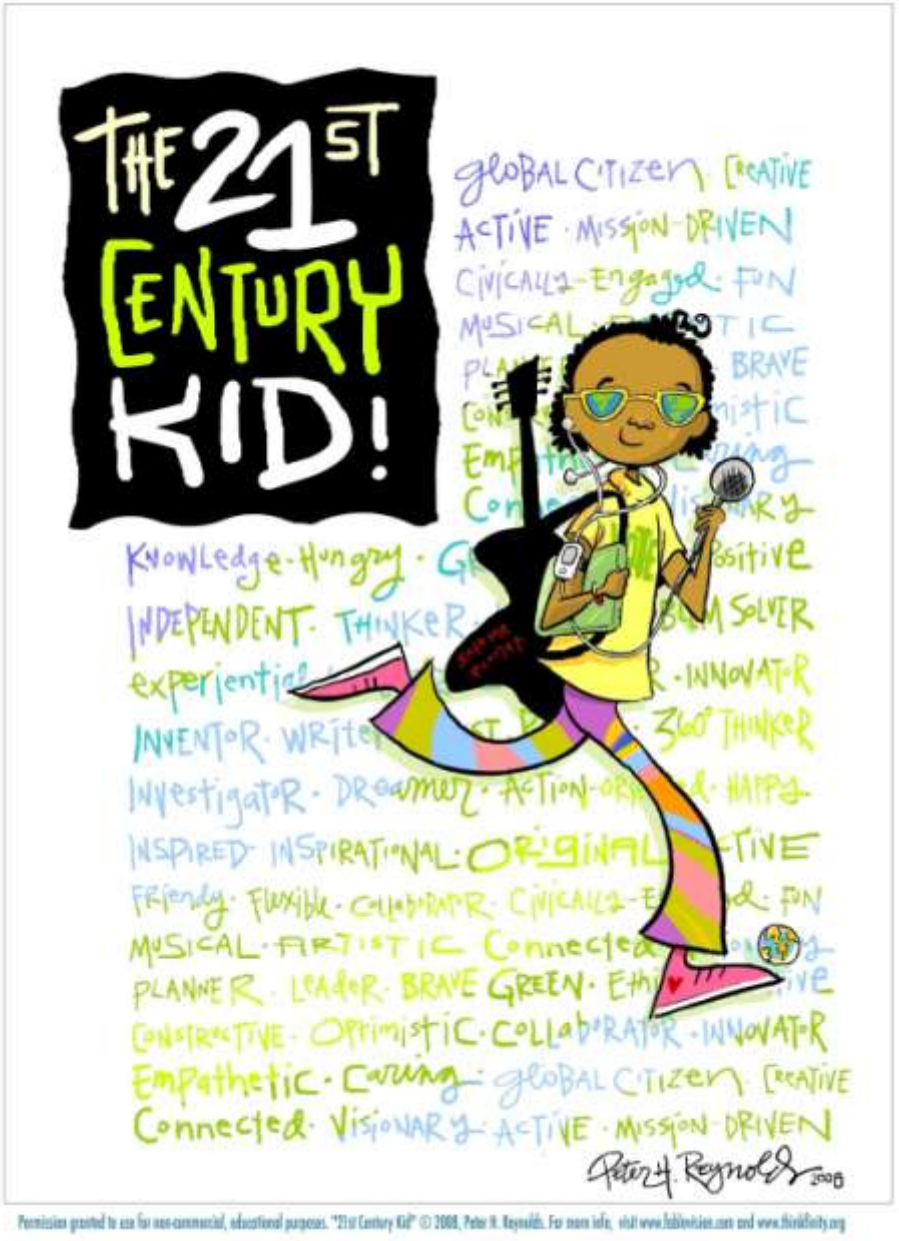


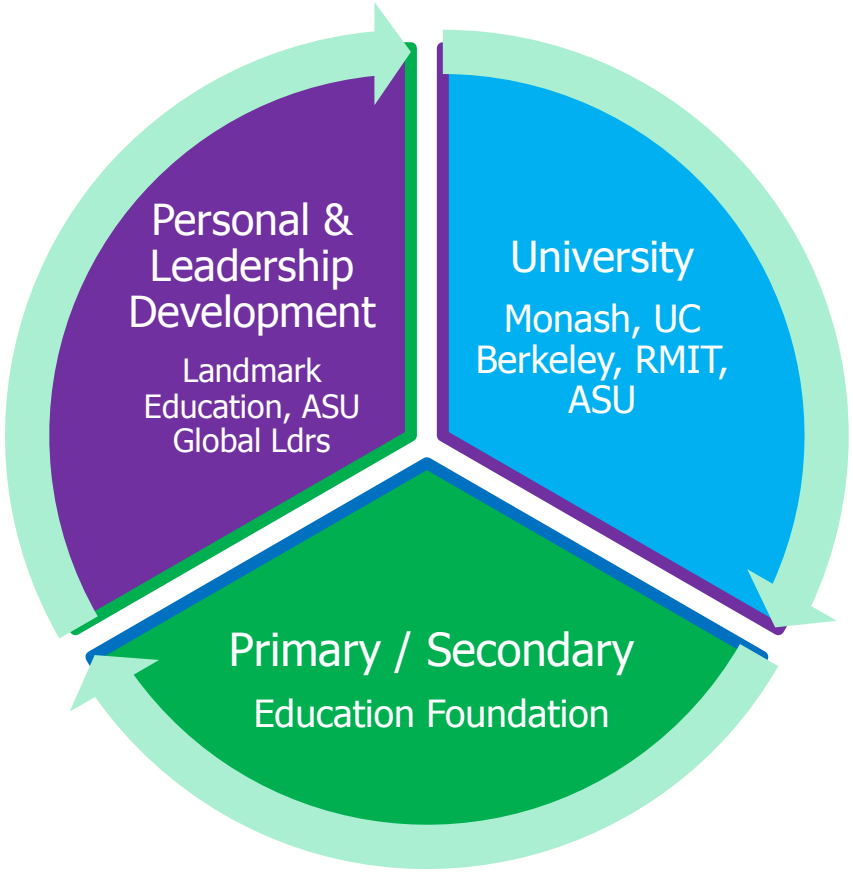
Designing Formative Rubrics

July 2011

Dr Adrian Bertolini

Intuyu Consulting
EMPOWERING LEARNING FOR THE 21ST CENTURY

Introduction – Intuyu Consulting



Intuyu Consulting
EMPOWERING LEARNING FOR THE 21ST CENTURY

Intention of Today

- To shift the mindset you are thinking from and planning from as you develop your classes
- To have you design a formative rubric that allows for student skill development
- To point to the thinking that needs to be done as you shift teaching practice and build a high performance learning culture.

Intuyu's Goal: Teachers work less, work smarter, have students develop themselves in being disciplined, responsible independent learners, and produce *better results*.

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Today – what is it about?

