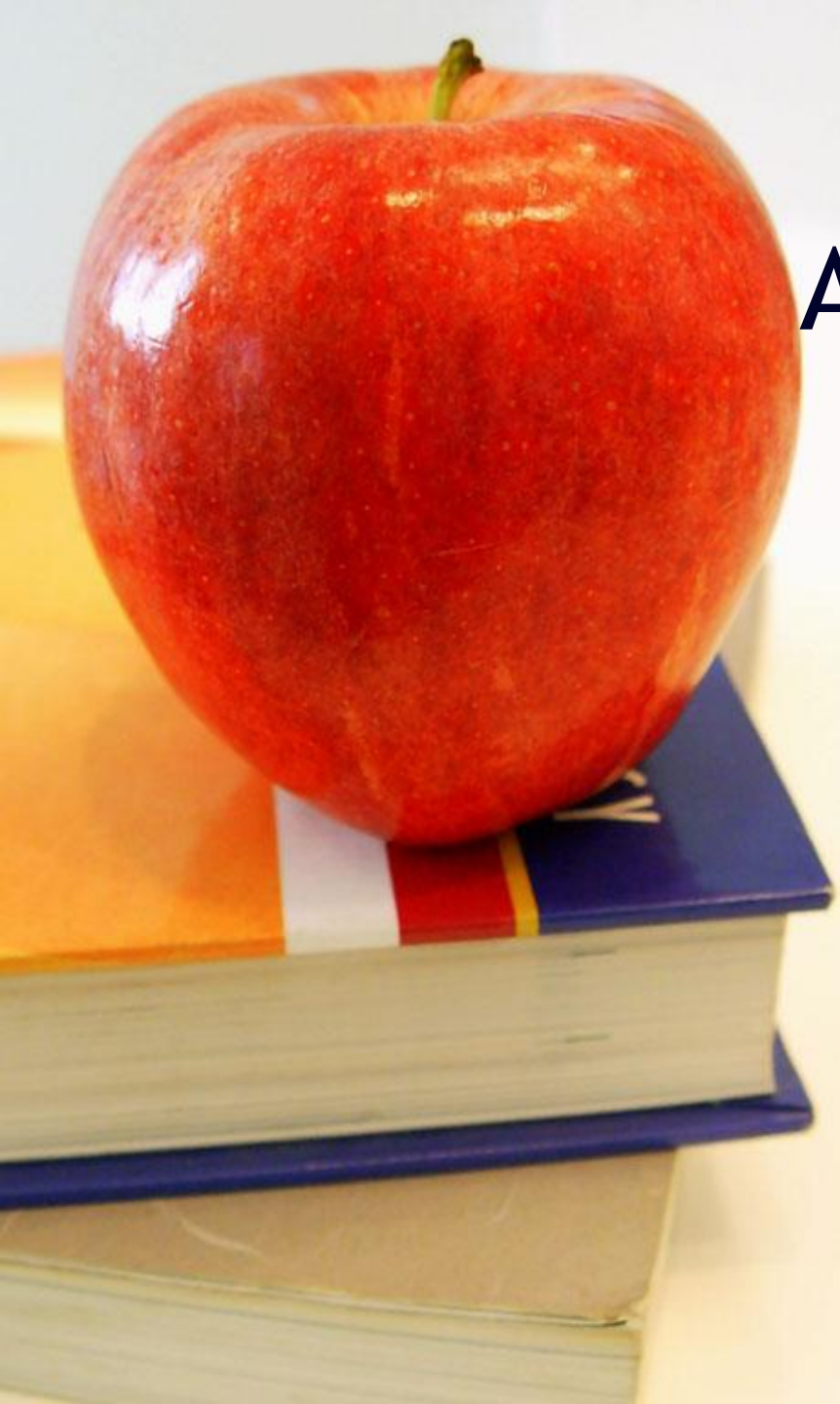
