

**Learn from yesterday
Live for today
Hope for tomorrow**
(Albert Einstein)



**Wageningen, Jan Hak
- 4 December 2014 -**





Learn from Yesterday





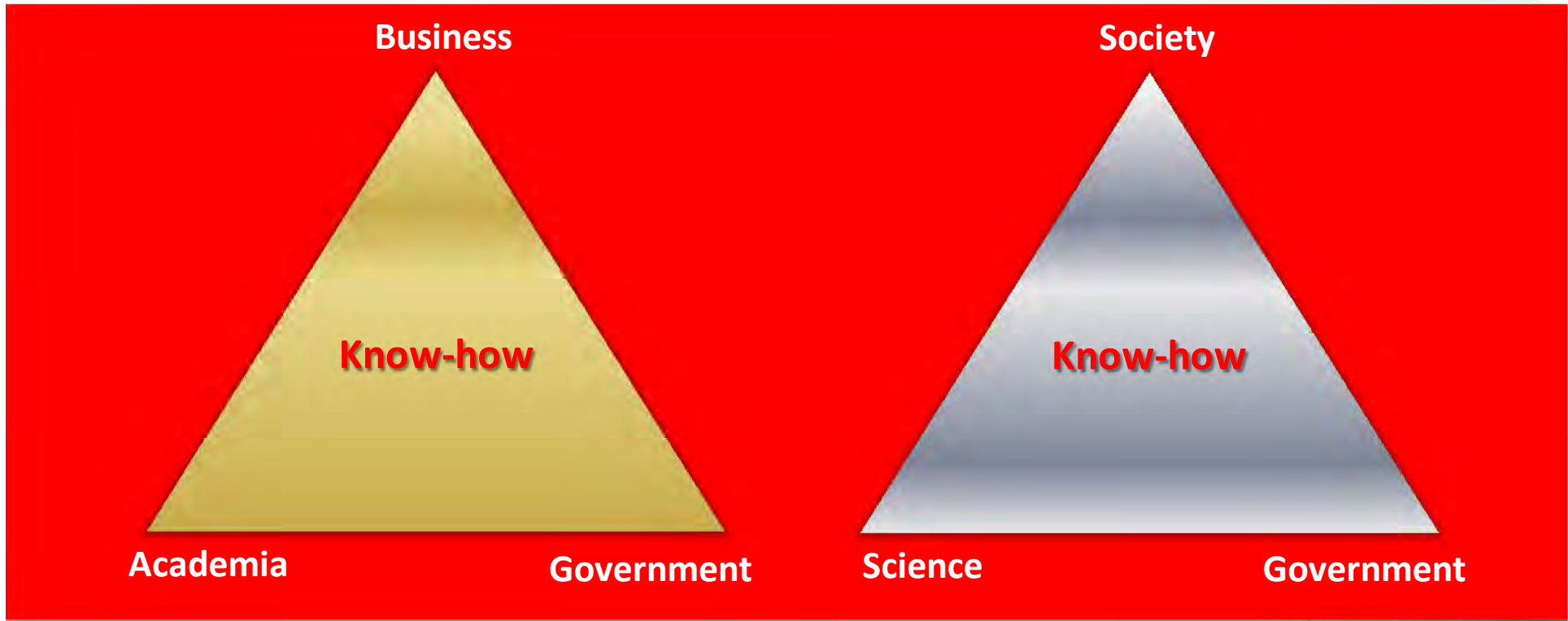
Eve's Apple



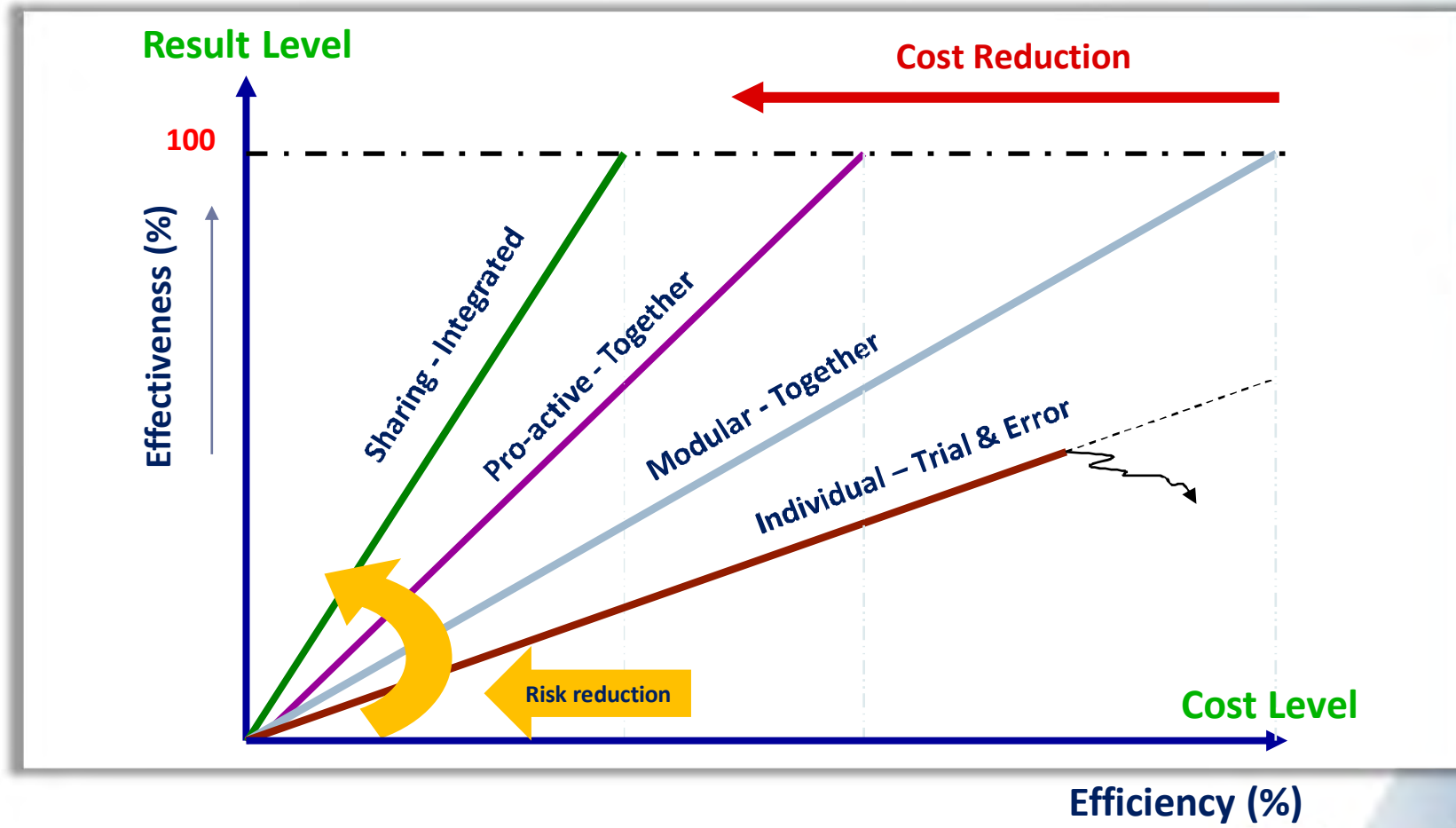
The most expensive lesson in history!







