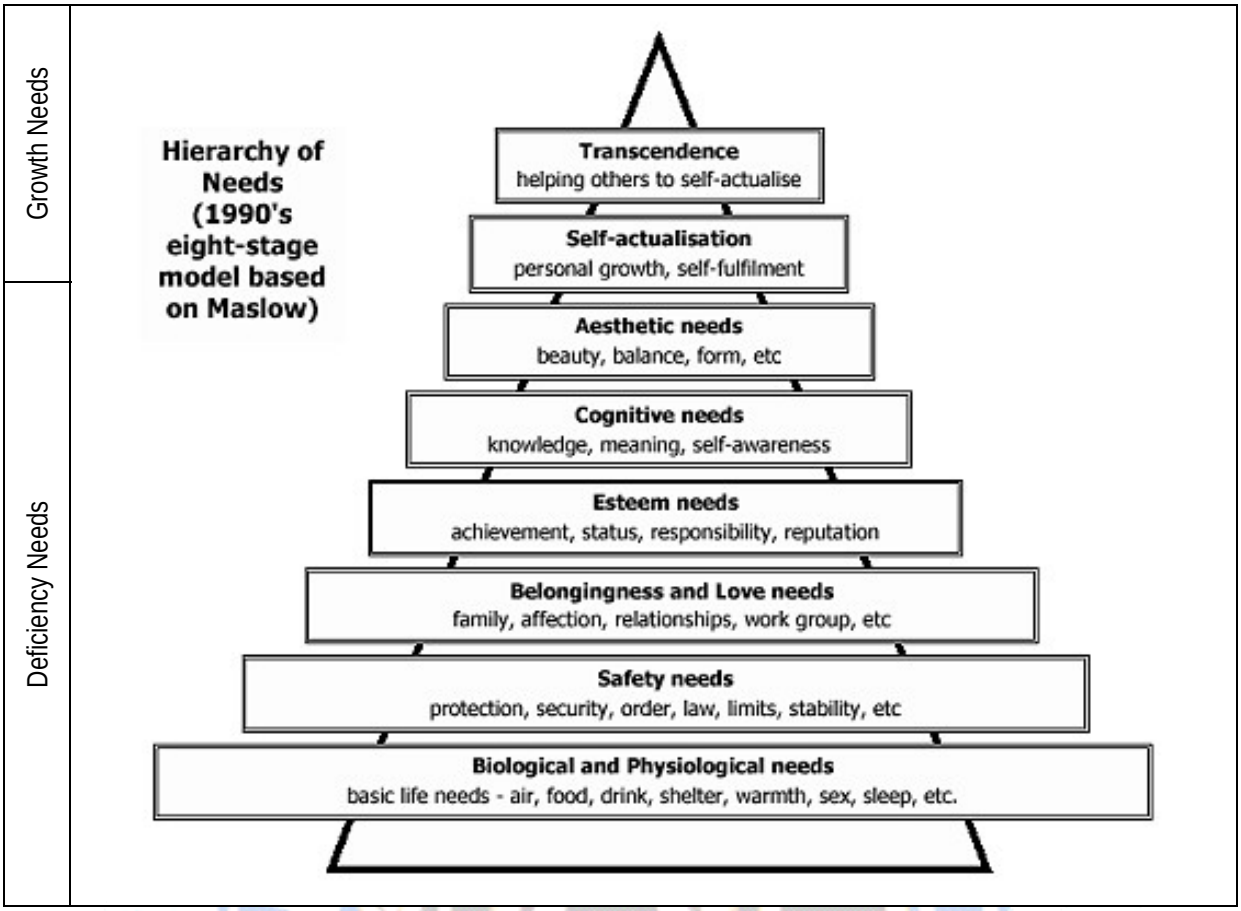
Education is derived from two Latin words: “ex” and “ducere”; meaning “to lead out.” All too often traditional education is like an assembly line of empty bottles (students) to be filled from the fountain of knowledge. Examinations are like quality control checking to see if the bottles are filled to the minimum acceptable level. To further the “leading out” process of true education, the RTC-TH C-bE method makes use of some basic models or concepts. These models are used to systematically search for connections and relationships of the variables involved in any given problem or question. This systematic organization aids in the detection and identification of patterns that could be clues pointing to solutions sets. [**Note:** *A solution set is a collection of possible answers to a problem. Selecting one or more possible solution requires sound and effective decision making. Decision making is discussed later in another section.*]

4.1 Maslow’s Hierarchy of Needs: About 1943, Abraham Maslow presented his ideas about human motivation. Maslow felt that people would seek to fulfill basic survival needs before taking on other tasks. He arranged these needs in a vertical array starting with basic needs



rising to more complex needs. Educators should use Maslow’s ideas to help create effective learning environments for students. Lessons should be progressively sequenced rising vertically through the hierarchy. Students are more receptive to learning when they are “comfortable” and have a sense of “security”. Teachers who are able to create conditions promoting these feelings may see more student success.

Fisher created a hierarchy of skills and correlated them to Maslow’s hierarch of needs. Others have expanded Maslow’s original 5 hierarchical topics to 8. A quick glance at the categories gives you a sense of progressively higher levels of cognition and motivation. This suggests that encouraging better students in a class to help “teach back” to others is a useful classroom strategy. It is wholly consistent with our cyclic saying “Teachers should be students; students should be teachers.” It also contains elements of “networking rather than not working.” There is nothing wrong with encourage students to collaborate in learning. This is quite different from cheating.



There is still considerable debate as to the validity and even the existence of Maslow's hierarchy. But it is fair to say that learning is not fully realized when learners are not comfortable or under life-threatening circumstances.

Cronburg updated Maslow's hierarchy by specifying more levels (for a total of 11) and indicating ages when a need is a priority for an individual.