What YOUR job is today

- Be open, honest and participate
- Be a SPONGE

Not a crusty old dry one
hard as a rock and it takes ages
for it to suck up water

Be more like a SHAMWOW!
Suck in all the ideas
Without judgement and assessment
Think about them
Discuss them
Learn what you learn

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Today's workshop

- WHY: 21st Century Paradigm and Skills
- WHAT: How we learn - 4 Stages of Insight
- WHAT: Fixed vs Growth Mindsets
- HOW: Rituals and Formative Rubrics

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of the 21st Century

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The times they are a changing!

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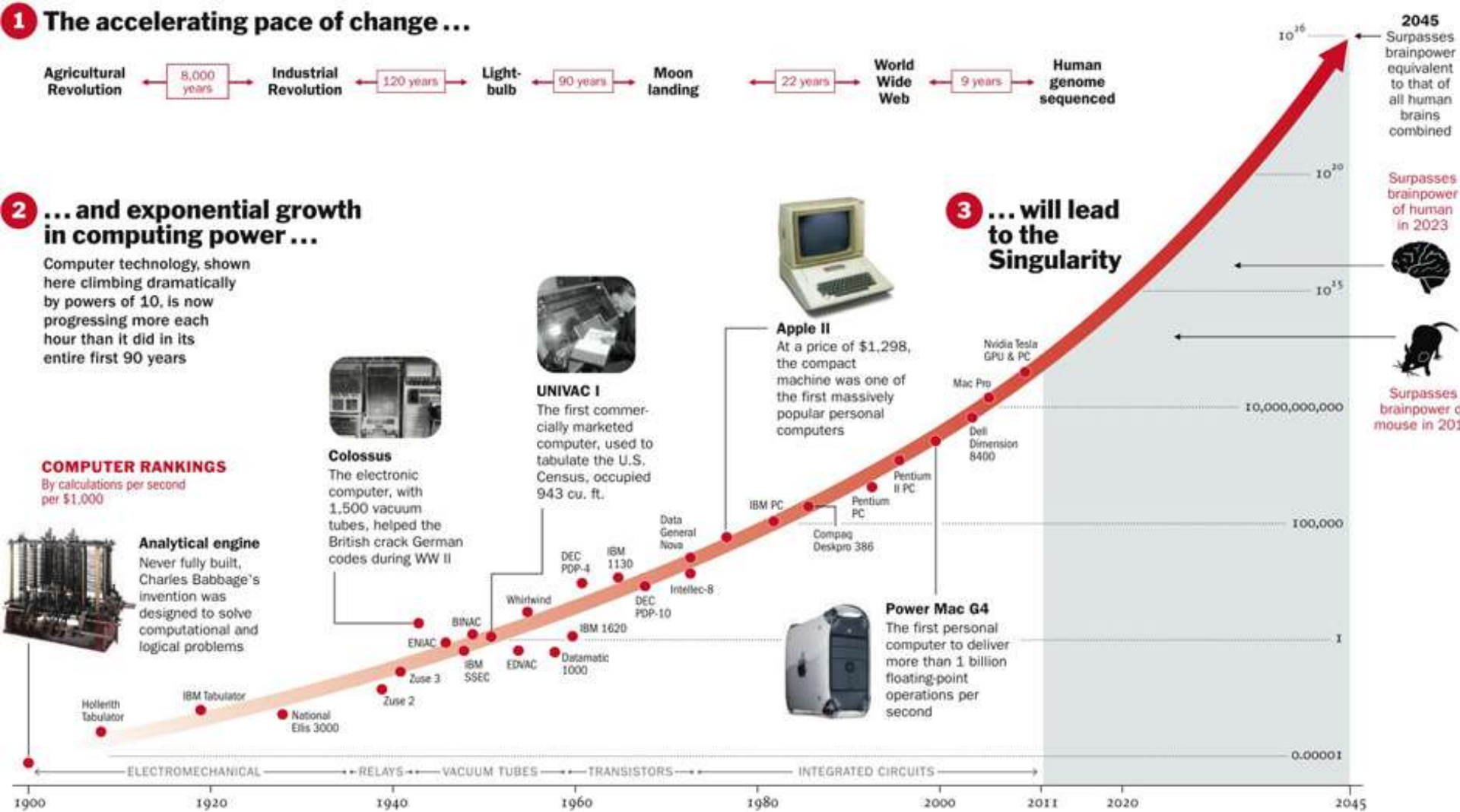
Exponential Growth in Computing