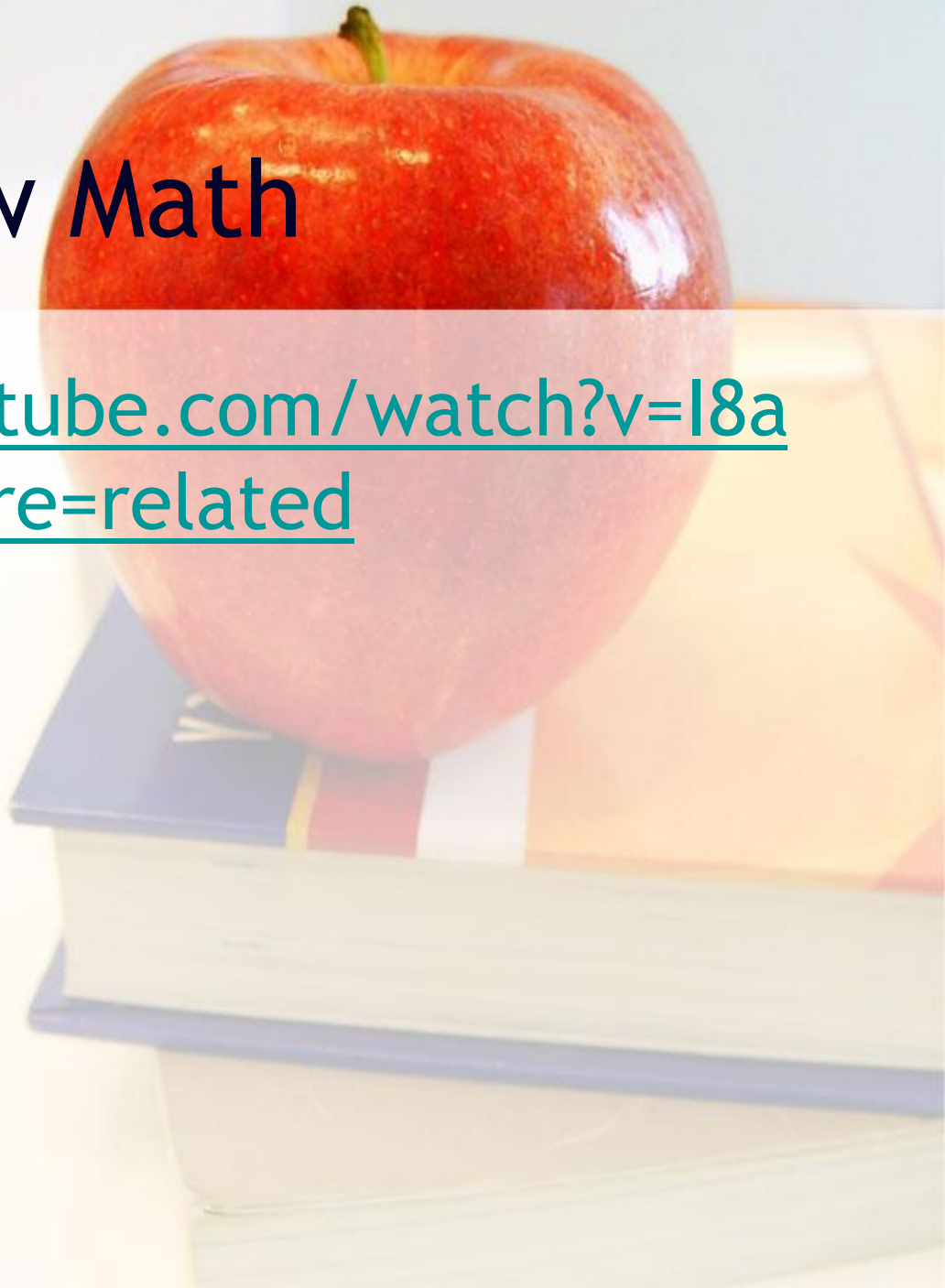