It is not the purpose of this paper to discuss the merits or flaws of these hierarchies. The key point is to be aware of these ideas and to see if they will help you to create new and interesting lessons for your students.

4.2 The Scientific Method: The Scientific Method is a valuable critical thinking tool to systematically organize your observations. It helps develop analytical thinking based on quantifiable and verifiable data. This systematic approach requires documenting your work. This way, others can look at the data and experimental results and judge for themselves if your conclusions are reasonable and valid.

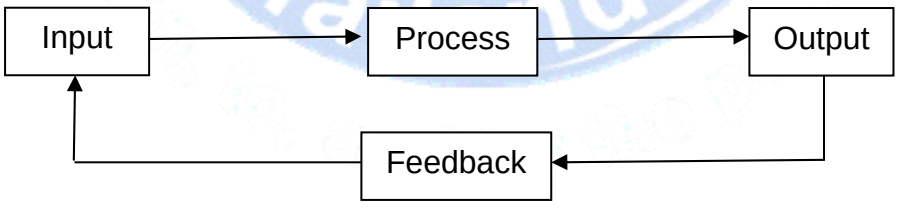
The Steps of the Scientific Method [For more details, see the paper "The Scientific Method" in the RTC-TH Study Skills Guide.]		
Step 1.	Making careful, systematic observations.	Science uses mathematics and measurement to more precisely compare and contrast phenomena.
Step 2.	Stating a hypothesis.	This is a possible explanation for the observations.
Step 3.	Set up an experiment.	This is a test of the match between the observations and the explanation.
Step 4.	Do the experiment.	This often involves a control and an experimental group to compare and contrast results
Step 5.	Accepting or rejecting the hypothesis.	This is not about "right / wrong" or "success / failure". It is all about consistency between the observations and the explanation.

A major difficulty in science is being objective. Scientists are human. Sometimes it is difficult to separate yourself from the experiment. Subtle (and sometimes not so subtle) biases can unintentionally become part of the experiment. The drive to succeed can affect your judgment and compromise your objectivity, ethics, and integrity.

The process of peer review is designed to be the professional check and balance to maintain the integrity of the system. However, there is a downside to peer review. If the dominate opinion discourages opposing views, a mindset may develop. If the mindset is strong enough and narrow enough, alternative views will be dismissed off-hand. This can set you up to be blindsided by new break throughs.

4.3 General Systems Theory: A system is a collection of parts working together as a unit. General Systems Theory is the fancy name given the basic systematic interaction pattern shown below:

The General Systems Model



Most people easily understand the first 3 steps in the model. Feedback is a bit more complicated. The arrows tell them the pattern moves in one basic direction. For example, here is a simple example. You get some food and put in into your mouth (input). You eat it (process). One of the outputs is a signal from your tongue to your brain that sends the "taste" signals to your brain (output). Your brain sends a signal to your mouth to say "it tastes good" and to please ask for more (feedback).

In a science context, there are two basic kinds of inputs and outputs: matter and energy. This is because of the assumption that matter and energy can

neither be created nor destroyed. In General Systems Theory, the forms of matter can be changed by various processes, but the amounts of matter and energy remain the same. This can be demonstrated by weighing a piece of paper and burning it in the laboratory and capturing all of the gases. After the paper is completely burned, weighing the ash and gases results in the same total weight of the unburned paper.

The processes can do one of two basic things to all inputs: alter (change) them, or store (not change) them. This is like going to the market and buying food for the family. Some of the food is used to make dinner (altered). Some is put away to be used for another meal tomorrow (stored).

The outputs of the process are either matter or energy (consistent with the discussion on inputs). Feedback can get complex. But it is important to realize that some outputs are feedback (going into the same system), and that some feedback becomes input to other systems. In general terms, feedback can be considered "balance" in a natural system. A plant dies and goes through the process of decay and decomposition. The output doesn't look like the original plant at all, but in nature, balance is maintained. On the other hand, some the decomposed plant materials are eaten by soil organisms and become "input."

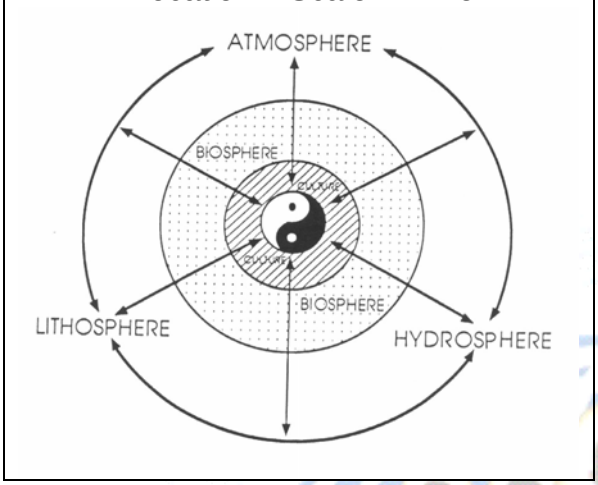
A closed system means all inputs-processes-outputs-feedbacks occur within the system boundaries. An open system means some inputs-processes-outputs-feedbacks come from or go beyond the system boundaries.