A rapid and constantly changing future

The times they are a changing

Star Wars hologram

"Help me Obi-wan, you're my only hope." This was how Princess Leia was introduced to Luke Skywalker in *Star Wars*, via a hologram projected by that nimble little robot R2D2. In November, a team led by Nasser Peyghambarian, of the University of Arizona, announced they had developed a holographic system that could record a moving 3D image of a person or object in one place and display it at another location in close to real time.

Minority Report/XBox

In the 2002 blockbuster *Minority Report*, Tom Cruise navigates through the enormous computer screens of the future by gesturing his hands through the air.

The Kinect sensor of the latest Microsoft XBox console works the same way. A camera sensor plugs into the console, reads the human body and creates an avatar, or computer image, of the user. The user moves, and the avatar on screen follows suit.

Revolutionary New Paper Computer Shows Flexible Future for Smartphones and Tablets

ScienceDaily (May 4, 2011)

'Racetrack' Magnetic Memory Could Make Computer Memory 100,000 Times Faster

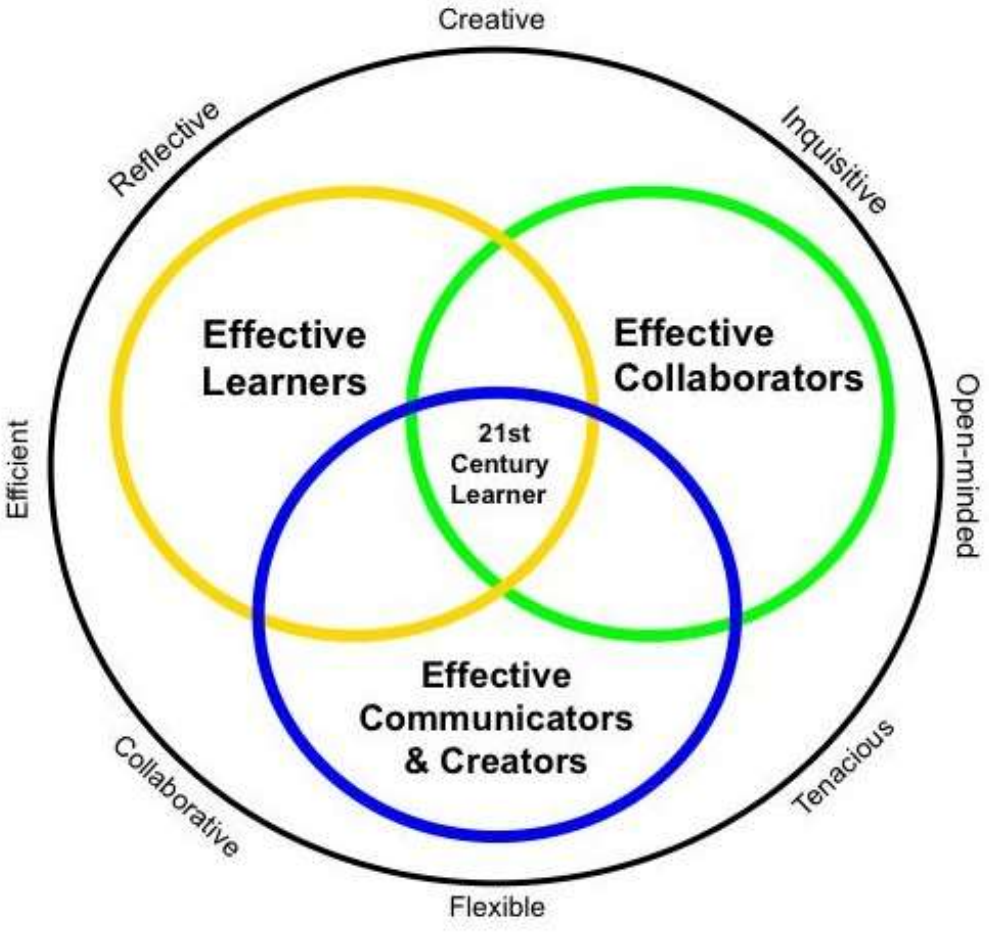
ScienceDaily

Your source for the latest research news

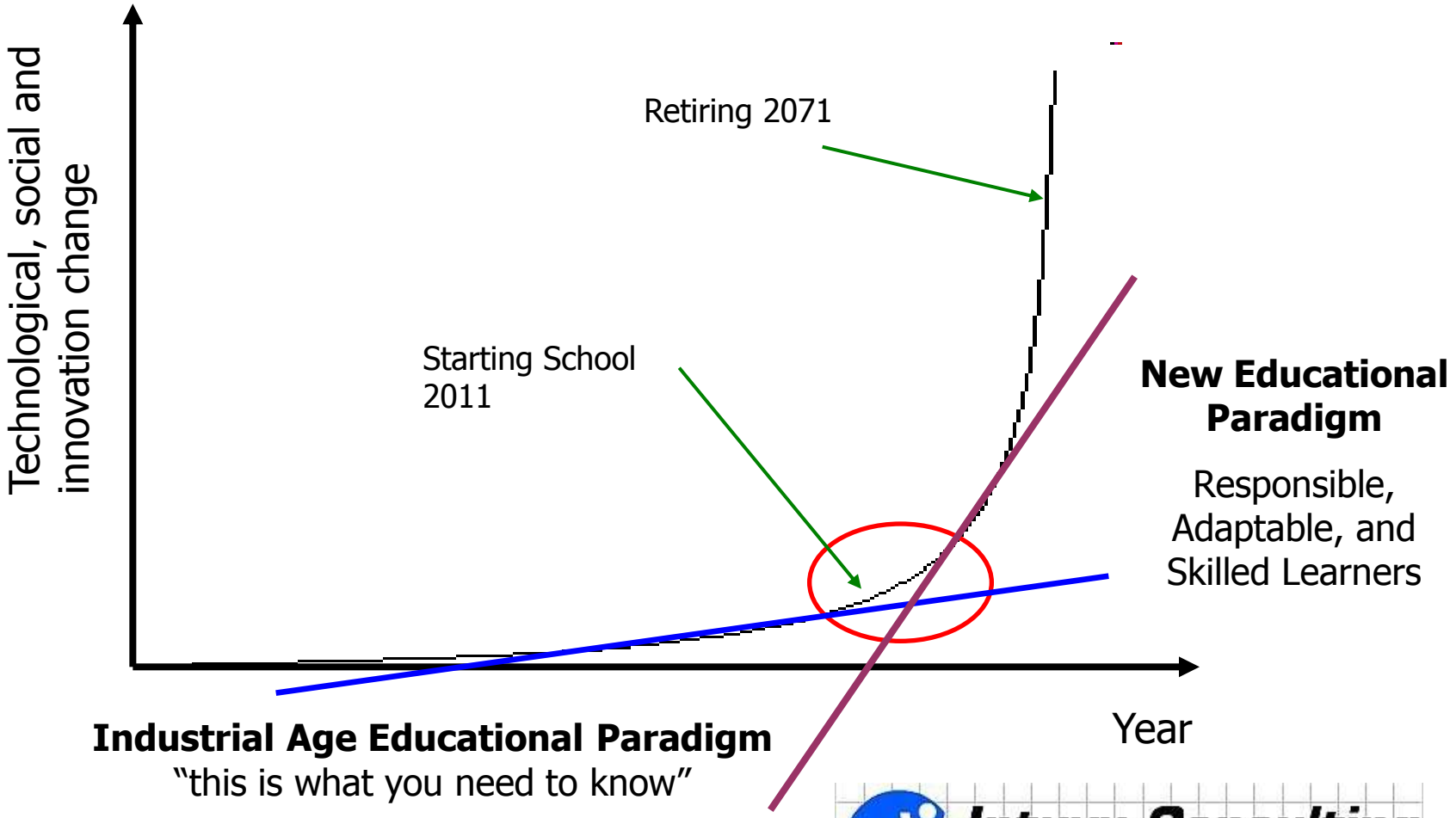
Web address:
http://www.sciencedaily.co
101115210937.htm

'Space-Time Cloak' to Conceal Events

What are the skills needed to be successful in the 21st Century?



Tension that exists



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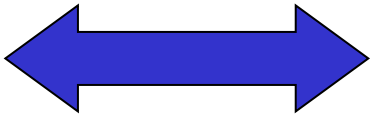
