Entrepreneurial Economics

Integrating Economics, Accounting and Money

An Aid to Teaching

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Abstract

The current practice of introducing basic economics, money and accounting, isolated from each other, creates a fragmented picture of the world devoid of meaning and without a sense of where we've come from and where we're going to as individuals or as a civilization. The focus of this research is to identify and describe a more integrated approach and practice that includes basic economic concepts, explanatory images and an historical context. Three sections are offered as guides with a view to providing a deeper and broader understanding of the relationship between the economic process, money and accounting.

1) 'World History through Economics' and its timeline of milestones and characteristic individuals depicts the development of the individual and society in relationship to the evolving forms of money and accounting from the beginning of civilization through to the Renaissance. Two critical characteristic historical figures are highlighted representing the pedagogical theme of the great 'time of transition' and the influential story of the two streams of mathematics underlying modern economic life.

2) 'Economics from the Ground Up' identifies fundamental economic ideas and a set of associated explanatory images that can be used as a guide for 'thinking things through' in regards to understanding the underlying nature of the economic process and the exchange of values. The creation of economic value begins with the land and the products of nature as it moves to economic value coming more and more from the intelligence of the individuating intelligence of the developing human being. The double entry accounting process provides an organizing tool essential for perceiving the movement of these economic values. After all, it is the actions of all human beings that moves economic life, not the market or the state.

3) 'Accounting in a Nutshell' focuses on an actual activity by going through and completing a set of accounting exercises that follow the historical transition from single to double entry accounting, and finally, to the closing entries. This provided the basis for modern day accounting technique and became commonplace during the Renaissance as a means for obtaining a meaningful understanding of the fundamental accounting process. This experiential learning process makes visible the basic structure and technique of the accounting process while linking it to the origins of money and the management of economic life. The basic principles and practice of this accounting process, in effect a universal language, provides the lens for understanding money and the economic process. Money is accounting.

Combining the presentation of essential economic milestones and concepts historically, parallel to looking at money and accounting-in-practice, provides a coherent framework and way of economic thinking that makes for a new awareness of the economic process in it many facets and movements. This guide provides an aid to economic awareness and perception providing the basis for a will to associate with each other, thereby, bringing consciousness and balance to economic life.

Acknowledgements

I am indebted to my colleagues in associative economics who have contributed to my ongoing economic education through participation in numerous workshops, conferences and projects that have taken place around the world since 1997. Many of the ideas in this paper derive from on-going research conducted collegially in the context of the Economics Conference. The Associative Economics Festival that year (1997) marked a new level of commitment and earnestness in regard to spiritual scientific research in the field of economics and its relationship to money and accounting.

A word of gratitude goes to Christopher Houghton Budd and Marc Desaules for their invaluable contributions to my own journey to understand and engage with associative economics in a living way. Much of this research project is derived from their work, generously and patiently shared. Recommended for an introduction to associative economics: 'A Human Response to Globalization: Discovering Associative Economics' by Marc Desaules and 'Metamorphosis of Capitalism: Realizing Associative Economics' by Christopher Houghton Budd.

Finally, thank you Susan Gravelle. This research project would not have been possible without her encouragement, patient scrutiny and ongoing dialogue.

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The following document is partly based on a reading of the fourteen lectures by Rudolf Steiner given in Dornach, Switzerland from the July 24 to August 6, 1922 translated in 1936 by A. O. Barfield and T. Gordon-Jones, GA 340. This was published as *World Economy* by Rudolf Steiner Press, London 1972

All references refer to the more recent publication from New Economy Publications, Canterbury, England, 1993. This translation has been edited and brought up to date by Christopher Houghton Budd, PhD and is titled *Economics: The World As One Economy*.

Dedication

This first effort as a researcher is dedicated to Werner Glas, PhD., who in 1976 recognized and encouraged my then tentative explorations of the spiritual nature of economic life in light of Rudolf Steiner's economics course of 1922 where he often hinted at its significance for my future endeavors.

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ONE: WORLD HISTORY THROUGH ECONOMICS

Introduction

The approach to the historical narrative that goes along with the visual timeline mixes a history of economics and economic history.[1] Significant characteristic images and events are marked and described in order to develop a broad brushstroke feel and understanding of the story of exchange in the economic process. This narrative follows economic thought and the development of economic ideas as well as highlighting major changes in economic practices and conditions beginning with the process of developing the first human settlements.[2]

A visual timeline of events is presented first in order to provide a context for the introduction of economics, accounting and money. The timeline is a storytelling device and explanatory tool for exploring economic concepts and significant historical moments from Jericho to the Republic of Venice. This acts as an aid to 'living into' the economic process with our thinking by following its logic and technique. Jericho is identified because it is recognizable as representative of its time and place.

The story begins with the exchange of values setting the economic process in motion when the first settlements created a surplus through the new phenomenon of trade. The use of an imaginative and engaging economic history exercise places us above the horizon of history in order to provide a deeper understanding of the evolution of economics. This timeline story ends with a visual depiction of the pace and evolution of the physical economy relative to those of the more recent expansion of the financial economy.

Timeline Narrative

Using color chalk on 3’ x 6’ black paper, a chronological sketch depicts significant characteristic moments and biographies along a line showing the historical development of the individual and society and their relationship to the changing forms of economic life and money. Artistically, the idea is to create the feeling of acceleration as humanity moves toward an explosion of individual creativity, toward something momentous and epoch-making, at the time of transition during the Renaissance. The extra space on the right side of the time line is space for the future, imaginatively speaking, the future yet to be written by individuals striving toward the impulse of freedom and responsibility.

The historical development of the accounting process and its technique provides a means for bridging the gap in our understanding of economics and money by making objective sense of the world and one's place in it. The purpose is to create an introduction to basic economic axioms and history for the novice based on the first seven lectures of the economics course given by Rudolf Steiner in 1922 and subsequent work in associative economics. 'World History through Economics', 'Economics from the Ground Up' and 'Accounting in a Nutshell' are designed to work in conjunction with each other to enable an integrated understanding of economics, accounting and money.

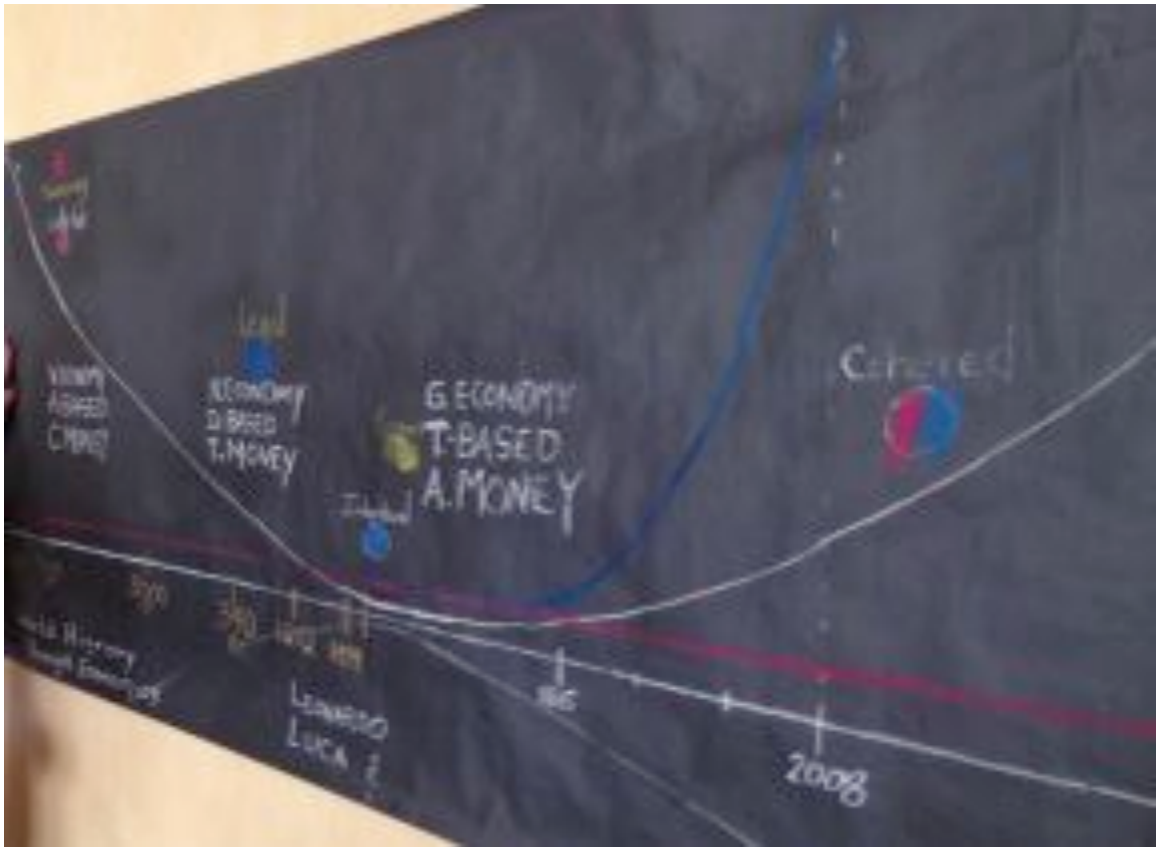
[1] The history of economics is about the history and evolution of economic thought, its origins and the development of economic ideas, whereas, economic history is concerned with changes in economic practices, institutions and conditions.

[2] When the first human settlements began is still debated. At what point human beings began to make permanent settlements seems to be more of a process than a single point in time.

11,500 BC to the Present

The main purpose of economic life, meaning humanity's joint provision for material existence, is to create economic value while, seen economically, the purpose of cultural life is to use up those values while developing and applying the skills and capacities of every individual. Image and color are used in the presentation as an aid to entering imaginatively into these two processes that perpetually flow into each other. By rising above the horizon of history we can look back and examine where we have come from, where we are now, and where we are going to – all in the context of economic life, money and accounting. This imaginative exercise is meant to engender a sense of economic and financial history. The more we understand economic history the more we can sense and find our place in it.

Slide 1 - World History through Economics Time Line



Associative Economics Café • Sebastopol, CA March 23, 2015 French Garden Banquet Room

Three aspects of 'World History through Economics':

1) A chronological journey from the first settlements around 9,000 BC to the Renaissance up to 1,500 AD showing the development of the individual and society;

2) The evolution of economic life and the related changing forms of money over the same time period;

3) The linkage of the development of the individual and society to the emancipation of the 'money market' relative to the 'goods market'.

The Story of Exchange

The Agricultural Revolution

As time marched on more and more human beings began acting on and transforming nature in order to meet their mutual needs. As they did so their know-how and understanding of their new circumstances expanded, beginning a process of continuous innovation and creativity. By working upon nature and slowly applying their creative intelligence the first surplus of goods beyond their immediate needs was created.

For the most part, current economic concepts are derived from looking at competitive relationships between buyers and sellers. Another way to look at the crossing point, where buyer and seller meet, is to see these relationships emerge from two opposing streams of economic life. On the one side, economic values are created through economic activity and on the other side economic values are consumed or 'used up' by cultural activity, the wide range of innovative and productive things people do. It is possible to see two streams that arose with these early settlements that inaugurated economic exchange and the phenomenon of buying and selling. Value gained from modifying the products of nature and value gained through applied know-how constitutes the true origins of accounting and money. Jericho serves as a starting point for describing the stage of civilization that culminates in the milestone of Mesopotamia 6,000 years later in 3,000 BC.

Economic development and activity accelerates from the time of Mesopotamia all the way to the advent of the Greco-Roman period when another expansive impulse radically changes how civilization operates. The last period covered by the 'World History through Economics' timeline ends with the period recognized as a pivotal time of transition for civilization, the Renaissance. The following narrative material is designed to be used in conjunction with the storytelling imagery of the timeline visual that can be built up from scratch. Population numbers are approximate and based on several sources including the United States Census Bureau, Wikipedia and the Ancient History Encyclopedia.

Four major periods: 1) Natufian Epipalaeolithic to Neolithic settlements (12,500 BC to 9,500 BC), (2) Jericho and Tepe Asiab to Mesopotamia (9,500 BC to 2,000 BC), 3) Mesopotamia to the Greco/Roman (2,000 BC to 340 BC) and 4) Greco/Roman to Renaissance (340 BC to 1,500 AD).

Abu Hureyra 11,500 BC

The gradual creation of human settlements has been a long process that may have had its origins in the Epipalaeolithic and on into the Neolithic period. Abu Hureyra was an ancient settlement mound just east of Aleppo and was home of the Natufian culture. It is widely thought that they were the eventual settlers of Jericho. They were hunter-gatherers that over time became the first farmers even before Jericho.[3] Also, new findings reveal the possibility that semi-permanent settlements and food cultivation existed 21,000 years ago at a site called Ohalo II on the ancient Sea of Galilee. This process of human settlement towards agriculture led to the formation of the first known cities like Jericho.[4]

[3] Andrew Moore, Gordon Hillman and Anthony Legge "Village on the Euphrates: From Foraging to Farming at Abu Hureyra" (Oxford: Oxford University Press 2000).

[4] Nadel, D., Piperno, D., Holst, I., Snir, A., & Weiss, E. "Antiquity",(2012) 86 (334), 990-1003). doi:10.1017/S0003598X00048201. 'New evidence for the processing of wild cereal grains at Ohalo II, a 23 000-year-old campsite on the shore of the Sea of Galilee, Israel.'

Jericho 9,500 BC

From one point of view, it can be shown that the emergence of civilization, economic life and accounting all began over 11,500 years ago with the first cities and early settlements of human beings. Jericho is in the West Bank of the Palestinian Territories and is but one of many possible such starting points. [5] This spreading phenomenon of exchange with each other – trade – resulted in surplus grains and salt accumulating beyond the immediate needs of the community.[6] The need to keep track of various contributions to the central granary or salt column required a method for recording this ongoing story. It is now thought that the single tally stick was used as a simple recording device to accommodate the new life of economic exchange.[7] This recording or marking took place long before writing or numbers came into play. These early record keepers, 'the accountants', may have provided the narration explaining the markings, so, do they then become the first storytellers? To account is not only to count but also to supply the narrative – the story behind the numbers. Markings and tally sticks were used to track grain in storage before writing and money were developed and recent archaeological evidence suggests that the individuals doing the accounting eventually developing story telling, writing, counting and money.[8]

At this time the world population is estimated have been four million with the largest settlements having from 1,000 to 2,000 inhabitants.

Notes:
Exchange of value begins the economic process
Meeting each other's needs through trading with each other
Household economics and small surpluses scattered about
Tally stick as memory device
Human beings act upon Nature to meet their needs
'Know-how' begins to be developed and applied
Population of the largest human settlements is from 1,000 to 2,000

Tepe Asiab 7000 BC

Recent archaeological work done by a French archaeologist has shed light on the very ancient clay-fired token shapes found scattered in abundance all around the area.[9] The evidence suggests that by 7,000 BC

[5] Kathleen Mary Kenyon, https://www.britannica.com/place/Jericho-West-Bank, Retrieved 2017-04-01. "The city's site is of great archaeological importance; it provides evidence of the first development of permanent settlements and thus of the first steps toward civilization." Jericho is a town located in the West Bank in the country of Jordan.

[6] D. R. Piperno, E. Weiss and I. Holst, "*Nature" (*2004) p. 670–673. Domesticated einkorn wheat in Turkey dates back to 9,500 BC according to these scholars.

[7] Alexander Marschack, "*Archaeology of the Peabody Museum", Harvard University* (May/June 1979): Vol. 32, No. 3, p. 22-31. Tallying, from the Old French word tailler, meaning to cut or notch, may have been the first recording method used by ancient people, the earliest notations being concerned with the reckoning of time and inventory – the tally stick.

[8] Dr. Gunter Dreyer of the German Institute of Archaeology is perhaps the most prominent of a number of archeologists who believe that writing actually developed out of early marks that were used to tally the kinds and amounts of goods in stock at ancient warehouses.

[9] Denise Schmandt-Besserat, Archaeology (May/June 1979) Vol. 32, No. 3, p. 22-31. "Their popularity continues with time and practically all excavated Middle Eastern mounds dating from 10,000-4,000 BC have yielded some tokens."

temple accountants were using small clay tokens of various shapes and sizes as recording devices to represent goods – wheat, sheep, goats, oxen, oil, and wine.[10] She makes the case that ancient fired clay tokens were the precursor to the Sumerian ideographs and they functioned as a kind of note acting as currency by the fact that they were bookkeeping entries inscribed into the clay figures as well as the clay envelopes holding them.

This new economic life of exchange and surplus was still based on household economics and small, dispersed settlements. The invention of clay token accounting represented a cognitive leap for mankind that led to the development of counting and writing. And yet, it took many more millennia to develop rudimentary single entry accounting using columns of numbers.

By now the world population is estimated to number less than 8 million and the largest settlements were around 3,000 to 5,000.

Mesopotamia 3000 BC

Over 4,000 years later larger cities and trade systems developed where clay tokens began to be replaced by images that then evolved into the ideographs used to create the Cuneiform script.[11] Mesopotamia saw the economic life of exchange continue to accelerate and recordkeeping became more complicated as trade increased and writing was established. The ability to build cities and monuments was due to the expanding surplus from a continuing and accelerating division of labor, or a division of function, since Jericho. This resulted in a multitude of professions and crafts distributed over an ever wider yet connected geographical circle. The wheel connected to the cart and the plow harnessed to oxen accelerated economic life widening the expanse of civilization.

The categories of clay tokens representing the various types of goods available greatly increased. A token going into a clay envelope was a value coming in, called a debit in double entry accounting, and a token removed was a value going out, or a credit.[12] In today's terms, accounting historians interpret the sealed transfer of clay tokens as part of the long development of accounting that preceded the advent of portable money. A narrative accompanied this simple single entry accounting system. Barley, the shekel, and ring money served as Mesopotamian currency.[13] The rings were made of silver and were

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[10] . Niloufar Moghimi and Hassan Fazeli Nashli, PhD Candidate in Prehistoric Archaeology, Abstract "An Archaeological Study on the Tokens of Tepe Zagheh, Qazvin Plain, Iran" Department of Archaeology, University of Tehran, Tehran, Iran (2013). "Tepe Asiab became, in the eighth millennium BC, the first sites in Iran to include tokens. It was in these sites, still in the process of Neolithization, that tokens and human and animal figurines were discovered."

[11] Denise Schmandt-Besserat, Scientific American. June 1977, Vol. 238, No. 6, p. 50-58. "With the rise of cities and the development of large-scale trade the system was pushed onto a new track. Images of the tokens soon supplanted the tokens themselves, and the evolution of symbolic objects into ideographs led to the rapid adoption of writing all across western Asia."

[12] Richard Mattessich, 'The Beginnings of Accounting and Accounting Thought: Accounting Practice in the Middle East 8000 B.C to 2000 B.C. and Accounting Thought in India 300 B.C. to the Middle Ages'. Publisher, New York, N.Y.: Routledge, 2000.

[13] Denise Schmandt-Besserat, "The Earliest Precursor of Writing" *Scientific American*. (June 1977), Vol. 238, No. 6, p. 50-58. They were triangles, circles, spheres, beads, cones, and pieces for stringing. She offers us a convincing equivalence between the various clay figures and the goods being traded: sheep, goats, oxen, wheat, oil, wine, etc., and suggest the hypothesis that these simple clay figurines represent the first currency in history: Currency is a note, a bookkeeping entry, and the opening to writing.

sometimes used to hold 60 shekels as a means for making larger purchases.

Jericho to Mesopotamia 6000 Years

This phenomenon of increasing economic exchange among people set into motion two major evolutionary forces that shaped the future of society. The first is the accumulating surplus beyond immediate need or use and the second is the increasing diversity of economic activities – the division of function (labor).

Geographical considerations and opportunities have a lot to do with the location of settlements. What began in Jericho, with household economies producing the first surpluses by cultivating nature, led to the town economies of Mesopotamia, with its rapidly developing division of labor, and the first large surpluses that made possible the building of larger cities and monuments.
The increasing intelligence of human beings through six thousand years of experience relied on abundant food production, the plow with oxen and the wheel and cart – making the rise of civilization possible. Farmers were now able to pursue specialized economic tasks becoming craftsmen and entrepreneurs.[14] The life of the community was more important than the individual and society was still 'ordered' and kept cohesive through commandments administered by the very few as a theocracy.

Economic life during this long period of time was based on household economies that grew into villages and then cities by 3,000 BC. Both the ancient household and village economics developed a nature-based commodity-money using grains, cattle or metals. For the first time, human beings began to exchange value between each other in order to meet each other's needs. This early role of money – acting as an intermediary in order to facilitate fair and equitable trade – is now called the 'means of exchange' function (MX) or purchase money. This money was used for immediate purchase (buying and selling). Nowadays, these circulating values are made visible through the income and expense accounts in double entry bookkeeping. At this time money was very physical and cumbersome, relative to today.

By now, the world population is fewer than 45 million and the size of Uruk approximately 45,000.[15]

Notes:

Local economies within a small geographical area meeting human needs
Personal and village economy
Wheel/cart and plow/oxen
Writing and counting
Division of task as an evolutionary force in civilization
Cities and monuments
Farmer freed to specialize (larger surpluses)

[14] Hays, J. "Mesopotamian Economics, Money, Labor" (2009). "As agriculture became more advanced surpluses were generated freeing farmers to perform other tasks and learn new techniques. Over time, farmers could branch out and specialize in specific tasks, becoming more like craftsmen. Tablets listed the professions: tradesmen, butchers, stonemasons, water carriers, fishermen, estate workers, farmers, tanners, weavers, boat builders, furniture makers, bakers, silversmiths, metal workers, pottery makers, beer brewers, bread makers, leatherworkers, spinners, weavers, clothes makers, tool and weapons makers, jewelers, woodworkers and people in charge of preparing sacrifices and maintaining buildings."

[15] From the Ancient History Encyclopedia (https://www.ancient.eu/uruk/) "The Uruk Period stretched from 3800 to 3200 BC. This time saw an enormous growth in urbanization with impressive structures and the earliest evidence of writing. Uruk probably had a population of around 45,000 at the end of the period."

Agriculture-based / Commodity-money
Means of exchange – Purchase money – Income and expense accounts
Silver ring money and the Shekel
Temporary relationship / both sides make a gain

Greece/Rome 340 BC

Coherent thinking about economic life was lacking, and perhaps not needed, until Aristotle inaugurated modern economics by articulating a few key principles and questions (340 BC). One such contribution that holds up today is the idea that the economic process takes its course through exchange – the act of buying and selling. Human needs are met as one's individuality unfolds in order, as J. M. Keynes put it, 'to do fine actions' for others. In other words, economic life is brought into motion through the universal fact of human needs (differentiated coincidence of demand) and the initiative from the varied talents and skills of human beings (coincidence of uniqueness). In relation to future economic life Aristotle identified the need to think about fair exchange, equitable distribution, a common measure and a permanent record.[16]

The dignity of the human being cultivated in Greece continued as Rome introduced the structure of law and the rights of citizens, with accountability to each other built into the culture. Athenians as well as the later Romans were required to do their accounts under the serious threat of sanctions. Emperor Augustus kept his accounts[17] and expected every citizen to do the same. The tabulae rationum was the most important account book of the Roman businessman and was divided into two sides of offsetting entries that ultimately comprised a whole. Accounting historians describe this as a metaphor expressing the dichotomy of human existence and the tendency to divide the world into two only to bring them back together into a whole again for perception.

Augustus connected accounting transparency and the publication of accounts to political well-being and stability. This imperial accountant's deeds faded into history until much later when accounting itself was transformed into a new tool and technique that allowed for the dramatic explosion of economic activity that came about as the individual begins to emerge with the dawn of the Renaissance.[18]

This new legal world of 'rights' and the concept of the citizen emerges along side the religious cultural life as the state begins to form. The future state also becomes, more and more, intertwined with economic life, eventually leading to national economies and a debt-based trade money or – looking at the other side – credit money. This new credit money functioned as a 'store of value' (SV) used to invest productively over a period of time. In accounting terms, this is made visible through the balance sheet

[16] Houghton Budd, C., Rudolf Steiner, Economist - Articles & Essays, New Economy Publication, Canterbury, Kent, England. 1996.

[17] From the History of Accounting, Wikipedia, Retrieved 201-04-017. "The Roman historians Suetonius and Cassius Dio record that in 23 BC, Augustus prepared a rationarium (account) which listed public revenues, the amounts of cash in the aerarium (treasury), in the provincial fisci (tax officials), and in the hands of the publicani (public contractors); it included the names of the freedmen and slaves from whom a detailed account could be obtained."

[18] History Research Guides by Boston University Students, Department of History at Boston University. (http://blogs.bu.edu/guidedhistory/) (January 20, 2017). In it Professor Madeleine Atkinson, Boston University, 'Renaissance Individualism': "As the individual became increasingly important during the Renaissance, many philosophers developed their own ideas of a "perfect" individual, a Renaissance man, or a man who is capable and knowledgeable of all things."

created from the accounts. Money was now in the form of metal coins, even though paper money had to appear. How economic life will be conducted in the near future, as individuals continue to become more economically assertive and aware, is a growing problem yet to be resolved.
By now, world population was approximately 140 million with Rome estimated to have had a population at its peak of almost one million inhabitants.

Notes:
Legal State and Legal Person Emerges along side Cultural/Religious Order
Aristotle as Father of Modern Economic Thought
Debt Based / Credit-Money (Trade-Money)
Store of Value – Loan Money – Expressed in Balance Sheet Accounts

Modern influences:

Greek Culture –	Roman Structure –
Jury	Architecture
Theater and Olympics	Citizen / Rights
Democracy	Accounting part of Culture / Law

Northern Italy 1202 to 1494 AD: Time of Transition

British mathematician and science writer Keith J. Devlin of Stanford University has written the most recent and best history of ancient mathematics and the impact of Fibonacci on modern science and mathematics. In addition, mathematician Timothy Johnson, professor at the Maxwell Institute for Mathematical Sciences at Heriot Watt University, Edinburgh, UK has written a paper that appeared in the Journal of Business Ethics (2015) that argues that a fundamental principle of contemporary financial economics is balanced reciprocity and not the principle of utility maximization as per conventional wisdom. Scattered about this technical paper Johnson identifies the mathematical historical links from Leonardo Bonacci and Luca Pacioli to today's modern mathematics and econometrics. Much of the narrative below comes from Devlin's and Johnson's work connecting ancient and modern mathematical innovators.

Italians Leonardo Bonacci (Fibonacci) and Luca Pacioli
The near three hundred years between the publication of the encyclopedic Liber Abaci by Leonardo Bonacci (Fibonacci) in 1202 and the Summa by Luca Pacioli in 1494 marks a period of time where science, mathematics, art, accounting and commerce all went through major transformations. During this time the seeds for today's modern economy were sown, in part, by the adoption of double entry accounting. This time of momentous transition from the 13th through the 15th century saw the acceleration of trade, individual innovation and new abilities, which then developed into today's modern technological global economy. Leonardo Bonacci (Fibonacci) and Luca Pacioli are natural bookends to this colorful story, as it sheds light on this radical time of transition to the future modern globally connected world.