Using the General Systems Model to systematically identify "variables" in a problem or question is simplified in the form below. The General Systems Matrix uses basic general physical science to systematically guide the identification of the key variables in the problem or issue at hand. The matrix can be readily adapted to other fields of study as well. [**Note:** *This matrix will be used with the Geographic Systems Model which is discussed later in this paper.*]

<table>
<tr><th colspan="6">General Systems Matrix</th></tr>
<tr><td rowspan="5">Input</td><td rowspan="3">Matter</td><td>Solid</td><td colspan="2">Has a definite shape; molecules are tightly bonded; high density</td><td rowspan="3">All matter has mass and occupies space</td></tr>
<tr><td>Liquid</td><td rowspan="2">These have no definite shape</td><td>Molecules loosely bonded; medium density</td></tr>
<tr><td>Gas</td><td>Molecules very loosely bonded; low density</td></tr>
<tr><td rowspan="2">Energy</td><td>Potential</td><td colspan="3">Energy of rest (static, not moving)</td></tr>
<tr><td>Kinetic</td><td colspan="3">Energy of motion</td></tr>
<tr><td rowspan="3">Process</td><td rowspan="2">Alteration</td><td>Physical</td><td colspan="3">Mechanically breaking matter into smaller pieces that look similar to the original matter.</td></tr>
<tr><td>Chemical</td><td colspan="3">Making matter into smaller pieces by breaking the molecular bonds. The smaller pieces may not look similar to the original matter.</td></tr>
<tr><td>Storage</td><td>Physical
Chemical</td><td colspan="3">No change in the form, size or composition (molecular bonds) of the matter.</td></tr>
<tr><td rowspan="5">Output</td><td rowspan="3">Matter</td><td>Solid
Liquid
Gas</td><td colspan="3" rowspan="5">See the detailed descriptions in the Input section above.</td></tr>
<tr><td rowspan="2">Energy</td><td>Potential
Kinetic</td></tr>
<tr><td></td></tr>
<tr><td rowspan="2">Feedback</td><td>Internal</td><td colspan="4">Outputs go to the Input of the same system in a repeating / cyclic pattern (closed system).</td></tr>
<tr><td>External</td><td colspan="4">Outputs go outside the boundaries of the system (open system).</td></tr>
</table>

4.4 Geographic Systems Model: This is an example of the General Systems Model applied to Geography. Geography is the study of the Earth and the inter-relationships of the basic environmental spheres to explain the distribution of phenomena on Earth using the integration of all life, physical, and social sciences.

The Geographic Systems Model
Location Scale Time



The diagram on the left is the actual Geographic Systems Model. It shows the 4 environmental spheres of the Earth: Atmosphere, Hydrosphere, and Lithosphere (the abiotic or non-living spheres), and the Biosphere. If possible, try to imagine the Biosphere contained inside one large shell made up of three parts---the Atmosphere, Hydrosphere, and Lithosphere. This way the arrows interconnect all 4 spheres simultaneously. The processes move inputs / outputs between the environmental spheres. The arrows are double headed. This means a process or some processes can move things (inputs) into and out from (outputs) a sphere. Some processes also connect to other processes. This is the core model for all RTC-TH lessons. It gives the "big picture" overview to show how a particular topic "fits" or "connects" to the world and all other lessons. Remember the cyclic saying "Learn to connect, connect to learn".

It is important to note that people (part of the Biosphere), see the world through an envelope of their culture. This readily explains why different people can look at the same object (e.g. a tree) and "see" something that can be very different. It isn't an issue of a "right" or "wrong" view. In fact, it is also possible for individuals of the same culture to "see" the same object differently. It's just a different view. The recognizing, acknowledging, and understanding of the "validity" of having a different point of view is fundamental to the principles of mutual respect, mutual benefit.

Location, Scale, and Time are important concepts for this model. These can be specified in both absolute and relative terms. "Absolute" terms are associated with finite, discrete measurements leading to numerical analyses. "Relative" terms are general comparative descriptions often using subjective judgments less dependent on finite measurements. Location refers to the place of interest. Location can be specified "absolutely" (e.g. latitude, longitude, and elevation) or "relatively" (e.g. the market is east of the town square). Scale involves the level of detail and / or the size of the area being studied. "Absolute" scales in mapping are precise ratios of the map proportional to the actual Earth. Relative scales in maps refer to the amount of detail shown on the map (e.g. large scale maps showing a large amount of detail vs. small scale maps showing a small amount of detail). Time in the Geographic Systems Model is most often applied in 2 modes: chronological measurements of time units (e.g. 24-hour day, months, years, etc.) are considered "absolute". Examples of relative time measures include seasons (relative to location and culture) or the chronological sequence of past, present, future. Another relative time scale is day / night.

Summary Table: Geographic Systems Model Key Concepts			
Key Concept		Absolute	Relative
Location	The Place	Latitude, Longitude, Altitude	place name…North of…next to…close to…
Scale	Level of detail	Specified by mathematical ratio	General to specific.
	Size of the area	Area measurement (e.g. sq km. etc.)	Large, medium, small; global, regional, local
Time	Diurnal	Specific hour of the day	Morning, noon, afternoon, night
	Seasonal	Specific time of the year	Dry season, hot season, wet season
	Chronological	Specific year numbers	Before the Chakri Dynasty, stone age, etc.

[**Note:** *There is another paper devoted to a detailed discussion of using the Geographic Systems Model and the General Systems Outline to study and solve problems. See RTC-TH AG 2010-1 Introduction to Geography in the "Applied Geography section at www.neighborhoodlink.com/RTC-TH_Tech*]

4.5 Yin-Yang & Goldilocks: Yin-Yang is a non-linear model from ancient China expressing the dynamic balance of forces in the universe. It is often described as a blending of opposites. More accurately, it is the integration of compliments in a whole entity in dynamic equilibrium. [**Note:** *It is assumed that most people are familiar with linear models (e.g. a linear continuum and polar opposites). Non-linear thinking is introduced as another thought process tool. It is not meant to replace linear thinking. Again, it's not so much about "right / wrong" or "good / bad" as much as it is "just different." When it comes to problem solving and thinking, you use the most appropriate tools for the particular job.*]