Cluster Agro Food Technology





Dutch Agri-Food Technology

Turn-over:

Steady with overall growth 6% yearly, EUR 15 billion (2013) - 42% outside the EU

- Agricultural machinery and systems: 6,3% of world market
- Food processing equipment: 11,4% of world market
(80% poultry, 70% cheese and > 50% potato processing systems)

Dutch Agri, Food and Technology Sector

Turnover excluding technology:

Steady with overall growth 3% yearly, EUR 65 billion (2013) – 9% outside the EU
13% of our GDP comes from the Agri, Food & Technology Sector





Live for Today





Metropolitan Food Security

World is Urbanizing

More people - Less land

Reach the Consumer

Deliver quality food

Changing Consumption Patterns

Purchasing power in metropolises

Food Availability

Increasing demand puts higher pressure
on local food systems



Metropolitan Food Security



Innovating Markets
(US/Canada, EU,
Israel)

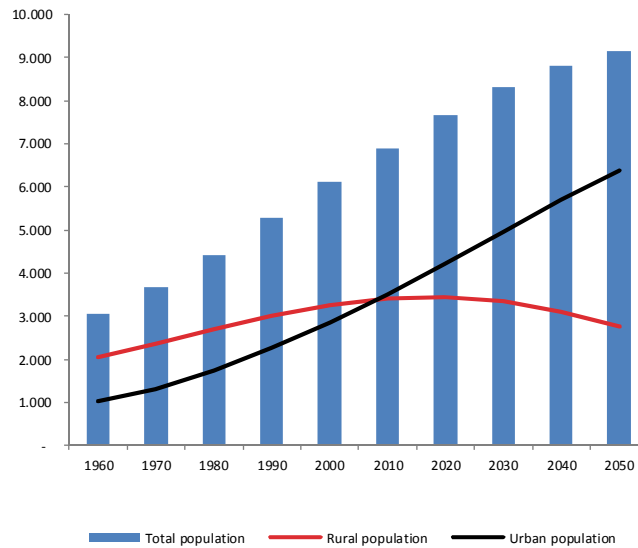
Emerging Markets
(BRICS, CIVETS)

Frontier Markets
(Mid/South-America,
Africa, Middle East)

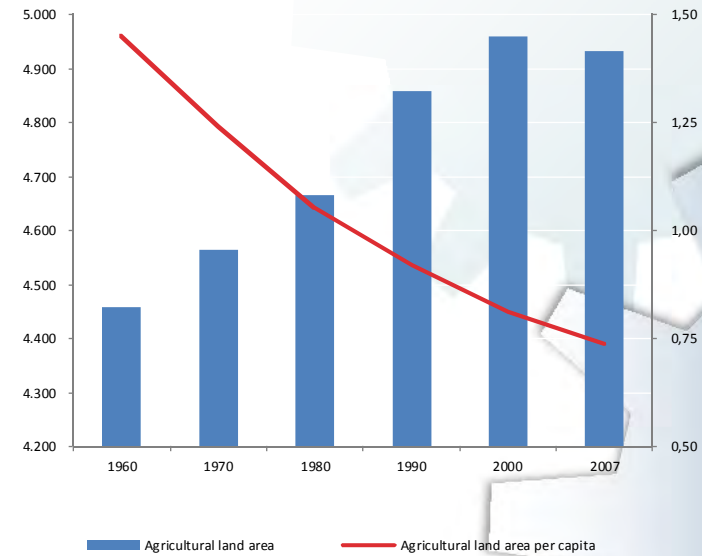
Twice as Much Food - Twice the Quality - Half the Resources

More people, less land

Global population (in millions)



Agricultural land (1,000 ha)



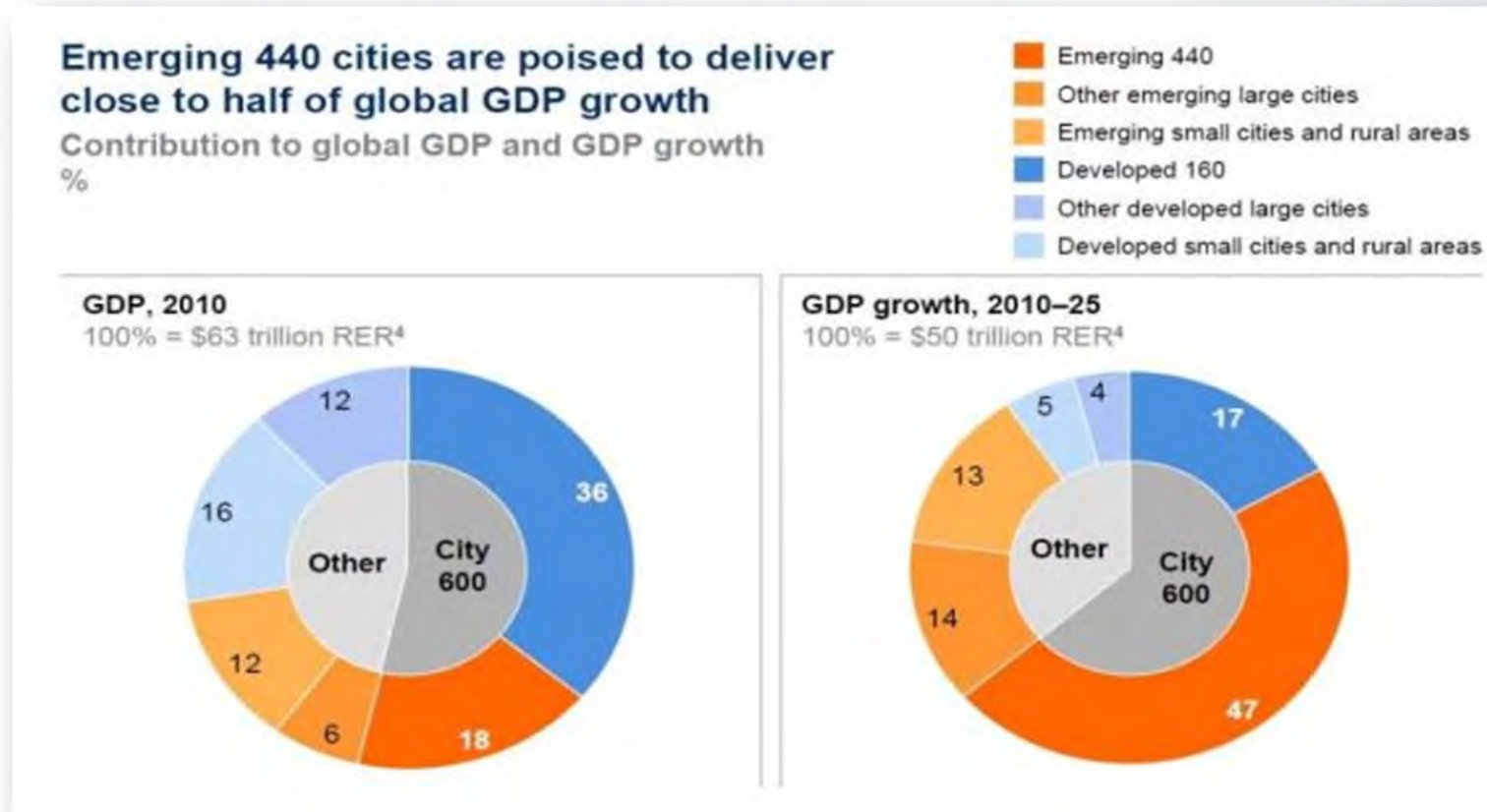
90% of population growth will occur in Sub-Saharan Africa (one billion or 49%) and Asia (900 million or 41%)