Leonardo Bonacci's Liber Abaci introduced the Hindu-Arabic numerals and Arabic algebra to Europe from Pisa, Italy where they eventually replaced Roman numerals and launched modern mathematics and science. Bonacci was a merchant and mathematician who travelled throughout North Africa and the Middle East, before Marco Polo's famous journeys, where he learned advanced algebra and its numeric place system as he went about his business. The work of Leonardo Bonacci inspired the 'abbaco schools'

that began the popularization and dissemination of this new mathematics and number system. Throughout the 13th and 14th Centuries, it was copied in shorthand form and spread throughout Europe without any citation or recognition of its source.

Roman numerals were still preferred by the church and the guilds so they persisted all through the 15th century because, for many, the new Arabic numbers and mathematics were not to be trusted. The traditional method of tracking exchange, before Arabic numerals, used moveable pieces as 'counters' on a board. This made it possible to spatially and visually work out the calculation, and then record the final result using Roman numerals. Therefore, there was no way to preserve the transaction process itself until the new system came along.

Adding, subtracting, dividing and multiplying, as we know it today were hardly known at the time, let alone practiced. The ability to see or understand the advantages of consolidating and summarizing the accounts periodically was limited due to the kind of consciousness of the time. Most did not have 'adding in one's head' as an experience or ability, for calculating was still spatial until the use and knowledge of Arabic numerals became common place. The advent of this new technical 'closing' process (summary of accounts) in accounting was a major technical breakthrough that revolutionized the culture and economy of the Renaissance. (This is demonstrated in the 'Accounting in a Nutshell' practice exercises, see pages 15 -17.)

Since Fibonacci, the merchants of Italy began to apply the new mathematics and number system to commerce, single entry bookkeeping, banking and teaching in the vernacular rather than in Latin. They also gave new life to the higher problem-solving mathematics formerly used for recreation and speculation. Two streams of mathematics existed side by side, an abstract problem-solving scholarly mathematics practiced by a few, and another practical mathematics applied to commercial affairs in the newly emerging schools. These new abbaco schools, as they were called, were known for using what today would be called 'story problems' to create live examples of how to solve issues in commercial arithmetic. For the first time, both streams of mathematics began to be introduced in the vernacular to the everyday people of the time.[19]

Without this introduction of Hindu-Arabic numbers into Europe double entry accounting could not have developed into the language of commerce and foundation of today's global financial architecture. The decisive role of Fibonacci in the spread and growth of algebra and mathematics to the common person would have gone completely unnoticed to history if mathematician Pietro Cossali had not by chance come across the only known reference to the monumental work of Leonardo Bonacci (Fibonacci) in an old manuscript he was studying and subsequently published in his 1797 book on the history of algebra and mathematics.[20]

[19] Richard Mattessich, 'The Beginnings of Accounting and Accounting Thought: Accounting Practice in the Middle East (8000 B.C to 2000 B.C.) and Accounting Thought in India (300 B.C. and the Middle Ages)'. Publisher, New York, N.Y.: Routledge, 2000.

[20] That one mention in Pacioli's 'Summa de Arithmetica Geometria Proportioni et Proportionalità' was the only clue to Leonardo's (Fibonacci) pivotal role in the dramatic growth of arithmetic, algebra and mathematics. It lay there, unnoticed, until the late eighteenth century, when an Italian mathematician, Pietro Cossali (1748–1815), came across it while studying the 'Summa' of Pacioli in the course of researching his book "Origins, Transmission to Italy, and Early Progress of Algebra There". Publisher, Springer, New York, Copyright Holder, Springer. Online ISBN 978-0-387-48946-9.

Continuing the abbaco tradition centuries later, mathematician and monk, Luca Pacioli, took it further when in 1494 he published the 'Summa de Arithmetica Geometria Proportioni et Proportionalità', commonly called the 'Summa' for short, that included the first codification, explanation and demonstration of the double entry accounting technique that had already been in use for some time in northern Italy. The transition from single entry bookkeeping in Fibonacci's time to its codification and teaching as double entry accounting, epitomized in Luca Pacioli's work almost 300 years later, corresponded with the emergence of capitalism, expanded trade, increased production and the explosion of individual creativity and invention, characteristic of the Renaissance.[21]

Pacioli had the advantage of a new technology – the printing press – that allowed for unprecedented dissemination of knowledge. Mathematical, scientific and artistic abilities were becoming more and more apparent in more and more people, now no longer restricted to only the fortunate few. Both Bonacci and Pacioli were considered master teachers and synthesizers of the most current mathematics. Arabic numerals eventually became customary, as the abbaco schools became popular training for boys throughout the region during this period. The introduction of Arabic abbaco mathematics and recent developments in the science of optics led to a deeper understanding and application of perspective, creating a revolution in the art and architecture of the time.

A leading figure during the Italian Renaissance, Piero della Francesca was a master of mathematics, perspective in art and the emerging science of optics.[22] It is now thought that Pacioli studied under Piero and then taught perspective to his friend and collaborator Leonardo da Vinci, this just after working with the polymath Leon Battista Alberti. Perspective in art, emerging science and mathematics were all part of a long and fruitful collaboration that eventually shaped the modern world and particularly the two parallel separate systems of mathematical procedures and knowledge – a 'lower' vernacular system related to commercial activity, and a 'higher' Latin system based on Greek mathematics and geometry.[23]

Two Parallel Streams

Bonacci (Fibonacci) and Pacioli were, to a large extent, responsible for the spread of one of the most

[21] 'Civilization' from Wikipedia, the free encyclopedia January 4, 2017. Retrieved 2017-04-01. "A major technological and cultural transition to modernity began approximately 1500 AD in Western Europe and from this beginning new approaches to science and law spread rapidly around the world, incorporating earlier cultures into the industrial and technological civilization of the present."

[22] Monograph, "Alberti and Piero della Francesca: The History of the Mathematical Theory of Perspective from Alberti to Monge". Springer Verlag (2007). Luca Pacioli studied under Francisco Del Piero as well as Leon Battista Alberti and then taught Leonardo Da Vinci the mathematics of perspective he used to paint the 'Last Supper'. One chapter is devoted to two of the oldest written sources on perspective constructions — and the main sources for quattrocento — composed by Leon Battista Alberti and Piero della Francesca. Piero was an artist and a mathematician who wanted to connect these two disciplines – optics and painting.

[23] Monograph, "The Origins of Modern Algebra and its Notations", Published by Catrina, (2016). "By the end of the fifteenth century there existed two independent traditions of mathematical practice. On the one hand there was the Latin tradition as taught at the early universities and monastery schools in the quadrivium. Of these four disciplines arithmetic was the dominant one with De Institutione Arithmetica of Boethius as the authoritative text. Arithmetic developed into a theory of proportions as a kind of qualitative arithmetic rather than being of any practical use, which appealed to esthetic and intellectual aspirations. The south of Europe also knew a flourishing tradition. Sons of merchants and artisans, including well-known names such as Dante Alighieri and Leonardo da Vinci, were taught the basics of reckoning (accounting) and arithmetic in the so-called abbaco schools in the cities of North Italy, the Provence, and Catalonia."

impactful human innovations, double entry accounting, a technique and practice for perceiving and managing the accelerated trade that fueled the rise of the Renaissance and eventually led to our current global financial economy. Merchants used this technology to guide their own enterprises as well as the economy as a whole. This invention was also called the 'Venetian Method', commonly known as double entry bookkeeping (accounting).[24]

In addition, historians of mathematics can trace the roots of modern mathematics and science, at least indirectly, to these same two individuals. For example, Leonardo Bonacci (Fibonacci) introduced symbolic algebra and the algorithm, while Luca Pacioli used the story problem method of solving complex commercial situations. Indeed, today's financial mathematical concept of present-value analysis can be traced to Leonardo Bonacci.

The 'problem of points' in mathematics, was used by Luca Pacioli for instructional purposes and led to what is now called the Cox-Ross-Rubenstein formula now used for pricing a digital call option in modern finance.[25] Gambler and mathematician Gerolamo Cardano took their contributions further. Mathematicians Blaise Pascal and Pierre de Fermat then took up Cardano's probability work. This eventually led to algorithmic computational schemes that evolved to the input-output model, ideal for computers and the future econometrics that holds sway today. Mathematical models are now being developed that begin to supplant the use of double entry accounting as the guiding technology for managing the future economy.[26]

Proportion, Probability and Econometrics: Accounting Endures

1) Mathematical probability is in Book V of Nicomachean Ethics (Aristotle), a text that addresses how an individual can live as part of a community and directly addressing the issue of social cohesion.
2) Modern mathematical probability originates out of a synthesis of Fibonacci's commercial mathematics and the analysis of exchange by the Scholastics, the schoolmen of medieval universities in Europe.
3) Gambler Gerolamo Cardano recognizes the mathematical 'Problem of Points' from a text by Pacioli.
4) The Pascal–Fermat solution to the 'Problem of Points' becomes the practical starting point of mathematical probability.
5) The Cox/Ross/Rubenstein formula (Cox et al. 1979) for pricing a digital call option can be traced back to the work of Pascal and Fermat.

Venetian Method Moves Westward

The leading center for international trade activity moved from northern Italy to the north and west as Luca Pacioli and his companion Leonardo de Vinci flee Milan in 1499 to escape the latest invading army. The Netherlands (Low Countries) was becoming the new center for the international economy and the

[24] Jane Gleason-White, Double Entry, Allen & Unwin Publishing (2011).

[25] Timothy C. Johnson, *Maxwell Institute for Mathematical Sciences and Department of Actuarial Mathematics and Statistics*, Heriot-Watt University Journal of Business Ethics, "Reciprocity as a Foundation of Financial Economics" (Edinburgh 2015). "Essentially, Pascal and Fermat established what would today be recognized as the Cox/Ross/Rubenstein formula (Cox et al. 1979) for pricing a digital call option."

[26] MacKenzie (2008, p. 158) p. 52. Johnson; J Bus Ethics (2015) 131:43–67. "Black-Scholes was what really enabled the exchange to thrive where we were faced with the issue of gambling. That fell away, and I think Black-Scholes made it fall away. It wasn't speculation or gambling; it was efficient pricing."

teaching and practice of double entry accounting. Dutch accounting manuals sparked worldwide interest in accounting and Amsterdam become the world center for accounting expertise.[27]

As an example of the powerful effects of this new technology, called the Venetian Method, the Hanseatic League lost its control of a huge trading region at the end of the 15th century in great measure due to this new technology being imported by the Dutch, which gave them a trading advantage that led to an intensification and exponential increase in the amount of trade.[28] The 'Venetian Method' included innovative credit vehicles and bills of exchange that they began using, which expedited and quickened trading activity greatly. This was in contrast to the cumbersome, inconvenient and risky use of silver coins by the League.

By now, world population had increased to 425 million people, with Republic of Venice estimated to be close to 150,000.

Notes:

Capital, individual and liabilities emerge
Economic life begins to widen and accelerate
New science of optics and perspective in art, clock and compass
Single to double entry accounting
Roman numerals to Arabic
Arabic numbers, unit of account and concept of equity (capital) now double entry
Manual to machine printing
Leading to a future:
Global closed economy
Technology-based
Capacity money and Book Money

Summary: Time of Transition 1202 – 1494 AD

This three hundred-year period of social transition was characterized by an unprecedented explosion of individual talent, genius and new abilities, setting the tone and impulse for the current times and beyond. Born in Pisa, Italy in 1170 Leonardo Bonacci's monumental contributions to modern society would have been lost in the dim shadows of the long past had it not been for an accident of history. Before Fibonacci (Bonacci) came on the scene Roman numerals ruled, Latin was the language of knowledge practiced by the few, while books and manuscripts were rare and accessible only to highly trained scholars and nobles.

Mathematician Pietro Cossali in 1797 discovered a reference to Fibonacci in an old manuscript he was studying that led to the re-recognition of his contribution to both streams of mathematics through his introduction of the place system and advanced Arabic algebra to Europe. The place system and unit of account were the last essential elements needed for the emerging development of a complete double entry accounting technique that Luca Pacioli codified and published almost 300 years later.
Born in Sansepolcro, Italy in 1447, Luca Pacioli picked up where Fibonacci left off by synthesizing,

[27] Jacob Soll, "The Reckoning: Financial Accountability and the Rise and Fall of Nations" (Basic Books New York, NY 2014).

[28] Hanseatic League from Wikipedia, the free encyclopedia. Retrieved 2017-05-01. "New vehicles of credit imported from Italy, where double-entry booking was codified in 1494, helped the Dutch outpace the Hansa economy, in which silver coin changed hands rather than bills of exchange."

codifying and teaching the new double entry accounting technology, that had already contributed greatly to the economic rise of the Renaissance by the time of his 1494 publication of an encyclopedic summary of mathematics. Surprisingly, Pacioli's 'Summa de Arithmetica Geometria Proportioni et Proportionalità' was the old manuscript found by Cossali in 1797 that resurrected Fibonacci's place in history. Pacioli enthusiastically attributed to Fibonacci as well as mathematician and artist Piero della Francesca much of the work in his 'Summa'.

Bonacci and Pacioli were considered master teachers of their time, synthesizers of the most current mathematics and expanded algebra, influencing both streams of mathematics: the academic higher math as well as the 'lower' commercial mathematics. They also made the two different mathematics streams accessible to the everyday person by writing, and later printing, in the common Italian rather than in the conventional Latin. Their combined efforts, along with others, provided the fundamental basis and impetus for modern mathematics and science as well as current double entry accounting that underlies the modern global financial system. Both Bonacci and Pacioli explained the new methods in terms that tradesmen, merchants and school children could understand.[29]

Centuries later, the econometrics that evolved from this mathematics would supplant double entry accounting as the guiding tool for the economy beginning in the early 19th century. Meanwhile, invasion and geography spur a westward movement. The next chapter runs from 1509 Antwerp through to 1914, WW I and the Treaty of Versailles.

Synopsis: World History through Economics

Jericho to Mesopotamia: 9,000 BC to 3,000 BC (6,000 years)

The field of human needs expands as agriculture-based commodity money in the form of grains fulfills immediate needs and begins the phenomenon of money issue in a household/small village setting. This is conventionally called the 'means of exchange', per Rudolf Steiner' purchase money', and also reflected in the income and expense accounts.

Mesopotamia through Greece/Rome and Middle Ages: 3,000 BC to 1,200 AD (4,200 years)

The field of human dignity expands, as debt-based trade-money in the form of metal, fulfilling future payment needs and resulting in the new phenomenon of credit creation in a national-state setting. Expressed through Loan Money, Store of Value, and the Balance Sheet.

Renaissance: 1,200 to Present (800 years)

The field of human abilities expands as technology-based capacity-money in the form of debits and credits begins to show a potential that will establish itself in the future as mobile accounting money used globally. Future-applied abilities create economic value resulting in the possibility of a balanced economy on a global level. Recognition is growing for considering the importance of the mission of an activity or enterprise along side the other two.

[29] Karel Davids, C. A. Davids & Jan Lucassen "A Miracle Mirrored: The Dutch Republic in European Perspective", (Cambridge University Press 1995) p. 240. "Abbaco schools teaching commercial mathematics and other practical skills flourished throughout northern Italy coinciding with Fibonacci's publication of 'Liber Abaci' in 1202. A high percentage of boys attended these schools in order to do accounting, writing and clerical work in the professions."

The financial economy also begins to separate from the 'real' economy. In other words, the money markets diverge acting on their own account as distinct from the goods market. Mathematics also begins to insert itself into the managing of economic life as double entry accounting knowledge weakens, becoming a shadow of itself, despite its role as the basis for the global financial architecture. Economists are beginning to perceive the need to understand double entry accounting anew by re-examining its role in managing economic life.

TWO: ECONOMICS FROM THE GROUND UP

Introduction

Prelude to Understanding Economics and Accounting

In the process of working with the economics lectures of Rudolf Steiner[30] and the work of other colleagues several basic concepts related to the 'exchange of value' in the economic process emerge. They are particularly useful and necessary for building a picture and basic understanding of the economic process and its characteristics before proceeding further. These leading economic concepts need to be examined and thought through in order to provide the groundwork for deepening one's understanding of the economic process, the role of accounting, and money.

From a reading of the evening seminars during the economics lectures Rudolf Steiner links money and bookkeeping (accounting) to economics and its conscious management. Many centuries ago the main tool used to guide an enterprise and the economy was double entry accounting until overshadowed by modern mathematic models and econometrics. Accounting is once again gaining recognition as a universal language and technique for understanding, perceiving and managing modern economic life. Discussion of these essential economic ideas provides an introduction and even prerequisite for understanding the principal relationships between the economic process, money and accounting.

Two qualities of our economic nature – self-serving and other–serving – emerge as the first human settlements spark trade between people meeting each other needs.[31] This new phenomenon of exchange through trade produces the first surplus of goods beyond immediate needs and sets the economic process in motion - self-serving in that we consume for ourselves and other-serving when producing for others. We can be both. Balancing consumption and production is accomplished by managing circulation.

The current practice of introducing basic economics, money and accounting isolated from each other creates a fragmented picture of the world devoid of meaning and without a sense of where we've come from and where we're going to as individuals or as a civilization. In the context of history, it can be seen that money and accounting are born out of the activity of human beings as a result of the exchange of value in the economic process. It is Aristotle who first identifies the exchange of value as the beginning of economics, and more recently, Rudolf Steiner describes the two fundamental qualities of any exchange in the economic process.[32]

Youth of all ages are entering an economic culture in debt and without direction in a world where taking initiative is becoming paramount to finding a job. Modern demands of our economic culture are making it increasingly necessary for responsible individuals to become more economically and financially aware, aware beyond one's own immediate circumstances, at an earlier and earlier age. By awakening economically, a deeper sense of entrepreneurship inspires aspiring youth to develop their talents and abilities by meeting human needs in the world. There is a need to learn how to take initiative as young

[30] Rudolf Steiner, Economics: The World as One Economy (Canterbury, England: New Economy Publications, 1996)

[31] Christopher Houghton Budd and Arthur Edwards, 21 Policies: For the 21st Century (Canterbury, England: Associative Economics Worldwide, 2012)

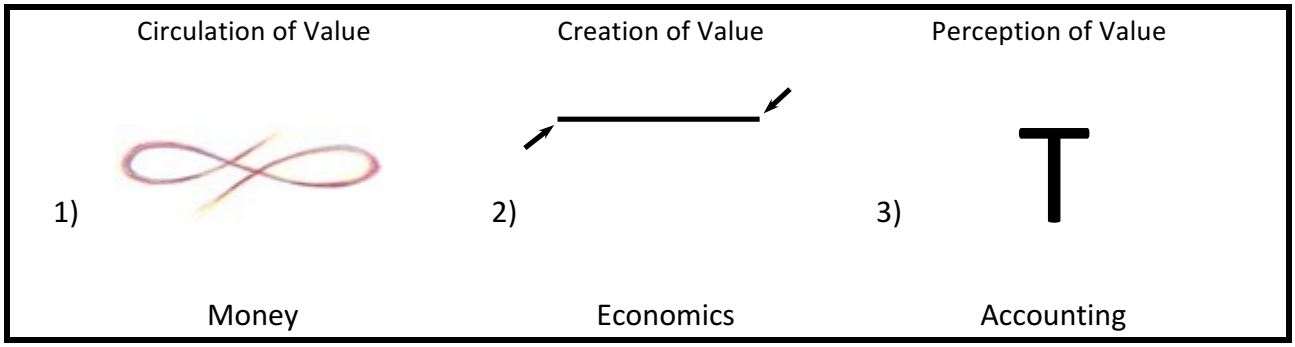
[32] Rudolf Steiner, Economics: The World as One Economy Lecture Six (Canterbury, England: New Economy Publications, 1996)

people develop and hone their skills, thus engendering a new sense of purpose and meaning.

The entrepreneur taking initiative through an activity or even just staying alive sets into motion a series of four economic events. In other words, initiative creates exchange, value, accounts and cash flow that all need to be managed in order to maintain the original aim and ethos. Exchange is needed because we no longer rely on ourselves alone to meet our material needs but on those around us with whom we trade. When this is done economic value is created, in that both parties in exchange gets what they need to satisfy their economy, their situation. In order to view and share with others the ongoing activity of the constantly moving values in economic life it is necessary to have a permanent record of the corresponding values coming in, going out and remaining. An account holds this information about the values exchanged, expressed as a price.

Economics, Money and Accounting

Economics, money and accounting have a special relationship to value**.** In one sense, economics is about the creation of value as we meet each other's needs through exchange. This brings the economic process into motion wherein money can be seen as facilitating the circulation of these economic values in the form of a common instrument. This language is accounting – used to precisely perceive and communicate these economic values as they move through the three domains of society – culture, rights and economy. Using an appropriate image for each one can enhance the articulation and understanding of these three essential elements of the economic process.



The images above are used to enhance the process of understanding economics, money and accounting as a whole. For money and accounting are really two sides of the same coin, designed to be a precise reflector of the economy in every exchange.

The first is an open-ended lemniscate image used to help explain concepts related to the circulation of value and money in the economic process. The second image represents a continuum alluded to in lecture 1 of Economics where Rudolf Steiner used it to illustrate the value creation process that has evolved over time. This is used as an aid for understanding the value creation process and other related economic concepts. The third in this lexicon of economic images serves as a visual aid for understanding the language of double entry accounting that serves as the basis for perceiving economic value while also communicating with others in a common language. These three pedagogically useful images, in conjunction with the use of color coding, are used to enhance and deepen the process of understanding economics, accounting and money as an integrated whole.

These three images have been chosen to act as aids for communicating economic ideas pictorially and used separately as appropriate in order to add layers of meaning in the various economic concepts, visually revealing their relationships.

Respectively, these are: 1) an open-ended circulation lemniscate, 2) the continuum line pointing upward and downward and 3) a left-right oriented T-form. With this orientation and use of the three images it is possible to quickly gain a very basic understanding of economics by focusing on the most essential aspect of economics – the exchange of value in the economic process of circulation and its relationship to money and accounting. Accounting is presented as the language of exchange used as an aid for consciously perceiving the economics process in order to maintain its health.

Essential Ideas of Associative Economics

The Exchange of Value in the Economic Process

What is economic value and how is it formed in the economic process? In order to answer the question, the following associative economic leading thoughts have been distilled and derived from a reading of the economic lectures of Rudolf Steiner 1922 and arrived at through an ongoing collegial dialogue in the context of spiritual scientific research. In the process of buying and selling, exchange that is, economic value is created in addition to meeting each other's immediate needs; so, the first task is to begin to create a picture for ourselves of the economic process and the exchange of value.

Taking initiative in the world meeting human needs creates exchange, values, accounts and cash flow that all need to be managed in order to maintain the original aim and ethos.

I. The Human Being Taking Initiative (1 through 9)
II. Exchange (10 through 16)
III. Value (17 through 27)
IV. Accounts (28 through 29)
V. Cash Flow (30 through 31)

I. THE HUMAN BEING TAKING INITIATIVE

Civilization, economics and accounting simultaneously began as human settlements created exchange and the first surplus of goods beyond their immediate needs – setting the economic process in motion.

1) Economics is done by human beings with other human beings.

The driving force to economic life is the human being and not the market or state. It is possible to just take what is given from the land, from nature, and subsist as animals do. It is when human beings begin to exchange needed goods that economics truly begins.

2) Human beings are capable of acting in self-interest as well as in the interest of others.

It seems that market economics has an incomplete view of the human being that emphasizes one side of human behavior – self-interest. While it is true that the human being is and needs to be self-interested, it is also true that human beings are also capable of acting in the interest of others. This side of life makes altruism and an expanded view of the human being possible and necessary for a more complete picture.

3) In order to understand the economic process one needs to consider influences beyond one's own circumstances.

It is possible to see things clearly when they are close at hand, whereas it is necessary in a global economy to look beyond one's own household and neighborhood and think of economics and economic life as a whole.

"We must not confuse the issue by thinking in the narrow sense of household economics." Rudolf Steiner, Economics, The World As One Economy, Lecture 4: Division Of Labor and Creation of Values (1922) p. 62

"We can only grasp in sharp outline that which lies close to us. However, our task is to achieve real insight, yielding mobile ideas, which never correspond to those derived from our immediate neighborhood." Rudolf Steiner, Economics, The World As One Economy, Lecture 4: Division Of Labor and Creation of Values (1922) p. 62

4) Economic life and its management has become the common responsibility of us all.

Living in an increasingly globally connected economy everyone is affected by everyone else's economic thoughts and actions. Rather than relying more and more on central authority and expertise it is now possible and necessary for individuals to become economically and financially aware so that we become our own authorities. In the language of double entry accounting used in all cultures we have the means to begin to consciously manage the economy so that it works for and belongs to everyone.

“Everything up to the highest realms has to be seen from an economic point of view. If an angel were to come down to earth today, then it would have to appear merely in a dream – and be unable to change anything – or, if it wanted to appear to people in their waking consciousness, it would have to enter the economic life. It could not avoid doing so.” Rudolf Steiner, Economics: The World As One Economy, Discourse 1 July 31, (1922) P. 185

5 There is Insufficient thinking in regard to understanding the modern economic process.

First, the elements of economics are perpetually fluctuating and are difficult to understand as static phenomenon. If we ask, what is capital? a static definition is given, whereas, if we ask, 'what is the capital formation process?' a dynamic description from different perspectives and movement in our thinking can result.

"Today we are called upon by the facts of life to get movement into our concepts, so as to penetrate the economic processes with conscious understanding. We must obtain such mobility of thinking as enables us to think a process through to its end quite inwardly." Rudolf Steiner, Economics, The World As One Economy, Lecture 4: Division Of Labor and Creation of Values (1922) P. 71

Second, thinking with movement requires a kind of thinking that is all together comprehensive, taking into consideration many reciprocally related phenomena.

"But one must be aware of the fact that economic thinking must be more or less total, a thinking of a very comprehensive kind. It is much easier to think juridically which, indeed, is what most economists do." Rudolf Steiner, Economics: The World As One Economy, Discourse 1 (July 31, 1922) P. 186

Third, unlike the scientist who observes nature from outside, the economist who observes economic phenomenon from outside is also within the economic process being observed! We are in the retort and are not just outside the process but in it as well, unlike the chemist. In order to accommodate this phenomenon in economics and finance a certain type of reflexive thinking is required, a kind of reflexive thinking described by George Soros in his 1988 publication, "The Alchemy of Finance".

"The economic processes are distinguished by the fact that we ourselves are within them; therefor we must see

them from within." Rudolf Steiner, Economics, The World As One Economy, Lecture 4: Division Of Labor and Creation of Values (July 27, 1922) p. 71

"In natural science we stand outside the process." Rudolf Steiner, Economics, The World As One Economy, Lecture 4: Division Of Labor and Creation of Values (July 27, 1922) p. 72

6) A comprehensive all-encompassing thinking with ample torque is needed in order to understand the economic process in a global economy.

Everyone needs clothes but not everyone needs to be a clothes maker. Thinking economically, especially in relation to the ultraviolet or intelligence pole of the value creation continuum, is challenging and difficult.