It is important to note that the overall shape is a circle. A circle has no clear beginning or end point. The two large sections of the circle each contain a smaller circle of the opposite color. This indicates that nothing is 100%; expect "contradictions" or "exceptions" in life. The line separating the two larger sections is curved. It is not straight. The curved line suggests that change is dynamic and is to be expected. A straight line would suggest a static balance; a fixed ratio of dark to light. [**Note:** *The origin of Yin-Yang goes back to solar observations of ancient Chinese astronomers studying Earth-Sun relationships. You read the story about it at http://www.chinesefortunecalendar.com/yinyang.htm*]

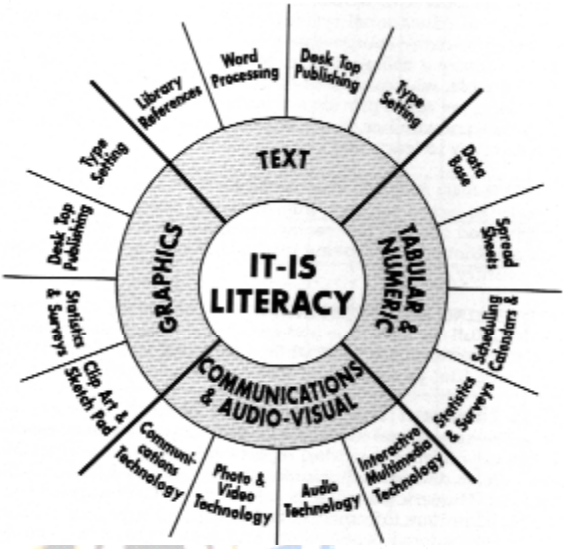
Combining Yin-Yang with the Geographic Systems Model helps to systematically organize and study the more complex natural inter-relationships of moving matter and energy between the environmental spheres. Natural systems strive for a balance. But the balance is usually "dynamic" and not static. Mention balance and most people think of the mathematical symbol "=" which is static.

The children's story of Goldilocks is a handy reminder of the nature of dynamic balance being relative. Throughout Goldilocks, the magic number for balance seems to be expressed by 3 relative amounts: "Not too much", "not too little", but "just right." In nature, the "just right" balance may change from one location to another. It may change depending on the level of detail. It may different at different times. The "balance" for one person may not be the "balance" for another. Again, this is not about "right" or "wrong". It is important to recognize and acknowledge the existence of differences suitable for different locations,

scales, and times. Ultimately, the goal is to understand the dynamics of natural balance in the systems involved in the local area.

4.6 Learning Styles: Academics differ over the validity of categorizing learning styles: auditory, visual, and kinesthetic. Rather than join the debate, we prefer to make students aware of these ideas. In the spirit of the Kalama Sutta, we prefer to let students decide about these categories from their own experience. It follows that if you are aware of how you learn, you can use that insight to your advantage. On the other hand, you must avoid using that insight to limit your learning. Be open to improvement. [**Note:** To learn more about the various learning styles, see RTC-TH C-bE 2010-3 Guide for Self-Learning in the Community-based Education section of our website www.neighborhoodlink.com/RTC-TH_Tech]

4.7 IT-IS LITERACY: We live in the "Information Age". The Information Technology-Information Systems (IT-IS) model is a guide to integrating information technology in your learning experience. These tools are very useful in modern life. You can use this model to guide your awareness of the technology even if you cannot afford the equipment. Having the knowledge is still powerful in preparing yourself to function in the Information Age.



Failure to prepare yourself in this area will relegate you to lower paying jobs. You will also lack social and economic mobility and longevity in the workforce. This will begin the downward spiral for many. It will lead to a greater social stratification into "haves" and "have-nots." [**Note:** *For more details about the IT-IS Literacy model see RTC-TH C-bE 2010-3 Basic Study Skills in the Community-based education section on our website at www.neighborhoodlink.com/RTC-TH_Tech.*]

4.8 Classification & Reclassification / Contrast: Classification is a fancy word for the "name game" (what something is called). The classification can be based on any characteristic an object shares with other objects in the same group. For example, food is a general class of objects people eat to get nutrition and sustenance. All food can be reclassified (put into other groups) such as fruits or vegetables (subdivisions within "Food"). Classification and reclassification are convenient tools in learning about connections between phenomena.

Last but not least, consider including a "Miscellaneous Others" category. When developing a classification scheme, expect some phenomena to defy easy classification. Having a "Miscellaneous" category allows you a place to keep the non-conforming data. Given enough time, you may find more like it, or further understanding may allow you to "reclassify it".

When working with different cultures, confusion and complexity can arise from how people classify / reclassify objects. For example, some people look at a plant and consider a resource; others consider it a noxious weed. The point is not to argue over who is "right / wrong" but to recognize, acknowledge and understand the different points of view.

Contrast is the difference between an object of interest and the background against which it occurs. This means if you cannot separate the object of interest from other things around it, the object goes undetected. Once detected, you need to recognize the object. Once recognized, you can identify it. And once identified, you can begin to classify it.

There are different kinds of contrast you can use to detect objects of interest. For example:

- visual contrast (e.g. going from uniform gray to black vs. white which helps delineate the edges of objects),
- Numerical / statistical differences (e.g. using ratios rather than linear numerical sequences),
- Textural differences (e.g. degrees of roughness)
- Contextual differences (e.g. unusual associations such as an bank armored car in the middle of a cornfield)
- Classification / reclassification (e.g. a general group of objects could be subdivided into smaller groups; these smaller groups are formed based on differences to other subdivisions.)

