

**Numeracy at Work  
Workshops**

**Facilitators' Notes and Handouts**



***Workshop 1 – Spring 2010***

**A Social and Holistic Approach  
to Math in the Workplace**

*- pages 2 to 27 -*



***Workshop 2 – Autumn 2010***

**A Social and Holistic Approach  
to Building Activities**

*- pages 28 to 46 -*

# **Numeracy at Work Workshop 1**

## **A Social and Holistic Approach to Math in the Workplace**

Spring 2010

### **Workshop Facilitators**

Wendy Tanner, Joy Lehmann, Tom Ciancone

### **Goal**

Gain and or deepen an understanding of a social and holistic approach to numeracy in the workplace through reflection, discussion and action

### **Objectives**

Participants will:

- deepen their awareness and analysis through reflection on their lives, individual learning experiences and collective situations
- situate practice and learning in the broader economic and social context
- identify ways that the approach can be effectively integrated into workplace/workforce literacy practice
- try out some of the ideas presented in the workshop

## **Agenda**

9:00	<b>Coffee/registration</b> Warm-up
9:30	<b>Opening</b> Welcome and Introductions Expectations
10:00	<b>Math Stories</b> Sharing the experiences Learning from Stories
10:45	<b>Break</b>
11:00	<b>A Social and Holistic Approach to Numeracy</b> A Schema of Learning Rethinking Assessment The Jigsaw
12:00	<b>Lunch</b>
1:00	<b>Math Stories, continued</b> Listening to Stories Responding to Story
1:45	<b>The Larger Story</b> A Deeper Understanding of the Story Connecting to the Larger Story
3:15	<b>Break</b>
3:30	<b>Social and Holistic Approach in Practice</b> Trying It Out
3:50	<b>Closing</b>

9:00 – 9:30

## **Coffee/registration**

### ***Warm Up Activity: Bean Salad***

(Seating at tables)

#### Materials:

Bags of different beans for participants to go and help themselves

Recipe sheet

- set items on tables
- ask participants to try out “Recipe” using beans, if they wish

9:30 – 10:00

## **Opening**

### ***Welcome and Introductions***

(Seating at tables)

- Go round – name, organization
- Housekeeping/timing for lunch and end of day

## ***Agenda***

#### Materials:

Flow Chart to provide big picture view

Objectives

Parking Lot

- Go through Objectives
- Present flow chart – where are we going for the day

### ***Expectations for the day***

- Ask group for their expectations and relate group objectives to our objectives and agenda
- Provide parking lot for those items we can’t address

## ***Responding to the Warm Up***

(whole group)

- Invite participants to share their thoughts about the activity

### ***Prompts:***

- *Were you familiar with the activity?*
- *Did you work on it alone or with people at your table?*
- *What did you do when you completed one recipe?*
- *How many recipes did you manage to complete?*
- *Did you get a chance to make up your own recipe?*
- *How did you feel about doing the activity?*
- *Do you think this is a good activity? Why?*

10:00 – 10:45

## **Math Stories**

### ***Individual Journal Activity***

(10 minutes, whole group)

#### Materials:

**Journals**

- Ask participants to write down 2 experiences/situations related to math past or present: a meaningful experience when they have felt an “AHA moment” or a good feeling; and an experience which was difficult when they have been frustrated or discouraged

### ***Prompts:***

- *What were the circumstances? Why did it happen?*
- *Who was involved?*
- *When did it happen?*
- *Where did it happen?*

## ***Sharing the Experiences***

(15 minutes, move to small groups x 4)

### Materials:

Sticky notes (one colour per group)

Positive experiences – (flipchart)

Instructions – (flipchart)

- Ask participants to briefly share the 2 experiences
- Ask participants to reflect on positive experience and write in journal key elements that they feel made it positive
- As a group, talk about what were these elements, and together write down one word that expresses each element (if there is overlap, use one card for that word) on large sticky notes
- Then, everyone to place sticky notes on “Positive” flipchart and present

## ***Learning from Stories***

(20 minutes, whole group)

- Refer to chart of key positive elements and ask:
  - *What themes emerged?*
  - *Can you name the categories?*
  - *Do you think these elements are important in any learning experience?*
- Record additional elements that come out of this discussion

### ***Points to highlight:***

- *Learner first: prior knowledge, learning/life experiences, interests, daily activities, funds of knowledge*
- *Why math is needed or wanted: what is the goal/purpose?*
- *Learner and facilitator relationship*
- *Context of learning is relevant and meaningful to the learner*
- *Confidence*
- *Success/positive outcomes, good feeling, fun*
- *Reflection process/looking back at what happened, making sense and making meaning*
- *Next steps/how to build on, move forward*
- *Action taken in daily living that comes from learning experiences*
- Facilitators can add any elements from this list that might not be brought forward by groups. Others from the groups will be invited to make additions also.

10:45 – 11:00

## **Break**

11:00 – 12:00

## **A Social and Holistic Approach to Numeracy**

### ***A Schema of Learning***

(10 minutes, whole group)

#### Materials

The model (schema) – individual handouts

Schema (flipchart)

- Provide explanation of the model
- Ask for questions for clarification
- Draw links with positive elements derived from previous activity on “Learning from Stories”

### ***Rethinking Assessment***

(30 minutes, World Café in small groups)

#### Materials:

Chart paper with “Instructions” for World Café

Chart paper on tables with questions:

- *What more could assessment be?*
  - *What is numeracy competency?*
- Read through instructions for group (on flipchart)

#### ***Instructions:***

1. *One person will be the host for the table and will remain there throughout the activity to explain the thoughts of the group to the next group*
  2. *In small groups of 3 - 4 people*
  3. *discuss question and record - 10 minutes at each table*
  4. *ask participants to be creative - provide coloured markers to draw – use images and symbols, write word, phrases, sentences on the chart paper (laid flat on table)*
  5. *after 10 minutes move to the next table*
- Come back to whole group and ask for report back from charts

## ***The Jigsaw***

(10 minutes, whole group)

### Materials:

Large jigsaw

Individual jigsaw handouts

- Introduce resource, *Rethinking Assessment: Strategies for Holistic Adult Numeracy Assessment*
- Present and explain the jigsaw ensuring that each piece is addressed and clearly understood
- Ask participants to relate their responses on charts to the components of the jigsaw: *How does it all tie together?*
- Provide jigsaw hand-out

12:00 – 1:00

## **Lunch**

1:00 - 1:45

## **Math Stories, continued**

### ***Listening to Stories \****

(15 minutes, individual journal activity, whole group)