Traditional versus Future

Old Paradigm	vs	New Paradigm
Content Focus		Content and Skill Focus
Teacher Directed		Learner Centred
Basic Skills	SCHIZOPHRENIC	Applied Skills
Curriculum		Projects
One-size-fits-all		Personalised
Largely passive learners		Active Learners
Competitive		Collaborative
Isolated Classrooms		Interconnected Learning Spaces
Independent Teaching		Collaborative Teaching
Theory		Practice
Learning for School		Learning for Life

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Traditional versus Future

Old Paradigm **vs**

Content Focus

Teacher Directed

Basic Skills

Curriculum

One-size-fits-all

Largely passive learners

Competitive

Isolated Classrooms

Independent Teaching

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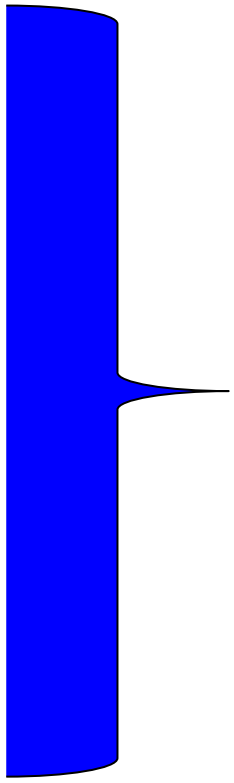
Learning for School



- Habits
- Teaching Practices
- Unconscious Conversations
- Systemic school structures
- Ways that we think about students and learning
- Unchallenged thinking & approaches

Traditional versus Future

What do we need to rethink in the

- How do we explicitly plan to develop skills in the students?
- What are the important skills?
- How do we progressively develop these skills?
- How do we keep students engaged and ignite a love of life-long learning?
- How do we ensure that our academic results are kept high?
- What are the habits, systemic practices, and structures we now need to have the students become more responsible and indept learners
- What do we need to develop ourselves in?