"But a certain flair is essential to thinking economically." Rudolf Steiner, Economics: The World As One Economy, Discourse 2 (August 1, 1922) p. 197

"In nature biology takes the part of something that pushes you if you do not have a certain flair yourself; in economics you need to generate this by yourself." Rudolf Steiner, Economics: The World As One Economy, Discourse 2 (August 1, 1922) p. 198

7) The very nature of economic phenomena calls for a descriptive method of thinking that considers a constellation of perspectives all at once.

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Descriptive thinking is a mobile thinking that is agile and able to hold reciprocally related concepts in a fashion similar to a walk-around. This is where phenomena are looked at from multiple perspectives in order to gain a shared picture of a fluctuating invisible process before diving into definition through deductive or inductive thinking.

“Economics needs a descriptive method of thinking, which sets out from different starting points, allowing them to culminate in concepts.” Rudolf Steiner, Economics: The World As One Economy, Discourse 1 (July 31, 1922) P. 180

"One reaches economic conceptions by verification and modification of concepts in the light of experience." Rudolf Steiner, Economics: The World As One Economy, Discourse 1 (July 31, 1922) P. 181

8) There is no such thing as intrinsic value in economics.

Prices fluctuate with place, time and human circumstances. It is human beings that give and take away economic value as time passes or as place varies or circumstances change.

“To begin with, we can do little more than observe how price fluctuates with place and time.” Rudolf Steiner, Economics, The World As One Economy, Lecture 2: The Economic Process (July 25, 1922) p. 43.

9) The future economy will increasingly rely on the cultivating of a portfolio of marketable skills and capacities.

The economic life today prefers the 'intelligence pole' of value creation, for economic value is more and more created by products and services derived from the creative intelligence and intuition of human beings. Peter F. Drucker pronounced the future age of the knowledge worker 37 years after Rudolf Steiner anticipates this by pointing to the need for people to cultivate multiple and various abilities and capacities over the course of one's lifetime as well as to the increasing role of human intelligence in the creation of economic value. As trade becomes a worldwide affair it is the intelligence and capabilities of individual human beings that creates the future economy.

"Human economic working has to a very large extent been drawn into what I am here comparing with the ultraviolet." Rudolf Steiner, Economics, The World As One Economy, Lecture 1: From Industrialism To World Economy (July 24, 1922) p. 38

"We must see to it that people are not restricted to one solitary activity throughout their lives, but are able to turn their hands to other things." Rudolf Steiner, Economics, The World As One Economy, Lecture 5: The Production And Consumption of Values (July 28, 1922) p. 82

II. EXCHANGE

Economics, money and accounting all meet at the transaction – the exchange of economic value.

10) In an exchange or transaction both sides make a gain in economic value – a dual surplus is created.

Conventional wisdom holds to the thought that when one person makes a gain, the other person somehow suffers a loss. A medieval custom that lasted through the Renaissance was the cultural shunning of commerce and accounting. The original source of this erroneous economic thought can be found in 'The Essays' of Michel de Montaigne, in which he confidently explains how the profit of one man is the expense of the other.[33]

"The economic process takes its course in the activity of buying and selling, essentially, that is, in the exchange of values." Rudolf Steiner, Economics, The World As One Economy, Lecture 2: The Economic Process (July 25, 1922) p. 49.

"By the bare process of exchange, the things exchanged on both sides become of greater value." Rudolf Steiner, Economics, The World As One Economy, Lecture 10: On Associations (August 2, 1922) p. 125.

11) Economic values created need to be used up and consumed.

When what is produced is not consumed an unhealthy balance arises. It takes perception and intervention, i. e. distribution, by human beings to ensure that production and consumption are in balance. Production for production's sake is uneconomic, so how does one determine what to produce and what not to produce?

"I think this matter will be of great significance as far as the production and consumption of values is concerned - because values exist to be consumed, and if they are not, an unhealthy tendency arises in the economic process." Rudolf Steiner, Economics: The World As One Economy, Discourse 2 (August 1, 1922) p. 193.

12) Economic values and prices change as they circulate in the economic process.

Without circulation there can be no economic value. Circulation in this sense means exchange of value between people as they meet one another's needs. Values change as they move through three areas of production, consumption and distribution. And in addition, how values move through the three aspects of social life – culture, economics and human rights.

"Thus the price changes in the process of circulation." Rudolf Steiner, Economics, The World As One Economy, Lecture 2: The Economic Process (July 25, 1922) p. 42

[33] Three books, 107 chapters, published 1580. "The Essays of Michel de Montaigne", Book 1, Chapter 21: "… that the profit of one man is the damage of another."

"Nevertheless, here again there is the underlying idea of taking hold of something static and giving it a definition, whereas in the real economic process things are in perpetual movement." Rudolf Steiner, Economics, The World As One Economy, Lecture 2: The Economic Process (July 25, 1922) P. 45

13) Paying for something immediately, whether through money or barter, is the first kind of exchange in the economic process.

This form of money came about with the first human settlements that led to exchange for meeting each other's needs through trade. This 'trade money' facilitated exchange in the present for products made in the past. These exchanges happened immediately as a trace in time of a now past transaction. This form of exchange is derived from the nature pole of the value creation continuum designated as Value One (V1).

"Something very important happens when, in buying and selling in the market, I pay on the spot for what I get." Rudolf Steiner, Economics, The World As One Economy, Lecture 4: Division Of Labor and Creation Of Value (July 27, 1922) p. 88

"That is payment. That is one thing there must be in the economic process." Rudolf Steiner, Economics, The World As One Economy, Lecture 4: Division Of Labor and Creation Of Value (July 27, 1922) p. 88

14) Paying for something over time creates an enduring relationship that constitutes a second kind of exchange in the economic process.

This form of money began to develop later in history as human beings began to recognize individual rights and dignity. The rise of the 'citizen' in Rome to the 'just price' of Aquinas led to the expansion of loan money and individual creativity and initiative at the dawn of the Renaissance. The exchanges, i.e., transactions, endure over time and create a space and a relationship lasting into the future. Loan money as a form of exchange is derived from the intelligence pole of the value creation continuum designated as Value Two (V2). Loan money endures as a relationship into the future, rather than trade money that is immediate and completed all at once,

"The second thing, which plays a similar part to payment, is lending. This does not interfere with the concept of payment as such. Lending is an altogether different fact which simply exists." Rudolf Steiner, Economics, The World As One Economy, Lecture 6: True Price (July 29, 1922) p. 88

"If I have intellectual or creative capacities in some direction, it must be possible for me to obtain loaned capital."

"In addition to payment there must be loan capital. Here then we have two very important factors in the economic process – payment and loan." Rudolf Steiner, Economics, The World As One Economy, Lecture 6: True Price (July 29, 1922) p. 88.

15) Gift, payment and loan money together form an inherent movement in the economic process.

Understanding three qualities of exchange provides a means for cooperating human beings to take responsibility for balancing and managing the wider economy. These three qualities weave through society's three domains: trade of goods and services, productive enterprise and renewing of education and culture.

The classical factors of the economic process called land, capital and labor serve as a starting point for understanding the economy that needs to include the underlying impelling force moving the economic process. It is the movement from payment to loan to gift money that forms the factors of price formation in the economic process.

The three aspects of modern finance can be described in terms of the global financial structure as 1) trade, 2) capital, and 3) central banking; or in terms of the functions of money as 1) means of exchange, 2) store of value, and 3) unit of account; or in terms of accounting as 1) income and expenses, 2) balance sheet, and 3) closing entries.

"Payment, loan and gift - this is a real trinity of concepts, essential to a healthy economy." Rudolf Steiner, Economics, The World As One Economy, Lecture 6: True Price (July 29, 1922) p. 88

16) A second economy has emerged from the normal economy of goods and services.

Accumulated capital (value) arising from the normal economy at a certain point began to do business on its own account separate from that which is created through the interplay of the modification of the land into goods (V^1) and the application of intelligence to human activity (V^2) – the normal economy.

The financial system grows above the ultra-economic life of accumulated surplus capital not needed for the means of production. This is money seeking to preserve itself after it becomes visible at the moment of the closing entries or it can be consciously allocated in that moment, to where it is needed.

Financialism, money economics, arises out of the capital formation process when there is excess liquidity beyond what is needed for investment in enterprises. Freely capitalized active cultural life creates economic value for the future – education, arts and initiative – especially the youth and social entrepreneurs.

The human being is a navigator between two logics, between two worlds that need balancing.

“Over and above the economic, there lies an ultra-economic life, which is essentially determined by the peculiar power inherent in the actual masses of capital.” Rudolf Steiner, Economics, The World As One Economy, Lecture 1: From Industrialism To World Economy (July 24, 1922) p. 38

“Thus capitalism arises in the process of the division of labor, and in the process of capitalism the financial system, money economics.” Rudolf Steiner, Economics, The World As One Economy, Lecture 4: Division Of Labor and Creation of Values (July 27, 1922) p. 66

III. VALUE

Values and prices arise through the fact of their perpetual circulation in the economic process.

17) Cultural and aesthetic value is not equivalent to value in a technical economic sense.

While it is true that all things can said to be valuable, to have value in an economic sense some work needs to be performed that can create a commodity that meets a human need. Exercise is valuable to a person, and with extension, to society generally. However, in economics it is not walking for exercise that has economic value whereas walking to deliver packages to customers does create economic value.

"If, for instance, we find it necessary for our bodily health, having worked upon land in some way, to get some exercise, all this may of course be judged from another standpoint; but we thus do cannot be described as labor in the economic sense, nor can it be regarded in any way as a factor creating economic values." Rudolf Steiner, Economics, The World As One Economy, Lecture 2: The Economic Process (July 25, 1922) p. 48

"But the moment a rope is wound round the wheel and used to drive some machine, at that moment, that which would not otherwise be labor at al in the economic sense, is turned to good account by intelligence." Rudolf

Steiner, Economics, The World As One Economy, Lecture 2: The Economic Process (July 25, 1922) p. 48

18) Economic value is created through human activity transforming the land and its products.

First, economic value is created when human activity enhances and transforms nature and its products. Food and products come from nature and the resources coming from the land. Agriculture and exchange that began with the earliest settlements creates the new phenomena of economic value and a surplus beyond one's immediate needs.

"To grasp economics we must first consider how, on the one hand, value appears as land transformed by labor - land seen through labor- while, on the other hand, it appears as labor seen through intelligence." Rudolf Steiner, Economics, The World As One Economy, Lecture 2: The Economic Process (July 25, 1922) p. 51.

"That which reaches down into nature would then be comparable with the part of the spectrum which extends into the infra-red." Rudolf Steiner, Economics, The World As One Economy, Lecture 1: From Industrialism To World Economy (July 24, 1922) p. 37

19) Economic value is created by human intelligence modifying and organizing human activity.

Second, economic value is created when human intelligence enhances human activity or labor. Intelligence creates human capacities, skills and talents. Since the early Renaissance an explosion of innovation, creativity and individual achievement has provided the groundwork for our modern 'knowledge and content worker' economy[34]. Intelligence creates human capacities and products come from Nature.

"Human economic working has to a very large extent been drawn into what I am here comparing with ultra-violet. I refer to the workings of capital as such." Rudolf Steiner, Economics, The World As One Economy, Lecture 1: From Industrialism To World Economy (July 24, 1922) 2 p. 38

20) Two origins of economic value can be seen as a polarity between land on one side and intelligence on the other.

A continuum image is used in the economics lectures to depict how economic values are created in the economic process. Invisible infrared represents the nature pole of value creation and invisible ultraviolet represents the intelligence pole of value creation. The visible light between these two represents the normal everyday economy represented by the activity of human beings as they produce, distribute and consume values (in the form of goods), all mediated by money.

“There is every kind of fluctuating condition, but one fact will always be in evidence: The value-creating factors in the economic process will always be found at these two opposite poles.” Rudolf Steiner, Economics, The World As One Economy, Lecture 2: The Economic Process (July 25, 1922) p. 49.

"These two origins of value are real polar opposites: they differ as, in the spectrum, the one - the luminous or yellow pole - differs from the other - the blue or violet." Rudolf Steiner, Economics, The World As One Economy, Lecture 2: The Economic Process (July 25, 1922) p. 51.

21) Economic values are created from two directions: the land and its products are modified by human activity or human activity is modified and organized by intelligence.

Coal in the ground has no economic value until it is brought to the surface, cleaned, sorted, bagged and delivered

[34] Peter Drucker, "Landmarks of Tomorrow" (New York, Harper and Row 1957). p. 122. Drucker coined the term 'knowledge-worker' that was later adopted by the marketing department of Apple Computer, Inc. to introduce the Macintosh computer in 1984.

to market – by and for human beings. As time passes, the increase in human ingenuity and creativity means that more and more value is of the V^2 kind, resulting, as it were, in more capital or credit in the world relative to money. The economic process is predicated at one side' on land or 'nature', who's products result from human labor (V1) all the while organized by intelligence (V2) – which is the other side.

Rudolf Steiner in his 1922 lectures to economics students used the electromagnetic spectrum to describe the two ways economic value can be created. Visible light exists between the two poles of infrared and ultraviolet where the normal economy (visible light) is analogous to human activity. The invisible infrared pole is analogous to Nature and ultraviolet pole represents human creative intelligence. Economic value is first created when human activity enhances and transforms nature and its products. Economic value is also created when human intelligence enhances human activity (labor).

The economic values created from labor working on nature (V1) are exchanged immediately to actively meet human needs. The economic values created from intelligence working on human activity (labor) are resources exchanged over a period of time. The first is related to trade, purchase money and the Income & Expense accounts whereas the second is related to finance, the balance sheet and loan money. On the one side is the quality of immediate exchange that reflects the trace of the transaction (flow). The other side is a quality reflecting a more enduring transaction or relationship (stock). The one having a lot to do with the past and the other with the future.

"There is indeed no other ways in which economic values are created. Either land is modified by labor (V1), or labor is modified by intelligence (V2)." Rudolf Steiner, Economics, The World As One Economy, Lecture 2: The Economic Process (July 25, 1922) P. 48

22) The economic health ratio below is a mathematical way of expressing the fact that economic values derived from intelligence (V2) acting on human labor has the effect of extending economic value derived from nature (V1) stretching it further and further, increasing its value exponentially.

When the value creation process is looked at as a polarity there is on the one side land and its products being transformed by human activity (labor) and made into a value. This is V1 or the nature pole of the value creation continuum (polarity). This can also be expressed as land (Ld) modified by work (w) Value (V). This is expressed in the shorthand as – LdwV – land modified by human work creating economic value.

These commodities from nature (land) are continually divided (extended) by human intelligence thereby continually multiplying their effects creating another form of economic value, human intelligence improving and organizing labor. This is V2 or the intelligence pole of the value creation continuum. This is expressed symbolically by saying that labor (La) organized by intelligence (i) and made into a value (V) in the shorthand is: La i V. This 'money from intelligence' is the divisor in its relationship to 'commodity from nature' as it extends the values derived from nature and its products.

The one kind of value (V1) is circulating trade money for purchase of commodities that is made more efficient and valuable through another kind of value (V2), applied intelligence and creativity, that becomes capital money. The point is not to solve the equation but to see and understand the significance of the relationship between the two. Commodity-values are expressed in the form of a price as purchase money (PM). It is in relationship to a different kind of value expressed in the form of capital as loan money (LM) or capital money as a value derived from active intelligence applied to labor.

This relationship or ratio describes a process of synthesis when the products of the land along with the subsequent human activity disappear into the creation of pure capital. Capital is emancipated from both land and labor – a synthesis of nature and human effort.

"This interaction, which cannot be represented by a subtraction but only by a division, represents the real health of the economic process: *

$$\text{Economic Health (X)} = \frac{Ld \text{ w } V = \text{Commodity}}{Lr \text{ i } V = \text{Money}}$$

Rudolf Steiner, Economics, The World As One Economy, Lecture 4: Division Of Labor And Creation Of Value (July 27, 1922) p. 71

This formula represents the relationship between the two poles of value creation – nature and intelligence or land and capital. Where Ld is land and w V is value derived form the human being working on and modifying the land (nature) and its products. On the other side there is Lr that represents Labor and i V is value derived from intelligence modifying labor.

* Ld = Land or Nature; w = labor; V = economic value; Lr = labor; i = intelligence (NI^V; Ls^V)

23) Prices arise from the interplay of values between the two poles of V^1 and V^2.

By using the visual of the value creation continuum image (see image # 5 - page 35) it is possible to understand the two poles of value creation – goods born of the land and born of intelligence. Economic values are derived from a varied mix of these qualities as they interact and combine, resulting in price. It is very difficult to follow the myriad values that play a part in establishing a price.

"Now what is it that emerges in the economic process when value and value, as it were, impinge on one another in the process of exchange? It is price." Rudolf Steiner, Economics, The World As One Economy, Lecture 2: The Economic Process (July 25, 1922) p. 49.

"Value set against value gives you price." Rudolf Steiner, Economics, The World As One Economy, Lecture 2: The Economic Process (July 25, 1922) p. 49

24) Values are invisible and fluctuating as they move through the economic process.

It is not the things that are exchanged in economic life but the ever changing invisible economic values attached to them that are exchanged and not the substance.

"But we must not forget that whatever appears in the economic life will always be fluctuating" Rudolf Steiner, Economics, The World As One Economy, Lecture 4: Division Of Labor And Creation Of Value (July 27, 1922) P. 71

"Ideas in economics must be altogether mobile. We must rid ourselves of the habit of constructing concepts capable of absolute definition. We must realize that we are dealing with a living process, and must transform our concepts along with that process." Rudolf Steiner, Economics, The World As One Economy, Lecture 1: From Industrialism To World Economy (July 24, 1922) P. 39

25) Invisible values are exchanged in economics not the physical goods per se.

This is an important economic concept that is worth thinking through. First, when an exchange happens both parties need to evaluate in the moment, "Does it makes sense to trade and will I be the better for it?" Only if both decide to do so will the exchange occur. A piece of fruit has a certain value at one moment and the next it has less value due to satiation or decay. Even though little time is spent thinking through the actual process of an exchange, it is nonetheless true that 'value' exchange hovers, so to speak, above goods – whether directly as in

barter, or indirectly as when money serves as proxy. In pure economic terms, it is the fluctuating invisible values that are exchanged and not the goods.

"In economics we must speak of values, not goods, as the elementary thing." Rudolf Steiner, Economics, The World As One Economy, Lecture 2: The Economic Process (July 25, 1922) p. 49

26) Values and prices are indicators of economic conditions that point to something else.

Just as a thermometer acts as a sensor of the ambient environment economic values and prices sense the economic environment. The temperature indicates action is needed in order to balance the ambient environment higher or lower just as value and price indicate that action is needed to balance the economy. Just as direct manipulation of the thermometer will not balance the temperature, setting values and prices directly will not balance the economy in the long run.

If prices are to high for a product it could indicate a need to have more human beings involved in the production. When prices get to low a way needs to be found to increase sales or reduce the number of workers.

"It only begins to have a real meaning when we regard prices and values much as we regard the positions of the mercury - as indicators, pointing to something else." Rudolf Steiner, Economics, The World As One Economy, Lecture 3: Economic Science (July 26, 1922) p. 52

"The cardinal question is that of price. We must observe prices as we observe the degrees of the thermometer, and then look for the underlying conditions." Rudolf Steiner, Economics, The World As One Economy, Lecture 2: The Economic Process (July 25, 1922) p. 59

"The point is: if prices fall in such a way, we must do something of a kind that can increase turnover." Rudolf Steiner, Economics, The World As One Economy, Lecture 2: The Economic Process (July 25, 1922) p. 53

27) Their is a tendency for the prices that arise from the value creating process to be distorted and need be brought into balance.

Rents and land increase in value due to false ascending processes while values related to intelligence and will are undervalued.

"Such ascending and descending processes must equally be present in the economic life: there must be the tendency on the one hand to falsify prices by the formation of rent, and on the other hand the tendency to lower prices on the side of industrial capital." Rudolf Steiner, Economics, The World As One Economy, Lecture 7: The Factors Of Price Formulation (July 30, 1922) p. 101

IV. Accounts

Money has become moving bookkeeping.

In order to view and share with others the ongoing activity of fluctuating invisible values it is necessary to have a permanent record of the corresponding values coming in, going out and remaining. An account holds this information about the values exchanged all expressed in the form of prices.

"Money is nothing but the externally expressed value which is gained in the economic process through the division

of labor and transmitted from one person to another." Rudolf Steiner, Economics, The World As One Economy, Lecture 4: Division Of Labor and Creation of Values (July 27, 1922) p. 66

28) Money has become an interconnected worldwide movement of bookkeeping transactions.

Money is really an accounting concept that dates back to antiquity and has provided the means for managing society and the economy. Accounting (bookkeeping) in one form or another has been underlying or accompanying human development since civilization began. Considering that in its current form double entry accounting provides the structure underpinning the global financial architecture, it is no wonder that technological developments have made it so that money has become moving bookkeeping – shared and universal double entry accounting, that is.

“All forms of money transactions are book-keeping. It’s just that money changes hands instead of entries changing from debit to credit columns.” Economics, Rudolf Steiner, Discourse 6, August 5, 1922 p. 223.

29) The key tools for consciously managing the economy sustainably are money and accounting.

The insight from Rudolf Steiner's economic lectures of 1922, that money was becoming global bookkeeping (accounting), has proven to be the case, as modern technology has made instant electronic transactions and virtual distributed ledgers possible worldwide. The underlying structure of money, as well as today's modern global financial structure, is the technique or even language of double entry accounting. Double entry accounting acts as a tool to perceive the effects of world trade and world finance, which is managed by modern central banks and bankers. The new trend is to have an association of individuals and payment systems replacing central bank expertise as individuals increase their economic awareness worldwide.

"For it is with money that we master the economic process nowadays." Rudolf Steiner, Economics, The World As One Economy, Lecture 12: Money (August 4, 1922) p. 155.

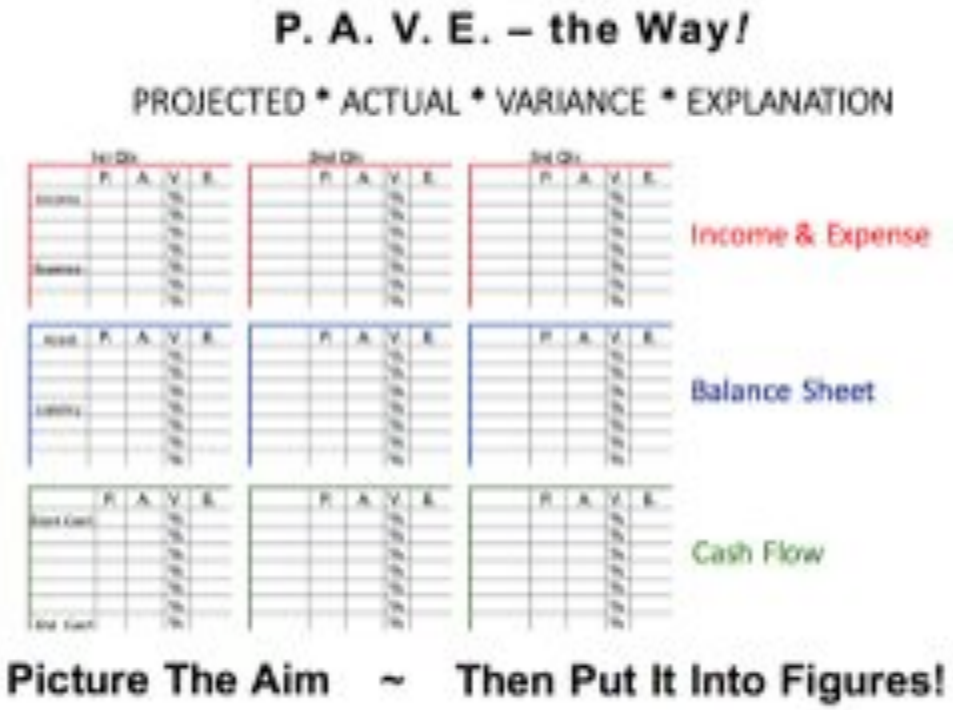
“All forms of money transactions are book-keeping. It’s just that money changes hands instead of entries changing from debit to credit columns.” Rudolf Steiner, Economics: The World As One Economy: Further On Money, Discourse 6 (August 5, 1922) p. 223.

"The student learns to think about economic events in the first instance as altering the accounts." John Hicks, (1904 - 1989).

V. CASH FLOW (P.A.V.E.™)

30) Understand and Manage:
1) Profit - I & E
2) Capital - B/S
3) Cash - CF

P.A.V.E. the Way® Exercise
This exercise introduces the basic purpose and principles underlying a financial forecast. A forecast is created that includes projected figures next to the actual along with the variance between the two followed by an explanation, whether over or under the projected figures. Insight and foresight are gained in the process.



31) The Money View - Understanding 2 kinds of money from an accounting perspective.

1) Everyone is a Bank

2) Every human being faces the need to have enough cash inflow to match the anticipated cash outflow.

3) The economy is the sum of all the bank-like individuals all related to each other in a worldwide 'money flow' economy.

4) My inflow is your outflow. My asset is your debt.

5) The interconnected nature of all balance sheets, great and small, is the reason for its inherent instability and dynamic tendency to fluctuate between extremes.

6). The inherently hierarchical money-flow system determines what counts as money (inflation metric) and what counts as credit (interest metric) all depending on the level in the system. This creates elasticity and expansion on the one side and discipline and contraction on the other.

7). The dealers (banks) knit together the layers in the hierarchy and make a profit on the two-way markets between money at a higher level and credit at a lower level.

8). Central banks can, but do not need to, make a profit and therefore, can play a special role as stewards of the economy as a whole.[4]

[4] Bagehot is the origin of all modern monetary policy.

Source: Professor Mehrling's 'Money View' Blog (http://ineteconomics.org/blog/money-view/), adapted and edited edited. from the August 2011 Associate! Publisher: Centre for Associative Economics Ltd., on behalf of the Economics Conference of the Goetheanum.

Economics Lectures: Links to Accounting and Money

From the excerpts related to the theme 'exchange of value' three stood out. One is from Lecture Two, with input from Lecture Ten, and the other is from Lecture Six. The first is about buying and selling (exchange) and the second describes the essential qualities of payment and loan in the economic process. Both can be viewed directly through experience in the process of doing a short set of accounting exercises from 'Accounting in a Nutshell' (See Section Three, page 50). The concepts from Lecture Two and Six are especially useful for understanding how economics, accounting and money are linked. In addition, a third theme includes two excerpts that go together as bookends making clear what the accounting and money are tracking as the economic process takes its course.

Lecture Two: Buying and Selling (Payment)

"The economic process takes its course in the activity of buying and selling, essentially, that is, in the exchange of values." Rudolf Steiner, Economics, The World As One Economy, Lecture Two: The Economic Process (July 25, 1922) p. 49

"By the bare process of exchange, the things exchanged on both sides become of greater value." Rudolf Steiner, Economics, The World As One Economy, Lecture Ten: On Associations (August 2, 1922) P. 125

There is no better way to see the results of economic exchange than in the specially organized accounts of double entry accounting. The nature of exchange is depicted using a simple sketch that visually demonstrates that both parties in an exchange make a gain – a surplus – in fact, a dual surplus.[35] This economic phenomenon can be perceived in precise fashion as one proceeds through the hands-on accounting exercise, makes visible the dual surplus of any transaction.