- Ask participants to write down their reflections on their math experiences and share at their table.
- Come back together as whole group, one facilitator to chart points
- Ask - *What affects our ability to listen - What do we need to be aware of?*

### ***Prompts:***

- *Who we are as individuals (personalities)*
  - *Our socio economic backgrounds*
  - *What's happening in our own lives*
  - *How we relate on a personal level to the other person*
  - *If the story is familiar to us*
  - *Relating to what is being shared*
  - *Context of the story*
  - *Where were you coming from in terms of your own experiences, background, knowledge?*
- 
- Ask - *How will this thinking/discussion help with your practice?*
  - Ask - *How does this affect a person's ability to do (and use) math?*

**\* Note:** Include this activity if time permits and is appropriate to the audience



## ***Responding to Story***

(30 minutes, whole group)

- Ask participants to keep in mind their reflections and invite one volunteer to share a difficult experience with the whole group
- Introduce this part of the workshop: to explore the process of an *open-ended* assessment
- Invite participants to very briefly, tell the whole group about their negative math situations - refer to example of figuring out the tip when out for dinner with a group of friends (*keep the description of the situation very brief*)
- Select one as a sample for assessment process
- Listen to the participant's math story in greater detail by conducting an informal interview/conversation to gather information about specific math knowledge

### ***Prompts:***

- *How? When? Where? Why? with Whom?*
- *How did you feel?*
- *What strategies did you use?*
- *When might you need this strategy? How often?*
- *Do you feel confident with [certain math skills]?*
- Have co-facilitator stop process after about 5 minutes; then ask group about their impressions and familiarity with what happened.
- Afterwards, discuss math strengths and needs identified from the interview/conversation
- Focus on one specific need/gap and explore possible next steps, i.e. learning support, techniques and strategies, activities and resources

### ***Prompts:***

- *What were the circumstances? Why did it happen?*
- *What math knowledge, strengths and needs could be identified from the story?*
- *How would you support this person in a learning situation?*
- *Think about the specific area of math to begin with and some next steps: personal support, strategies, useful techniques, activities and resources.*

1:45 – 3:15

## The Larger Story

### *A Deeper Understanding of the Story*

(45 minutes, whole group)

#### Materials

Home Safe Video

Joannie's Story (handouts)

3 Individual questions (flipchart)

- Show the PMP clip from Home Safe: as a case study, use Joannie's story relating to the financial/economic hardships that have been faced as a result of the lay-off and plant closure. No comments needed
- Ask participants to divide into smaller groups x 4 – one question per group
- Hand out Joannie's Story (work in small groups)
- Ask participants to respond to the following questions: (10 mins)
  1. What impacts and changes did Joannie experience in her life?
  2. What math knowledge, strengths and needs could be identified from the story to deal with some of her challenges?
  3. How would you support her in a learning situation?
  4. Think about the specific area of math to begin with and some useful techniques, strategies, activities and resources.
- Invite each table to present what they were able to draw out from the story

### *Connecting to the Larger Story*

(45 minutes, whole group)

#### Materials

Wealth Distribution (handout)

Questions for discussion (flipchart)

- Present Wealth Distribution Activity
- Open up discussion about the activity. Ask:
  - *Were you familiar with the activity?*
  - *How did you feel about doing the activity?*
- Give out hand-out of the Wealth Distribution Activity
- Divide into different groups and write responses on flipchart
  - *Would you use this type of activity with your learners?*
  - *If not, why not?*
  - *If so, how would you use it and what more could you do with it?*
- Invite each group to present their responses
- Reflect on purpose of the activity and the stages throughout the workshop. Refer to the Ripple Chart and the Schema to summarize the flow of the day, starting with "You" – the individual and moving to the greater whole

3:15 - 3:30

## **Break**

3:30 – 4:00

## **Social and Holistic Approach in Practice**

### ***Trying It Out***

(20 minutes, whole group)

#### Materials

Instructions (hand-out)

“A Social and Holistic Approach in Practice” (handout)

- Hand out instructions for “Trying It Out” back home
- Go over instructions, hand-outs and answer clarifying questions

#### ***Main points to cover:***

- **Assessment** – ask participants to select one learner to practice and record the initial assessment process
- **Math need/gap** – together go over assessment notes and select one math need/gap that the learner may want to/be required to work on in the next month
- **Next steps** – together brainstorm and record possible next steps with suggestions about how to proceed (i.e. strategies and tasks) and what resources may be needed
- **Resources** – together select one resource ( i.e., written materials, graphics/visuals, workplace specific materials, manipulatives) that might be helpful to support the math learning and bring it to the next workshop
- **Pair Reflective Journal** (*provide 1A hand-out*)
  1. Together complete journal forms to reflect upon and provide feedback about the process of assessment and brainstorming
  2. In a journal scrapbook (*provided*) make journal entries in any way that is meaningful to them – be creative: write, draw, doodle, add post-its, photos, collages. In addition feel free to use video or audio taping devices and store files on a usb/disc
- **Shared Understanding** – together gather information about what’s happening in the learner’s workplace, work sector, and/or community to find out why he/she is in the present situation. Try to describe the situation.

- **Pair Reflective Journal** (*provide 1B hand-out*)
  1. Together complete journal entries to reflect upon and provide feedback about the information gathering process and analysis of findings
  2. In addition, in a journal scrapbook (*provided*) make journal entries in any way that is meaningful to them – be creative: write, draw, doodle, add post-its, photos, collages. In addition feel free to use video or audio taping devices and store files on a usb/disc
- **Practitioner Personal Reflection Journal** - practitioner participants will be **invited** to record any personal thoughts/responses about the project process (workshop, practicum, resources, questions) and make journal entries in any way that is meaningful to them – be creative: write, draw, doodle, add post-its, photos, collages. In addition feel free to use video or audio taping devices and store files on a usb/disc
- **“A Social and Holistic Approach in Practice”** - (*provide hand-out*)
- **Support** - facilitators will provide ongoing support to each pair by email or phone conversations as required during the practicum process

### ***Closing: What will you take away?***

(10 minutes, whole group)

#### Materials

Written evaluation form

- At the next workshop, we will develop this social and holistic approach to numeracy further and focus on activities and techniques
- Hand out written evaluation form

# **Numeracy at Work Workshop 1**

## **A Social and Holistic Approach to Math in the Workplace**

Spring 2010

*Hand-outs*

## Three Bean Salad\*

Each salad contains Red beans, Lima beans, and Black-eyed peas (also known as Black-eyes)