Source: FAO Stat, 'Framework for an Inclusive Food Strategy', Rabobank (2012)

Economic Growth (2010-2025)

Growth: 75% comes from emerging economies, 82% from large cities



Source: MCKinsey Global Institute, June 2012

Function of Food

- **WHAT**
- **WHEN**
- **WHERE**
- **WITH WHOM**
- **HOW PREPARED**

Calories → "Experience" → Nutrition & Health, Variety
Regular → Grazing & Snacking
In-home → Out-of-home
Social → Individual
From Scratch → Ready-to-eat, Heat & Eat



Trends

Society



Freshness



Packaging



Technologies



Society

- **Rapid Urbanisation:**
Transformation of lives as driver and consequence of economic growth
- **Rural Remoteness:**
Urban centrality
- **Breakdown of Social & Economic Village Structures:**
Individual search for spaces left empty (not created) by government
- **Disappearing Old Rural Networks:**
“Fend for yourselves”; Surge for individual entrepreneurship (creating individual businesses)

Freshness



- Packaging differentiation by "Green" aspects
- Innovator: Best practices in fresh produce
- Freshness Phobia
- (Organic) Freshness
- Intelligent and active packaging



Packaging

- **Functionality and Sustainability**
- **Sustainable Packaging**
- **Paper-based Packaging**
- **Stand-up Pouches**
- **Bio-plastics**

Finding the balance

Focus on recyclability

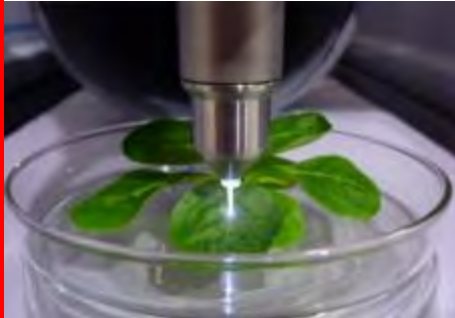
Keep the Molecule in Play

Maximum Flexibility,

Sustainability and Convenience

A viable eco-friendly solution?





New Technologies

- Pulse Electric Field (PEF)
- High Pressure Conservation
Ultra High Pressure (UHP)
- Cold Plasma
- 3D (Food) Printing
- Cultured meat





Focus on Innovation

- Sensory and structure
- Bio ingredients and functionality
- Genomics
- Precision agriculture
- Added value creation and logistics





Beijing, New Delhi, Cape Town, etc.

*Your gateway to vast
Knowledge and
Expertise available in
The Netherlands!*

*Our chain-oriented
clusters meet
your requirements
from farm to fork*

*Meet our clusters:
Food Processing Cluster
Potato Cluster
Dairy Cluster
Cold Chain Cluster
Horticulture Cluster*

Dutch Expert Clusters

- **Animal Protein**
- **Bakery**
- **Biobased Systems**
- **Cold chain & Logistics**
- **Confectionery**
- **Dairy**
- **Fruits Vegetables**
- **Horticulture**
- **Liquid Foods**
- **Packaging**
- **Potatoes**