New Paradigm

Content and Skill Focus

Learner Centred

Applied Skills

Projects

Personalised

Active Learners

Collaborative

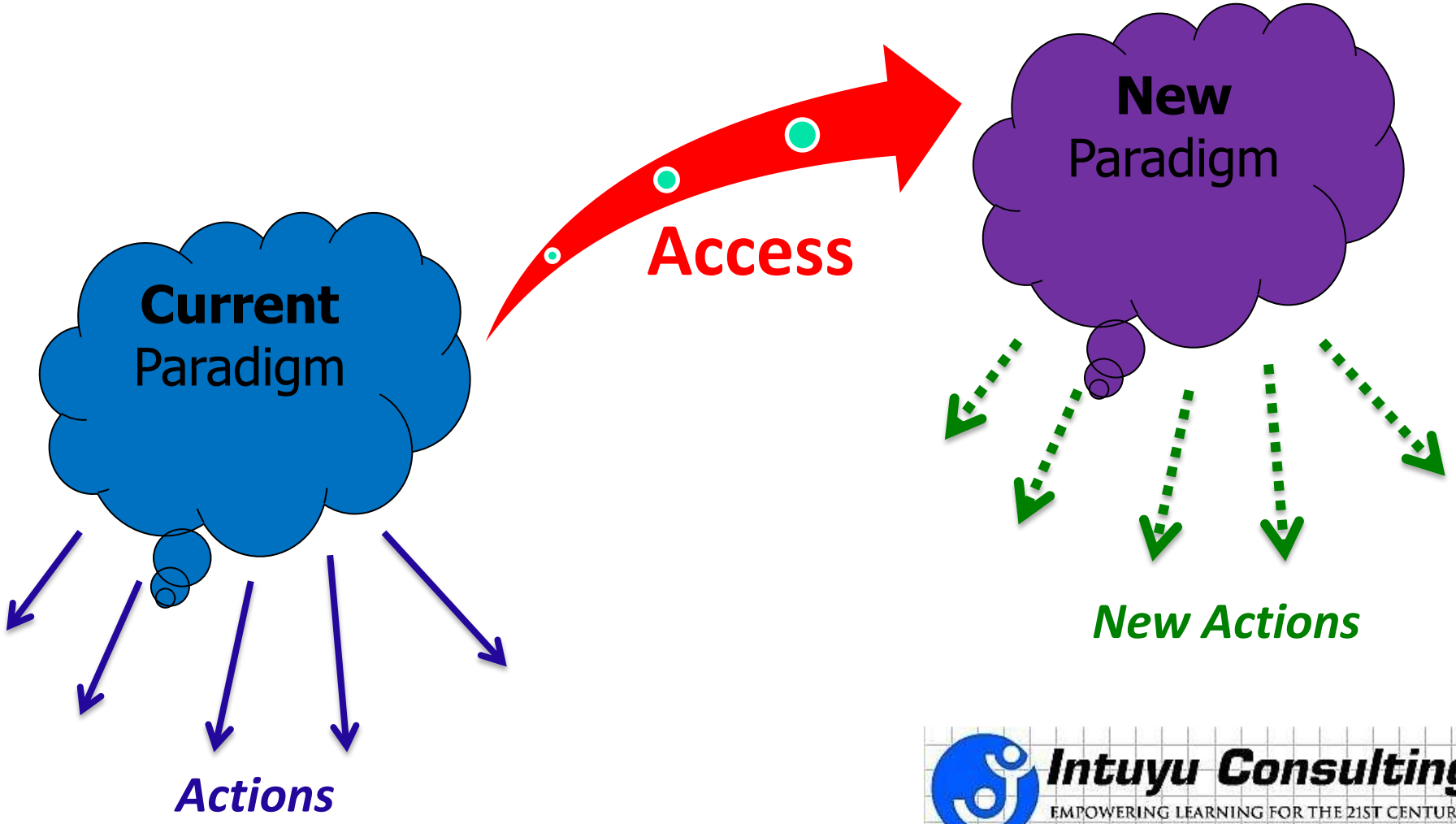
Interconnected Learning Spaces

Collaborative Teaching

Practice

Learning for Life

Shifting Educational Paradigm



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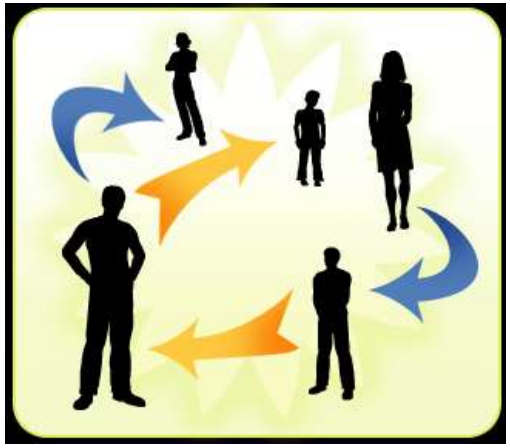
What this points to

If you are going to have a 21st century learning environment then you need to have teachers and school management **thinking from** and **operating from** a 21st century paradigm

otherwise you will be building practices and systems that are actually inconsistent with the world that your students are operating from



Paired Sharing

What are some of the habits, practices or structures that you see need to be looked at and possibly challenged?