When this process is examined carefully it is apparent that both sides in any transaction are making a double valuation, balancing immediate and future needs, before the exchange is made. In addition, as human beings settled, as in Jericho, they exchange with each other more and more as they met each other's needs. As noted above however, there is a growing correlated phenomenon of surplus value arising from the exchange itself. This coming into movement as a result of buying and selling is described in Lecture Two and Ten as an invisible perpetual process in which we are all participants.

Lecture Six: Payment and Loan

"In addition to payment there must be loan capital. Here then we have two very important factors in the economic process – payment and loan." Rudolf Steiner, Economics, The World As One Economy, Lecture Six: True Price (July 29, 1922) p. 88.

The description of buying and lending in this lecture also the source of the two qualities of an exchange or transaction – immediate and ongoing. With immediate payment for a good the relationship is completed and finished at once. A loan continues, as it is not completed all at once. There is a continuing relationship until the loan is paid, when the transaction is completed.

[35] See chapter one in 'Of Wheat and Gold' for an explanation of Rudolf Steiner's twin theory of value and the nature of exchange as creating a dual surplus. Of Wheat and Gold: Thoughts on the Nature and Future of Money, Christopher Houghton Budd, PhD (New Economy Publications, Canterbury, Kent, England, 1988).

Concepts in accounting can be depicted using colors and multiple layers of related concepts using the value creation, circulation and perception images. The accounting exercise following single to double to closing entry will show how these two qualities form the basis of double entry accounting. The economic category of 'Loan' is not the same as a loan from someone, which is a financial instrument and not an ordering concept.[36]

Lecture Two & Seven: From Land, Labor & Capital to Purchase, Gift & Loan

"Certainly, to begin with, tracing the economic process reveals these three factors – that which comes from land, that which is achieved by labor and that which is derived from, or directed by means of capital." Rudolf Steiner, Economics, The World As One Economy, Lecture Two: The Economic Process (July 25, 1922) p. 44.

In this lecture land, labor and capital are recognized as the conventional starting place for understanding the economic process: value derived from land, achieved by labor or derived from capital. But does economic value inherently come from the land, labor or capital? This question is addressed in the value creation continuum image used to visualize the economic value creation process in relation to these three factors (see image # 5 page 45).

"Let us realize at once that there can be no economic system without this interplay of loan, gift and purchase." Rudolf Steiner, Economics, The World As One Economy, Lecture Seven: The Factors of Price Formation (July 30, 1922) p. 93.

Rather than look at these three important economic factors in a static fashion Lecture Seven makes it clear that, lying underneath as it were, there is something else moving the economic process – the interplay of purchase, loan and gift money. Double entry accounting tracks economic actions by making money visible as it changes value in its movement through production, consumption and distribution. Three economic images are used to visualize the movement of economic value through land, labor and capital in order to see the relationships between accounting and money and their use for managing the economy. [37]

[36] "Loan is meant to refer to an economic category that hovers above, includes, but is not synonymous with, the loans we more usually speak of Loan as an ordering concept, not a financial instrument. Bank loans can indeed, and often do, have a non-loan character. They become gifts when remitted in the face of over-indebtedness, for example: purchases when the cost of the loan is as great as the return it provides – that is, when the borrower's profit is soaked up by economically excessive interest charges, which transfer away from him more value than he has been able to create." Economics, Rudolf Steiner, Lecture VI July 29, 1922 p. 88 (see Note 38, editor Christopher Houghton Budd, page 237.)

[37] This refers to three of the twelve images used as aids for thinking through economic concepts for establishing a living relationship and deeper understanding of the exchange of value in the economic process (see # 4 'Synthesis: The Economics Process' at the top of page 35).

Essential Images

The Economics and Accounting Images

The images are based on the economics course of Rudolf Steiner given in 1922 to economics students. Three large format black panel drawings were used as representative images for describing the creation, circulation and perception of economic value in the economic process. A fourth depicts the evolution of society, the individual and exchange in the economic process using a timeline, significant events and biographies. The remaining eight black panel drawings are used for explaining essential associative economics axioms and double entry accounting.

All twelve large-format wall visuals (p. 42-48) are used to accommodate several layers of related economic and monetary ideas as they arise in conversation during the training. Both students and trainer use the visuals in conjunction with 'Economics from the Ground Up' and 'Accounting in a Nutshell' as a reference and communication tool for asking and answering economic and financial questions.

Timeline Image

One of the twelve panes is the 'World History through Economics' timeline (# 3 page 43) that provides an introduction and ongoing reference point for both 'Economics from the Ground Up' and 'Accounting in a Nutshell'. The timeline begins on the left side of the large format black paper drawing beginning with the time of the Agricultural Revolution, then passing through the 'Time of Transition' at the end of the Renaissance, then advancing to the present on the right of the drawing. The timeline presentation depicting the evolving economic life reveals for discussion key connections to the changing forms of money and accounting in relation to the individual and society

Twelve Images: Titles - Descriptions - Methods

1) Driver of Economic Life: The Human Being in a World Economy
2) Symmetry as Explanatory Device
3) World History Through Economics and Finance: A Visual Timeline
4) Synthesis: The Economic Process
5) Money: Circulation of Economic Value
6) Economics: Creation of Economic Value
7) Accounting: Perception of Economic Value
8) Synthesis: The Economic Process
9) Taking Initiative: Stepping into The Future
10) Find a Need and Meet it with Your Abilities
11) The Structure of Double Entry Accounting
12) P.A.V.E. – Picture the Aim and Express it in Figures for the Future

Image Descriptions (12)

1) Driver of Economic Life: The Human Being

This image is used to talk about the human being as driver of the economy and not the market or state. Related layers of concepts from the text of the Economics Course can be added to the image reinforcing

related ideas in order to build a shared image. Accounting has become the universal language for a one-world economy that all share. Individual micro actions can be seen to have large-scale macro significance.

Instructor Notes:
The human being is also capable of having interest in others and their needs in addition to self-interest. Associative economics includes both. Adam Smith indicated that self-interest is the most social thing one can do, for it automatically orders society so that it works for everyone. The dominant concepts of competition and market forces can evolve towards cooperation and responsibility. Rather than looking at the part of the human being that is focused on our often unconscious drives, it is also possible to emphasize a higher more enlightened consciousness.

Both J. M. Keynes and R. Steiner described the emergence of world economy out of the old personal and national economies. The self-contained system of household economy grew into the town economy, which grew into the state economy, and now we have moved into a world, or global economy. "The inhabitant of London could order by telephone, sipping his morning tea in bed, the various products of the whole earth he could at the same time and by the same means adventure his wealth in the natural resources and new enterprise of any quarter of the world he could secure forthwith, if he wished, cheap and comfortable means of transit to any country or climate without passport or other formality."[38]

In a market economy unconscious instincts strive for the lowest price; whereas conscious interest in others seeks to pay the true price. This means being aware of and interested in the 'other side' of the transaction – the exchange of economic value. Do we take advantage of our friends by trying to get the lowest price or do we ask if it is enough so they can continue in future? Economics is about finding the meaning in life, a balance.

2) Symmetry as Explanatory Device

Symmetry is a powerful explanatory tool in many disciplines, including mathematics, physics, art, economics, money and accounting. Symmetry does not mean dualism; it is more about polarity, continuum and the idea of different logics needing to be resolved.

Instructor Notes:
The concepts reciprocity, polarity and proportion play an important role in understanding economic life. J. K. Galbraith: 'The entirety of economics is a bi-polar affair.' Without two eyes crossing we could not perceive in the marvelous way we do!

"In all human perception a symmetry comes to expression, a right and left symmetry. Had he not two

[38] J. M. Keynes, "The Economic Consequences of the Peace" (New York: Harcourt, Brace, and Howe 1920). "The inhabitant of London could order by telephone, sipping his morning tea in bed, the various products of the whole earth, in such quantity as he might see fit, and reasonably expect their early delivery upon his doorstep; he could at the same moment and by the same means adventure his wealth in the natural resources and new enterprises of any quarter of the world, and share, without exertion or even trouble, in their prospective fruits and advantages; or he could decide to couple the security of his fortunes with the good faith of the townspeople of any substantial municipality in any continent that fancy or information might recommend."

ears, two eyes, and two noses, man would not attain to the perception of his own I or Ego." Rudolf Steiner, Lecture Two, November 1, 1914 Dornach, Switzerland.

"From our perspective symmetries are the foundations from which laws spring." Brian Greene, Physicist and Mathematician, Columbia University, New York, New York.

3) Visual Timeline: World History Through Economics and Finance

The economic and financial time line is built up through conversation in order to enhance an understanding of the evolution of money and economics as depicted in Rudolf Steiner's economics course 1922.

Instructor Notes:
A visual timeline of events is presented first in order to provide a context for introducing the development of economics, accounting and money. The process of exchange begins with the first human settlements where the story of civilization begins. The timeline is a storytelling device and explanatory tool for exploring economic concepts and significant historical moments from Jericho to the Republic of Venice in order to live into the economic process with our thinking and imagination.

Using color chalk on 3’ x 6’ black paper a chronological sketch of significant characteristic moments and biographies are depicted along a line showing the historical development of the individual and society and their relationship to the changing forms of economic life and money. By placing key events pictorially on a broad historical timeline it is possible to get a sense for the evolution of society and the individual in relationship to the parallel development of the forms of money and economic life.

4) Synthesis: The Economic Process

The three images have been designed to act as aids for communicating economic ideas pictorially and are used separately as appropriate in order to layer the various economic concepts, visually revealing their relationships: 1) the continuum line pointing downward and upward, 2) an open-ended circulation lemniscate, and 3) a left-right oriented T-form.

With this orientation and use of the three images it is possible to quickly gain a very basic understanding of economics by focusing on the most essential aspect of economics – the exchange of value in the economic process of circulation and its relationship to accounting as the language of economics as such.

Instructor Notes:
Economics, money and accounting have a special relationship to value. From one point of view, economics is about the creation of value as we meet each other’s needs, thus bringing the economic process into motion. Money facilitates the circulation of these economic values and accounting is used to precisely perceive and communicate them as they move through the three domains of economics, money and accounting. Using an appropriate image for each one can enhance the articulation and understanding of these three essential elements of the economic process. The images can be used to explain or communicate associative economic axioms derived from the economics course of Rudolf Steiner.

5) Economics: Creation of Economic Value

The electromagnetic spectrum image is alluded to in Lecture One of the economics course where Steiner used it to illustrate the value creation process. This image will be used as an aid to understanding the value creation process and other economic concepts.

Instructor Notes:
The next important economic concept is value. I use the image of the electromagnetic spectrum that depicts the continuum from low to high frequency waves. The left side, colored red, represents the invisible, to the naked eye, infrared pole. The right side, colored purple, is the ultraviolet pole. Between the two – orange, yellow, green, blue – representing visible light in this case, is the 'normal' economy.

Visible light exists between two poles of infrared and ultraviolet, the normal economy is analogous to the orange, yellow, green, blue portion, the visible light between the two poles.[39] The invisible infrared is analogous to nature and ultraviolet represents human intelligence. Economic value is created on one side when human activity enhances and transforms nature, creating goods.

Economic value is also created when human intelligence organizes human activity (labor). Intelligence comprises human capacities while products come from Nature. Capital is human intelligence and capacities expressing themselves. The products of nature come from the land. Human activity is called labor. Capital arises through the interplay of values derived from the land (nature) and acted upon by labor (human activity) and values derived from intelligence organizing human activity.

The modern division of labor is a profound spiritual and evolutionary process where the burden of a common economic task is shared. One can also say that capital results from the increasing division of labor.

Developing over and above the normal economy is an ultra economic life determined by the growing power of accumulated capital.

The financial system grows over and above the ultra economics life of accumulated surplus capital not needed for the means of production. Financialism - money economics - arises out of the capital formation process when there is excess liquidity beyond what is needed for investment in enterprises.

The active cultural life then creates future economic value.

Remove land, labor & capital as commodities and they become the natural boundaries of the economy – the three bottom lines – people, planet and profit - the social, environmental, and financial.

When I sell something I receive cash and debit the account as value entering. When I buy something

[39] Rudolf Steiner, "Economics: The World as One Economy" (New Economy Publications, Canterbury, England 1996). In Chapter Two July 25, 1922 P. 51. "You may well hold fast this picture: Just as in the spectrum the warm colors appear on the one side, so on one side of the economic process there appears the land-value which will show itself more in the formation of rents* – the side of land transformed by labor (V^1). On the other side there appears instead those values which are translated into capital. Labor transformed by intelligence (V^2)." * "Rent" is meant here in the strict economic sense, the value that emerges from land. (see Note 19, editor Christopher Houghton Budd, page 230).

cash leaves my account as a credit because value is leaving the account. Economic value arises on the one side when the products of nature are transformed by human activity as it is put into economic circulation.

Economic value can also arise when human activity (labor) is transformed and enhanced by human creative intelligence. Economic value can be created when land is modified by human activity (labor) and human activity (labor) is transformed by human creative intelligence.

6) Money: Circulation of Economic Value

An open-ended lemniscate image is used to help explain concepts related to the circulation of value and money in the economic process.

Instructor Notes:
What is the most important aspect of the economic process in exchange? It is the fact of buying and selling. Buying and selling is really production and consumption that forms a polarity that needs human intervention to counter the imbalances that arise. Exchange is the human element of economics. Production is done for others and consumption for oneself. Exchange belongs to neither pole alone and is neither selfless nor selfish but a resolution of the two and balances the poles of production and consumption.[40]

What brings the economic process into motion? The movement of production to consumption brings the economic process into motion. Circulation. Accurate knowledge of the nature of exchange, meeting one another's needs, is required for regulation and intrinsic self-balancing. In other words, recognizing that it is not possible for creative human intelligence to express itself without creating needs. Human needs cannot be met without human intelligence expressing itself.

The world economy is the sum of all exchanges that are also transactions. As long as there are needs to be met, this is a perpetual phenomenon and all its elements are in reciprocal relationship. Values fluctuate with place, time and varying human needs. Price comes about out of the invisible process of exchanging fluctuating economic values as a result of exchange, circulation, distribution and relationship.

When I sell something I receive cash and debit the account as value entering in. When I buy something cash leaves my account; credit entry (out).

7) Accounting: Perception of Economic Value

The third primary image serves as a visual aid for understanding the language of double entry accounting that is the basis for perceiving economic value and communicating with others in a common language.

[40] Christopher Houghton Budd, Prelude in Economics (New Economy Publications, Canterbury 1979). Many ideas and approaches to understanding the basic associative economic concepts from the economics course of 1922 by Rudolf Steiner are found in Prelude in Economics. The economic images can be used to present related concepts by adding layers to the drawing that can edify their relationships and functions. The purpose of this is to enhance the ability to perceive the economic phenomena and then be able to 'think them through' for ourselves.

Instructor Notes:
When I sell something I receive cash and debit the account as value entering. When I buy something cash leaves my account, credit.

Insights are gleaned from the summary accounts, and foresight from the projected budget accounts are gained as increased awareness and perception guide one's economic actions in order to navigate the ship of enterprise.

Double Entry Accounting is the universal language of exchange in the economic process and can be understood to be three kinds of money.

8) The Nature of Exchange

This set of images is used to tell the primal story of exchange, the economic transaction, reinforcing the associative economic axiom that both sides make a gain.

Instructor Notes:
When did economics begin? The first settlements near Jericho. Civilization, economics and accounting (money) began over 11,000 years ago when the first settlements created a surplus from mining and agriculture.

9) Stepping into the Future: Taking Initiative!

This visual aids our understanding, in accounting and money terms, of the movement of economic value when first undertaking something.

Instructor Notes:
To undertake something or just stay alive creates exchange, value, accounts and cash flow that need to be managed to meet the aim. Taking initiative begins with the first monetary event where capital comes from somewhere and is received as cash in order to begin. The T-Account form is a visual aid for recording and perceiving this process of values leaving accounts in order to be received into another account.

10) Find A Need and Meet It!

Perceiving a human need in the world can be met by taking initiative and applying one's talents and skills. This large format color image helps us imagine how money in the form of cash and perceived via the T-account is related to taking initiative meeting a need.
11) The Structure of Double Entry Accounting

The T form is used as a visual aid and organizing device for depicting the fundamental structure, essential elements and their relationship. The story in this image is linked to Lecture Six and the description of the nature of two kinds of money.

Instructor Notes:
This image shows the underlying structure of double entry accounting and the relationships between permanent and temporary accounts and the five categories and their relationship to values entering and

leaving an account. The balance sheet (permanent) represents the assets, debt and equity and the income and expense statement (temporary) represents the activity of incurring expenses and income.

12) Picture the Aim and Express it in Figures for the Future

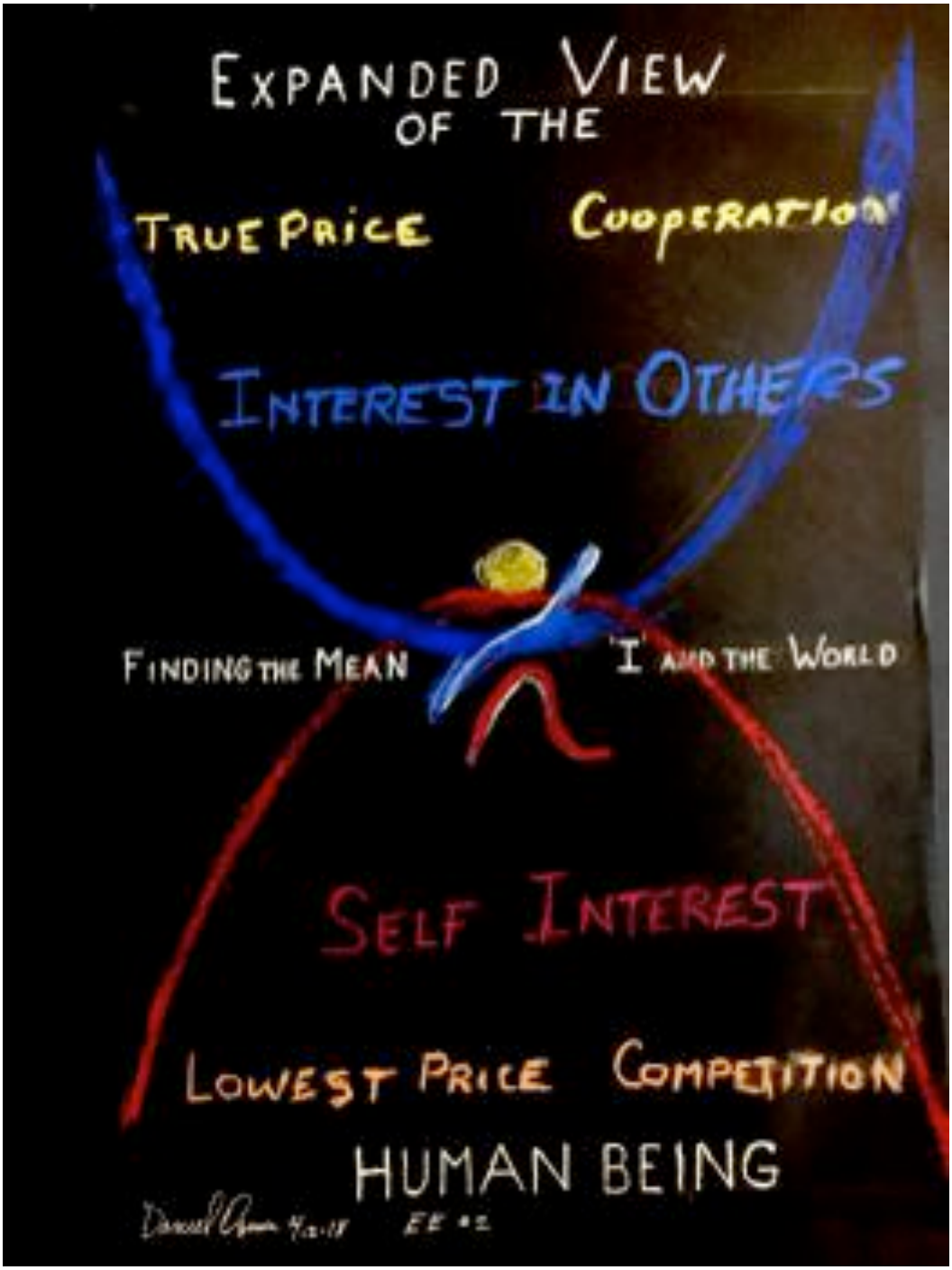
The expected results of an economic activity are projected into the future using the same categories and structure of double entry accounting. It shows the relationships between accounts by tracking future money flows and their effect on the economic activity. This anticipates future work.

Instructor Notes:
In any financial and economic literacy program for youth they would learn and practice creating a forecast for the future years' activity. Budgeted figures for the activity include the projected, the actual, the difference and an explanation, whether over, or under-estimated. This is done for each line item.

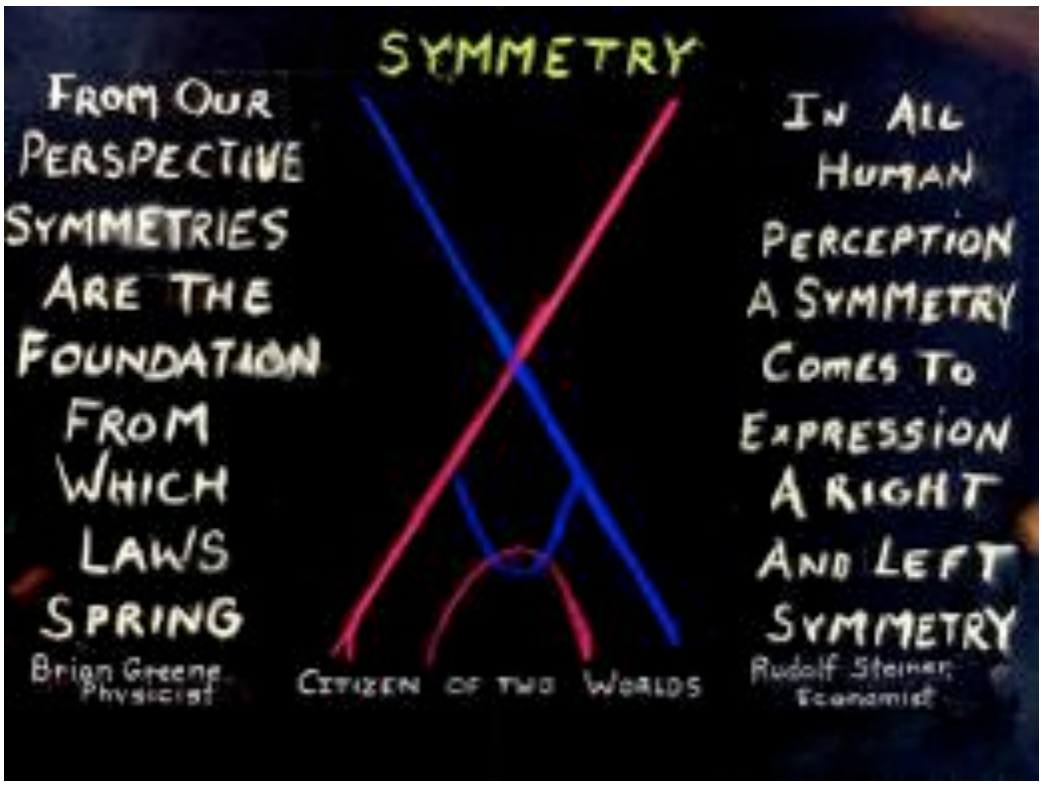
Methods for Black Paper Story Panels

1 Create the wall drawing from scratch as one presents the material to the participants
2 Create some of the drawing but leave aspects to be done during presentation
3 Create finished image and concepts to be used as story telling prompt
4 Create finished panel and then let participants describe its meaning
5 Ask participants to add to a drawing as they see things
6 Presenter and participants can build from a blank paper during the conversation

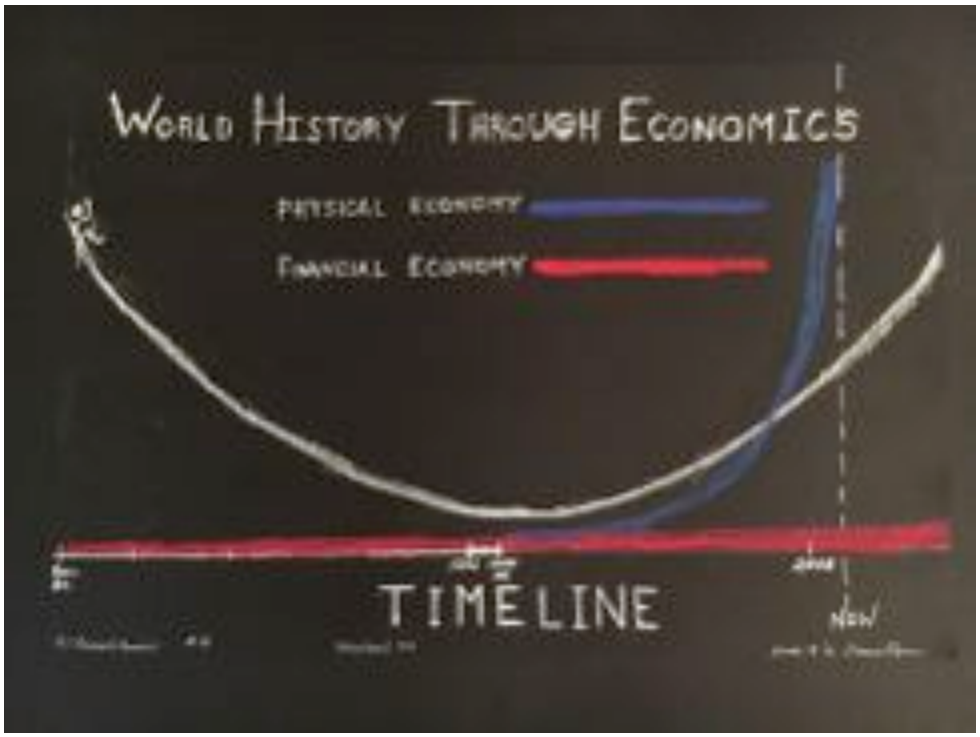
Twelve (12) Black Paper Drawings: Visual Aids