Alberta Revised K-9 Mathematics Program

Implications for Change

New Math

- http://www.youtube.com/watch?v=I8aW4YuFSiY&feature=related



When?

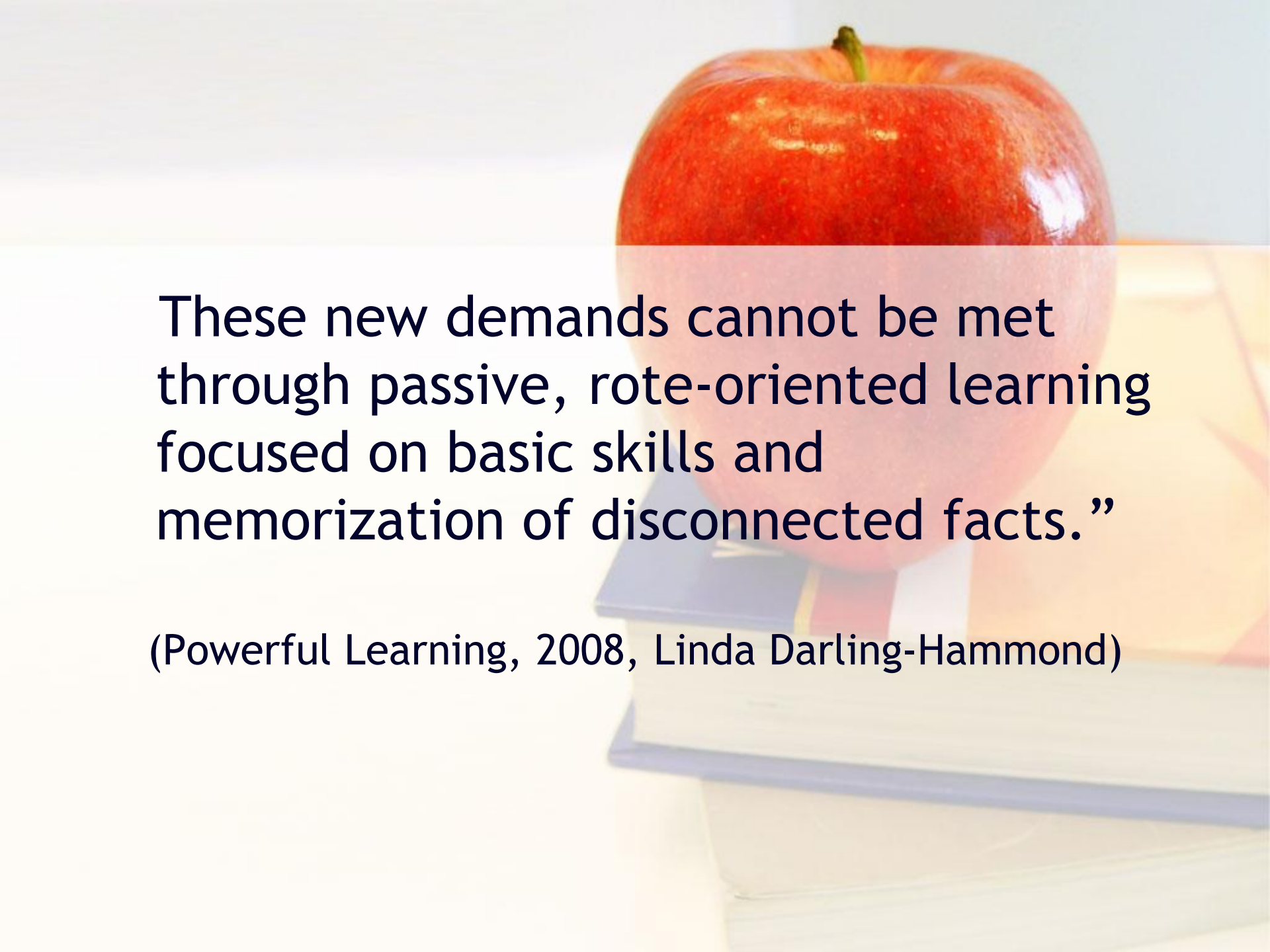
- Fall 2010
  - Mandatory for Grades 3, 6, 9 and 10
- Fall 2009
  - Mandatory for Grades 2, 5, and 8
- Fall 2008
  - Mandatory for K. Grades 1, 4 and 7

Why Change?

- "Since *A Nation at Risk* (1983) was published a quarter of a century ago, mountains of reports have been written about the need for more powerful learning focused on the demands of life and work in the twenty-first century. Whereas 95% of jobs in 1900 were low-skilled and required just the ability to follow basic procedures designed by others, today such jobs make up only about 10% of the US economy.

Most of today's jobs require specialized knowledge and skills, including the capacity to design and manage one's own work; communicate effectively and collaborate with others; research ideas; collect, synthesize, and analyze information; develop new products; and apply many bodies of knowledge to novel problems that arise.