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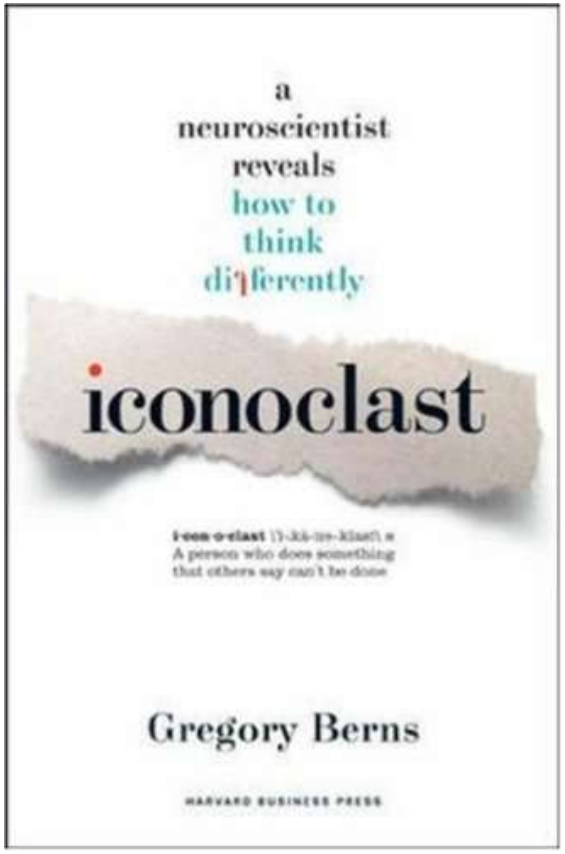
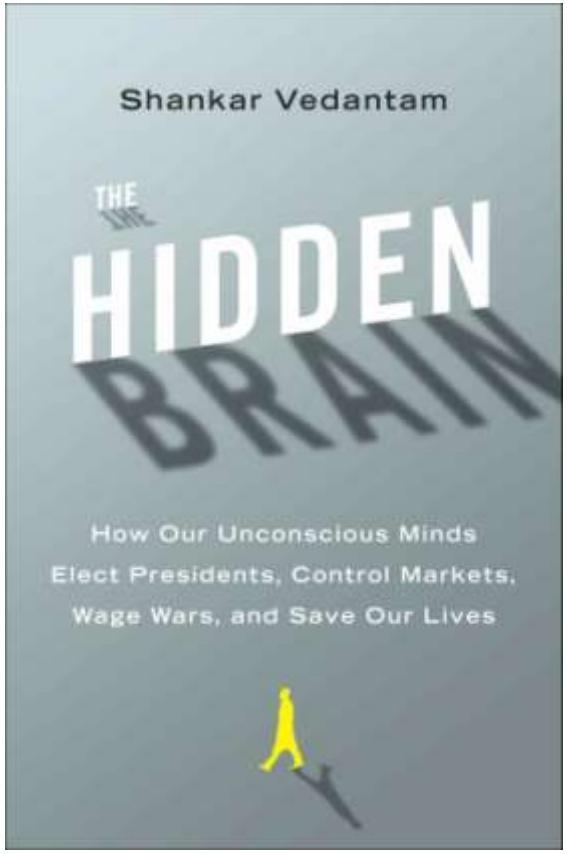
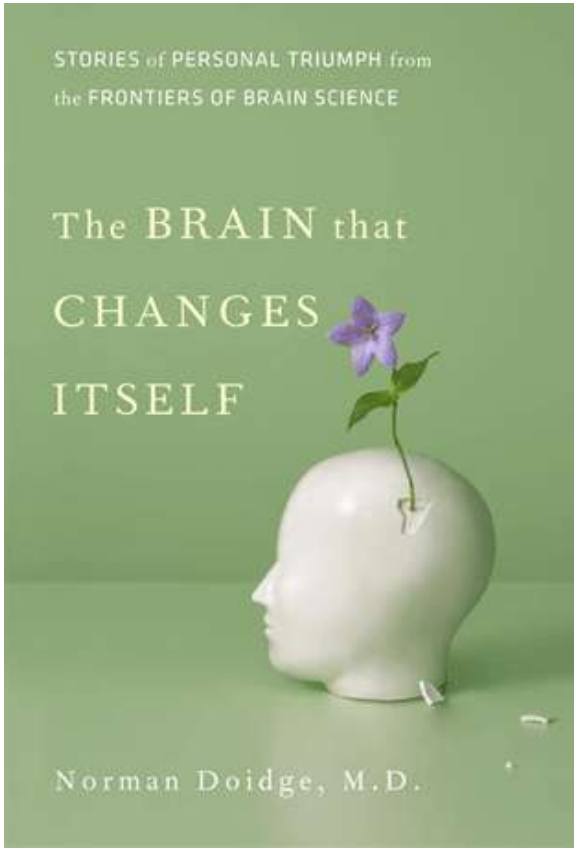
How the Brain operates

You are **slaves**
born into **bondage**
born into a prison
that **you can't** taste
or smell or touch