1) Driver of Economic Life: The Human Being

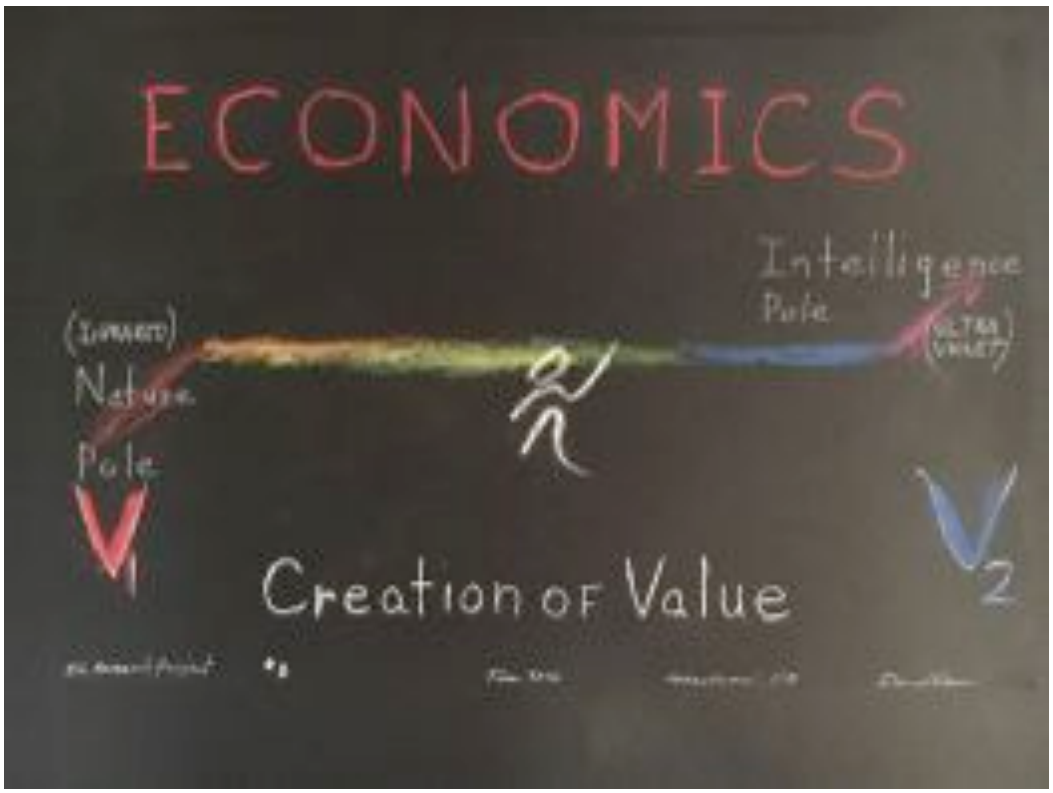


2) Symmetry as Explanatory Device

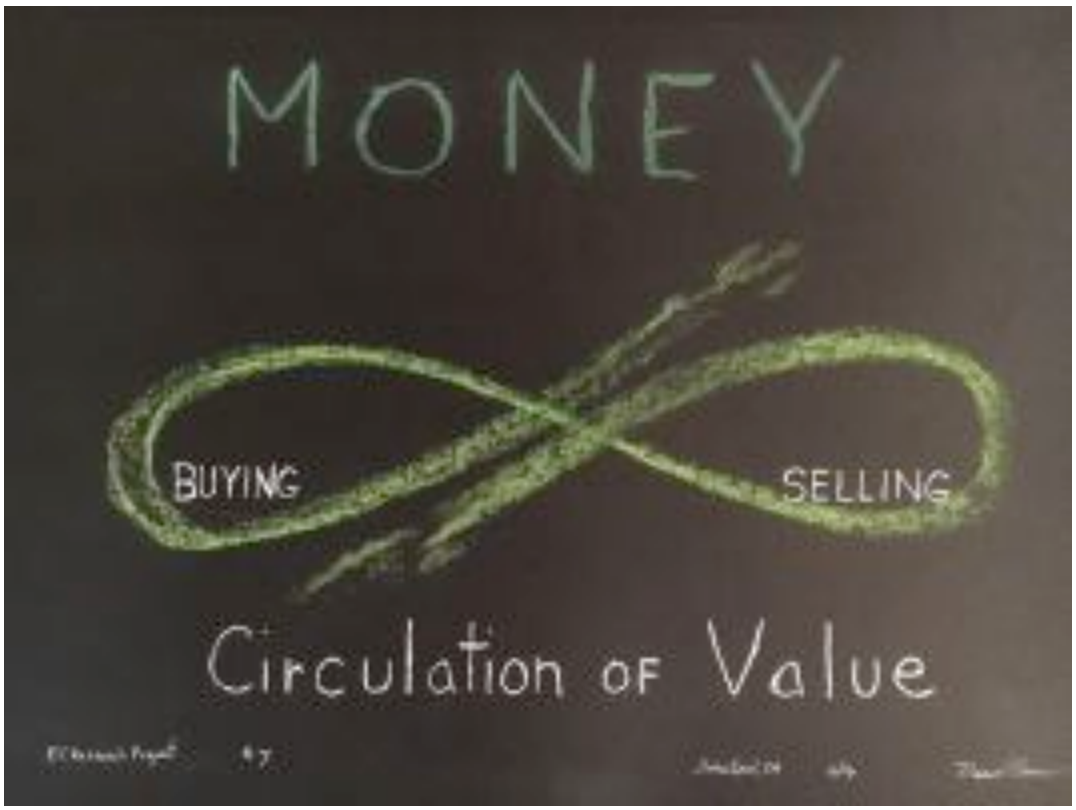


3) World History Through Economics and Finance: Visual Timeline

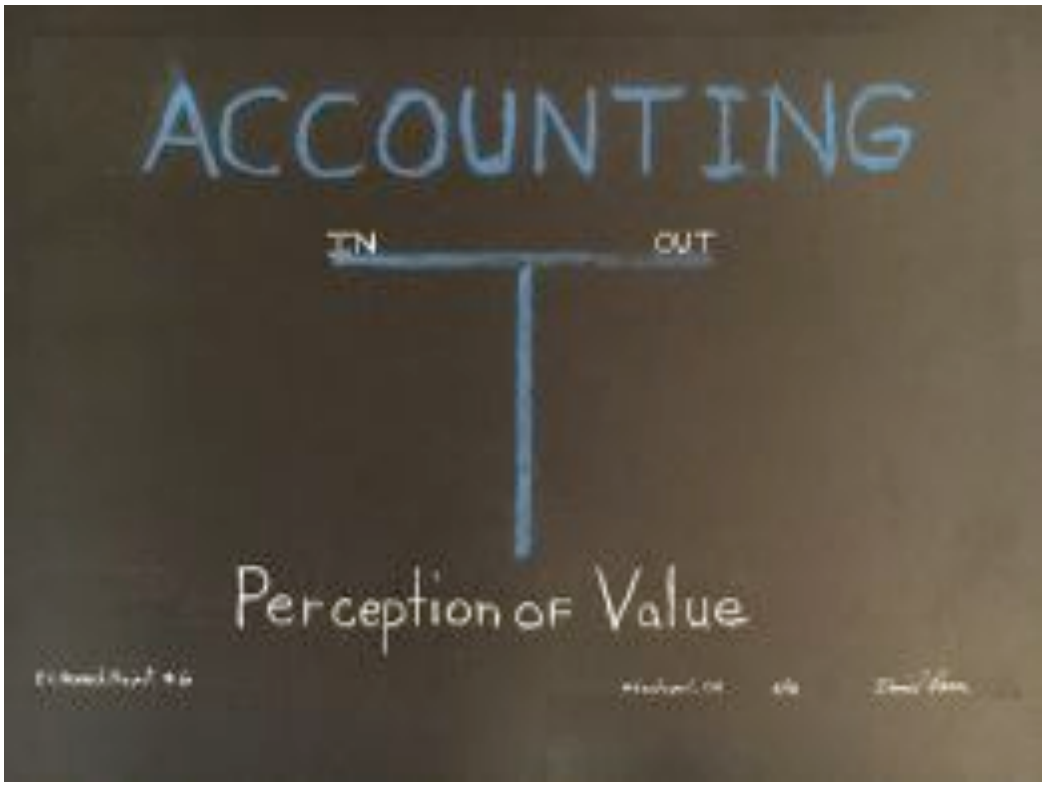
4) Synthesis: The Economic Process



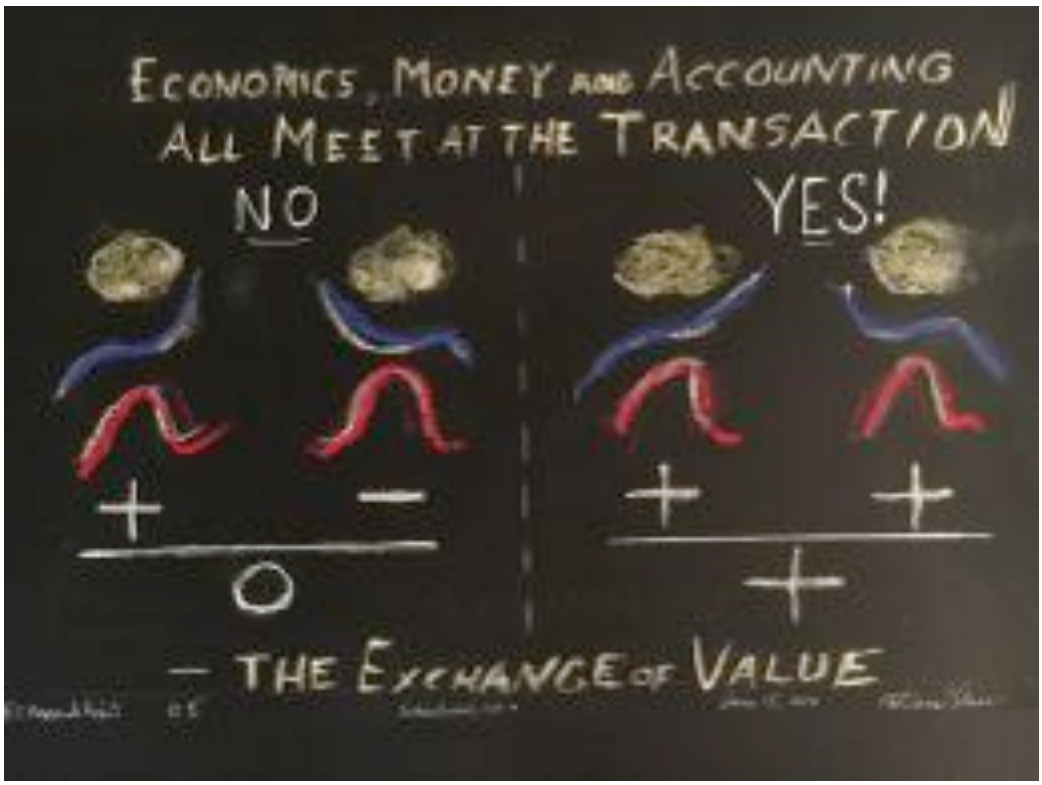
5) Economics: Creation of Economic Value



6) Money: Circulation of Economic Value



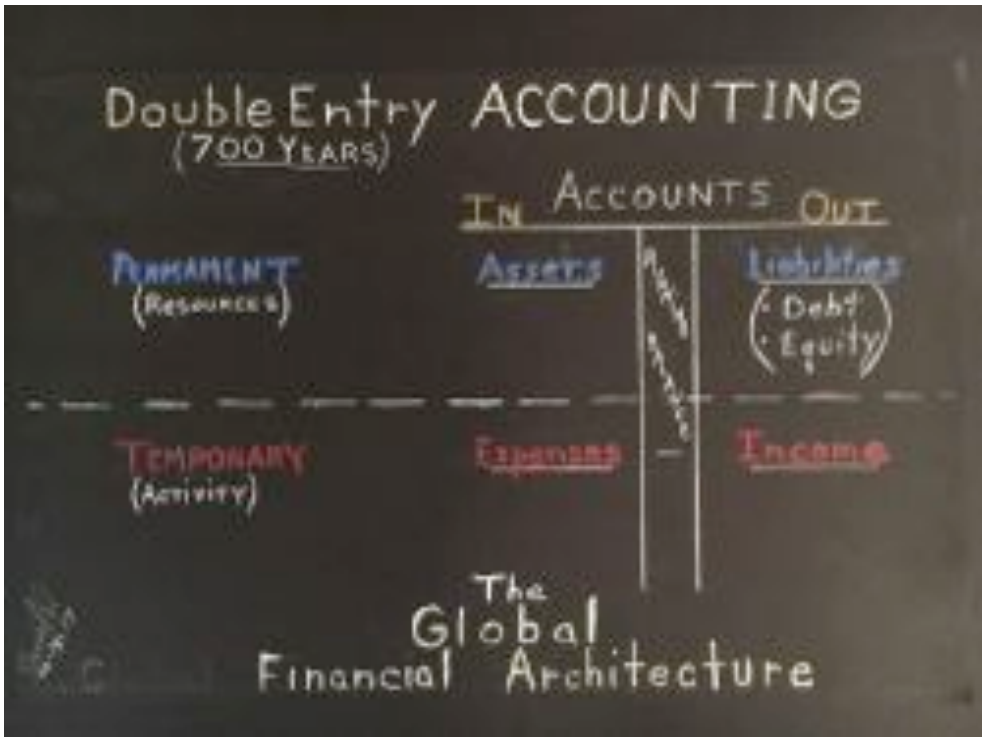
7) Accounting: Perception of Economic Value



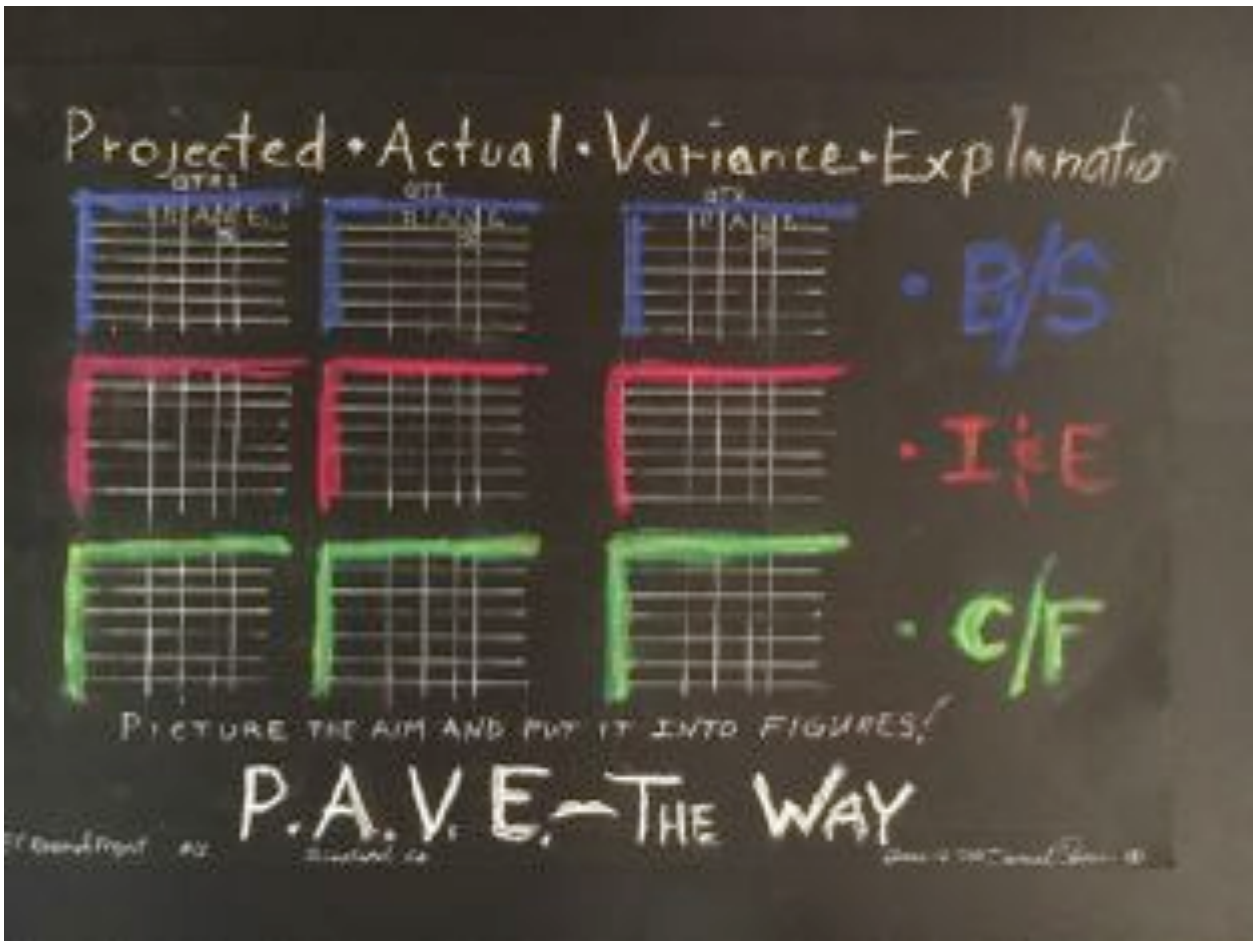
8) The Nature of Exchange in the Economic Process

9)Taking Initiative!: Stepping into the Future

10) Find a Need and Meet it with your Abilities



11) The Structure of Double Entry Accounting



12) Picture the Aim and Express it in Figures for the Future

THREE: ACCOUNTING IN A NUTSHELL

Introduction

The Transition from Single to Double Entry: Theory and Practice

A deeper understanding of the nature of money at an early age using double entry accounting helps avoid too strong a connection to money – or a too disconnected one – by making it possible to find a balance. Linking an understanding of the economic process and money with the practice of accounting informs and trains the youthful will in preparation for finding one's calling in life and stepping up to one's story with confidence, clarity and, hopefully, capital.

"If we bring back double-entry book-keeping – to business, to the commons, to the internet, to the marketplace, and to our everyday lives – we'll start another renaissance."[41]

'Accounting in a Nutshell' will use the transition from single to double entry accounting that took place from the 12th through the 15th century to provide a hands-on fast-path introduction to the technique of double entry accounting for the novice. This time period coincides with a general 'time of transition' that provided the impulse for the rest of the epoch and the birth of economic culture and a new emphasis on the importance of the individual. A burst of individual achievement, invention and discovery provided the platform and impetus for today's modern science, mathematics and econometrics.

Going through the process of moving from single to double entry accounting with a set of transactions acts as an effective teaching tool that allows for a deeper understanding of the underlying principles in a short period of time. The economics lectures from Rudolf Steiner in 1922 are intimately connected to an understanding of accounting and money. By taking a series of transactions that are needed in order to undertake a new activity in the world through the double entry accounting process a direct experience is gained. This is accomplished through a step-by-step hands-on entry of figures and a minimum use of technical terms, no formulas or semesters of accounting. Once learned, double entry accounting as a skill, is good for life. This language for life is the language of exchange and is used to manage economic life, take initiative and navigate the future. It allows individuals to act, not only for themselves, but also on behalf of others and the economy as a whole.

The ability to read and write was confined to a very few at the dawn of the Renaissance and yet is now the common possession of most elementary students. Just as today 'reading and writing' in the language of double entry accounting is confined to a few experts, in the future it will become the common possession of all students if it becomes embedded in the culture once again. Our founding fathers relied on double entry accounting to both manage themselves and new enterprises, and to build a country. Most of them were taught double entry accounting in their teens as a matter of course. The first American entrepreneur and economist Ben Franklin created a mini-manual on double-entry accounting that was made available to all postal customers, for he considered it essential for daily life. Franklin declared that all women and children should be trained in accounting because it would ensure "lasting advantage and enriching of the family." He practiced from and promoted an integrated

[41] Dan Palanza in an article by Doc Searles, *Medium* "The Second Coming of Double-Entry Bookkeeping" (August 19, 2016).

knowledge of economics, accounting and money as the way to manage oneself and the world.

The language of economics, exchange and finance is double entry accounting – a world language derived out of the nature of the human being – that today provides the basis for our global financial architecture.

The enhanced perception and ability to make adjustments to our actions that double entry accounting can achieve is much like crossing a busy street. Instead of blindly rushing immediately to the other side of the street because one can, despite the group of vehicles needing to come to a stop, one could perceive that waiting 10 seconds will allow for the clearing of the street so that traffic continues to flow. Now you can cross without effort or disruption of traffic at all. This is conscious perception and responsible action – in light of one's new awareness.

An epochal transformation in art, science and mathematics began just as Leonardo Bonacci (Fibonacci) published his Liber Abaci (1202). His Book of Calculation introduced Arabic numerals and algebra to northern Italy. This also ignited a transition from single to double entry accounting and from Roman numerals to Arabic numerals. The climax to this process was marked by the 1494 publication of Luca Pacioli's masterwork the Summa, an encyclopedic synthesis of current mathematical knowledge including the first complete description and codification of double entry accounting. They both contributed greatly to the transformation and eventual world wide implementation of double entry accounting, which also provided the vehicle for expanding the economy, fueling the Renaissance and shaping today's modern economy.

The Time of Transition: Historical Highlights

1. Eventually replacing Roman numbers, Arabic numbers and algebra were introduced to Europe via northern Italy by Leonardo Bonacci (Fibonacci) when he published his Liber Abaci in 1202 hastening the transition from single to double entry accounting.

2. The transition to the new financial technology of double entry accounting from single entry spread and enabled an unprecedented expansion of economic activity and innovation, financing the Renaissance in the process.

3. The Hanseatic League, a powerful collective of merchant guilds and towns, dominated commercial activity until they were undone by a new technology imported by the Dutch from Venice called the 'Venetian Method' (double entry accounting).[15] Their dependence on silver for transactions could not compete with the new vehicles of credit where bills of exchange made trade easier, quicker and safer.

4. The double entry accounting (bookkeeping) technique developed in northern Italy now forms the underlying structure of the modern global financial structure and the fundamental tool of all banks.

5. Double entry accounting became the anchor science for merchants and bankers in order to cope with rapid economic expansion and guide their enterprises.

6. The 12th through 15th centuries could be generally characterized as a 'Time of Transition' that provided the impulse for the rest of our epoch, meaning the birth of economic culture and the rise of individual will.

7. An explosion of individual achievement, invention and discovery sets the stage and leads to our current modern science, mathematics and global economy. Arabic numbers, algebra, Greek language teaching, dry compass, mechanical clock, universities, cathedrals, paper, printing press, lenses, optics, perspective in art, double entry accounting entered society.

8. Two streams of mathematics developed in parallel with each other – a lower commercial math for the lay person and a higher problem-solving math for the few scholars.

9. Leonardo and Luca had a major impact on BOTH mathematics and contributed to the popularization and advancement of BOTH.

10. Double entry accounting emerged from the lower commercial math and became the guiding science for the expanding economies. Modern mathematics and science emerged from the higher problem solving mathematics.

11. Algorithms, modern mathematics and eventually econometrics caused the eventual replacement of double entry accounting as the guiding technique for the economy.

Elements of The Transition: From Single to Double Entry Accounting

1. Early on the innovation of the Current Account allowed for the possibility of a running balance in accounting.

2. The Capital Account emerged and served as a place to show profit accumulation.

3. The Income and Expense accounts were recognized and the result of the activity at the end of a period is referred to as 'profit'.

4. The income and Expense accounts create an additional 'quality' of account. They are temporary ones that are periodically brought to zero (closed) in order to begin anew.

5. Single entry accounting is only concerned with one aspect of the exchange (transaction). What is coming ***in***, going ***out*** and left over?

6. Double entry accounting tracks the other side, namely where values have come from, and where they have gone to.

7. There are now two major qualities of accounts that are used to show values as they come in and go out and also where they come from and go to, thereby, adding perspective as there is an increased awareness of both aspects of the transaction.

8. Double entry accounting has five categories of accounts that can hold any transaction (exchange) that has an economic consequence and is measurable in monetary terms.

Accounting in a Nutshell Exercises

The following accounting exercises take the first few transactions of an activity so that students can use them to make entries as they go through the accounting process. Using pencil and worksheet the students follow the lead of the instructor doing the same in large print on the wall where all can see and hear as they do. Using the T form and very few technical terms, the initial start-up transactions are taken through the single entry accounting process continuing on through double entry and closing entries to its conclusion in the form of financial statements. This unique approach of utilizing the transition from single to double entry accounting as a pedagogical tool gives the student an engaging and relevant hands-on experience of the basic first principles of double entry accounting in an economic context in a short period of time.

Taking Initiative

Taking initiative through an activity creates exchange, value, accounts and cash flow that need to be managed in order to meet the original aim and ethos. Exchange is needed because we no longer rely on ourselves alone to meet our material needs but on those around us with whom we trade. When this is done economic value is created, in that both parties in exchange gets what they need to satisfy their economy, their situation. In order to view and share with others the ongoing activity of the constantly moving values it is necessary to have a permanent record of the corresponding values coming in, going out and remaining. An account holds this information about the values exchanged expressed as a price. The values that are held in the accounts are in the form of prices not all of which are cash or coin but promises to pay cash in the future.

Accounting is the language of the exchange of value in the economic process that can be expressed in three kinds of money. The duo of accounting and money makes it possible for the precise tracking of the flow of production, distribution and consumption in order to maintain a balanced economy – fair prices and affordable credit.[42]

One-Day Workshop

First, using a constructed timeline panel on the wall, a short history through the lens of economics is presented and discussed. This is a brief but broad historical sketch depicting the evolution of society and the individual in relation to the development of economic life and the changing forms of money. The final overlay of the timeline features an image of the development of the 'real' economy and the financial economy along with a discussion of its relationship to the 2008 financial crisis. (1 hour)

Second, the first accounting exercise set reflects a standard accounting approach fitting today's modern consciousness. Through both practice and theory, in less than 2 hours the students have experienced the entire journey from initial start-up transactions of an activity to ending financial statements in two hours. (1.5 hours)

Third, the second accounting exercise uses the exact same set of initial start-up transactions and takes them through the same double entry accounting process from the point of view of 'Roman numeral' consciousness. This is in contrast to the more evolved and useful 'Arabic numeral' consciousness that developed and taken for granted today. This side by side approach gives them a direct experience of the

[42] Christopher Houghton Budd, "Finance at the Threshold: Rethinking the Real and Financial Economies" (Surrey: Gower Publishing 2012).

dramatic changes brought about by the unprecedented explosion of individual creativity during the Renaissance time of transition (12th through 15th C.) that ultimately shaped and led to our current abstract thinking. (1.5 hours)

Finally, in a review of the accounting work just accomplished, one by one the technical terms are now substituted for the colloquial expressions. Questions and clarifications end the day's double entry accounting training. (1.5 hours)

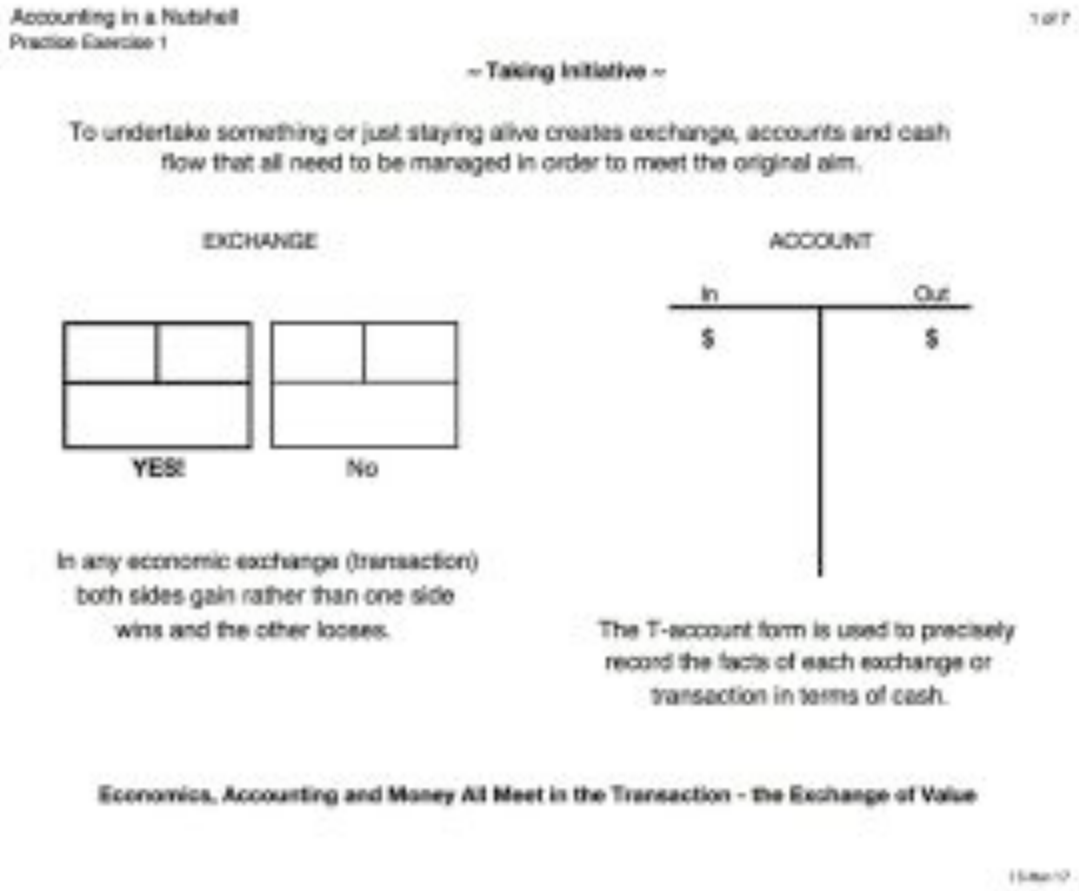
Training Time	5.5 hours
Lunch Time	1.25 hours
Break Time	1 hour (3 x 20 min.)
Total	**7.75 hours**

Accounting in a Nutshell

T-Account Exercise Set One (Indirect-With/Trial Balance)
Transaction to Statement (Current practice and thinking)

Accounting in a Nutshell: Exercise Set One – Current Practice

Set One: #1



Before starting the exercises, a brief introduction using 5 of the 12 economic images created (5, 6, 7, 8 & 11 below) is needed for a basic understanding of the process of exchange, creation of value and their reflection in accounts. The purpose of this first panel is to act as a visual aid and prompt for understanding and describing what happens in a typical economic exchange – a transaction.