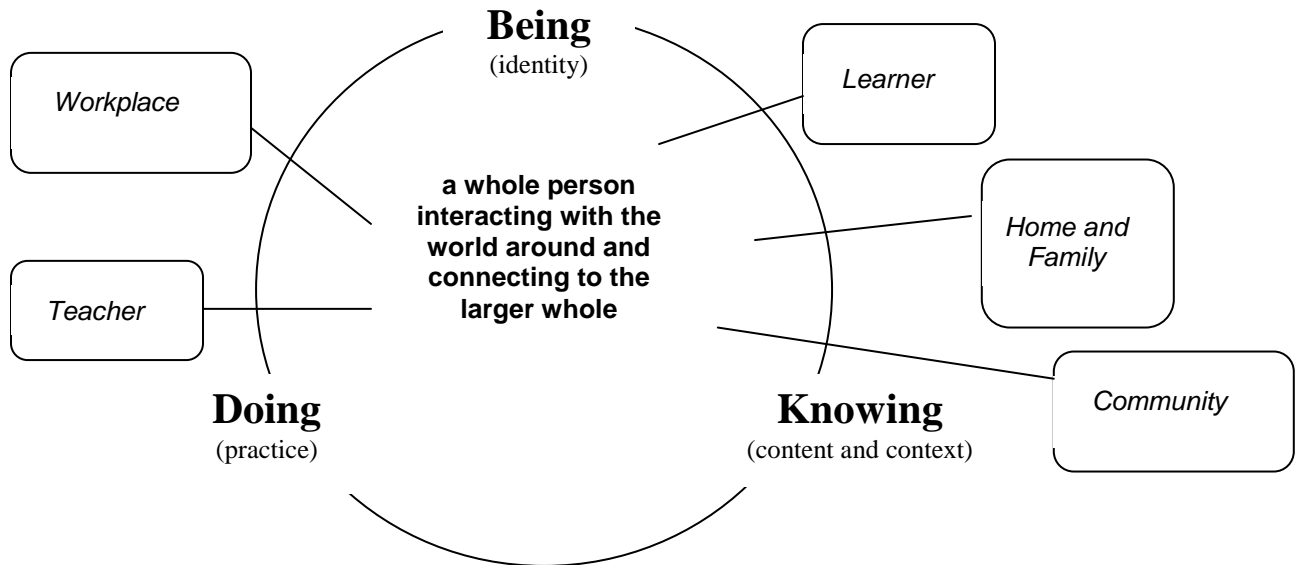
<p style="text-align: center;"><b>1</b></p> <p>This salad contains:</p> <ul style="list-style-type: none"> <li>▪ 2 Lima beans</li> <li>▪ Twice as many Red beans as Lima beans</li> <li>▪ 10 beans in all</li> </ul>	<p style="text-align: center;"><b>5</b></p> <p>This salad contains:</p> <ul style="list-style-type: none"> <li>▪ 12 beans</li> <li>▪ <math>\frac{1}{2}</math> of the beans are Red</li> <li>▪ Lima beans make up <math>\frac{1}{4}</math> of the salad</li> </ul>
<p style="text-align: center;"><b>2</b></p> <p>This salad contains:</p> <ul style="list-style-type: none"> <li>▪ 4 Red beans</li> <li>▪ <math>\frac{1}{2}</math> as many Black-eyed peas as Red beans</li> <li>▪ 10 beans in all</li> </ul>	<p style="text-align: center;"><b>6</b></p> <p>This salad contains:</p> <ul style="list-style-type: none"> <li>▪ At least 12 beans</li> <li>▪ It has one more Lima bean than Red beans</li> <li>▪ It has one more Red bean than Black-eyes</li> </ul>
<p style="text-align: center;"><b>3</b></p> <p>Lima beans make up <math>\frac{1}{2}</math> of this salad.</p> <ul style="list-style-type: none"> <li>▪ The salad has exactly 2 Red beans</li> <li>▪ The number of Lima beans is double the number of Red beans</li> </ul>	<p style="text-align: center;"><b>7</b></p> <p>This salad contains:</p> <ul style="list-style-type: none"> <li>▪ 3 times as many Red beans as Black-eyes</li> <li>▪ One more Lima bean than Red beans</li> <li>▪ 8 beans in all</li> </ul>
<p style="text-align: center;"><b>4</b></p> <p>This salad contains:</p> <ul style="list-style-type: none"> <li>▪ The same number of Red beans as Lima beans</li> <li>▪ 3 more Black-eyes than Red beans</li> <li>▪ A total of 18 beans</li> </ul>	<p style="text-align: center;"><b>8</b></p> <p>This salad contains:</p> <ul style="list-style-type: none"> <li>▪ An equal number of Red beans and Black-eyes</li> <li>▪ 5 more Lima beans than Red beans</li> <li>▪ No more than 20 beans</li> </ul>

Make up a different salad.

Write instructions for someone else to make your salad.

\* Reprinted from *Family Math* (Stenmark, J., Thompson, V., Cossey, R., Lawrence Hall of Science, University of California, Berkeley CA, 1986, page 135)

## A Schema of Learning



### Being (identity)

- becoming self-aware in using mathematics
- gaining confidence as a “numerate” person
- making personal connections throughout the learning process

### Doing (practice)

- choosing relevant information
- applying appropriate skills and strategies
- reflecting on the learning and the results

### Knowing (content and context)

- generating mathematical problems, skills or procedures
- employing mathematical content and techniques that
  - vary according to the situation
  - depend on the purpose and context in which the numeracy takes place
- creating meaning in daily activity

Superimposed on the three domains, we have associated four terms that are central to our approach: identity, content, context and practice. All this intertwining is made clear by our choice of using a circle with no beginning or end to contain all these aspects of learning. Aboriginal holistic principles also influenced us to use the circle, which is central to Aboriginal ways of understanding the world.