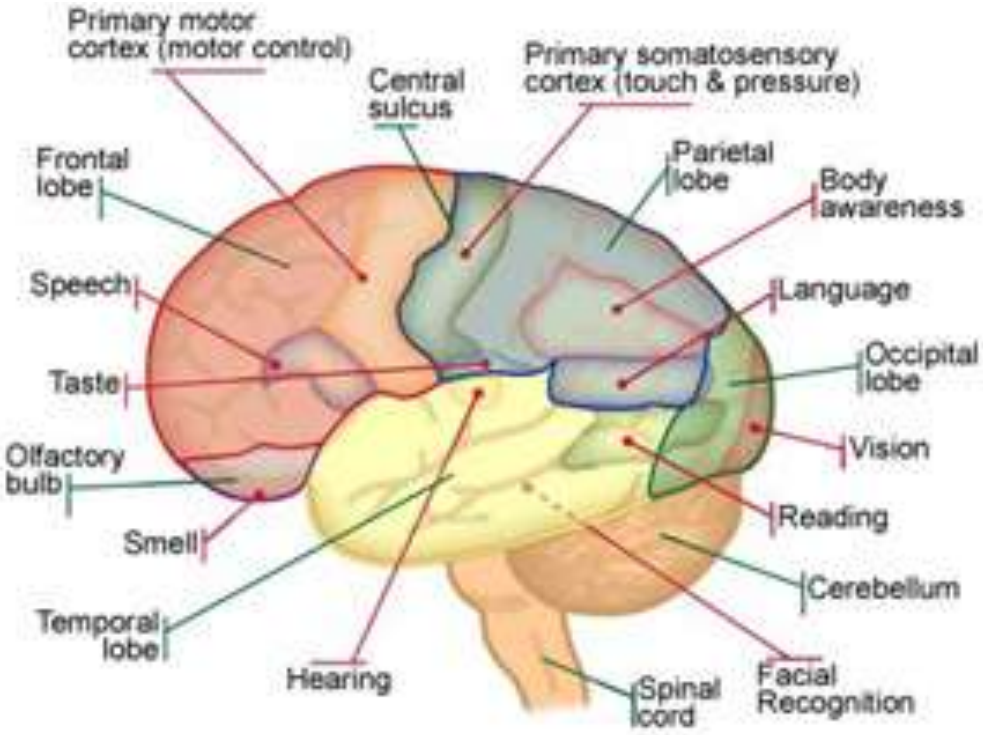
Since the Matrix (1999)





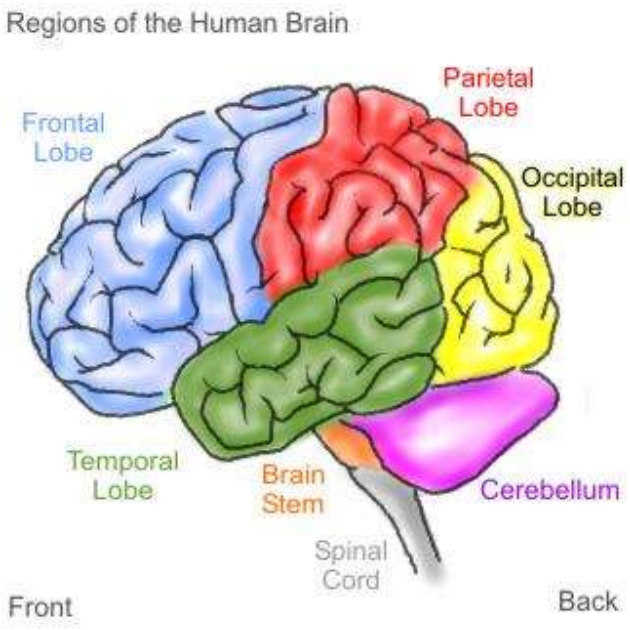


How does the brain work?