Set One: #2

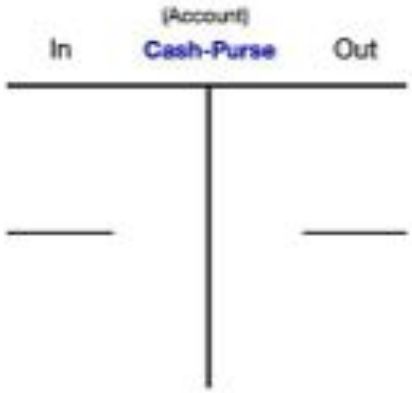
Accounting in a Nutshell
Practice Exercise 1

Find a human need in the world and meet it with your talents and skills.

First Week Exchanges (Transactions):

1)	Receive cash loan	700
2)	Pay cash for mower	250
3)	Pay cash for fuel	20
4)	Receive cash for mowing	125

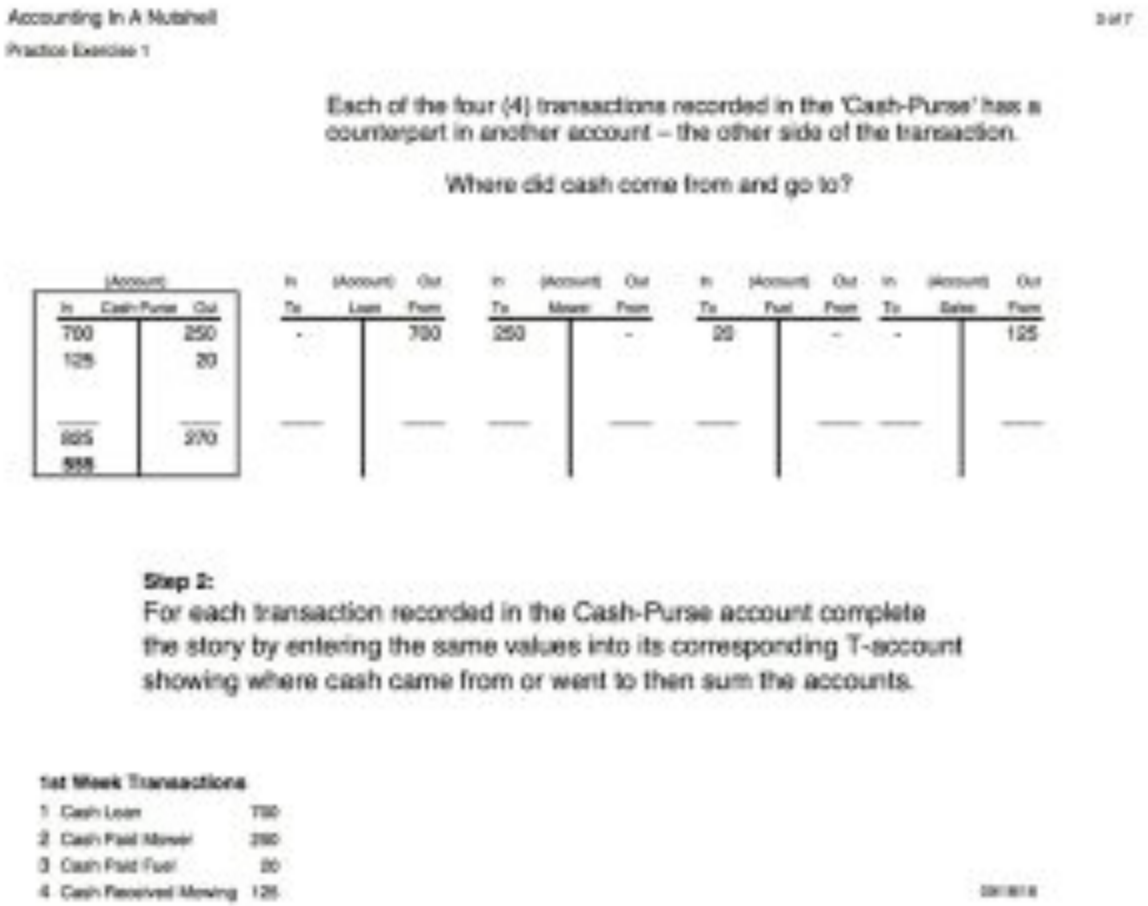
Single entry accounting is concerned with 1) the cash coming 'In' recorded on the left and 2) cash going 'Out' recorded on the right for each transaction.



Step 1:
For each of the four transactions listed above enter the figures into the appropriate column of the Cash-Purse account. Sum both columns and enter difference.

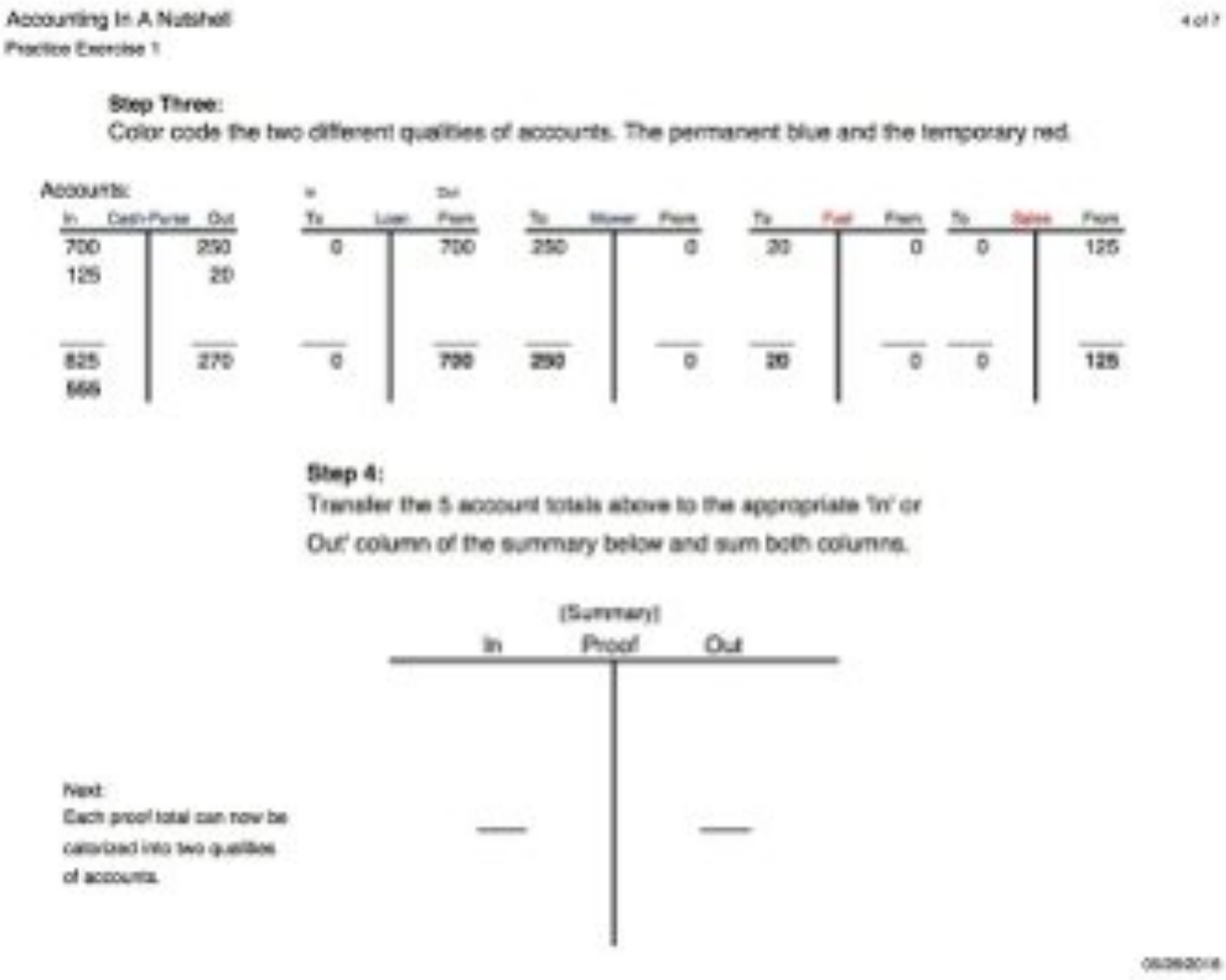
Economics is about all of us – every soul on the planet. Recognizing a human need in the world and contributing to its resolution is another way to look at the true nature of economic life. By beginning the exercise with the above initial four (4) economic transactions the accounting process is experienced as a natural and useful part of acting responsibly and effectively in life. This is simple single entry bookkeeping that developed over a long period of time.

Set One: #3



A new element is added to the single entry bookkeeping technique that expands its scope, perspective and effectiveness. Where do the values coming into an account come from and where do values leaving an account go to? Adding the needed accounts to see where values are coming from and going to creates a complete picture of the activity by recognizing the other side of any transaction. This is the beginning of double entry accounting as it adds to the partial view of single entry accounting where only what comes in and goes out is of concern.

Set One: #4



Accounting In A Nutshell

4 of 7

Practice Exercise 1

Step Three:

Color code the two different qualities of accounts. The permanent blue and the temporary red.

Accounts:

In	Cash-Purse	Out
700		250
125		20
825		270
555		

In		Out									
To	Loan	From	To	Mower	From	To	Fuel	From	To	Sales	From
0		700	250		0	20		0	0		125
0		700	250		0	20		0	0		125

Step 4:

Transfer the 5 account totals above to the appropriate 'In' or Out' column of the summary below and sum both columns.

(Summary)

In	Proof	Out
____		____

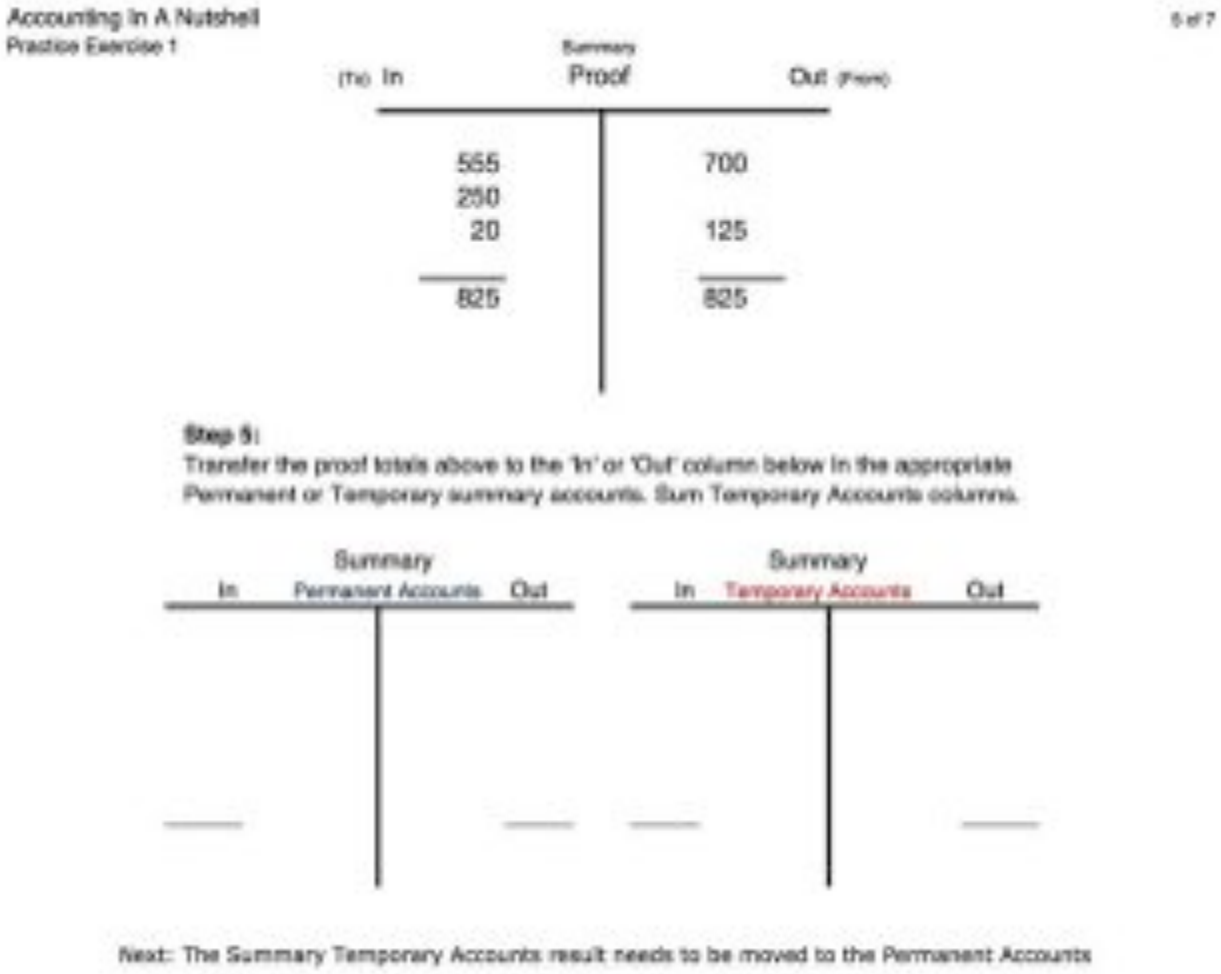
Next:

Each proof total can now be categorized into two qualities of accounts.

05/28/2016

In the process of adding accounts in order to gain a fuller picture of the activity, two different qualities of accounts become apparent as the account totals are moved or 'closed' to a T account that acts as a summary and proof that it is in balance before proceeding.

Set One: # 5



Now that the summary proof shows that the entries balance they are separated into the two qualities of accounts as represented by the two summary T accounts of permanent and temporary. The entries in the Proof are transferred or 'closed' into the two (2) qualities and the result of the activity can emerge.

Set One: #6

Step 6:
Calculate the difference between the In and Out columns for the Temporary Accounts Summary on the right (below). This result is then entered into the 'In' column. Sum the Temporary Accounts.

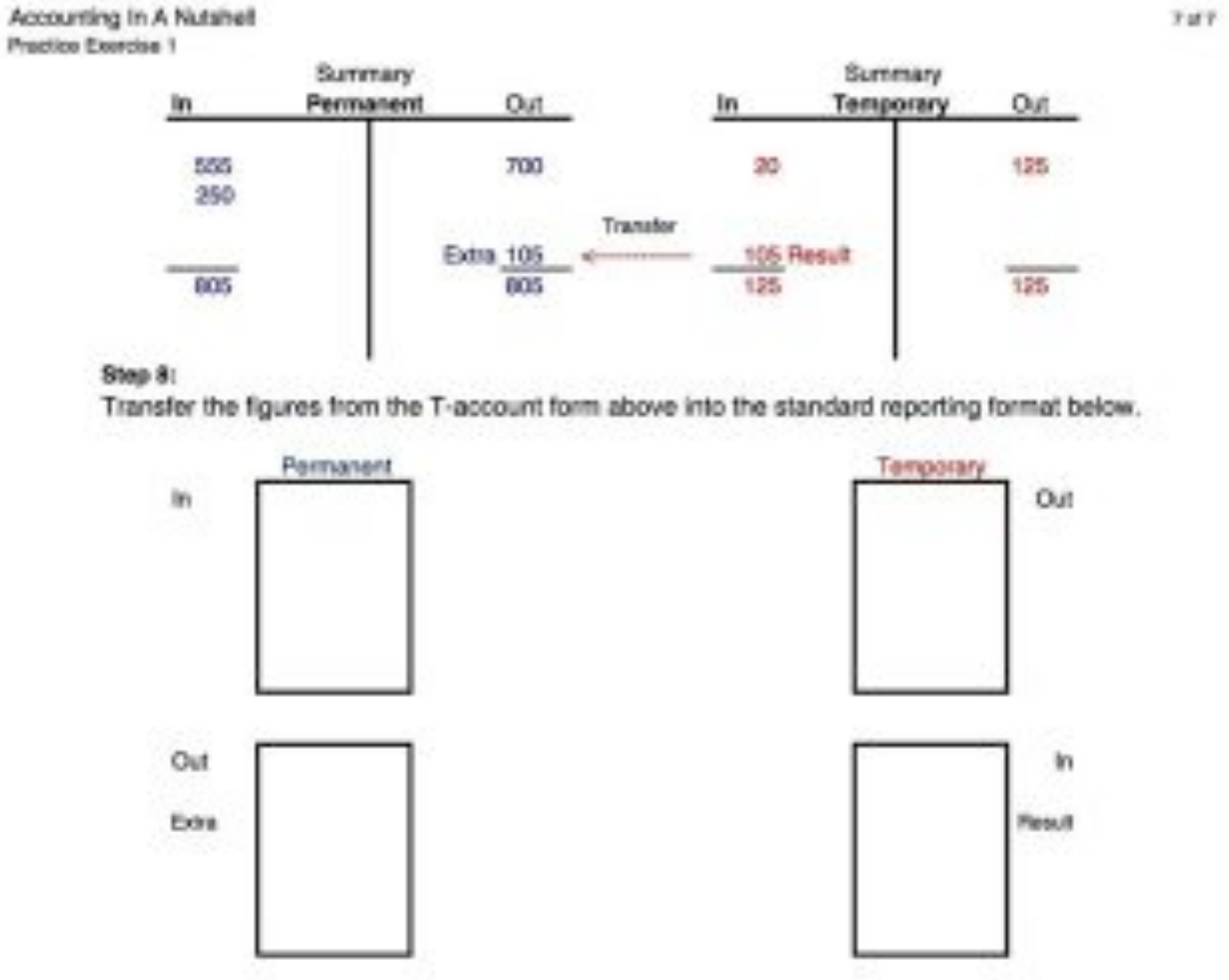
Summary		
In	Permanent Accounts	Out
555		700
250		

Summary		
In	Temporary Accounts	Out
20		125

Step 7:
Transfer the result from the Temporary Accounts to the Permanent Accounts. Sum the Permanent Account columns. A new period of activity can begin.

The Temporary Accounts Summary result is now calculated and moved or 'closed' into the Permanent Accounts Summary as demonstrated.

Set One: #7



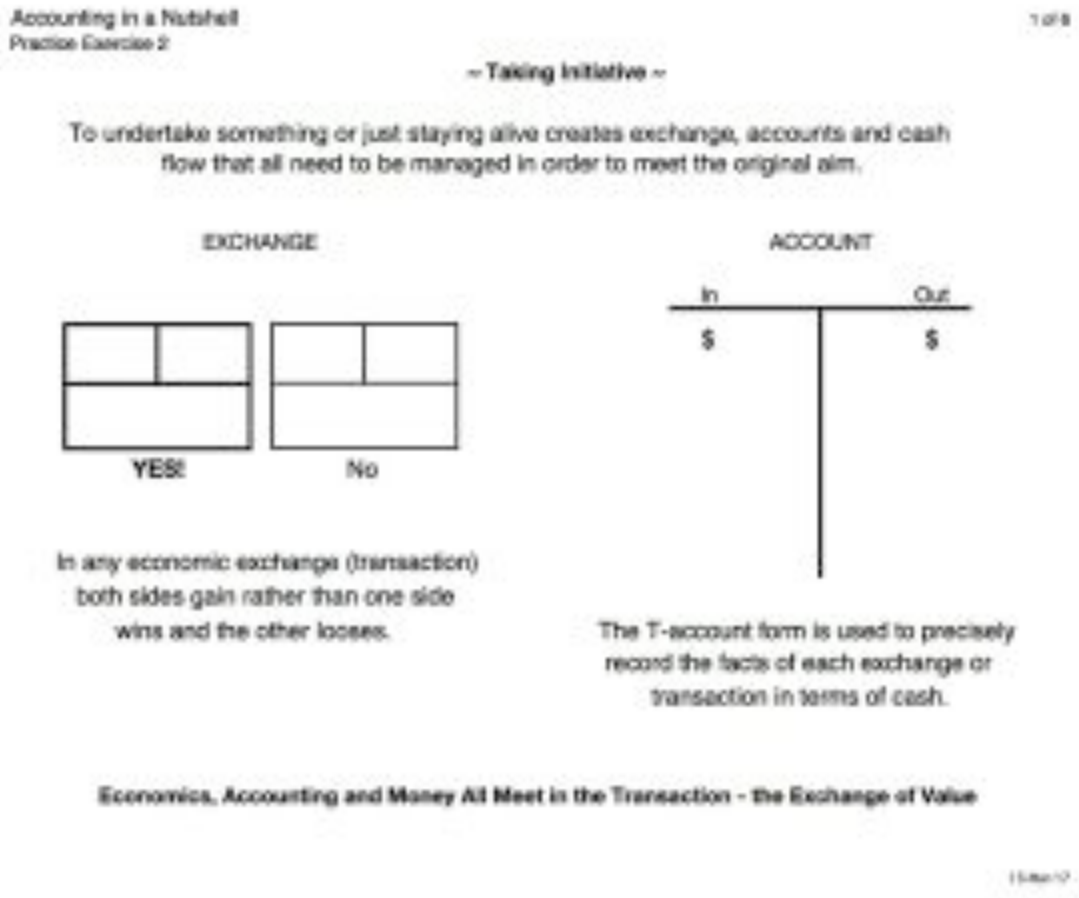
The last step in this exercise takes the two (2) T account forms and displays the same information in a different format that conforms to modern accounting practice. The summary Temporary Accounts and Permanent Accounts are transferred to the standard reporting format and are now called Income & Expense accounts (Temporary) and Balance Sheet accounts (Permanent) respectively.

Accounting in a Nutshell

T-Account Exercise Set Two (Direct-Without/Trial Balance)
Transaction to Statement (Past practice and thinking)

Accounting in a Nutshell: Exercise Set Two – Past Practice

Set Two: #1



Starting with the same four (4) initial start up transactions this set of exercises (Set Two) follows the same principles and technique contained and practiced in Set One. The difference between the two begins with page four (4) where the two qualities of accounts are summarized and directly entered into the two (2) summary T-accounts rather than using the extra step of creating a proof (trial balance) to check that both sums balance and are equal.

Also, the moving or 'closing' of the account totals to the two T-account summaries is accomplished without the use of Arabic numbers. The technique used is a spatial transposition that allows the movement or 'closing' of the account totals to the two (2) summary T-accounts. The abstract ability to add, subtract and multiply on the fly was then, a very rare ability that only developed since the introduction of Arabic numerals.

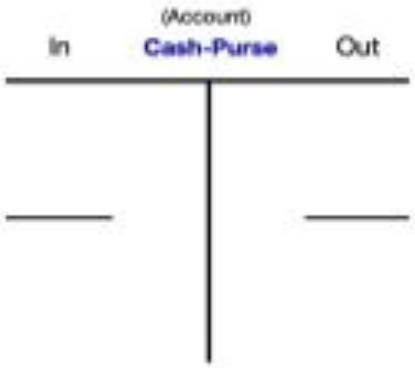
Set Two: #2

Find a human need in the world and meet it with your talents and skills.

First Week Exchanges (Transactions):

1)	Receive cash loan	700
2)	Pay cash for mower	250
3)	Pay cash for fuel	20
4)	Receive cash for mowing	125

Single entry accounting is concerned with 1) the cash coming 'In' recorded on the left and 2) cash going 'Out' recorded on the right for each transaction.



Step 1:
For each of the four transactions listed above enter the figures into the appropriate column of the Cash-Purse account. Sum both columns and enter difference.

Economics is about all of us – every soul on the planet. Recognizing a human need in the world and contributing to its resolution is another way to look at the true nature of economic life. By beginning the exercise with the initial four (4) economic transactions the accounting process is experienced as a natural and useful part of acting responsibly and effectively in life. This is simple single entry bookkeeping that developed over a long period of time.

Set Two: # 3

Accounting In A Nutshell

Practice Exercise 3

Each of the four (4) transactions recorded in the 'Cash-Purse' has a counterpart in another account. Where did cash come from and go to?