The central principle of our approach occupies the core of the schema:

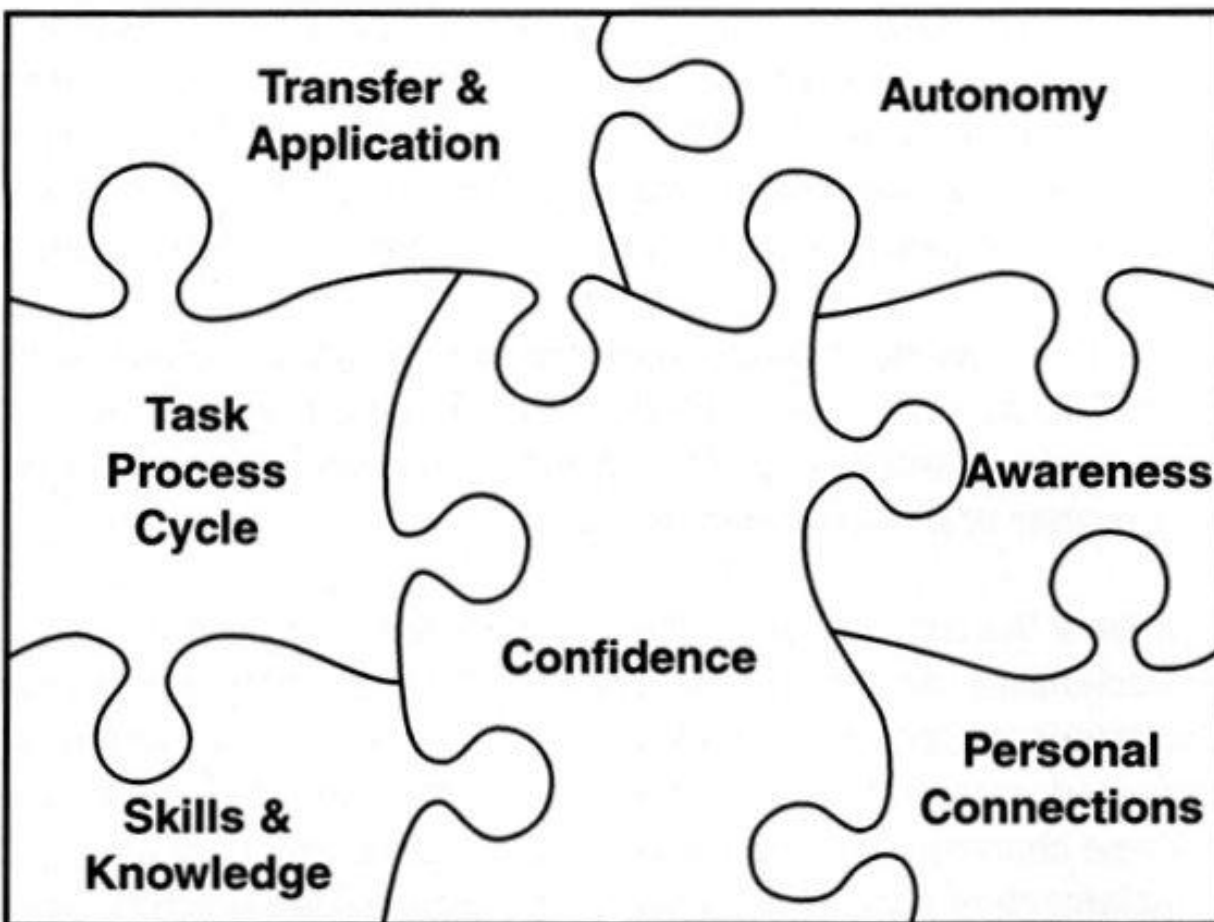
**A learner is a whole person – mind, body and spirit – interacting with the world around and connecting to a larger whole.**

We must keep this principle in mind at all times to avoid making learning a checklist of component skills. Learning is an interactive and interconnected process involving being, doing and knowing.



## Model of Holistic Numeracy Competence

The conviction of the teachers is that competence is more than mere completion of assessment tasks. They stressed the importance of recognizing and highlighting all components of holistic competence illustrated in the model. (p.4)



The cognitive aspects of competence illustrated in the model are identified as:

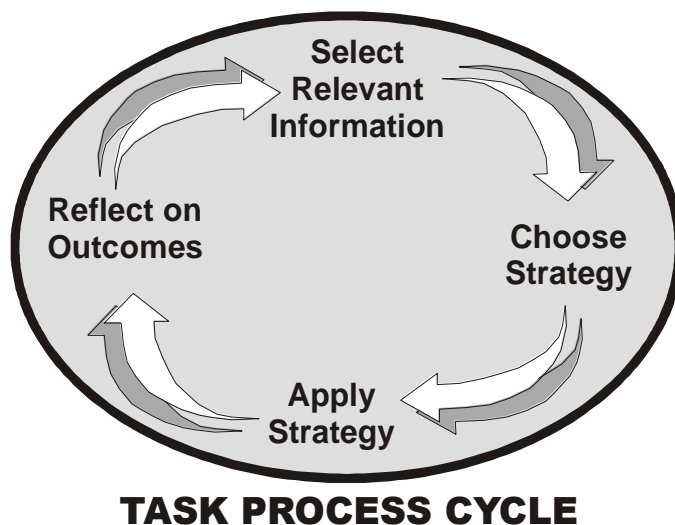
- **Using skills and knowledge.** The key elements of this competence are repeated demonstration, understanding of concepts, and integration of different aspects of numeracy
- **Using the Task Process Cycle.** Students demonstrate their competence through completing whole tasks following a 4-phase cycle, instead of simply demonstrating isolated math skills.

### ***Phase 1 and 2: Select relevant information and choose strategy***

Before using the mathematical skills students need to be able to select the information they will need and decide on the appropriate strategy to apply.

### ***Phase 3 and 4: Apply strategy and reflect on outcomes***

After they have performed the mathematical operations, students need to reflect on the meaning of the result, decide how reasonable this seems for the particular circumstance and consider its likely implications.  
(p.5)



- **Transfer and application of skills and knowledge.** Students are able to use what they have learned in diverse situations.

### **The affective aspects of competence:**

- **Confidence.** Shifts in a student's confidence or self-esteem as a numerate person.
- **Personal connections.** The ability to relate their learning to their personal lives and make connections with what they do outside.
- **Awareness of themselves as learners.** The importance of having awareness of your learning style as well as what you have learned.
- **Growth of autonomy as a learner.** Taking control of your own learning, have opinions and take risks.

In examining this model of holistic competence, what struck us most was the central role of confidence. 'Confidence' is the largest jigsaw piece centred in the model where it interfaces with all the other pieces. Throughout their discussions, the project participants emphasized change of identity or self-concept in the numeracy learner to be at the core of the holistic notion of competence. In recognizing this, we have embraced the essence of this notion as a basic premise in the social and holistic approach that we are proposing in this document.

## **Case Study: Joannie's Story**

Joannie was born in Vietnam and raised in China. She escaped from China to Canada with the help of her uncle. She worked at the PMP factory for 12.5 years. She has a 13-year old daughter and is a single mom.

Then Joannie lost her job when PMP suddenly closed in 2008. Upon closure, the workers got no financial compensation, no benefits and no pension. Joannie wondered how anyone could be so cruel. If she didn't have her daughter, she would just give up and walk away. Her daughter gives her a lot of hope.