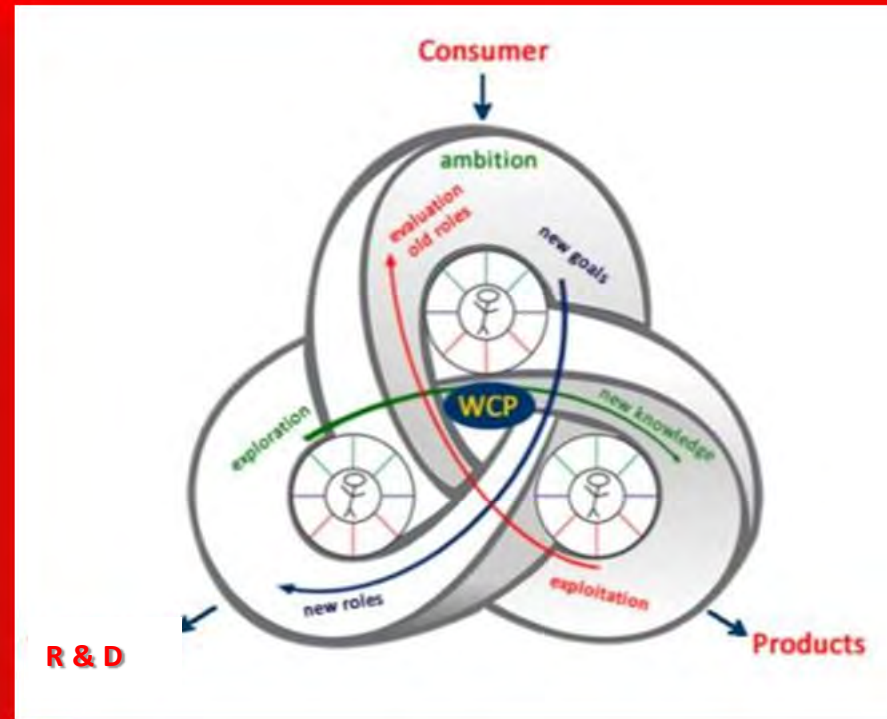


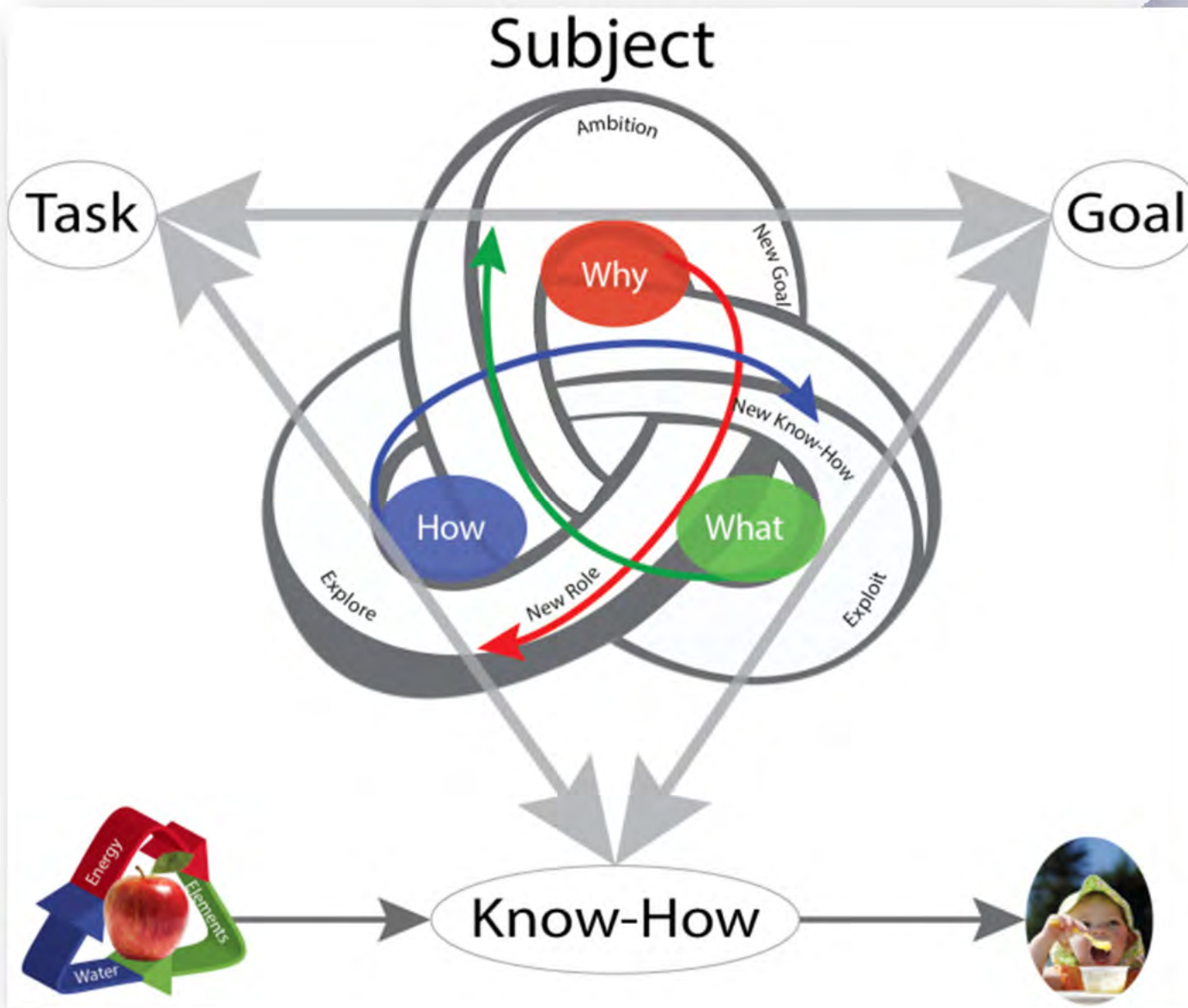


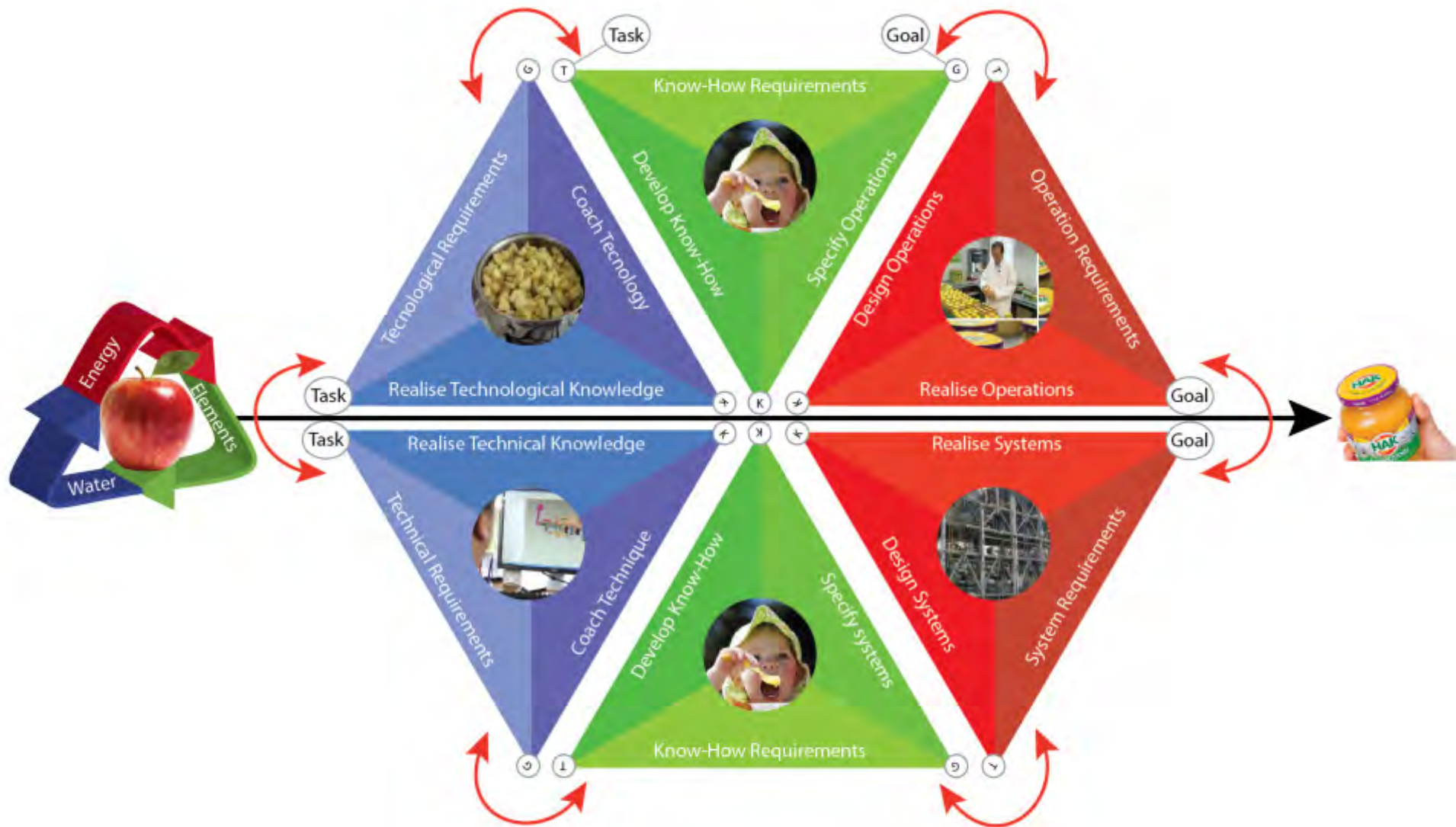


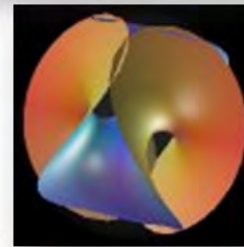