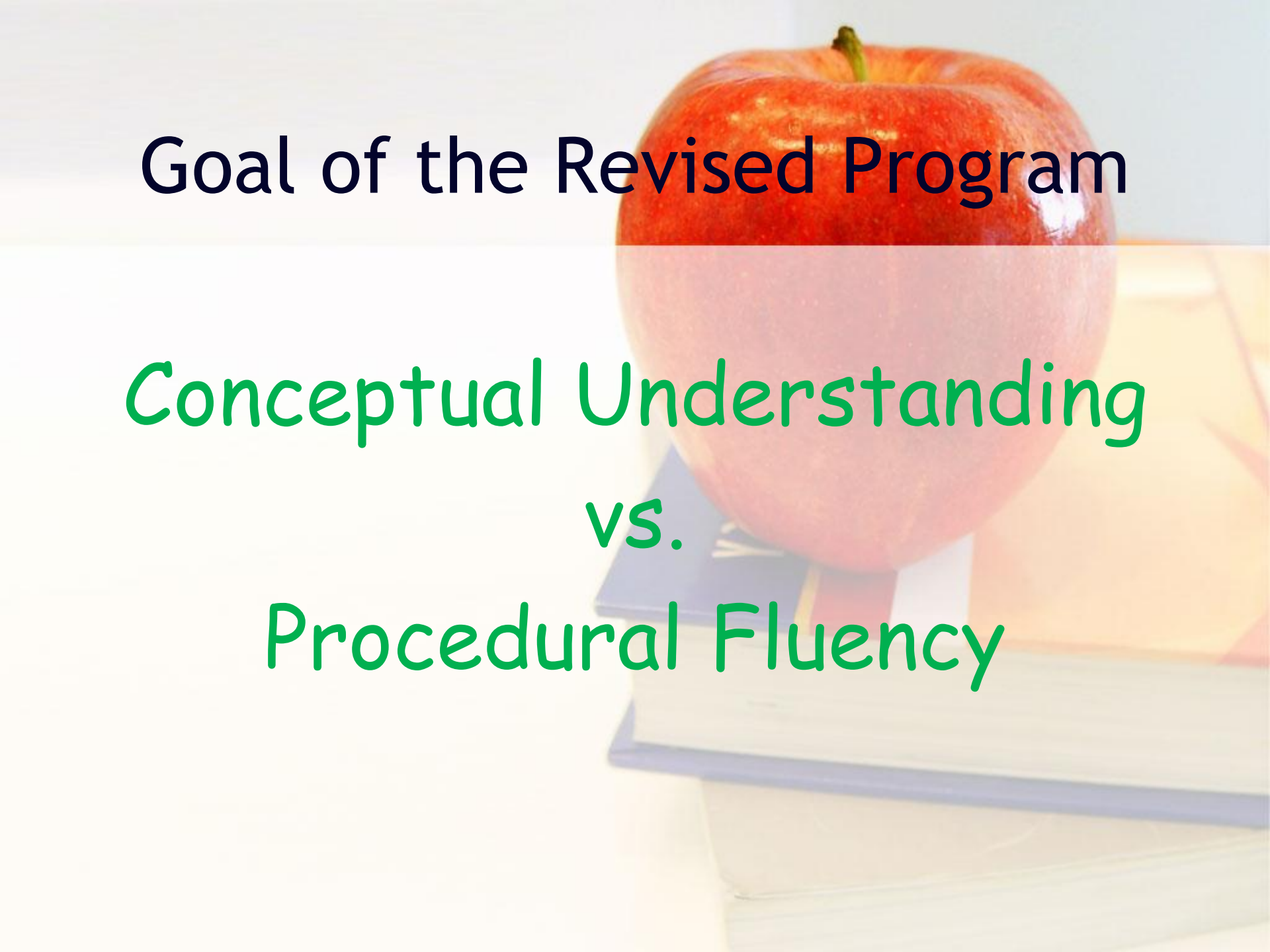
Furthermore, the nature of work will continue to change, and ever more rapidly. Whereas during much of the twentieth century, most workers held two or three jobs during their lifetime, the U.S. Department of Labor (2006) estimates that today's average worker holds more than ten jobs before the age of forty. The top ten in-demand jobs projected for 2010 did not exist in 2004. Thus we are currently preparing students for jobs that do not yet exist, to use technologies that have not yet been invented, to solve problems that we don't even know are problems yet.



These new demands cannot be met through passive, rote-oriented learning focused on basic skills and memorization of disconnected facts.”

(Powerful Learning, 2008, Linda Darling-Hammond)

Goal of the Revised Program



Conceptual Understanding

vs.

