



# A Beginner's Guide to Learning Circles

## Chapter 4a

A beginner's guide to complexity theory.

available at [www.nald.ca/learningcircles/bg.htm](http://www.nald.ca/learningcircles/bg.htm)

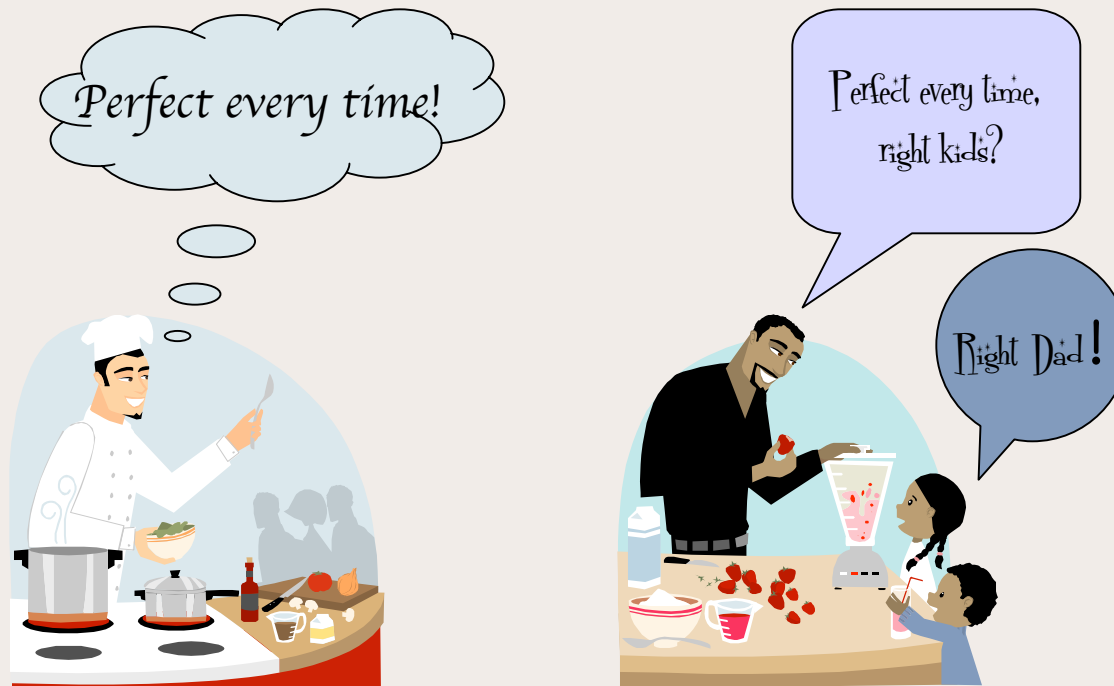
by Tracey Mollins with notes from Janice Brant, Arthur Bull, Guy Ewing  
and Tracy Westell

When dealing with **simple systems**, such as cooking by following a recipe, the recipe (the formula) is essential.



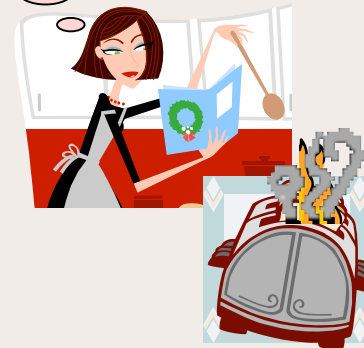
The recipe is like a map and if we follow it, we will all end up in the same place.

The recipe has been tested to make sure that the result will be the same every time and that we can get that result even if we are not expert chefs.



Recipes are designed to produce a standard result - the best recipes give good results every time.

Well what the #\$\$@\*  
is wrong with me then!



When dealing with **complicated systems**,  
such as sending a rocket to the moon,  
the formula (or recipe) - or the series of  
formulae - is important ...



but ...

the formula is not enough ...  
high levels of expertise in a variety of fields  
are also necessary for a good result.

Mr. Math is back!

and Mr. Physics

and Ms. Engineering

and Ms. Computer  
Programming

and Ms. Rocket Science!  
Tah - dah!



Sending one rocket increases the probability that the next mission will be a success.

In many ways, rockets are similar to each other and because of this we can be a relatively sure that they will act in similar ways if we apply the formulae correctly.



Well, I certainly hope so.