In	Cash-Purse	Out
700		250
125		20

(Account)

To	Loan	From
-		700

To	Mower	From
250		-

To	Fuel	From
20		-

To	Sales	From
-		125

Step 2:

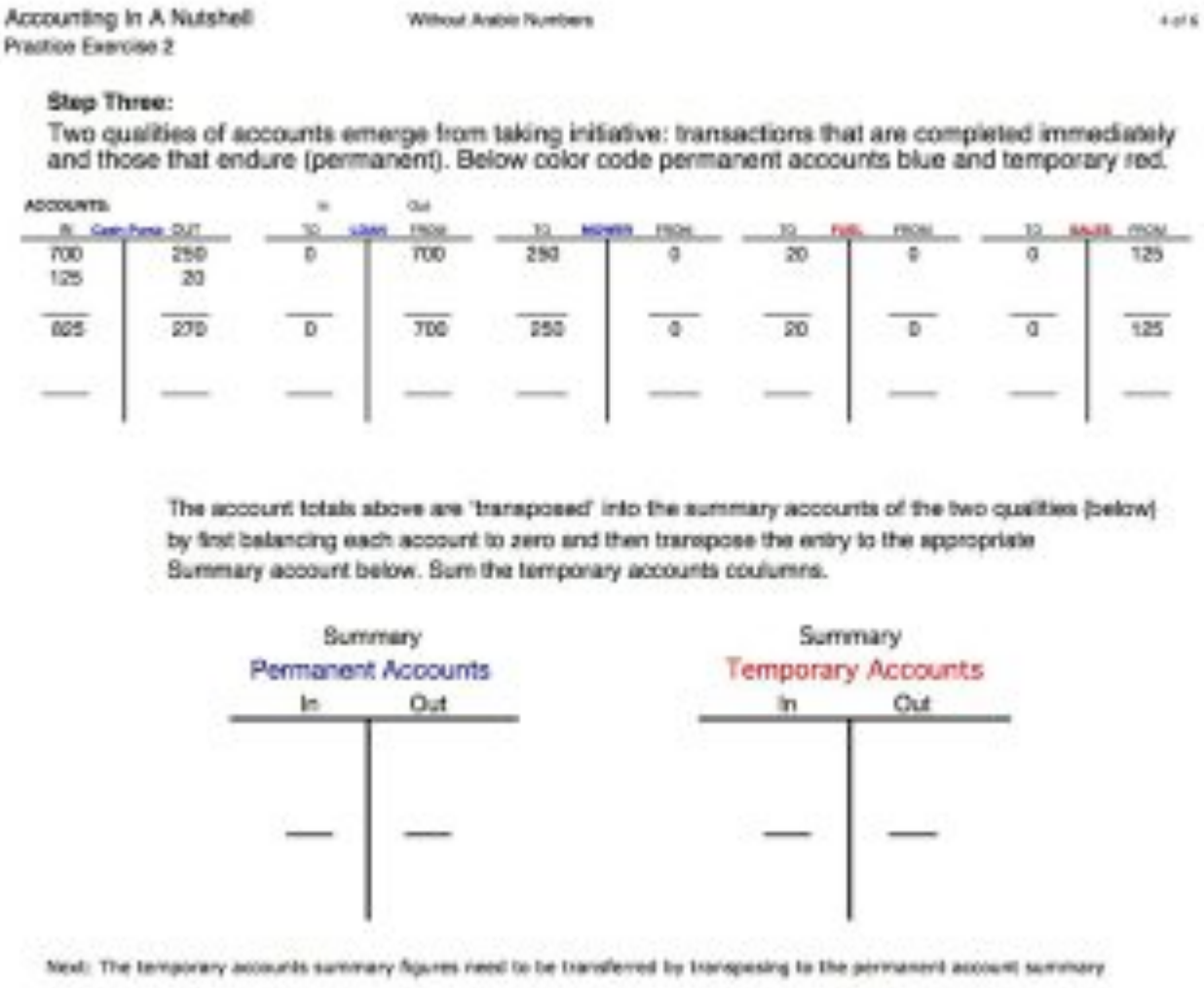
For each transaction recorded in the Cash-Purse account complete the story by entering the same values into its corresponding T-account showing where cash came from and went to and then sum the accounts.

1st Week Transactions

1 Cash Loan
2 Cash Paid Mower
3 Cash Paid Fuel
4 Cash Received Mowing

A new element is added to the single entry bookkeeping technique that expands its scope, perspective and effectiveness. Where do the values coming into an account come from and where do values leaving an account go? Adding the needed accounts to see where values are coming from and going to creates a complete picture of the activity by recognizing the other side of the transaction. This is the beginning of double entry accounting as it adds to the partial view of single entry accounting where only what comes in and goes out is of concern.

Set Two: #4



Accounting In A Nutshell Without Arabic Numbers 4 of 6
Practice Exercise 2

Step Three:

Two qualities of accounts emerge from taking initiative: transactions that are completed immediately and those that endure (permanent). Below color code permanent accounts blue and temporary red.

ACCOUNTS:		In	Out						
IN Cash Purse OUT		TO LOAN	FROM	TO MONEY	FROM	TO FUEL	FROM	TO SALES	FROM
700	250	0	700	250	0	20	0	0	125
125	20								
825	270	0	700	250	0	20	0	0	125

The account totals above are 'transposed' into the summary accounts of the two qualities (below) by first balancing each account to zero and then transpose the entry to the appropriate Summary account below. Sum the temporary accounts coulumns.

Summary Permanent Accounts	
In	Out

Summary Temporary Accounts	
In	Out

Next: The temporary accounts summary figures need to be transferred by transposing to the permanent account summary

This is where the exercise set diverges from the first Set One in that 1) the summary of accounts is entered directly into the two (2) T-accounts without a 'check' or proof. Also, a pre-Arabic numeral consciousness is mimicked in order to experience the spatial transposition technique to move or 'close' the account totals to the two (2) Summary Accounts: Permanent and Temporary.

Set Two: #5

Accounting In A Nutshell
Practice Exercise 2

Step 6:
Calculate the difference between In and Out for the Summary Temporary Accounts on the right below and enter the result into the 'In' column. Sum both columns.

Summary Permanent Accounts			Summary Temporary Accounts		
In		Out	In		Out
555		700	20		125
280					

Step 7:
Transpose the result from the Temporary Accounts to the Permanent Accounts in order to begin a new period of activity. Sum the Permanent Account columns.

The moving or 'closing' of the Temporary Accounts to the Permanent Accounts is accomplished in the same manner as before, but without the benefit of Arabic numbers. In essence, two (2) new T-accounts are created to complete the double entry accounting process called 'Closing'. The Period Profit account (result) and an Own Capital account are needed so the result of the activity as recorded in the Temporary Accounts can be moved to the Permanent Accounts Summary.

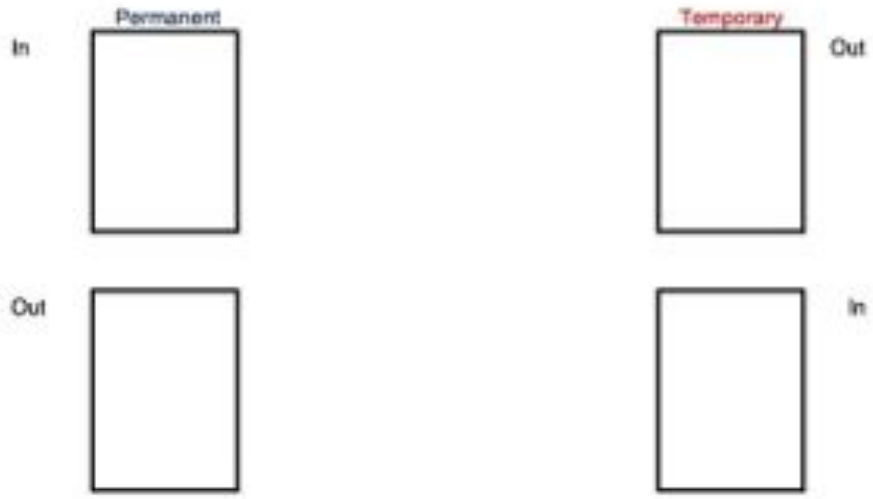
Set Two: #6

Summary Permanent		
In		Out
555		700
250		
	Extra	105
805		805

Transfer <----------

Summary Temporary		
In		Out
20		125
20		125
105	Result	0
125		125

Step 8:
Transfer the figures from the T-account form above into the standard reporting format below.



The T-account form used to understand the double entry technique and process can also be viewed in a modern standard format.

Accounting in a Nutshell *Workshop with PowerPoint*
May 26, 2017

Twenty-Four Slides

T-Account 'Accounting in a Nutshell Workshop with Three Sets of Exercises

ONE: Closing to the Two Summary Accounts (Spatial Transposing with Arabic Numerals)
(Slides 5 through 13)

TWO: Closing to the Trial Balance (Spatial Transposing with Arabic Numerals)
(Slides 14 through 16)

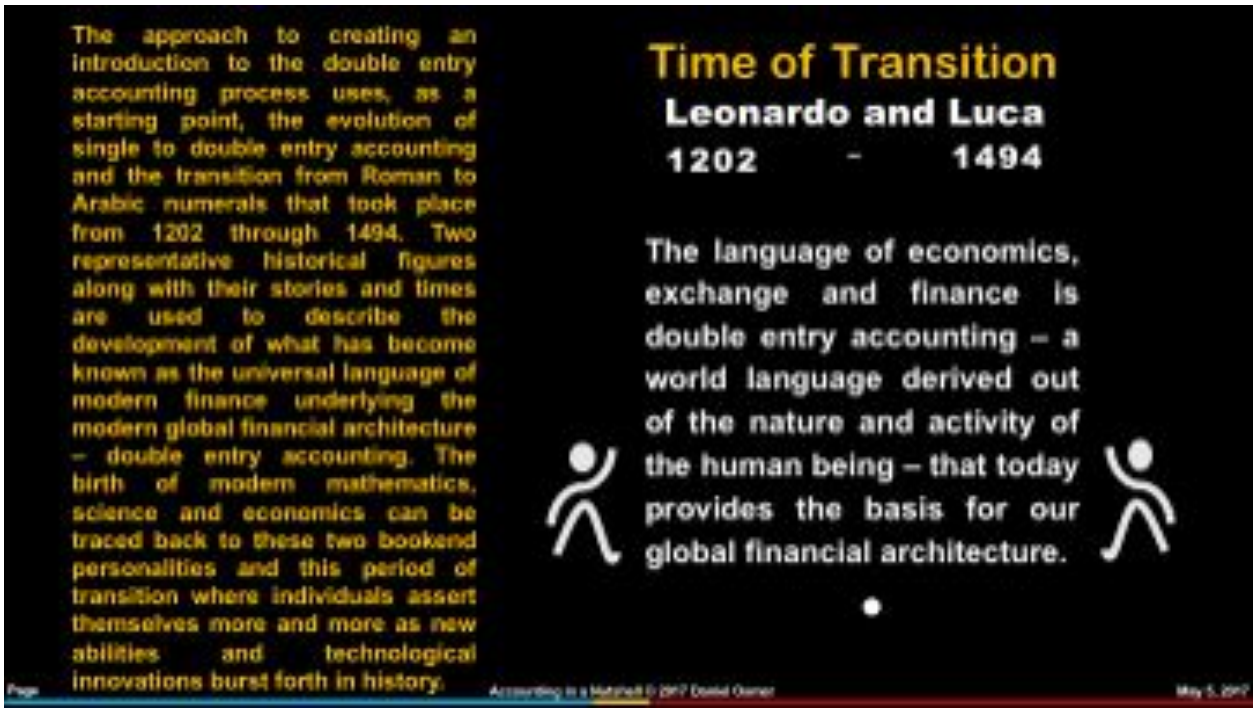
THREE: Closing to the Two Summary Accounts (Calculating with Roman Numerals)
(Slides 17 through 23)

A T-account demonstration of the transition from single to double entry accounting that took place from approximately 1200 to 1500 in northern Italy is used to learn through a series of exercises the underlying principles & technique.

Accounting-In-A Nutshell • Sebastopol • 5/2017

Slide 1

Slide 2



Slide 3

Time of Transition

Fibonacci,
Leonardo of Pisa
Son of Bonacci
1170 - 1250

1202 – 1494

Luca Pacioli,
Father of Double
Entry Accounting
1447 - 1517

Slide 4

Taking Initiative

An individual undertaking something or just staying alive creates exchange, values, accounts and cash flow. All need to be managed in order to accomplish the original aim and maintain the ethos.

- **Human Being**
- **Exchange**
- **Values**
- **Accounts**
- **Cash Flow**

Slide 5

I. Double Entry Accounting: Italian Method

1202 – 1494 Time of Transition: Fibonacci to Pacioli

Two Qualities of Accounts:

1) Permanent (Balance Sheet)
2) Temporary (Income & Expense)

Four Categories of Accounts:

Asset, Liability, Income & Expense

Some exchanges are completed immediately and others endure making for temporary accounts (income and expense accounts) and permanent accounts (balance sheet accounts). These two qualities of accounts are spread among four categories of accounts.

Debits and Credits:

Values from transactions entering an account are recorded on the left side called Debits

Values from transactions leaving an account are recorded on the right side called Credits

Debits and Credits will balance to zero as part of its self-correcting feature.

Slide 6

Double Entry Accounting Process: Original Direct Method

Accounting Exercise One

Closing Directly to the Two Summary Accounts

Arabic Numerals Transposed with a Running Balance

A natural progression of five typical transactions are put through the accounting process using the visual device of the T where it is used to demarcate left from right. The T form is used to represent each ledger page in order to organize the values from each transaction. Values coming into a ledger account are recorded on the left side of the page and values leaving an account on the right.

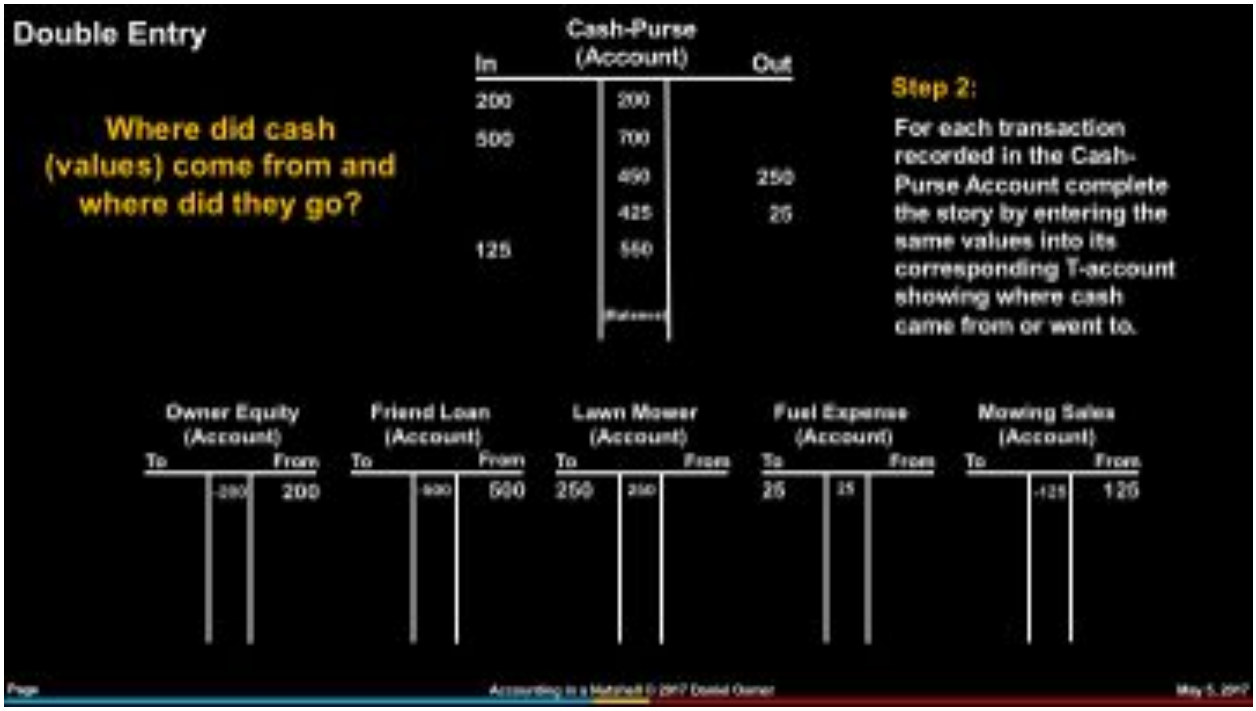
Using Arabic numerals and the T - account form, spatial transposition and not mental addition, is used to close the accounts directly to the summary of the two fundamental qualities of accounts – permanent (balance sheet statement) and temporary (I & E. Statement). Direct without the use of a proof summary (trial balance).

The transition from single to double entry accounting that took place from approximately 1200 to 1500 in northern Italy provides the backdrop used to demonstrate its underlying principles.

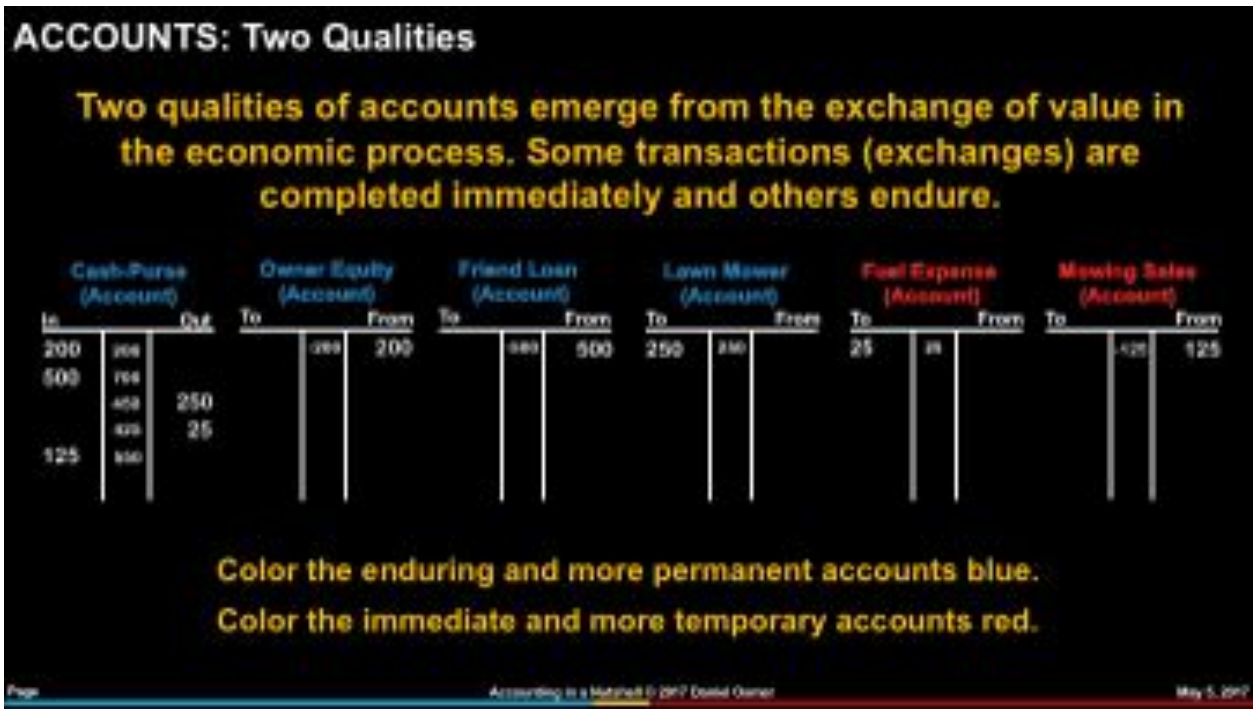
Slide 7

Slide 8

Slide 9



Slide 10



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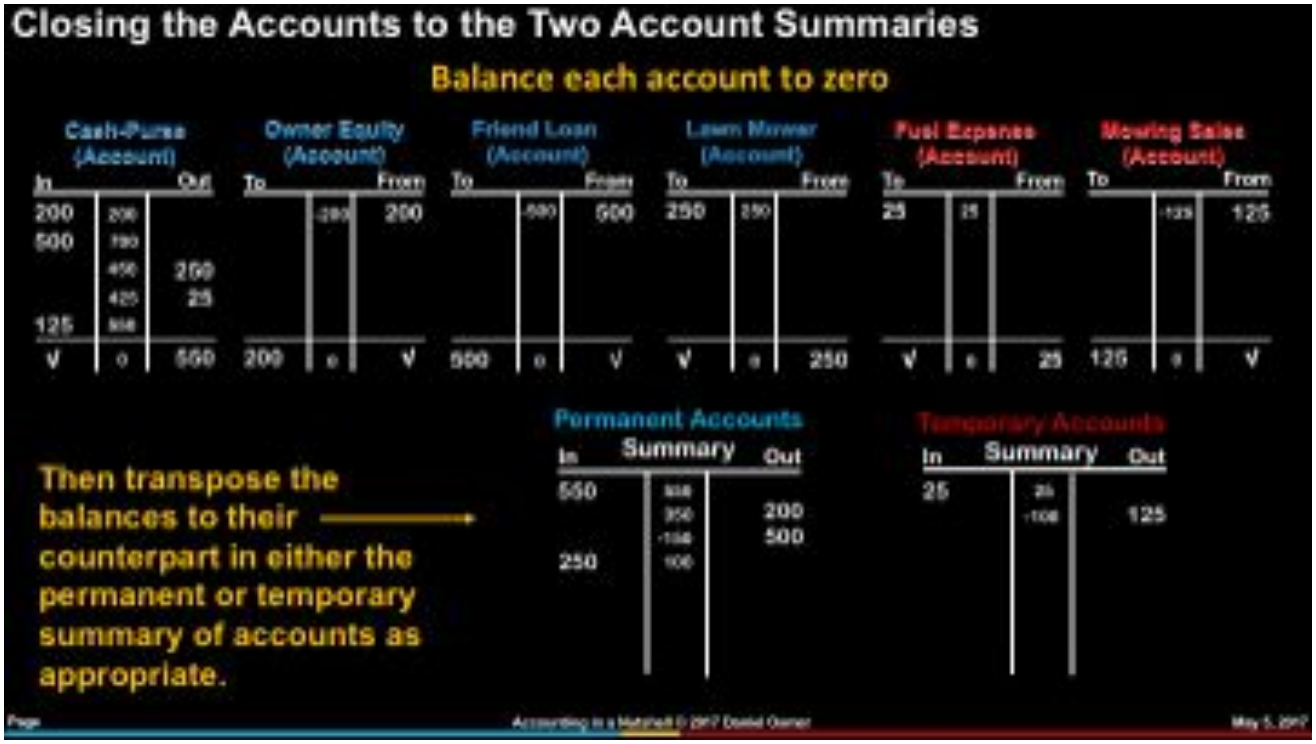

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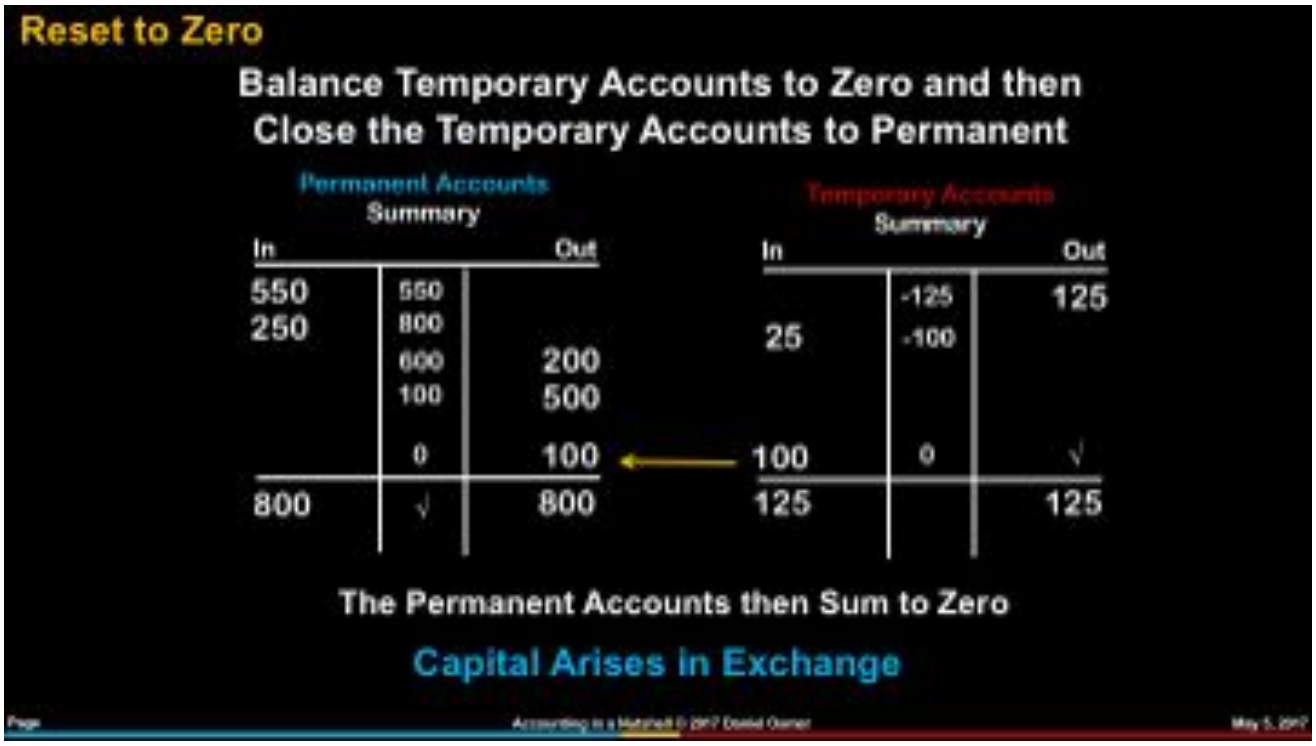
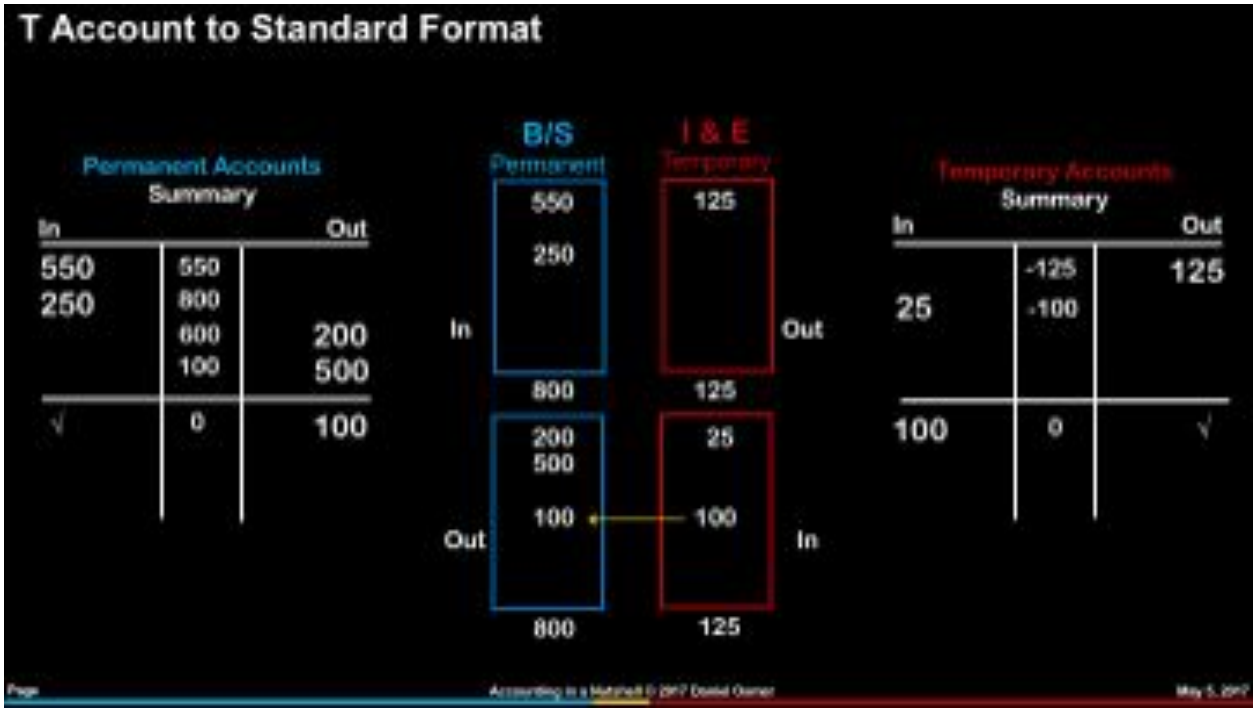