4.9 Pattern Recognition: Putting together jigsaw puzzles is a common way many people are exposed to pattern recognition. They visually search for parts of the "picture" image on the puzzle pieces. They look at the shapes of the pieces that may fit part of the larger assembled puzzle pieces. Much of this is a random process. In the RTC-TH C-bE lesson, we make systematic use of the General Systems Outline and the Geographic Systems Model to find "common points" in the Input, Process, Output, and Feedback of the problem. The outline can also be focused to a particular sphere or process entering or leaving a sphere. For example, we seek associations of connections to Location and Time to detect geographic / seasonal patterns in weather / climate phenomenon. This approach does not guarantee a pattern exists. Some phenomenon could be random. Using the General Systems Outline and Geographic Systems Model help to organize the data and to detect patterns. And these are not the only tools available (see Section 4.11 "Problem Solving").

4.10 High to Low: The idea is that things tend to move from high to low comes from the diffusion model and gravity model. You can pour some ink into a glass of water and see the diffusion process at work. The ink enters as a concentration. Over time, it flows from high concentration to areas of the water that have lower concentrations of ink. Pour some water on a high part of a slope and it flows to a lower position on the slope. Gravity tends to pull things down from high to low. These two basic models are used with the General Systems Outline, Geographic Systems Model, and Yin-Yang to study the movement of matter and energy in natural systems. For example, if you build a fire, you can sit back and enjoy it warmth on a cold night. Heat energy is highest in the fire and decreases in intensity as you move away from the fire. The heat energy is moving from high concentration to areas of lower concentration away from the fire. Gravity pulls rain from the clouds (high in the sky) to the ground which is at a lower elevation below the clouds.

When studying natural processes involving movement, you know to begin looking for "differences" in energy levels to explain why something is moving from point A to point B. This is why in studying the weather we say wind blows from high pressure cells to low pressure cells.

4.11 Problem Solving: The RTC-TH C-bE uses a systematic problem solving approach. It begins with a lesson from basic Algebra. In mathematics, the standard procedure to solve a problem goes like this:

1) Clearly state the problem
2) Identify the variables
3) State the relationship between the variables
4) Determine a problem solving strategy / method
5) Attempt the solution and identify alternative solutions
6) Check or validate the solution or alternative solutions

If no viable solution is found, the next step is to go back to the beginning and to check your steps. If no errors are found, then go back to the beginning and check to see if the assumptions you made are valid. Sometimes you may find that the problem was NOT what you thought it was in the first place.

In step 4, there are 10 basic problem solving methods to consider. These can be used singly or in combination as you need. No one method is better than another; it all depends on the problem you are solving and your circumstances. Use these methods to help detect patterns.

- **Use or make table** (i.e. a table can help to show relationships between items listed in rows to items listed in columns such as a bus schedule).
- **Make an organized list** (i.e. organize the list by priority order, or logically from general to specific or reverse, etc.)
- **Guess (estimate) and Check** (i.e. assume values for the variables and go through the calculations, double check your math; compare / contrast the results to reality).
- **Look for or use a pattern** (i.e. see the section above on Pattern Recognition.)
- **Draw a picture or diagram** (e.g. think of the old saying "a picture is worth a thousand words. A well-labeled diagram may help you to see relationships of the parts of the drawing that is difficult to see in a written description.)
- **Work backwards** (i.e. assume an answer is correct and work through the solution in reverse sequence).
- **Use objects** (i.e. use models to re-construct or re-enact the situation being studied. This is what police do when they are "re-enacting" a crime as they seek more clues or trying to solve the case.)
- **Use logical reasoning** (i.e. this is also good to do to check if your assumptions are reasonable)
- **Make it simpler** (i.e. this is especially useful when working on very complex problems. Another way to "simplify" a big problem is to break it down into smaller "steps" or "problems" rather than trying to solve the big problem all at once)
- **Brainstorm** (i.e. this is a good "last ditch effort" to try to find a different approach when nothing else seems to work. Brainstorming often leads to innovative or new ways to do things)

[**Note:** *See the RTC-TH C-bE 2010-3 Basic Study Skills in the Community-based education section on our website at www.neighborhoodlink.com/RTC-TH_Tech.*]

4.12 Decision Making: It is important to use your knowledge, skills, and insights to make effective decisions. You may not always make the "right" decision. But if you learn from your "mistakes" or "not so good decisions", you can improve over

time. It is said that a well-known executive was asked how he was able to make such great effective decisions to be so financially successful. His reply, "I made a lot of bad decisions in the past." It all goes to show, practice makes perfect.

Effective decision making has many parts. Key among them are getting good data, clear thinking, and accepting responsibility for your actions. That is to say, you accept and live with the consequences if your decision doesn't work out as you intended. Learning from your mistakes helps you be able to make better decisions in the future.

Indecision or not making a decision can produce two fundamental results. 1) Nothing changes for you and you are not better or worse off than before. This is what the Taoist mean when they say "By doing nothing, all things are done." The world moves on with or without you. 2) You are in limbo and by not taking action to decide to act or not, you are torn apart. Fear and doubt gnaw away at you. A leader's indecisiveness erodes their credibility and weakens their position.

Any decision you make impacts time (the schedule), money (financial resources), and energy (human resources). These can lead to affecting your ability to take other actions in the future. The RTC-TH C-bE activities engage learners in ways to develop effective decision making.

4.13 Listening & Learning: Research shows that people 45% of a typical day listening; 90% of what people know is obtained by listening. The details of these studies reveals people retain only 25% of what they hear. After 24 hours, they lose half of that and after a total of 48 hours, that is reduced another 50%. Basically, 90% of what people know comes from the 12.5% of what they heard. Improving your listening skills is a sure way to improve your learning. This is the inspiration for another cyclic saying: Learn to listen; Listen to learn.