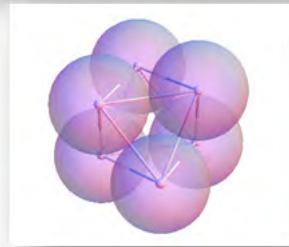
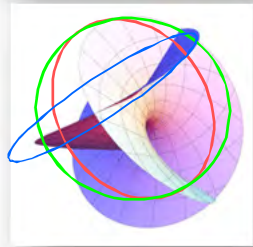
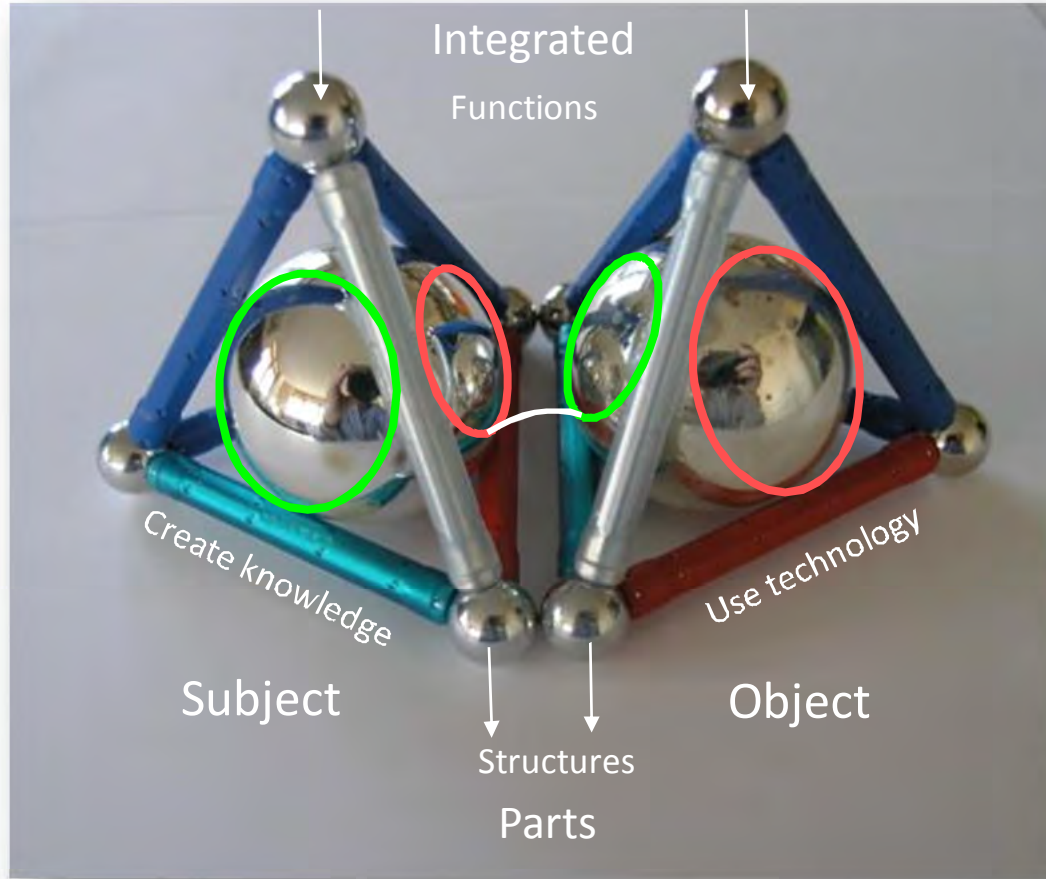
Hope for Tomorrow