The PMP Workers Action Centre gives Joannie support and hope and provides her with a community. She is upgrading her skills and wants to become a community social worker to help others in similar situations.

How has the economic crisis impacted Joannie?

- Her parents are now living with her.
- She receives family allowance that covers the costs of her daughter, herself, her mortgage and her car insurance.
- Her parents look after groceries, utilities, car maintenance and expenses, house repairs, and any other needs

Last week Joannie came to class and shared her immediate financial challenge. Her mortgage came due and she is faced with increased interest rates. At the same time, her car insurance has gone up. She needs help with adjusting her budget.

## Wealth Distribution in Canada

Let's take a look at how wealth changed over the last 30 years of the 20<sup>th</sup> century – 1970-1999. We need 5 volunteers to line up, side by side, shoulder to shoulder.

Canada did its first comprehensive national survey of assets, debts and wealth in 1970, then again in 1984, and in 1999. Wealth includes savings, property and investments, minus debt such as mortgages. Wealth does not include income from EI, CPP or welfare.

Each person represents 20% of family units in the country. Give out the 5 sheets, stating what each says.

Let's see what happens from 1970 to 1984.

Take one step forward or backward for every \$10,000 gain or loss.

### **Changes to wealth between 1970 and 1984:**

- The poorest 20 per cent gain just over \$3,000 ...thus take  $\frac{1}{3}$  (one third) of a step forward (a baby step).
- The next poorest 20 per cent gain about \$15,000...thus take  $1\frac{1}{2}$  (one and a half) steps forward.
- The middle 20 per cent gain about \$48,000... take 5 steps forward.
- The upper middle 20 per cent gain \$87,000...take 9 steps forward.
- The richest 20 per cent gain \$305,000...take 31 steps forward.

### **Now, look at what happened in the next 15 years, going from 1984 to 1999:**

- The poorest 20 per cent lose \$5,000... take  $\frac{1}{2}$  (half) a step backwards.
- The next poorest 20 per cent gain just \$800... move slightly forward (the length of your shortest toe).
- The middle 20 per cent gain \$14,000...  $1\frac{1}{2}$  (one and a half) steps forward.
- The upper middle 20 per cent gain \$70,000... 7 steps forward.
- The richest 20 per cent gain \$390,000... 39 steps forward!

## A Social and Holistic Approach to Numeracy in Practice

### *Funds of Knowledge*

Following is a list of potential funds of knowledge:

- *knowledge, experiences, histories, identities and images of themselves*
- *attitudes, dispositions, desires, values, beliefs, and social and cultural relations*
- *relationships with learning, teachers, and mathematics itself*
- *numeracy practices beyond the classroom*

(*Beyond Worksheets: A Social and Holistic Approach to Numeracy*, p. 17, D. Baker, 2005)

Learners bring their own “funds of knowledge.”

Practitioners build upon this knowledge and recognize their strengths.

Practitioners look for gaps in knowledge, and create learning activities that support what is needed.

It will help if practitioners identify, separate and link basic math concepts in a variety of contexts.

### *To begin*

With a few open-ended prompts, *a guided conversation* gives a practitioner valuable information about what knowledge a learner is bringing to the learning process, in addition to finding out for whom and for what purpose the learner is coming.

- a learner shares his/her story with a practitioner who is self-reflective and more fully aware of how to listen and receive the story

### ***Where to go from there***

- *Identifying strengths, gaps and needs* - learning is easier if practitioners become familiar and comfortable with identifying the strengths, gaps and needs of learners
- *Supporting the learning* - practitioners can think about what and how to support the learner once gaps and needs are identified
- *Building relationship* - a learner-practitioner partnership is essential if an effective learning process is to evolve
- *Choosing where to start* – to begin the learning process, focus on one area of math that will help to address a gap
- *Negotiating and planning* - as learning partners, together identify short and long term goals, then choose or create purposeful and contextualized tasks/activities to achieve those goals
- *Making a plan* - talk about a few activities that might be helpful to get started and try them out
- *Relevant resources* - resources can be created, adapted and selected taking into account familiar and meaningful context for the learner

Remember that the most effective resources are those that come from the learner's life circumstances and funds of knowledge.

- *Supplement the learning process* - textbooks, workbooks, software and other commercially produced resources are valuable, but should be looked at as secondary rather than primary sources of support

***Resources selected will depend on the individual learner's needs and reasons for numeracy support.***

## **Trying it out: A Social and Holistic Approach in Practice**

### **Assessment**

- ❖ Participants will select one learner to practice and record the open-ended assessment process.

### **Math need/gap**

- ❖ Together go over assessment notes and select one math need/gap that the learner may want to/be required to work on in the next month.

### **Next steps**

- ❖ Together brainstorm and record possible next steps with suggestions of how to proceed (i.e. strategies and tasks) and what resources may be needed.

### **Resources**

- ❖ Together select one resource (i.e., written materials, graphics/visuals, workplace specific materials, manipulatives) that might be helpful to support the math learning.

**\*\*\**Please bring resource to the next workshop.***

### **Shared Understanding: Looking at the Broader Social and Economic Context**

- ❖ Together gather information about the learner's workplace and/or community to find out why he/she is in the present situation.
- ❖ Try to record and describe the situation in both words and numbers if possible.

## **Learner and Practitioner Reflection**

### **Trying it out: pair reflective journal** (*hand-out*)

- ❖ Together reflect upon and provide feedback about the process of assessment and brainstorming. Complete journal form.
- ❖ In the journal scrapbook (*provided*), make journal entries in any way that is meaningful to the two of you. Please be creative - write, draw, doodle, add post-it's, photo's, collages. Feel free to use video or audio taping devices and store on a usb/disk to bring to the next workshop.

### **Shared Understanding: pair reflective journal** (*hand-out*)

- ❖ Together reflect upon and provide feedback about the information gathering process and analysis of findings. Complete journal form.
- ❖ In the journal scrapbook (*provided*) make journal entries in any way that is meaningful – be creative - write, draw, doodle, add post-it's, photo's, collages, in addition feel free to use video or audio taping devices and store on a usb/disk to bring to the next workshop.