A typical communication day:	Listening 45%	Speaking 30%	Reading 16%	Writing 9%

	Key facts given in Lecture	Key facts retained after lecture	Key facts retained 48 hrs after lecture
Main points in a talk	20	5	2.5 = 90% of what you know about the topic
Represent	100%	25%	12.5 % of the lecture
Retention with appropriate graphic	---	60%	30%

Additional research shows that retention is increases to as much as 60% if relevant graphics are used when studying. This adds credibility to the old saying "a picture is worth a thousand words." Clearly, students benefit by making a relevant sketch or diagram in addition to taking notes when studying. This gives rise to another cyclic saying: Learn to draw, draw to learn.

Keeping an open mind is important. The purpose is to listen to what is being said. Be careful NOT to judge or react to what is being said. Listen so you clearly hear what is being said whether you believe it or not. Try to gain an understanding the points being presented. Don't interrupt or argue. First listen and get what is being presented. You can sort out the facts from the opinions and assumptions later. When asking questions, seek additional information or clarification, but DO NOT argue with the presenter. You are free to think and believe what you want after the presentation. You are free to voice your opinion to others as much as you like AFTER the presentation. If you feel strongly enough about your view, you are free to give your own presentation. Be respectful (remember, mutual respect, mutual benefit) of others. [**Note:** *See the article on "Active Listening Leads to*

Effective Learning" in RTC-TH C-bE 2010-3 Basic Study Skills in the Community-based education section at www.neighborhoodlink.com/RTC-TH_Tech.]

4.14 Time Management: With only 24 hours in a day and seven days a week, there is only so much you can do. Learning to make good use of your time is a fundamental skill in striving for balance. Time is a critical resource to be managed in work, study, and on projects. Most people never seem to have enough time to get things done. So we all need to learn to make the best use of the time available to finish our work.

We ask people to sit down and account for every hour of the day for one week. This is just like a financial budget where you cannot see where the money goes unless you write it down. By having to account for every hour of the day for a week, you can see where the time is going. When you finish this accounting, you may find you have to give up some activities in order to have sufficient time to do another activity. This involves some critical decision making.

Filling in the "schedule" begins with "fixed time items". These are activities you cannot change easily (e.g. you class or work schedule). Next are activities such as like sleep. You have some control over when you sleep, but block out the "ideal" time of 8 hours a day. Travel time to get from place to place during the week takes more time away from the weekly total hours available. You can readily see how quickly time is spent. A time / schedule matrix is included at the end of this paper in Appendix 2. [**Note:** *See the article on "Effective Time Management" in RTC-TH C-bE 2010-3 Basic Study Skills in the Community-based education section at www.neighborhoodlink.com/RTC-TH_Tech.*]

4.15 Waste Reduction to Boost Efficiency & to Economize: Conservation is all about saving. Unfortunately, it is very difficult to save some things like time, soil, water, and many other non-renewable consumable resources. What is more probable is to reduce waste, inefficiency, and consumption rates of these resources. When starting at a personal behavior level, these actions are all within the control of the individual. In a family, these can be set by family rules. In the village or community, it becomes more of a challenge to get diverse families to cooperate to enforce the rules. But it all begins with education at the family level.

Reducing waste, inefficiency, and consuming less can also manifest itself in financial savings for the family. This slows the outflow of cash from the family. If properly saved, the money can be used to pay down family debts. Once debts are paid off, an active savings plan can be created. [**Note:** It seems obvious that you can only get as much freedom as you can afford. Poverty severely limits your choices.]

4.16 Curiosity and Learning to Be Your Own Best Teacher: "Why?" is the question that tends to drive parents crazy. When children learn this question word, parents get excited and soon after, begin to cringe. The ineffective responses soon kill the natural curiosity in children. This can even happen before entering school. In school, students asking this question drive some teachers to distraction. These disruptions are dealt with in ways that send clear messages of "don't disturb the class." Large class sizes tend to foster a learning atmosphere of keeping the class together and on track…not too fast, not too slow. Unfortunately, the "just right" is not the same for everyone.

C-bE strives to have students comprehend lessons so they put the knowledge to practical use. This is consistent with the idea of use it or lose it. Self-selection

tends to favor the curious. Interactive lessons, social interaction in the learning and project phases engage the students making them active learners. They are not passive receivers of information as they normally would be in a traditional classroom.

[**Note:** See various articles in RTC-TH C-bE 2010-3 Guide for Self-Learning in the Community-based Education section at www.neighborhoodlink.com/RTC-TH_Tech]

4.17 S.C.A.N.S & Self-Evaluation: Ultimately, regardless of how much education or how many degrees and diplomas a person gets, they need to be gainfully employed. In this sense, Vocational / Technical schools do a much better job than academic degree programs. In the US, the vast majority of college graduates do not get jobs directly related to their major or their degree. (That's because 60-70% of the jobs in the US do not require a college diploma.) Vocational / Technical schools use competency-based lessons directly related to employment. Academic training is largely theoretical and abstract.

The RTC-TH P.A.L. (Practical Applied Lessons) uses the SCANS Checklists from the US Dept of Labor to guide lesson development. The SCANS lists identify specific work place skills desired and required by employers. [**Note:** The set of 4 checklists are provided in Appendix 2 and are also presented in the RTC-TH publication CbE 2010-2 "Basic Study Skills" and CbE 2010-3 "Guide for Self-Learning" found at www.neighborhoodlink.com/RTC-TH_Tech]

The RTC-TH C-bE program does not use traditional written exams. The Teach Back is the practical exam. (See Section 4.19 for more information about Teach Backs.) Students are guided to use the SCANS checklists to monitor their own progress. They are also provided with self-evaluation forms similar to those used in some corporations. Self-evaluation is encouraged as a method to develop integrity and objectivity. Anyone falsely rating themselves too highly will be found out in the Teach Back practicum. If they cannot perform the actual work task or instruct others to do it correctly, the deficiency is obvious.