Procedural Fluency

Algorithms

$$\frac{3}{4} \div \frac{2}{5}$$

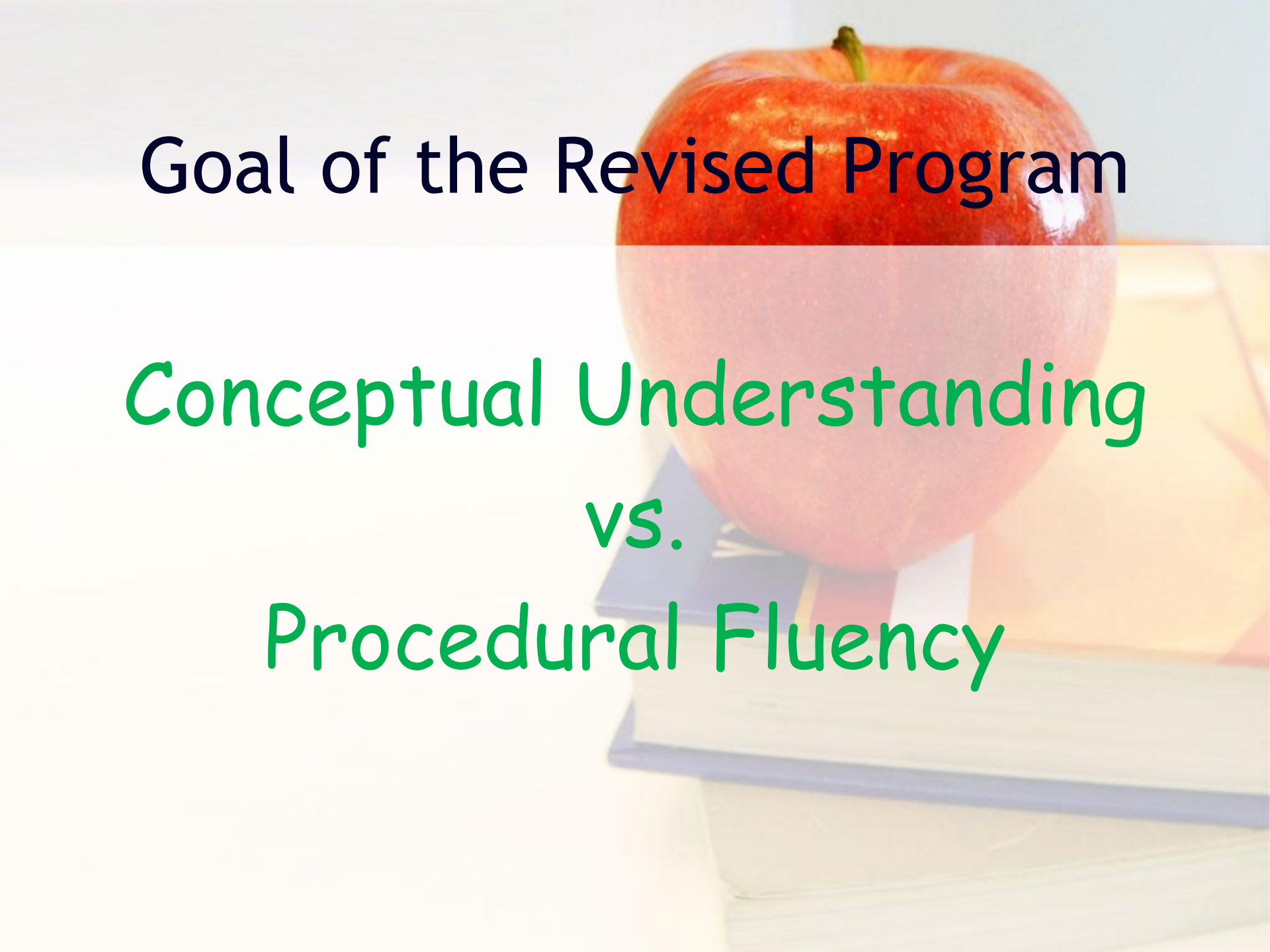
To divide fractions:

1. Find the LCM of the numerator and denominator of the divisor.
2. Multiply the numerator and the denominator of the dividend by the LCM and write the equivalent fraction. This fraction is your new dividend.
3. Divide the numerator of the new dividend by the numerator of the divisor.
4. Divide the denominator of the new dividend by the denominator of the divisor.
5. Reduce and simplify if necessary.