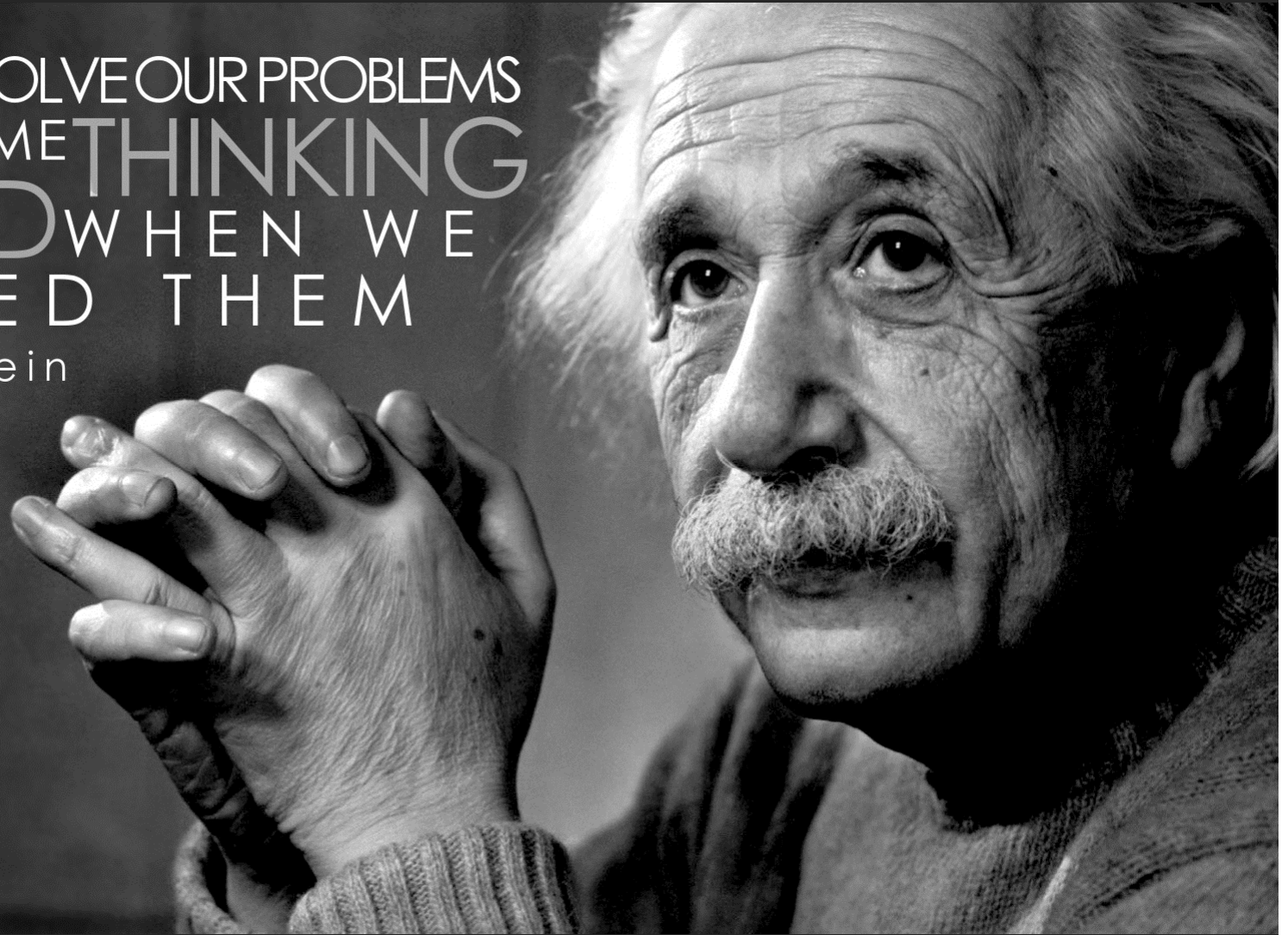








WE CANNOT SOLVE OUR PROBLEMS
WITH THE SAME THINKING
WE USED WHEN WE
CREATED THEM
- Albert Einstein



The human body



and team work





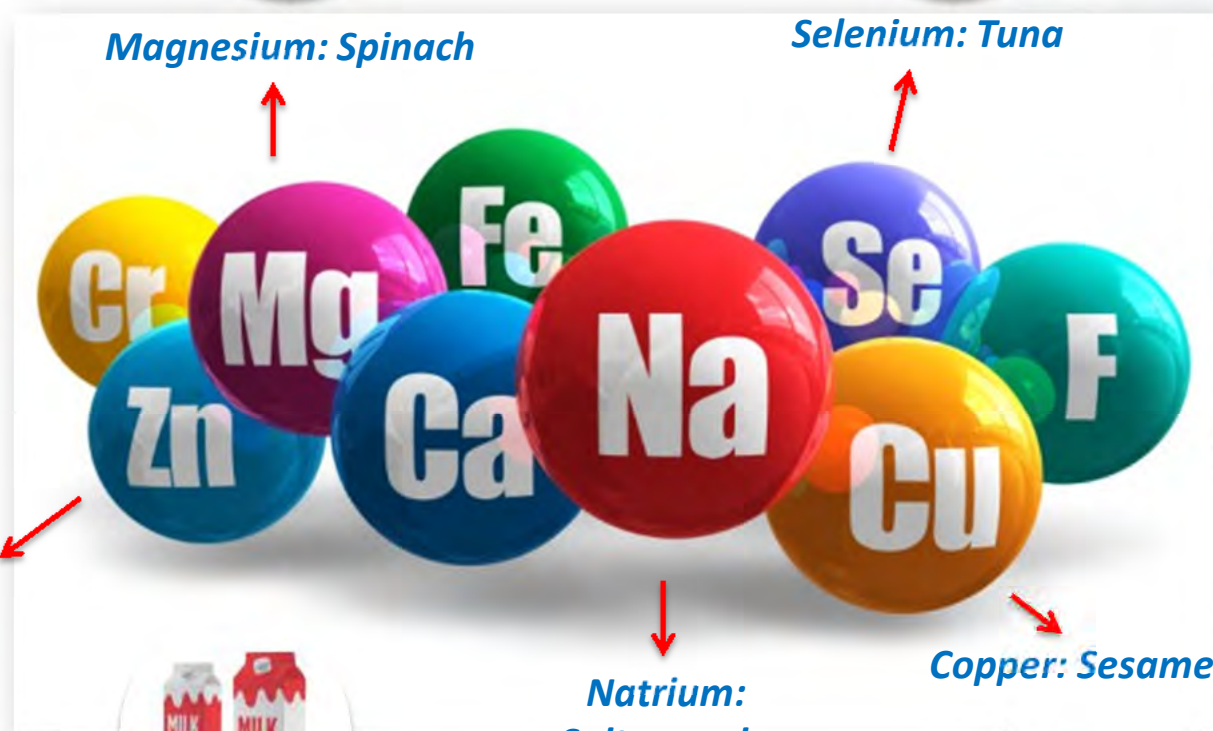
Zinc: Oysters



Magnesium: Spinach



Selenium: Tuna



Calcium: Milk



Natrium: Salty snacks



Copper: Sesame Seed



Periodic Table of the Elements

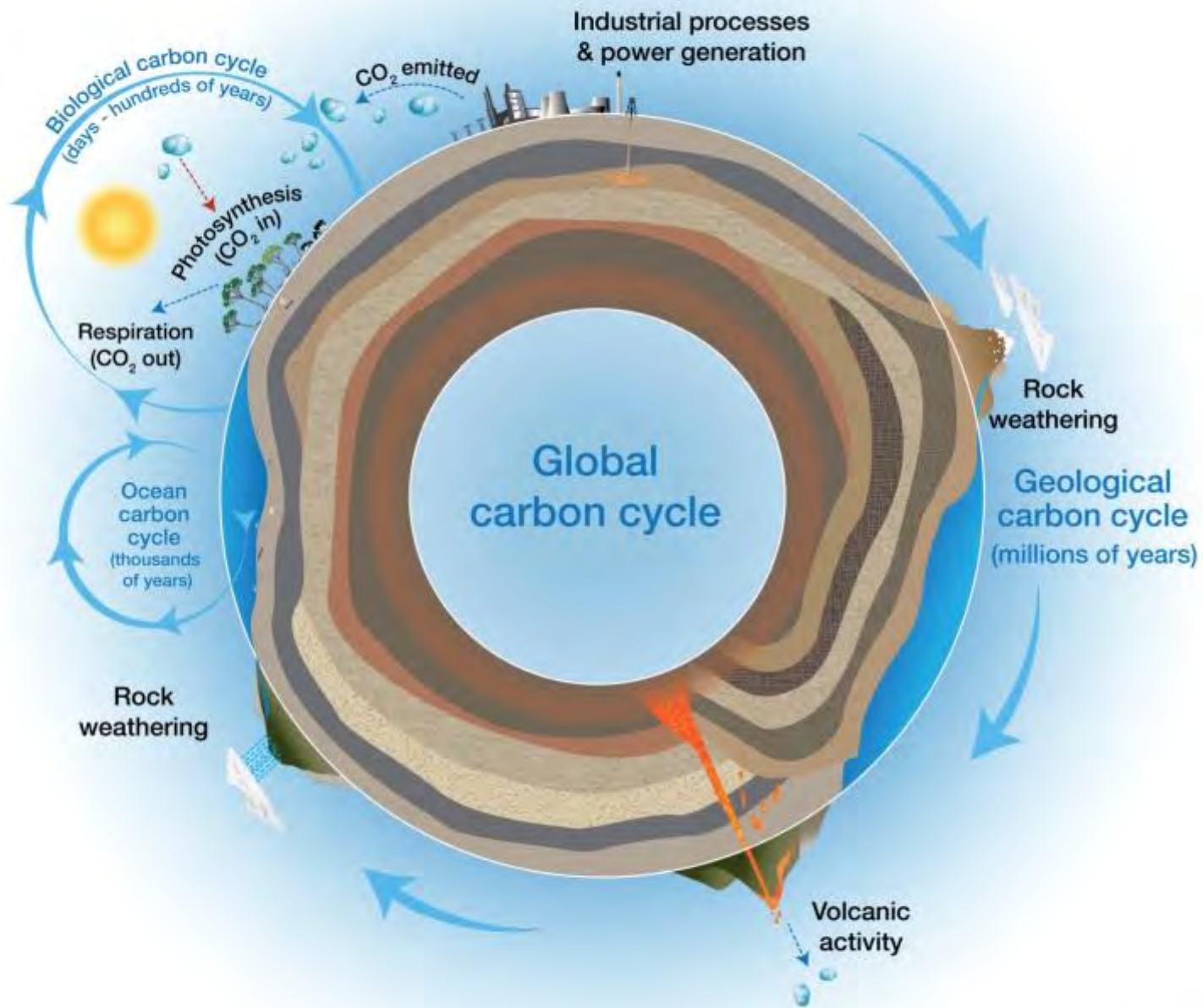
A standard periodic table of elements, color-coded by groups. The groups are: Group 1 (purple), Group 2 (orange), Groups 3-10 (various colors), Group 11 (yellow), Group 12 (green), Group 13 (blue), Group 14 (light blue), Group 15 (dark blue), Group 16 (purple), Group 17 (red), Group 18 (yellow). The lanthanide and actinide series are shown at the bottom.