Slide 13



Slide 14

Double Entry Accounting Process: Original Indirect Method

Accounting Exercise Two

Closing Indirectly through a Proof Summary

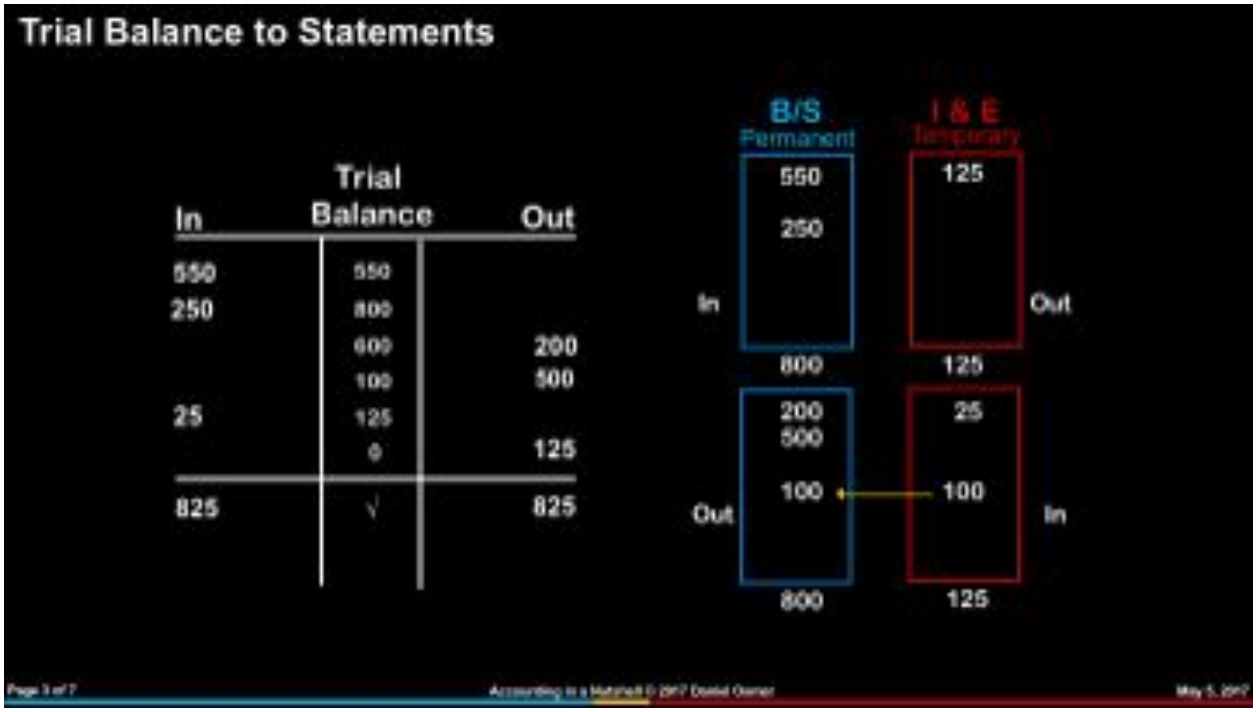
Arabic Transposed with a Running Balance

A natural progression of five typical transactions are put through the accounting process using the visual device of the T where it is used to demarcate left from right. The T form is used to represent each ledger page in order to organize the values from each transaction. Values coming into a ledger account are recorded on the left side of the page and values leaving an account on the right.

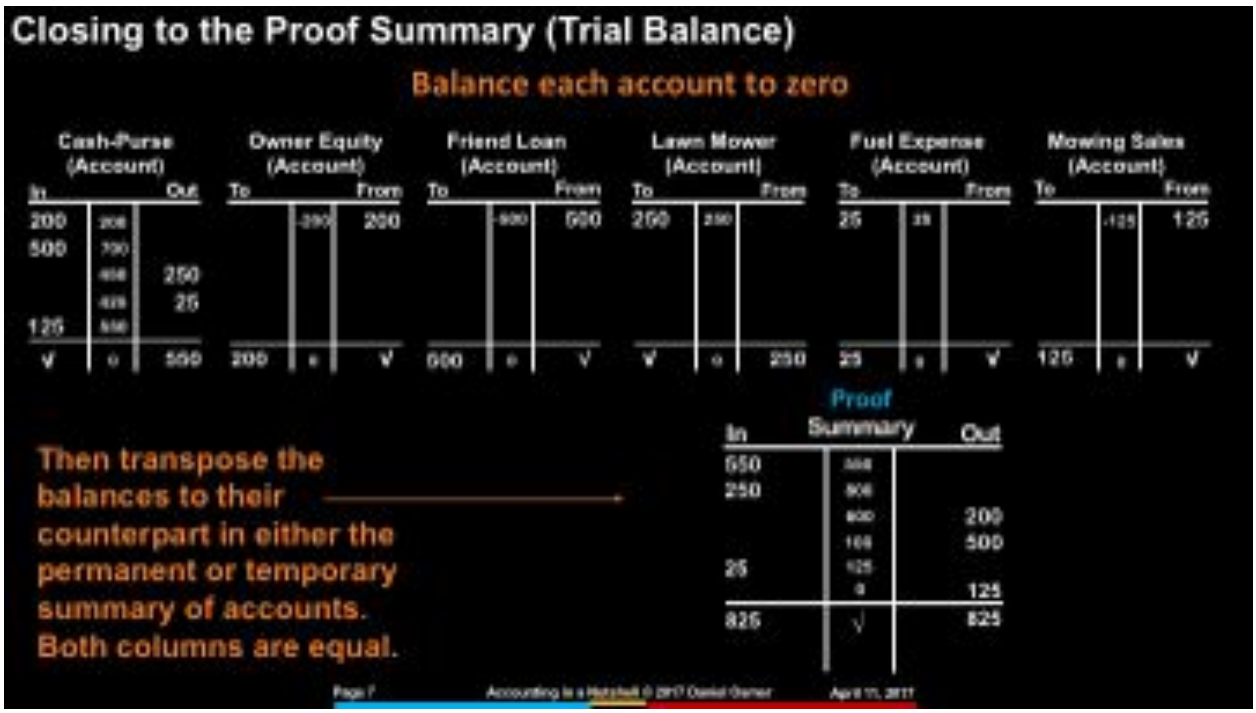
Using Arabic numerals and the T - account form, spatial transposition and not mental addition, is used to close the accounts indirectly to the proof summary statement (trial balance) before completing the two fundamental qualities of accounts – permanent (balance sheet statement) and temporary (I & E. Statement). Indirect because of the use of a proof summary (trial balance).

A T-account demonstration of the transition from single to double entry accounting that took place from approximately 1200 to 1500 in northern Italy is used to demonstrate the underlying principles and technique.

Slide 15



Slide 16



Slide 17

Double Entry Accounting Process: Direct Method Roman

Accounting Exercise Three
Closing Directly to **the Two Summary Accounts**
Roman Numerals Transposed with a Running Balance

A natural progression of five typical transactions are put through the accounting process using the visual device of the T where it is used to demarcate left from right. The T form is used to represent each ledger page in order to organize the values from each transaction. Values coming into a ledger account are recorded on the left side of the page and values leaving an account on the right.

Roman numerals, T - account form and normal mental Arabic calculation are used to close the accounts directly to the summary of the two fundamental qualities of accounts – permanent (balance sheet statement) and temporary (I & E. Statement). Direct without the use of a proof summary (trial balance).

A T-account demonstration of the transition from single to double entry accounting that took place from approximately 1200 to 1500 in northern Italy is used to demonstrate the underlying principles and technique.

Slide 18

Single Entry Roman — Tracking the Activity

Find a human need in the world and meet it with your talents and skills.

First Weeks Transactions:

1	Deposit own cash	CC
2	Receive cash loan (friend)	D
3	Pay cash for mower	CCL
4	Pay cash for fuel	XXV
5	Receive cash for mowing	CXXV

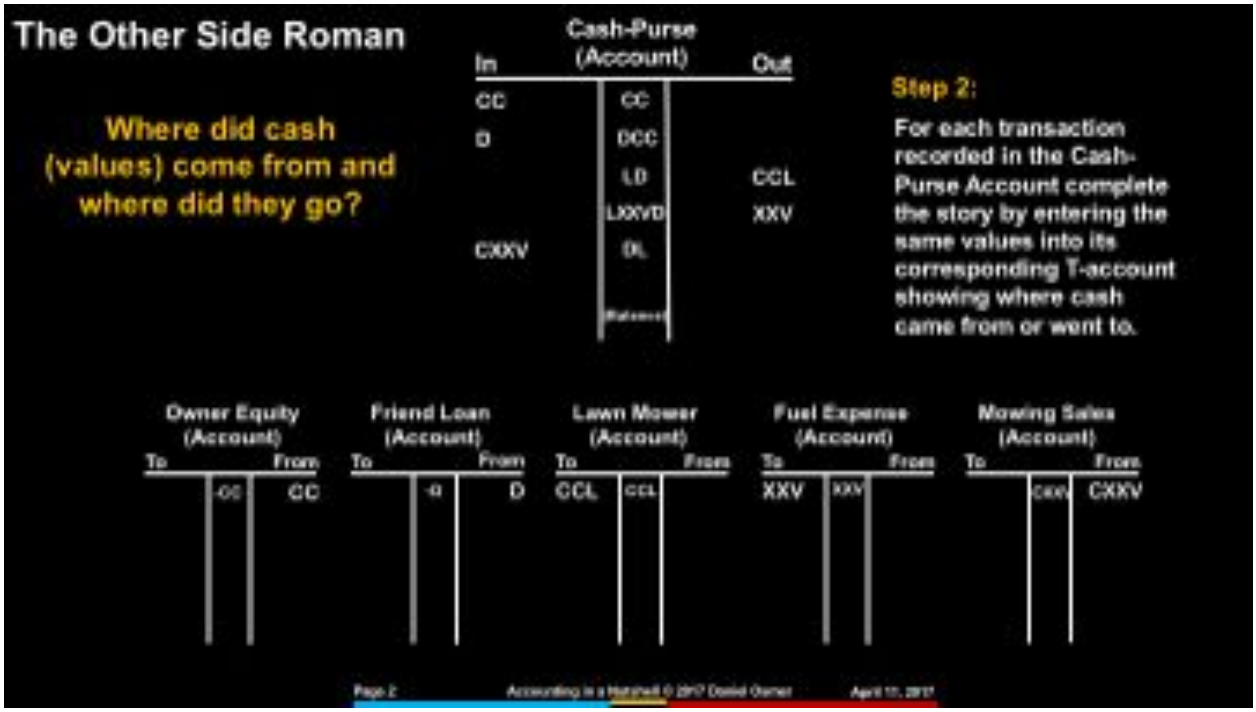
Step 1:
For each transaction enter the figure into the appropriate column to the right.

Cash-Purse (Account)

In		Out
CC	CC	
D	DCC	
	LD	CCL
	LXXVD	XXV
CXXV	DL	
	Balance	

Single entry accounting is concerned with the cash (values) coming 'In' recorded on the left and cash going 'Out' recorded on the right.

Slide 19



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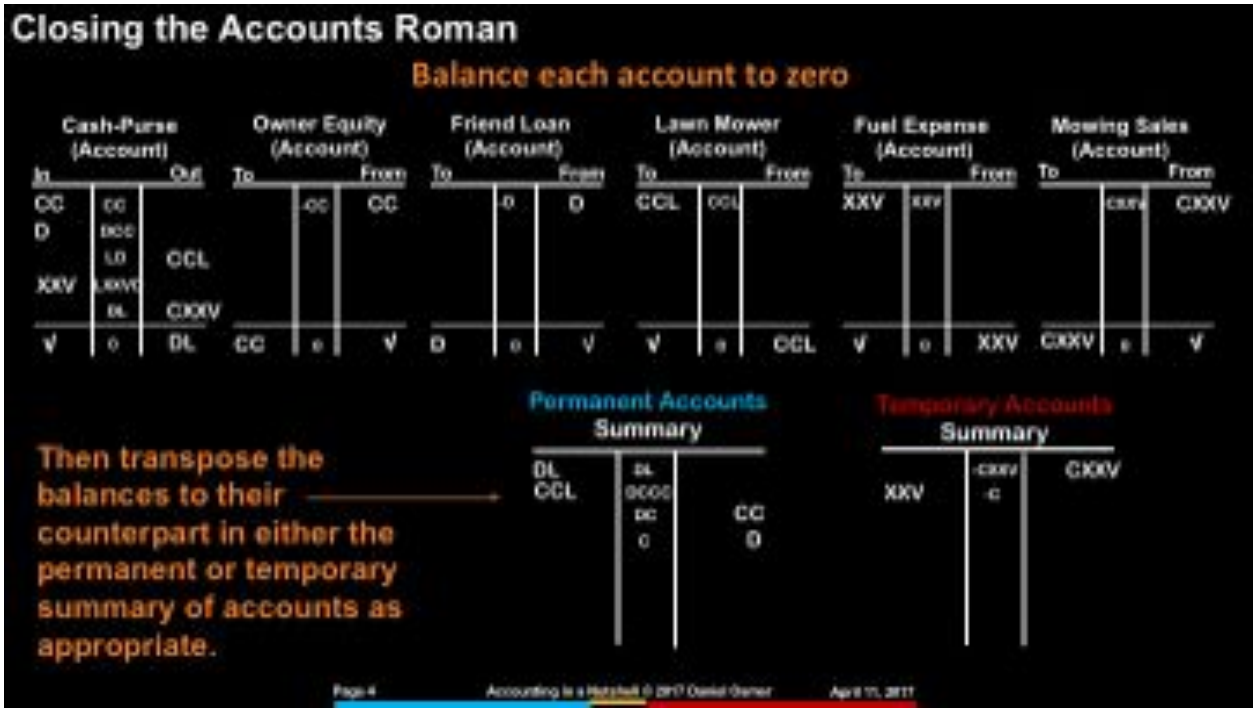
Slide 21



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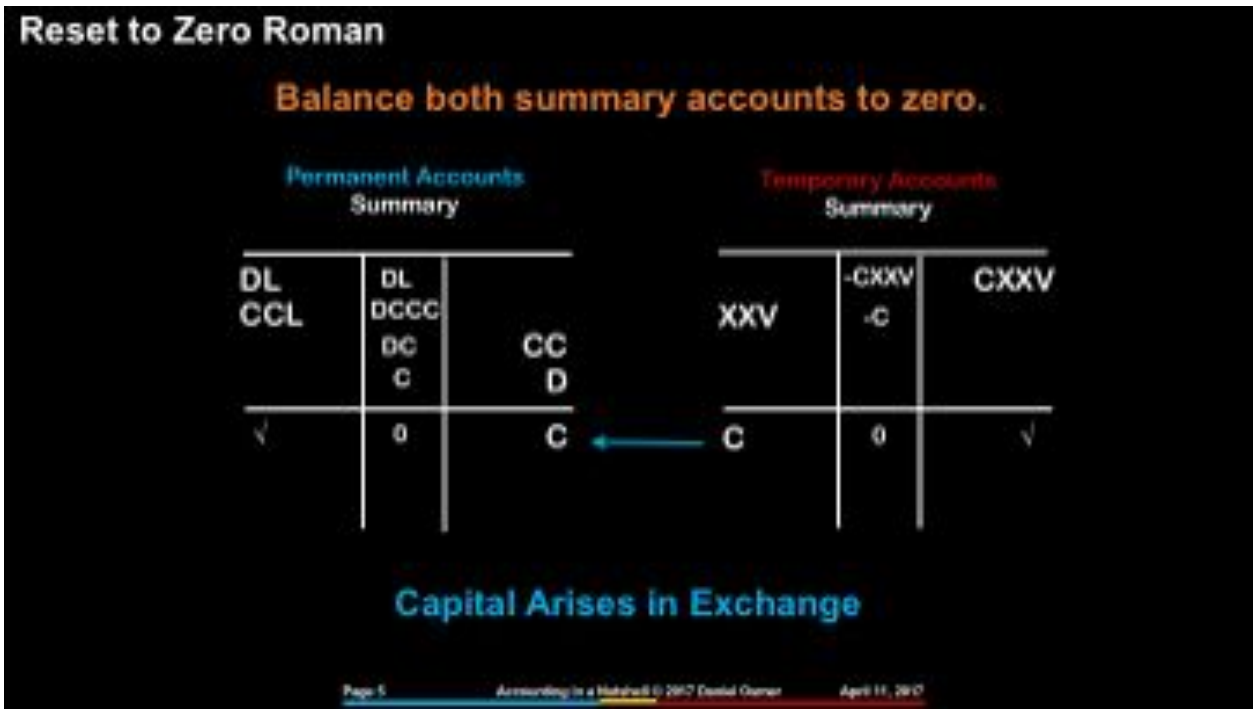

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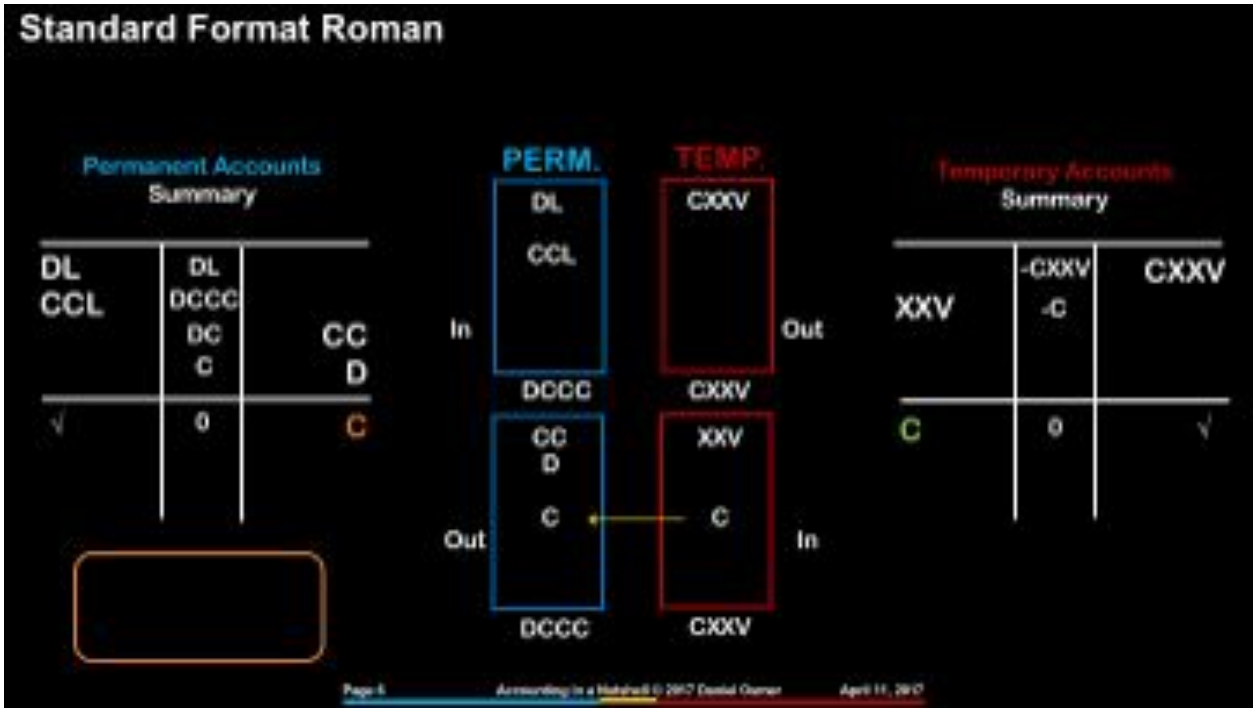

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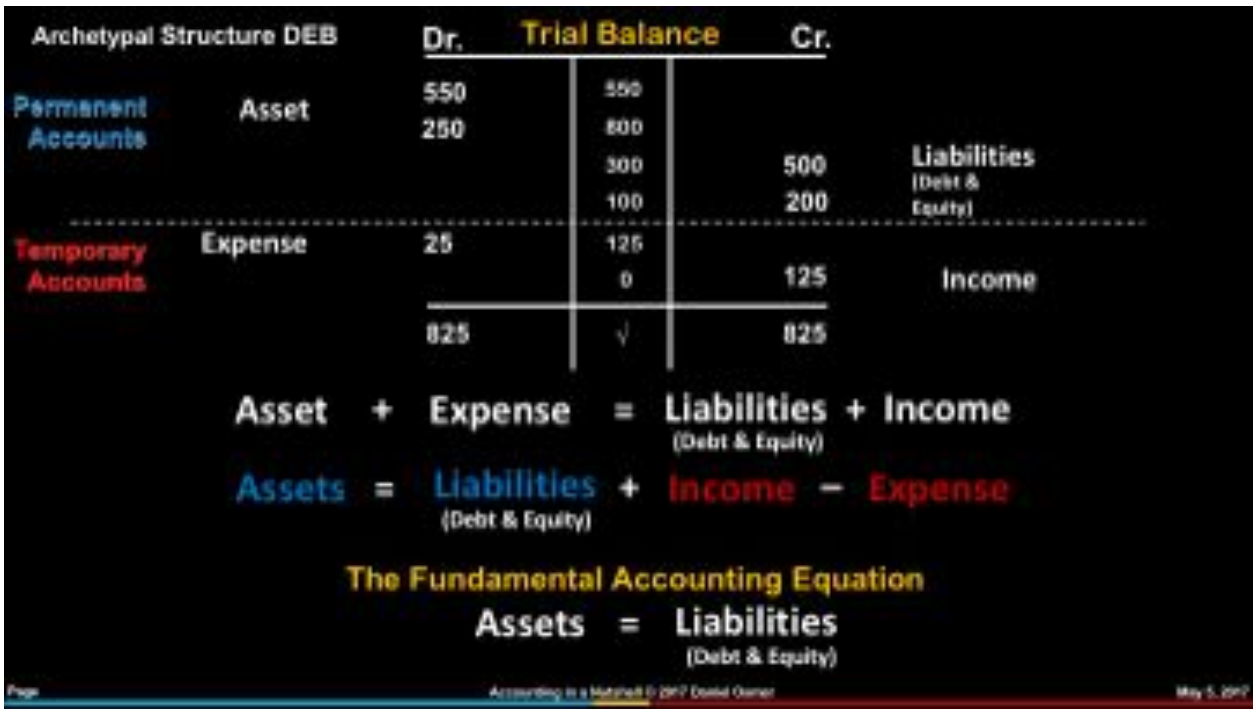

What is Double Entry Accounting for? *

1) The balance sheet reveals our position in regard to our deepest purposes in life as well as a cumulative account of net worth.

2) The income and expense statement is an exact description of one's relationship to the world as well as a record of profitability.

3) Learning the language of accounting itself enlightens our will, allowing us to be financially sovereign, while at the same time acting as an instrument of service to others. This in contrast to becoming a slave to egotism and one's own self-interest.

4) The numbers can bee seen as hieroglyphs that plot and reveal our relationship to ourselves and to one another – to the world.

5) The ability to 'read' our financials can deepen our relationship to society and our purpose in life.

6) Financial and economic literacy can be done for what one can gain, at a deeper level, it calls on us to perceive how effectively are we giving to Society.

7) Learning to read and write financially creates the possibility to inscribe into the economic life our own particular signature and unique contribution to the betterment of the world.

8) Budgets (projections) and accounts can be seen as representing the journey about to be tread and the path already made, not just abstract assemblages of dry information and dead statistics.

9) Financial literacy can be about stocks, bonds, insurance, how mortgages work and credit card training, yet it is also about meeting human needs through what we do in the world and fulfilling one's life purpose in the process of serving others.

**Adapted and edited from:*

Banking on Youth and Trade
The teaching of associative business, finance and economics to young people

Appendix

The Evolution of Double Entry Accounting

Many of these elements existed earlier but were not found together in a form and strength necessary to push to the innovation of double entry until the Middle Ages.

Private property

The power to change ownership in agreement needed to become standard practice.

Capital

Wealth productively employed allowed for commerce and credit to exist and expand.

Commerce

The interchange of goods on a widespread basis was needed because small volume local trading did not spur the creation of an organized system that eventually replaced the hodgepodge of recordkeeping.

Credit

The present use of future goods (value) has been around since Greece but not efficiently and now needing to be recorded as transactions.

Writing

A way to make a permanent record in a common language to aid a limited human memory.

Money

The "common denominator" for tracking value in exchanges is money.

Arithmetic

A means of computing the monetary figures of the deal or (transaction) needed to be quickly calculated.

Standard Accounting Principles

David Minars, CPA, J.D., M.B.A., Accounting, Second Edition, Barron's Educational Series, Inc., 2003.

Comparability means that the information is presented in such a way that the decision maker can recognize similarities, differences, and trends between different companies or between different time periods.

Consistency requires that a particular accounting procedure, once adopted by a company, remain in use from one accounting period to the next unless the users of the financial statements are informed of a change by means of notes to the financial statements.

Disclosure requires that all relevant information that would influence the assessment of a company's health by outside users must be disclosed in the financial statements.

Materiality refers to the relative importance of an item or event. If an item or event is material, it is likely to be relevant to the user of the financial statements.
Conservatism means that when accountants face major uncertainties as to which accounting procedure to use, they generally choose a method that will understate assets and income.

Timeliness requires that information generated by the accounting system must be received shortly after the end of the entity's accounting period in order to be useful for decision-making.

Continuity, also known as the going concern concept, assumes that the business will continue to operate indefinitely.

Entity refers to the accounting unit, business or activity that is separate and apart from its owner or owners.

Accounting period refers to the time span over which the accounting data is recorded and reported in the financial statements. Comparison of financial statements is made possible through the use of accounting periods of equal length. The time period could be one month, interim (three month), or annual (twelve month) financial statements. For most companies, the annual accounting period runs the calendar year from January 1 through December 31. Other companies use what is called a fiscal year, which ends on some date other than December 31.

Stable dollar theory assumes that prices will remain constant over time. This theory requires that all assets be recorded at their historical cost.

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Φ

Contact Daniel Osmer at: daniel@economicbuzzcafe.com

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