## **Practitioner Personal Reflection Journal**

- ❖ Practitioner participants will be invited to record any personal thoughts/responses about the project process (workshop, practicum, resources, questions) and make journal entries in any way that is meaningful – be creative - write, draw, doodle, add post-it's, photo's, collages, in addition feel free to use video or audio taping devices and store on a disk

### *Suggested Prompts:*

- *How did you feel about....?*
- *Did it make sense?*
- *What were you thinking when ...?*
- *Could you relate to...? How? If not why?*
- *What's familiar? What's not?*
- *How do you embark on something that is new for you... and the learner?*
- *What about context?*



- *Where were you coming from in terms of your own experiences, background, knowledge?*
- *What was helpful? What was difficult?*

**\*\*\*Optional activity\*\*\***

**Please reflect upon the math-related activities that could be done with your learners building on and as a follow-up to the *Wealth Distribution Activity* in Workshop 1.**

## **Numeracy at Work: Module 1**

### ***Trying it Out: learner - practitioner reflection journal***

Take time to talk with one another about your experience and write down your thoughts.

#### **Blank page assessment**

- How did this go?
- How did you feel about it?

#### ***Reviewing notes***

- How did this go?
- How did you feel about it?

#### ***Brainstorming next steps***

- How did this go?
- How did you feel about it?

#### ***Choosing a resource***

- How did this go?
- How did you feel about it?

## **Numeracy at Work: Module 1**

### ***Shared Understanding: learner - practitioner reflection journal***

Take time to talk with one another about your experience and write down your thoughts.

### **Gathering information about what's happening in the workplace, work sector and community**

- How did this go?
- How did you feel about it?

### ***Reviewing notes***

- How did this go?
- How did you feel about it?

### ***Finding out more about why you are in this present learning situation***

- How did this go?
- How did you feel about it?

# **Numeracy at Work Workshop 2**

## **A Social and Holistic Approach to Building Activities**

Autumn 2010

### **Workshop Facilitators**

Anna Larsen, Tom Ciancone, Joy Lehmann

### **Goal**

To gain and deepen an understanding of a social and holistic approach to numeracy in the workplace through reflection, discussion and action.

### **Objectives**

Participants will:

- deepen their awareness and analysis of numeracy practice through reflection on their lives, individual learning experiences and collective situations
- situate practice and learning in the broader economic and social context
- identify ways that the approach can be effectively integrated into workplace / workforce literacy practice
- develop and try out activities keeping in mind a social and holistic approach to identifying and meeting the learner's numeracy needs and gaps

## **Agenda**

9:00	<b>Opening</b> Resources, sharing table Sign-in activity Introductions
9:30	<b>Remembering Module 1</b>
9:45	<b>Reflecting</b> How did the “Trying Out” activities go?
10:30	<b>Break</b>
10:45	<b>Calculator activities</b>
11:00	<b>Veronica’s Pay Statement</b>
12:00	<b>Resources</b>
12:15	<b>Lunch</b>
1:00	<b>Activity Building: Together</b>
2:10	<b>Break</b>
2:20	<b>Activity Building: On Your Own</b>
3:15	<b>Activity Building Practice</b> <b>Summative Forum</b>
3:30	<b>Evaluation Circle</b> <b>Closing</b>

9:00 – 9:30

## Opening

### *Room Set-up*

- nametags at entrance
- room will be arranged with chairs in a large circle, as well as break-off tables for small group activities
- a large sheet (2 flipchart sheets) will be on wall near entrance used for the sign-in activity

### *Resources, Sharing Table*

- ask participants to place anything that they've brought on the Sharing Table, i.e. materials from the practice activities, resources
- make sure that they are labelled with names (provide labels)
- keep on display over breaks and lunch during the day

### *Sign-in Activity: Venn Diagram*

(10-15 minutes, circle)

#### Materials:

Sign-in sheet on charts

Markers

The sheet contains three interlocking circles with the following headings:

*I relax when I do a puzzle.*

*I worked with a learner on a math activity recently.*

*I know how to convert from pounds to kilograms.*

- as participants enter, ask them to **Sign-in** with their first name anywhere on the sheet that makes sense to them
- place the Venn Diagram on floor in centre of circle
- take up the activity together, asking participants to introduce themselves and tell us why they put their name on the diagram as they did
- conclude by drawing attention to the math concepts involved, such as set theory and use of Venn Diagrams

## ***What's happened in your community and in the world***

(10-15 minutes, go around in circle)

### Materials:

Ripple Chart

Tape

- ask participants to think back to the Ripple chart – individual, community, global rippling circles
- ask participants, in a word or phrase, to share what's happened in their community or in the world that's impacted them and their learners – facilitators to start.

## ***Agenda on chart***

(5 minutes)

9:30 - 9:45

## **Review**

## ***Remembering Module 1***

(15 minutes, standing)

### Materials:

Module 1 Charts and support material

Tape

Group 1 Ripple Chart, Schema, Jigsaw, Assessment Questions

Group 2 Personal Math Stories, World Cafe, Joannie's Story, Wealth Distribution

Stepping Activity (including Tom's numerical interpretation)

Photos where applicable

- place charts together in 2 groupings: theoretical content and activities
- have the whole group standing around the charts
- ask participants to share any lingering questions, stories, influences for each of the groupings

9:45 - 10:30

## Reflection

### *How did the “Trying Out” activities go?*

(45 minutes, circle)

#### Materials:

Chart paper

Index cards

Pens, markers

Tape

Basket

- sitting in the circle arrangement, ask participants to respond to reflective questions on index cards (ask them to write their name on the card)
- explain to group ahead of time that we might not get to side 2 of card due to time restriction, but we will keep the cards and use at the summative forum

#### *Front of card*

1. What would you like to share or reflect upon regarding the open-ended assessment and follow-up activities?

#### *Back of card*

2. What about gathering information about the broader social and economic context of the learner’s workplace and community?

- ask participants to place their card in the basket once they have finished writing their responses
- invite participants to draw a card, and then read aloud the name and response to Question 1 only
- then participant will ask the person whose card has been read whether s/he would like to add anything more
- chart the additional responses
- wrap up
- give reminder about sharing table during break and hand-out “Meet in the Middle” calculator activity to be done at tables after the break

10:30 - 10:45

## Break



10:45 – 11:00

### ***Calculator activities***

(15 minutes, at tables/groups)

#### Materials:

Calculator activity sheets

(source - <http://supergran-puzzlemaker.net/calcs.htm#LIST>)

Calculators

- Participants will do calculator activity after break at tables.
- Debrief
- Give additional hand-outs: “Calculator Crossword” and “Reverse Timetable” to take away

11: 00 - 12:00

### **Task Process Cycle (TPC)**

#### ***Veronica’s Pay Statement***

**Note:** In each workshop, we changed a few details of the story of Veronica’s Pay Statement. The individuals’ names, the name of the workplace, and the hourly rate of pay varied according to the city and province. We did this to make it more relevant to the participant group, given differences in cultural background and provincial minimum wage.