Now answer these questions:

- What is the answer telling us? What does the solution represent?
- Why does this process work? Will it always work? Are there other ways to divide fractions? Easier ways?
- Will you ever get a remainder? If so, what does that mean?
- Why is the answer larger? Will the answer to a fraction division always be larger? How do you know? Is the answer to other kinds of division questions also larger?
- How will you divide fractions if one of them is a whole number or a mixed number?
- Write a problem scenario that could be solved by dividing fractions.

Goal of the Revised Program



Conceptual Understanding

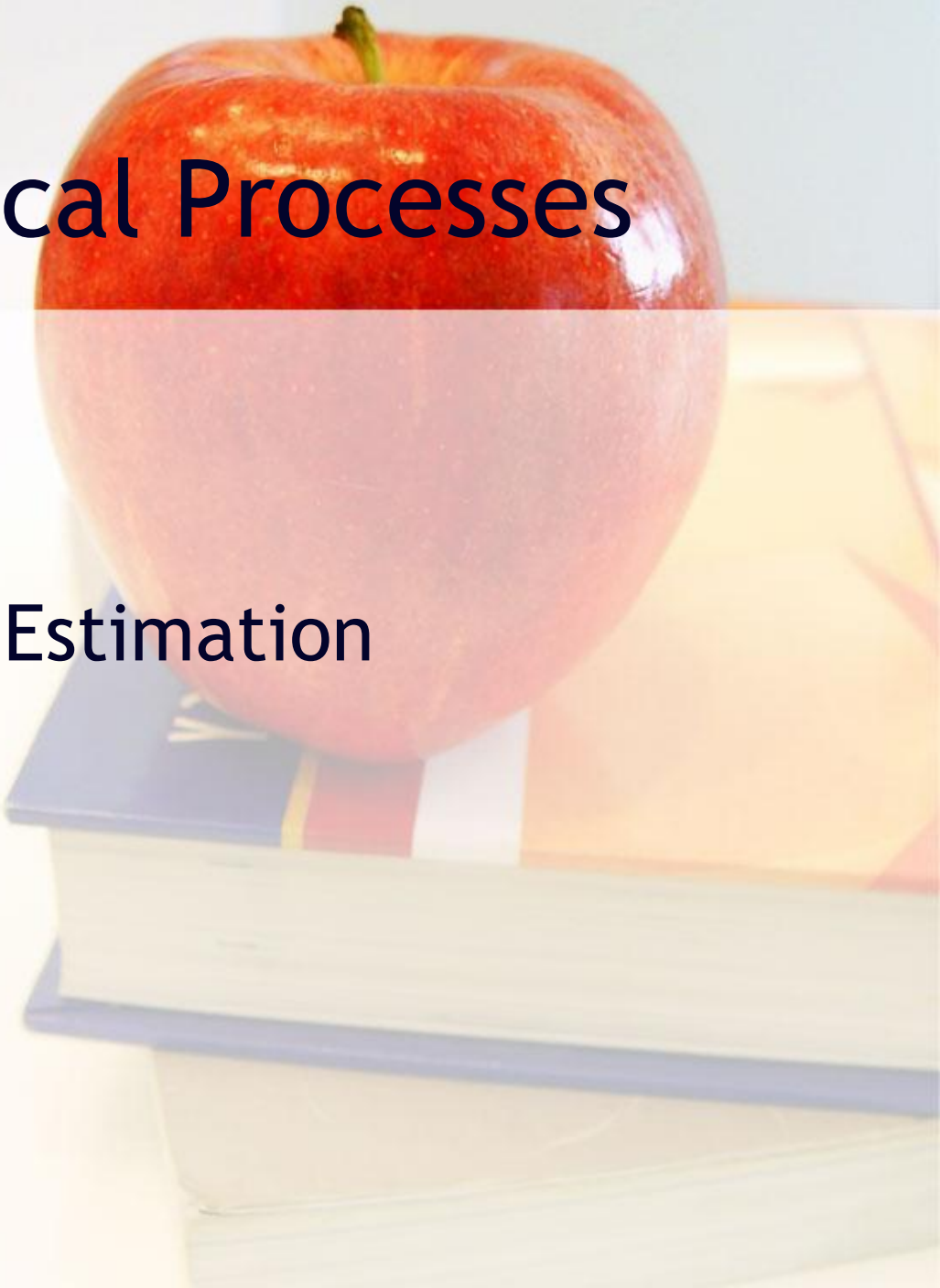
vs.