4.18 The Learning Log: In Section 2.4 we mentioned our favoring the Socratic Method. Consistent with this are our cyclic saying "Learn to reflect, reflect to learn". To stimulate reflection, the RTC-TH C-bE uses the Learning Log (see Appendix 4 for the form). Our experience shows students learn better when they internalize lessons. This happens when they can integrate the lesson contents to their personal lives. To facilitate this, we use the Learning Log as a required part of each lesson. The form also gives students the opportunity to ask germane questions about the lesson. We feel it is important for teachers to know what students don't understand about a lesson. The third question on the form is a key source for class discussion topics. It also suggests areas for improving class lessons and curriculum. [**Note:** To learn more about the Learning Log, see the article in RTC-TH C-bE 2010-3 "Guide for Self-Learning" found at www.neighborhoodlink.com/RTC-TH_Tech]

4.19 The Teach Back: Rather than written exams, the RTC-TH C-bE uses the Teach Back to assess student learning and proficiency. Getting practical and tangible results is proof positive the student acquired and comprehends the knowledge and skills. The assessment can be done in class as a demonstration. Individual or team projects can be practical assessments. Community service projects have the added advantage of setting examples for students to share. It also allows the public to see students doing something positive for the community.

The true power of the Teach Back can be demonstrated by requiring students to Teach Back to 4 people. This becomes a kind of pyramid scheme. The table below shows what happens if a class of 12 students must each Teach Back to 4 people.

Tier	Array of People / Tier	Total / Tier	Sub Total
1	1+1+1+1+1+1+1+1+ 1+1+1+1	12	12
2	4+4+4+4+4+4+4+4+4+4+4+4	48	60
3	16+16+16+16+16+16+16+16+16+16+16+16	192	252
4	64+64+64+64+64+64+64+64+64+64+64+64	768	1,010
5	256+256+256+256+256+256+256+256+256+256+256+256	3,072	4,082
6	1024+1024+1024+1024+1024+1024+1024+1024+1024+1024+1024+1024	12,288	16,370

Consider each tier was a week in a traditional school term. The number of students exposed to the lesson from one classroom teacher reaches a total of 16,370 students. In contrast, a traditional teacher in a classroom reaches only 30-40 students. Many schools set a goal of 70% for minimal student completion. Yet even with a failure rate of 50%, C-bE Teach Backs would have 204-206% more students completing. [Note: To learn more about Teach Backs see the relevant article in RTC-TH C-bE 2010-3 “Guide for Self-Learning” found at www.neighborhoodlink.com/RTC-TH_Tech]

5.0 SUMMARY

Community-based Education is an effective method to empower individuals, families, communities to improve the quality of education on their own. Traditional schools operate under many limitations (e.g. centralized control, budget and policy constraints, etc.) which are beyond the control of the people. Rather than sit and wait on a large, slow responding system, individuals and families can actively supplement the public education system. In other words, individuals can do what is in their control to ensure a quality education for children and adults in the community. C-bE is education of, by, and for the people.

Appendix 1: RTC-TH C-bE Trilogy Matrix

Right columns show corresponding page numbers for topics in the different C-bE publications	RTC-TH-CbE-2010-3 Guide to Self-Learning	RTC-TH-CbE-2010-2 Basic Study Skills	RTC-TH-CbE-2010-1 Community-based Education
Title / Topic	Page	Page	Page
1.0 INTRODUCTION			1
2.0 P.L.A.N.T. (Personal Learning and Natural Teaching).			2
2.1 Education Defined			3
2.2 Education is Holistic			
2.3 Self-selection			
2.4 Teachers: Examples & Facilitators			
2,5 Students as Learners			4
2.6 Students as Teachers			
2.7 Ethics and Integrity			
3.0 GUIDING PRINCIPLES OF RTC-TH C-bE			5
3.1 Self-Selection / Unconditional Acceptance			
3.2 Mutual Respect, Mutual Benefit / Thumper's Dad's Rule	2		6
3.3 Networking	2		
3.4 There Are No Dumb Questions			
3.5 Privileges & Responsibilities			
3.6 Teach By Example; Live And Be The Example			7
3.7 Seeking the Facts & Finding the Truth Using "FiLCHeRS"			
3.8 Caring and Sharing (Including Teach-Backs) / Synergy			
3.9 Stay Close to the People; Serve the People With All Your Heart			8
3.10 Learning is a Life-Long Activity			
4.0 SOME EDUCATIONAL CONCEPTS			9
4.1 Maslow's Hierarch of Needs			
4.2 The Scientific Method			11
4.3 General Systems Theory			
4.4 Geographic Systems Model			13
4.5 Yin-Yang & Goldilocks			14
4.6 Learning Styles	3-4	1	15
4.7 IT-IS LITERACY	7-8	42-46	
4.8 Classification & Reclassification / Contrast			
4.9 Pattern Recognition			16
4.10 High To Low			
4.11 Problem Solving	4-6	36-37	17
4.12 Decision Making			
4.13 Listening & Learning		34-35	18
4.14 Time Management		8-10	19
4.15 Waste Reduction to Boost Efficiency & to Economize			
4.16 Curiosity and Learning to Be Your Own Best Teacher			
4.17 S.C.A.N.S & Self-Evaluation	14-17	6-7	20
4.18 The Learning Log	13	40-41	
4.19 The Teach Back	20-23		
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Appendix 2: Time / Schedule Matrix Form