(at tables/groups)

#### Materials:

Questions on chart paper

Tape, markers

Veronica’s story hand-out

Journals

Task Process Cycle chart

Task Process Cycle hand-out

Jigsaw chart

#### **Step 1** (10 minutes)

- give out hand-out with Veronica’s story
- participants will read the story and be asked to imagine themselves as Veronica and try to find out if her pay statement is correct

### Step 2 (15 minutes)

- participants will respond to questions on chart in their journals:
  1. What information did I need to see if the statement is correct?
  2. What were the strategies I used to figure it out?
  3. What did I finally do to figure it out?
  4. What did I find out about how I did it? What about the result?
- then back to circle when finished journaling

### Step 3 (35 minutes, circle)

- display TPC chart
- with the whole group, invite feedback/discussion from journal questions and record key points on TPC chart - record on large post-its and place on appropriate phase of the TPC
- ask if participants are familiar with this process and its appropriateness and effectiveness in approaching a numeracy task/problem? ask if they focus on anything different when they do a problem?
- ask participants to relate the usefulness to their own learners and learning situations (this will help prepare for the activity building brainstorming after lunch)
- then explain the importance of the TPC as part of the Holistic Competency jigsaw model introduced in Workshop 1
- give TPC hand-out and highlight description for each phase

12:00 -12:15

## Resources

### *What's Out There?*

(circle)

#### Materials:

Resource List hand-out

Commercial resources

Sample activities

Excerpts from resources

*Article by Beth Marr, Adult Numeracy curriculum and assessment: How they shape and are shaped by our vision of "competence"*

Games, puzzles

Everyday sources (realia)

Make and Take sources (provide variety that can be used for individual or pair activity)

- review various types of resources, noting those brought by participants
- invite participants to take a look over lunch
- give out Resource List hand-out
- ask to meet back in the circle after lunch

12:15 - 1:00

## Lunch

1:00 - 2:10

## Activity Building

### *Together*

(whole group)

#### Materials:

hand-out- *How Can We Assess Veronica's Numeracy Competence?*

Reminders chart

Chart paper

Double chart with "*Figuring out pay slip*" in the middle of a circle for mind-mapping activity

Tape, markers

Jigsaw chart

TPC chart

Sample activities from *Rethinking Assessment*

### Step 1 (10 - 15 minutes, circle)

- using **mind map**, invite participants to brainstorm ideas about Veronica's pay slip:  
*What comes into play when trying to figure out the pay slip?*
- ask participants to consider factors other than skills and strategies, i.e. personal connections, autonomy, awareness or confidence - record input on mind map chart
- distribute and review hand-out, *How Can We Assess Veronica's Numeracy Competence?*

### Step 2 (10 - 15 minutes, circle)

- as a whole group, ask participants:  
*What kind of activity can we develop to help Veronica make personal connections between solving of her pay slip and other parts of her life?*
- together create a **mind map** as a first step in developing the activity
- together develop an activity from one of the ideas on the mind map chart - Joy will chart

#### **Reminders:**

- *Purpose, relevance and meaning for Veronica*
- *Theme/area of competency*
- *Need/gap that relates to Veronica's problem*
- *How do we integrate the math? or do we?*
- *TPC to reflect on the strength/effectiveness of the activity*

**Step 3** (30 - 35 minutes, *at tables/groups*)

- *have sample activities from “Rethinking Assessment” available to give to groups if necessary.*
- in three small groups, assign one of the other competencies to each group
- groups will brainstorm ideas around that competency using a mind mapping chart and develop an activity for Veronica, i.e. autonomy, awareness or confidence
- 10-15 minutes to prepare activity, chart, 5-min report
- 15 minutes for group report (3 groups x 5 min)
- 5-10 minutes wrap up then back to circle (*hand out sample activities, if needed*)

**Step 4** (15 minutes, circle)

- in whole group, ask participants to make links to their own learners referring to needs/gaps identified through the practice assessment activity
- set up individual/pair activity for after break
  - **individual/pair activity** - participants will develop an activity for their own learner focusing on affective competencies, write up in journals, then chart and post (*instructions on chart*)
  - refer to **Reminders chart** and the resources available to them

2:10 -2:20

**Break**

2:20 - 3:15

**Activity Building, continued**

**On Your Own** (*at tables/groups*)

Materials:

Chart paper

Journals

T P C chart

Jigsaw chart

Variety of Resources as noted above

Chart with individual/pair activity instructions

**Step 1** (40 minutes, pairs)

- bring participants back to develop an activity for their own learner focusing on affective competencies, write up in journals, then chart and post

**Step 2** (10 - 15 minutes, walking around)

- ask participants to travel around room to view all the charted activities and jot down feedback, questions in journal

**Step 3** (5 minutes, circle)

- gather feedback and questions, then back to circle

3:15 - 3:30

## Practice and Summative Forum

### Materials:

Practice hand-out

Summative Forum Consultation hand-out

### ***Activity Building Practice***

(circle)

- **Activities:** learner and practitioner pairs will try out the activity developed in the workshop; practitioner will develop and try out 2 more activities that will support and integrate this “affective” area of need into math learning
- **Using the Task Process Cycle**  
Pairs will try to follow the steps in the **Task Process Cycle** when working through activities
- **Pair Reflection**  
After completing each activity, pairs will talk about how things went, including the **Task Process Cycle**
- **Journal Scrapbook**  
Continue to make journal entries in any way that is meaningful, i.e. write, draw, doodle, add post-it, photo's, samples of activities
- **Learner Reflection** (*provide hand-out*)  
The learner, with the support of the practitioner, will complete the reflection sheet after each activity
- **Support**  
Tom and Joy will be available to support each pair throughout the practice process by email or phone conversations as required
- **Practitioner Reflective Journals**  
Continue to make entries in reflective journals

### ***Summative Forum***

(circle)

- distribute and review forum consultation hand-out

3:30 – 4:00

## Evaluation and Closing

### *Evaluation Circle*

(whole group, circle)

#### Materials:

Post-its

Chart paper

Chart with Head, Heart and Feet

Evaluation questions

Evaluation Form

- begin circle by giving participants different coloured post-its, representing the Head, Heart and Feet (H/H/F), to give feedback on workshop and place on H/H/F chart
- invite participants to respond to a series of questions developed to gather evaluative feedback – record on notepad
  1. What were the highlights of this workshop for you? Why were these particular aspects of the workshop important to you?
  2. How well did the workshop address the areas you asked to be included in Module 2? (e.g. practical activities and techniques to use within a holistic approach to numeracy). How well did Module 2 build on Module 1?
  3. What advice could you give us for changes to make to the workshop for another time?
  4. What are you looking forward to in terms of the concluding forum?
- ***Evaluation Feedback Option*** - have available written evaluation form with the same content ( H/H/F and questions) for anyone who wants to complete **as well as** or **instead of** giving verbal feedback