Procedural Fluency

Instructional Focus

- Integration of the mathematical processes.
- Decreased emphasis on rote calculation.
- Concepts developed concretely, pictorially, and symbolically.
- Use of personal strategies encouraged.

Mathematical Processes



- Connections
- Communication
- Mental Math and Estimation
- Problem Solving
- Reasoning
- Technology
- Visualization

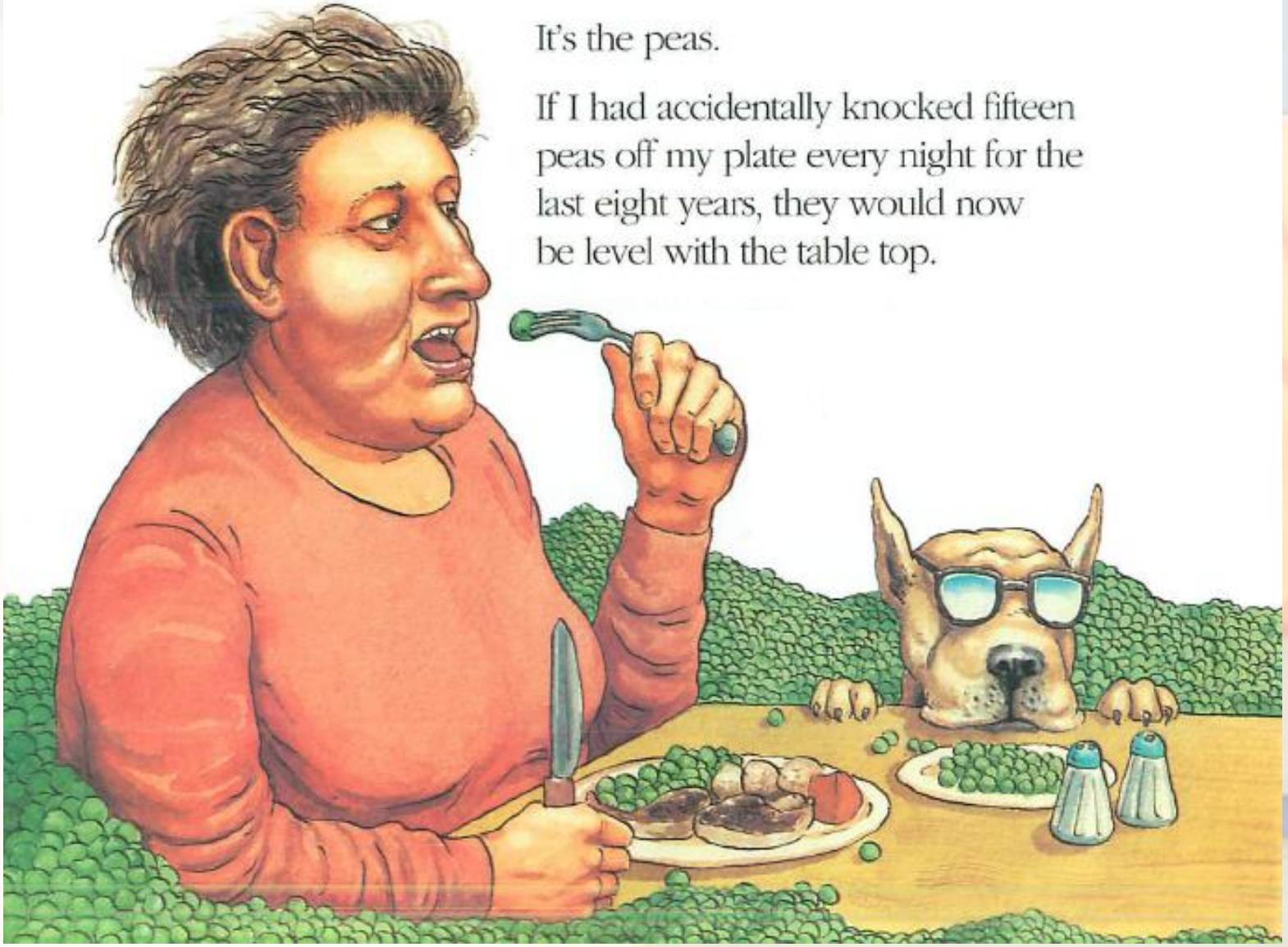
Incorporating the Process Skills

- Full of Peas
- Read through the following page of Rod Clement's book *"Counting on Frank"* and decide if the author's description is accurate.
- Write a letter to Mr. Clement explaining your findings.