Legend:

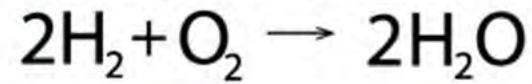
- Essential for humans
- Suggested to be essential for humans
- "So far" for humans

A periodic table where elements are highlighted based on their status for human health. The legend indicates three categories: purple for 'Essential for humans', green for 'Suggested to be essential for humans', and grey for '"So far" for humans'. The highlighted elements are: H, Na, K, Rb, Cs, Fr, Li, Be, Mg, Ca, Sr, Ba, Ra, Sc, Y, La, Ac, Ti, Zr, Hf, Rf, V, Nb, Ta, Db, Cr, Mo, Sg, Mn, Tc, Re, Os, Ir, Pt, Au, Hg, Tl, Pb, Bi, Po, At, Rn, Ni, Cu, Zn, Ag, Cd, In, Sn, Sb, Te, I, Xe, C, Si, Ge, As, Se, Br, Kr, N, P, S, Cl, Ar, F, Ne, He.



WATER - H₂O

Chemical Reactions

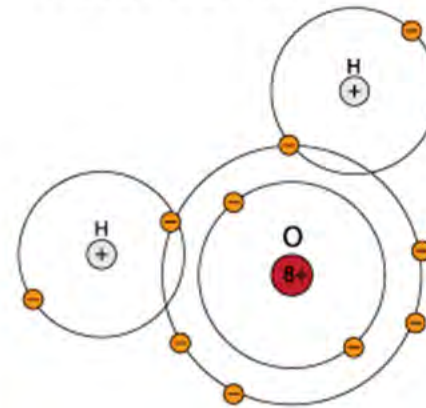


2 hydrogen molecules + 1 oxygen molecule yields 2 water molecules

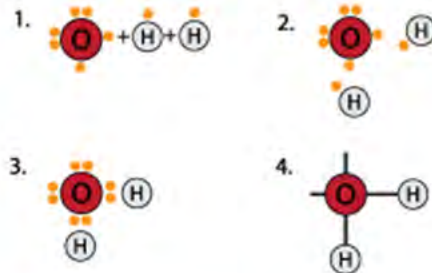
2 × (2,02 amu)	+ 32,00 amu	yields 2 × (18,02 amu)
4,04 amu	+ 32,00 amu	yields 36,04 amu