# **Numeracy at Work**

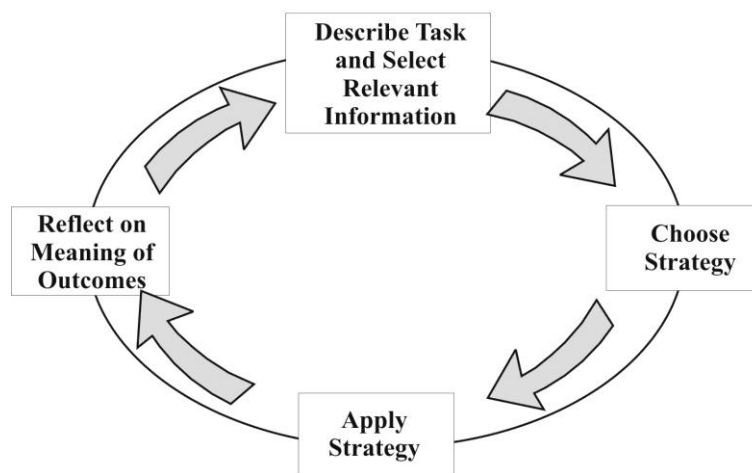
## **Workshop 2**

### **A Social and Holistic Approach to Building Activities**

Autumn 2010

*Hand-outs*

## Task Process Cycle



*4 Steps:*

### **1. Describe Task and Select Relevant Information**

Look at the task or problem and decide what information you will need to work it out.

### **2. Choose Strategy**

Choose the strategy or approach that seems to fit best (e.g., that might be deciding to start with adding or grouping).

### **3. Apply Strategy**

Try it out.

### **4. Reflect on Meaning of Outcomes**

How did it work out? Do the results make sense? Talk about what action you might take as a result of doing this task. Are there other situations in your life where this kind of problem has come up before or might come up again?

Adapted from *Rethinking Assessment : Strategies for holistic adult numeracy assessment*, Helme, S., Marr, B., Tout, D. (2003)



## Veronica's Problem

Veronica works for Exodus Cleaning Services at South Island College. She is a night cleaner. Her husband works in a non-unionized factory. They have three children. They live in a low-income working class community.

In a normal week, Veronica works from 9 p.m. to 5 a.m. from Sunday to Thursday, with a half an hour off every night for a "midnight snack". Her rate of pay is \$8.40 per hour. She usually makes \$336.00 before deductions for a 40-hour week. When she works overtime, she gets time and a half.

Last week, her co-worker, Maduri, stayed home with a sick daughter. So Veronica had to work extra hours. She worked until 6:00 a.m. on Monday and until 7:00 a.m. on Tuesday. On Wednesday and Thursday, she worked until 7:30 a.m. On Friday morning, she worked her normal shift. Veronica's pay for last week was more than usual, but it is less than she expected.

Here is Veronica's payslip:

Exodos Cleaning Service		<i>For the week of 2010-10-04</i>	
Hourly Rate:	\$	8.40	
Total Hours:		48.0	
Gross Earnings:			\$ 403.20
Deductions:			\$ 115.64
	Income Tax	\$ 88.70	
	C.P.P.	\$ 19.96	
	E.I.	\$ 6.98	
Net Earnings:			<u>\$ 287.56</u>

Is Veronica's pay correct?

What should she do about it, if it's not correct?

# **How Can We Assess Veronica's Numeracy Competence?**

## Cognitive aspects of competence

### **Skills and Knowledge**

Can she demonstrate her skills in repeated situations? Does she have understanding of skills and processes? Can she fit together different pieces of knowledge and connect new skills with past knowledge? Does she see numeracy as related competencies rather than isolated skills?

### **Task Process Cycle**

How does Veronica go about resolving her problem? What strategies does she use? Does she reflect upon the meaning of the outcomes?

### **Transfer and application (of skills and knowledge)**

Can Veronica apply her numeracy skills from this paycheque problem to other situations?

## Affective aspects of competence

### **Confidence**

Is there a shift in Veronica's confidence or self-esteem?

### **Personal Connections**

Does Veronica connect her learning to other aspects of her work or personal life?

### **Awareness of Oneself as a Learner**

Does Veronica recognize what she knows and understands? Is she aware of her "learning style"?

### **Growth of Autonomy as a Learner**

Is Veronica more independent? Is she more willing to have opinions and take risks, to get started on new tasks with less assistance than before?

## Overall

Has there been a shift in Veronica's identity as a more numerate individual?

## Focussing on Student Confidence

When I think about doing maths I feel ...  
(tick the words that best describe you)

OK	Nervous	Blank
Uncertain	Confident	Excited
Interested	Embarrassed	Relaxed

Any other words? \_\_\_\_\_

---

---

---

After the class today I feel \_\_\_\_\_

---

Because \_\_\_\_\_

---

---

---

From *Rethinking Assessment: Strategies for holistic adult numeracy assessment*,  
B.Marr, S.Helme, D.Tout, Melbourne, 2003

## Focussing on Student Autonomy

### Short prompts or sentence beginnings



Before asking the teacher 'Is it right?' I could

---

---

---

---

---



When I don't know how to get started I could

---

---

---

---

---



To help me feel more confident with \_\_\_\_\_ I could

---

---

---

---

---

From *Rethinking Assessment: Strategies for holistic adult numeracy assessment*,  
B.Marr, S.Helme, D.Tout, Melbourne, 2003

## Focussing on Awareness of Learning

Tick the words that describe what helps you learn best.

Asking someone else	Drawing pictures and diagrams
Working with other people	Trying out different ways of doing things
Writing things down	Explaining things to someone else
Working on my own	Trying out what I've learned at home or work
Using materials and equipment	Thinking about what we have done in class

Any more thoughts on what helps you learn?

---

---

---

---

From *Rethinking Assessment: Strategies for holistic adult numeracy assessment*,  
B.Marr, S.Helme, D.Tout, Melbourne, 2003

## Numeracy at Work: Module 2

### Learner Reflection

Take time after each activity to talk with the instructor about your experience. Please write down some thoughts.

#### Activity 1

- What I did:
- What have I learned?
- How does what I learned help me?
- Can I use what I've learned in other situations?
- What have I discovered about how I learn or how I can learn better?
- Am I more aware of using a strategy to solve problems?