I enjoy dinner, not because of the delicious chops Mom cooks every night or the conversation. . . .

It's the peas.

If I had accidentally knocked fifteen peas off my plate every night for the last eight years, they would now be level with the table top.



No more drill and kill!

- By decreasing emphasis on rote calculation, drill and practice, and the size of numbers used in paper and pencil calculations, more time is available for concept development.
- No more timed facts.
- Basic skill acquisition is still important, but is attained through conceptual understanding, rather than memorization – reinforced through practice via engaging activities (games, problem solving, projects).

Working with Manipulatives

- Concepts should be introduced using manipulatives and be developed concretely, pictorially and symbolically.

Comparing Fractions

- Mom and Jenny ordered a pizza for supper. Mom ate 1/3 of the pizza. Jenny ate ¼.
  - Who ate more?
  - How much did Mom and Jenny eat all together?
  - How much pizza is left for Dad?
  - Will Dad have enough to eat or will he still be hungry?

Personal Strategies

- Add 48 + 57

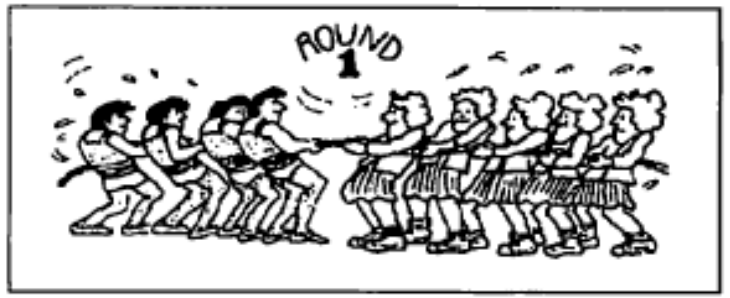
Mathematical Tug-of-War

Your job in this mathematical contest is to decide who will win the final tug-of-war. The first two rounds give you the information you need.

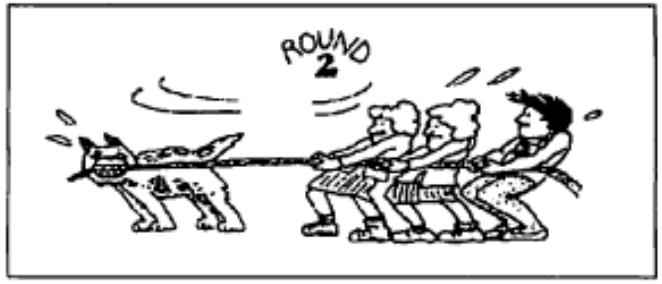
The First Round

On one side there are four acrobats who have come down to the ground during the off-season for this special event. They have well-developed arm muscles because of all the swinging they do, and have proven themselves to be of equal strength. Remember that fact.

On the other side are five neighbourhood grandmas, a tugging team that has practiced together for many, many years. They, too, are all equal in strength. Remember that fact also.



In the contest between these two teams, the result is dead even. Neither team can out-tug the other. Remember that too!



Round Two

One team is Ivan, the specially trained dog that got his start as a pup when he was taken out for a walk by his owner. Ivan gets pitted against a team made up of two Grandmas and once acrobat. Again, it's a draw – an equal pull. Remember that fact.

Final Tug

It's the final tug that you must figure out. It will be between these two teams: Ivan and three of the Grandmas on one side, the four acrobats on the other. Can you figure out who will win this tug of war?

Less is More!

- Less is More! The amount of content has been reduced to allow TIME for students to
  - make connections between concrete, pictorial, and symbolic representations of mathematics
  - build conceptual understanding
  - develop personal strategies and number sense
  - build vocabulary and communication skills
  - develop critical thinking and problem solving skills

Thinkers as opposed to Doers!

How can you help?

- Don’t show your children the “easy algorithms” that you were taught to complete calculations.
- Ask your children to explain why.
- Talk about numbers, play fun games together.
- Look for and describe patterns.
- Include your child in daily activities that require math (shopping for groceries, cooking from a recipe, measuring a window for curtains).
- Don’t say “I wasn’t good at math either.”

For More Information

- Email bonnie.layton@sapdc.ca

- SAPDC Website
  - Parent Newsletters
  - Click the MATH link on the left menu bar

http://people.uleth.ca/~sapdc