36,04 amu reactans

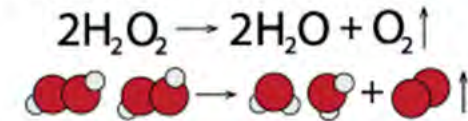
Water Molecule



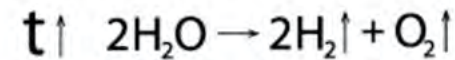
4 step formation of a molecule of water

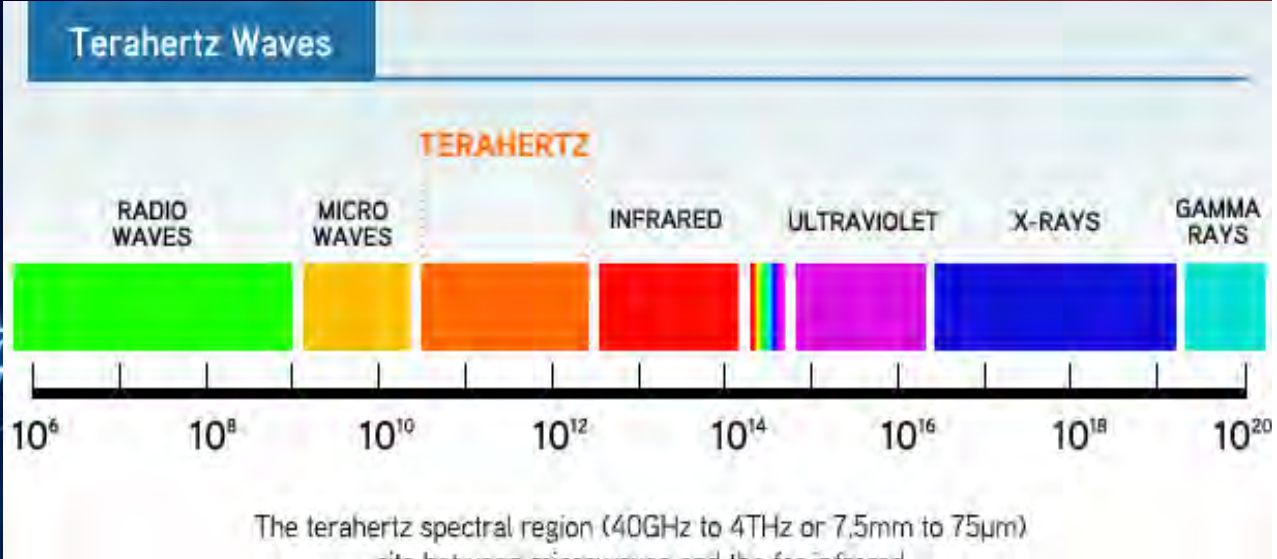
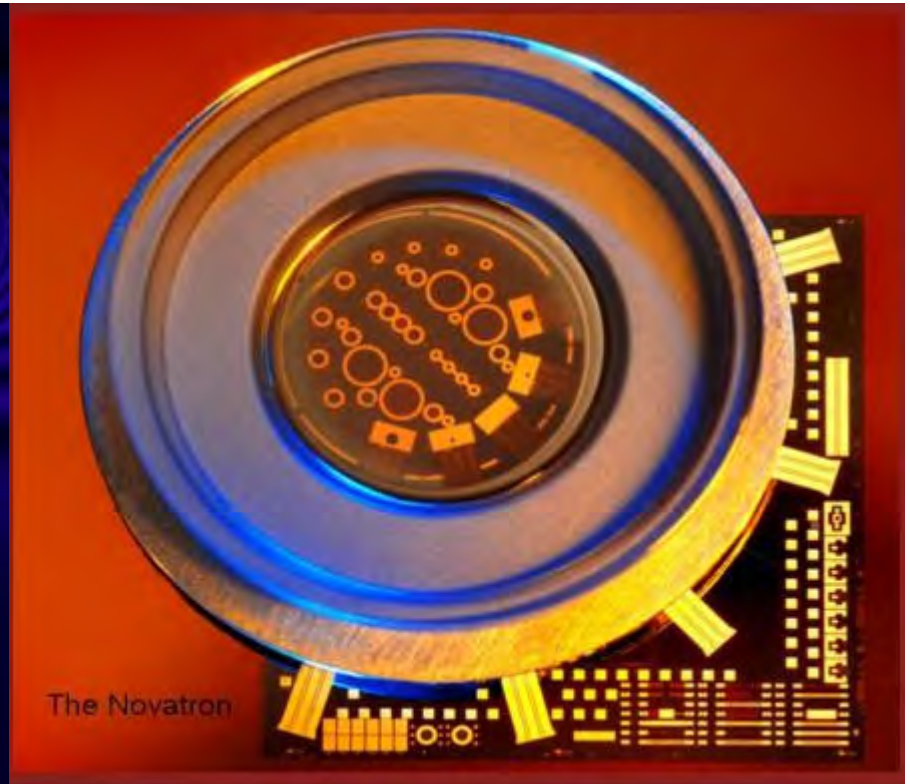


Hydrogen peroxide is thermodynamically unstable and decomposes to form water and oxygen



Under the influence of the very high temperatures or electric current water decomposes into molecular oxygen and molecular hydrogen:



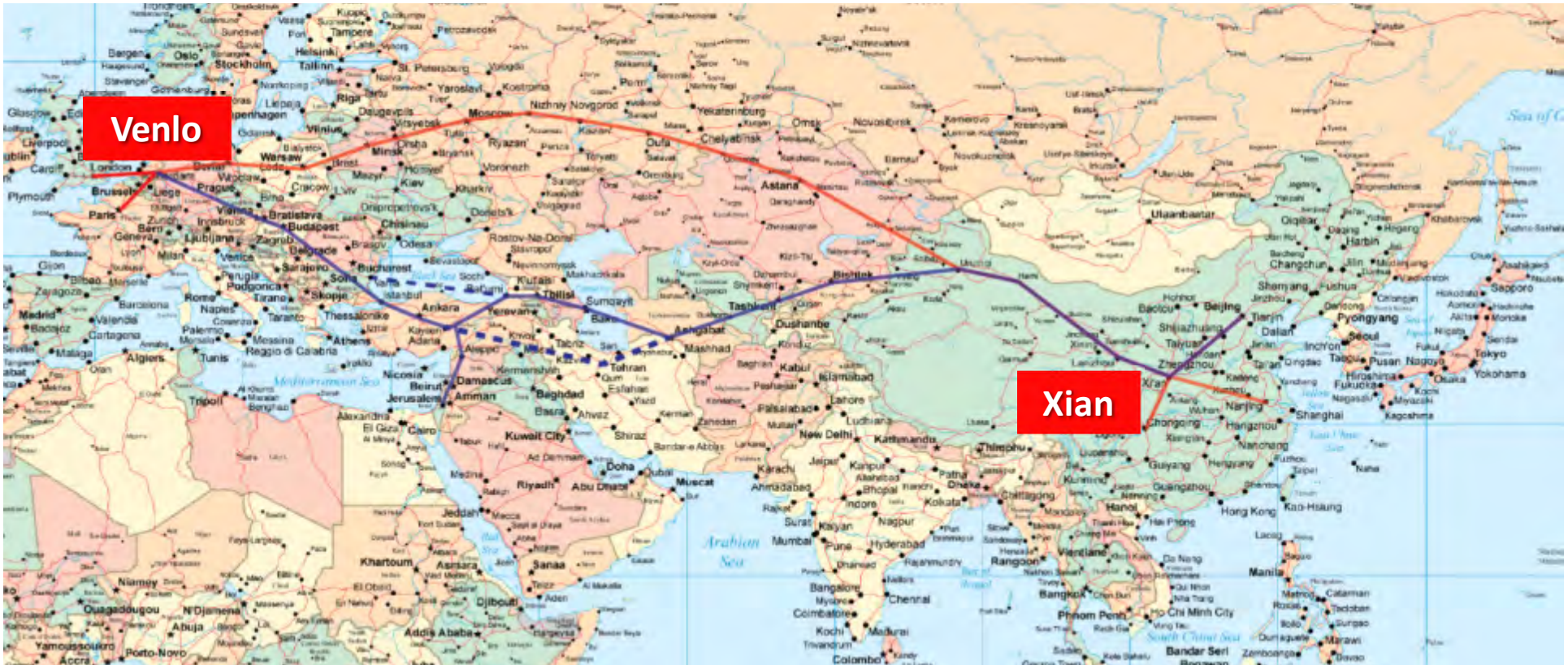


Nexus to Life





Silk Road Corridor



Alone we can
do so little;
together we can
do so much.

INDIVIDUALLY, WE
ARE ONE DROP.
TOGETHER, WE ARE
AN OCEAN.
RYUNOSUKE SATO

jenkelchner.com

Coming together is a beginning;
keeping together is progress;
working together is success.

"Organizations
are successful
because of good
implementation,
not good business
plans."

— Guy Kawasaki

IF YOU WANT TO GO
FAST, GO ALONE.
IF YOU WANT TO GO
FAR, GO TOGETHER.

AFRICAN PROVERB

Don't forget
to smile!!!







*Learn from
Yesterday*



Live for Today



and Hope for Tomorrow

Thank you!

more information www.quaternes.nl