Time / Schedule Matrix													
Year		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
12-hr	24-hr	M	T	W	T	F	Sa	Su	12-hr	24-hr			
1 AM	0100										1 AM	0100	
1:30 AM	0130										1:30 AM	0130	
2 AM	0200										2 AM	0200	
2:30 AM	0230										2:30 AM	0230	
3 AM	0300										3 AM	0300	
3:30A	0330										3:30A	0330	
4 AM	0400										4 AM	0400	
4:30 AM	0430										4:30 AM	0430	
5 AM	0500										5 AM	0500	
5:30 AM	0530										5:30 AM	0530	
6 AM	0600										6 AM	0600	
6:30 AM	0630										6:30 AM	0630	
7 AM	0700										7 AM	0700	
7:30 AM	0730										7:30 AM	0730	
8 AM	0800										8 AM	0800	
8:30 AM	0830										8:30 AM	0830	
9 AM	0900										9 AM	0900	
9:30 AM	0930										9:30 AM	0930	
10 AM	1000										10 AM	1000	
10:30 AM	1030										10:30 AM	1030	
11 AM	1100										11 AM	1100	
11:30 AM	1130										11:30 AM	1130	
12 PM	1200										12 PM	1200	
12:30 PM	1230										12:30 PM	1230	
1 PM	1300										1 PM	1300	
1:30 PM	1330										1:30 PM	1330	
2 PM	1400										2 PM	1400	
2:30 PM	1430										2:30 PM	1430	
3 PM	1500										3 PM	1500	
3:30 PM	1530										3:30 PM	1530	
4 PM	1600										4 PM	1600	
4:30 PM	1630										4:30 PM	1630	
5 PM	1700										5 PM	1700	
5:30 PM	1730										5:30 PM	1730	
6 PM	1800										6 PM	1800	
6:30 PM	1830										6:30 PM	1830	
7 PM	1900										7 PM	1900	
7:30 PM	1930										7:30 PM	1930	
8 PM	2000										8 PM	2000	
8:30 PM	2030										8:30 PM	2030	
9 PM	2100										9 PM	2100	
9:30 PM	2130										9:30 PM	2130	
10 PM	2200										10 PM	2200	
10:30 PM	2230										10:30 PM	2230	
11 PM	2300										11 PM	2300	
11:30 PM	2330										11:30 PM	2330	
12 PM	2400										12 PM	2400	
0:30 AM	0030										0:30 AM	0030	

Appendix 3: The SCANS Check Lists

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, and other information.		
2. Mentally process symbols, pictures, graphs, objects, and 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.		

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.		

Appendix 4: Learning Log

Community-based Education

Learning Log

By:

Community-based Education of, by, and for the people.

Complete the necessary information in the boxes on the left. Learning logs are used to A) give you a chance to think about what you learned; B) give you another way to ask questions about the lessons. If you fully understand the lesson, write "no questions at this time" in answer to the item "What I did not understand about the lesson." After the lesson, get a Program staff member to review your log, answer any questions, and to sign the "Verified by" box. Keep this log in your notebook.

Lesson	Comments	Verified by
Lesson: Taught by **Date**	What I learned that I didn't know before. How can I make use of this new knowledge? What I didn't understand about the lesson?	
Lesson: Taught by **Date**	What I learned that I didn't know before. How can I make use of this new knowledge? What I didn't understand about the lesson?	
Lesson: Taught by **Date**	What I learned that I didn't know before. How can I make use of this new knowledge? What I didn't understand about the lesson?	

Appendix 5: Teach Back Log

Community-based Education

Teach-Back Log

Community-based Education of, by, and for the people.

Instructions: As a participant in an RTC-TH C-bE activity, you are expected to "teach back" a lesson you learned to at least 4 other students who don't know the lesson. Your Teach-Back session should be witnessed and verified by your parents, teacher, or other RTC-TH staff member. During the Teach-Back, you will explain the RTC-TH C-bE program to your students and invite them to attend a future RTC-TH C-bE community activity. Complete this form and attach a photo of you and the people involved in your Teach-Back session. If you like, you may teach back to more than 4 other students. Attach a separate sheet of paper if necessary.

Your Name:

Name of Lesson Taught:

Activity learned at (activity name): Date:

Teach-back Location / Date:

Verified by (Name): □ Parent □Teacher □ RTC-TH Staff

Person(s) Taught		
Name:		
Street Address:		
City:	State:	Postal Code:
Phone:	E-mail:	
School:		Grade:
Did you ever attend an RTC-TH C-bE activity? □ Yes □ No If yes, trip/activity name & date:		
□ I learned about the RTC-TH C-bE	□ Tell me about the next RTC-TH C-bE activity	
Signature:		
Name:		
Street Address:		
City:	State:	Postal Code:
Phone:	E-mail:	
School:		Grade:
Did you ever attend an RTC-TH C-bE activity? □ Yes □ No If yes, trip/activity name & date:		
□ I learned about the RTC-TH C-bE	□ Tell me about the next RTC-TH C-bE activity	
Signature:		

Use back of form for more names.

RTC-TH C-bE: RTC-TH C-bE is the educational section of the Rural Training Center-Thailand (RTC-TH). The RTC-TH uses innovative community-based environmental education programs to empowering self-sufficiency and sustainability for small rural family farms.

FFI: rtc2k5@gmail.com.

Teach Back Log (continued)

Attach photo of teach-back participants here.

Additional names for		
Name:		
Street Address:		
City:	State:	Postal Code:
Phone:	E-mail:	
School:		Grade:
Did you ever attend an RTC-TH C-bE activity? ☐ Yes ☐ No If yes, trip/activity name & date:		
☐ I learned about the RTC-TH C-bE	☐ Tell me about the next RTC-TH C-bE activity	
Signature:		

Name:		
Street Address:		
City:	State:	Postal Code:
Phone:	E-mail:	
School:		Grade:
Did you ever attend an RTC-TH C-bE activity? ☐ Yes ☐ No If yes, trip/activity name & date:		
☐ I learned about the RTC-TH C-bE	☐ Tell me about the next RTC-TH C-bE activity	
Signature:		