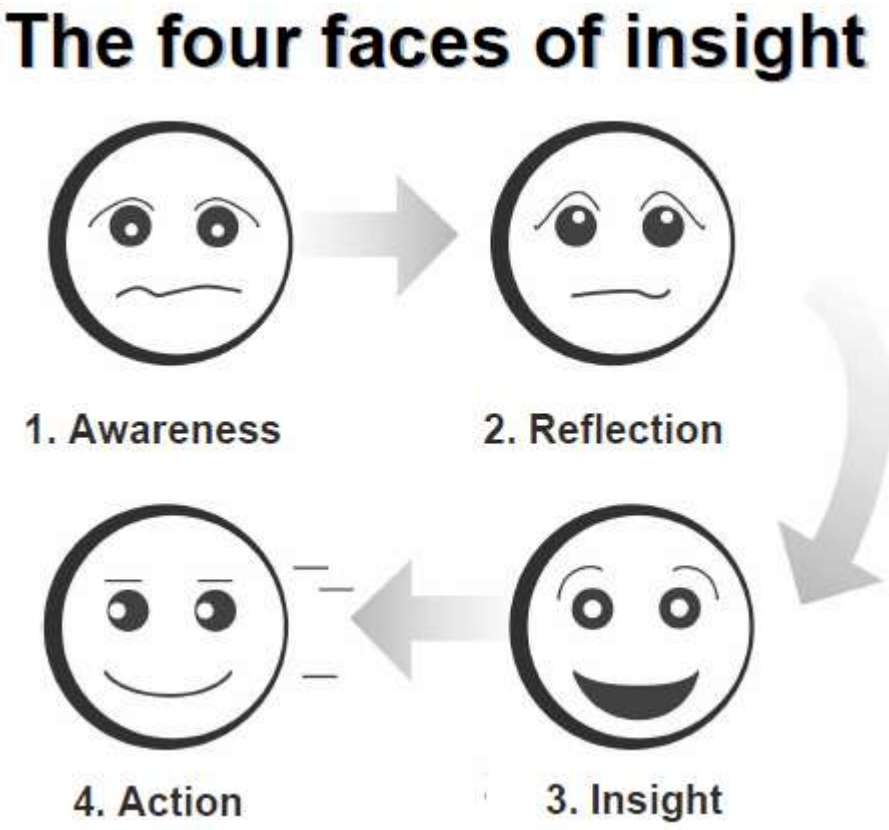


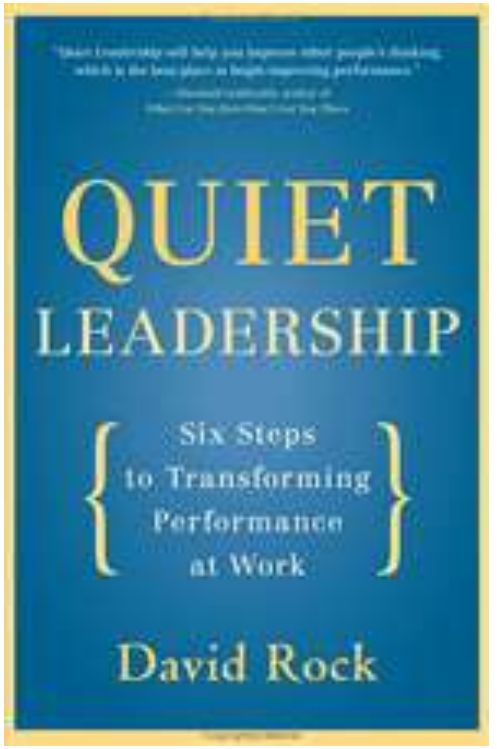
Design of Brain

- To ensure the survival of the body
- To take shortcuts to save energy usage
- To make what is conscious – unconscious so as to save energy usage
- To only keep that which is used (rituals embed knowledge and abilities). Use it or lose it.



How People Gain Deep Learning / Insight





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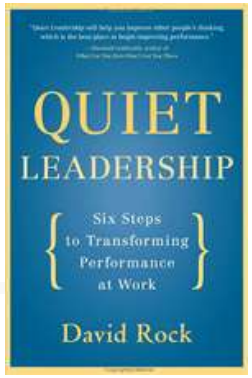
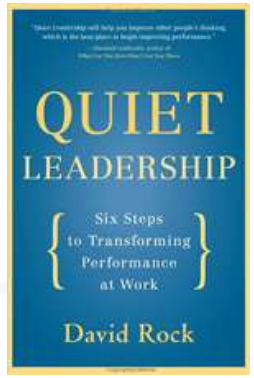
4 Steps to Create Insight – David Rock



First Step of Insight - Awareness

- Need to begin with an **awareness** of the problem
- We haven't thought hard about it but there is an issue to resolve
- This is the immersion and tuning in phase where information is gained
- From a neuroscientific perspective,
  - A **dilemma** means having various **mental maps in conflict**.
  - They have competing values or make competing demands for resources, and the brain has not yet worked out how to resolve this conflict by creating a new metamap or by reconfiguring the existing maps.
  - Our brain can't yet see how to reconcile the needs of these different desires.

Misconceptions / Ambiguity / Mental Maps

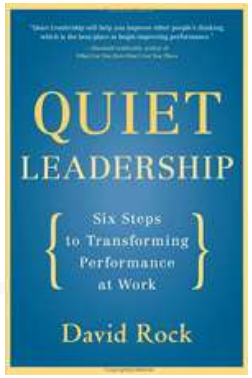


Time Flies Like an Arrow

Time flies in the same way that an arrow does

- Measure the speed of flying insects like you would measure an arrow
- Measure the speed of flying insects like an arrow would
- Measure the speed of flying insects that are like arrows
- "Time-flies" collectively (and individually) enjoy a single arrow
- The magazine "Time", when thrown, flies like an arrow

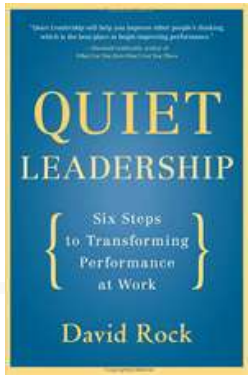
4 Steps to Create Insight – David Rock



Second Step of Insight - Reflection

- People's brains give off alpha-band waves just before they come up with an insight.
    - Alpha waves correlate with people shutting down inputs from their external senses and focusing on internal stimuli.
- Alpha waves are **decreased** by doing math calculations and other exercises that require engaging the conscious, logical mind
- Studies have shown that during reflection we are **not** thinking logically or analysing data;
    - we're engaging a part of our brain used for making links across the whole brain.

4 Steps to Create Insight – David Rock

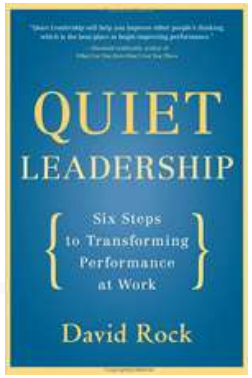


Second Step of Insight - Reflection

- We are thinking in an unusual way, tapping into more intelligence than the three to five pieces of information we can hold in our working memory.

- In practical terms, to help people have insights,
  - we need to encourage them to relax, reflect, look internally into own thoughts and think less … or at least less logically
  - *Michael Rennie* - managing partner of McKinsey & Co [counsel and develop only top 20 companies in Australia]
    - Reflection Process

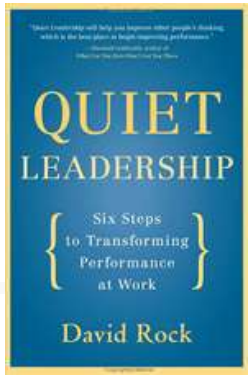
4 Steps to Create Insight – David Rock



Third Step of Insight - Insight

- It's clear that at the moment of insight various neurotransmitters like adrenaline are released as well as possibly serotonin and dopamine … thus the Ah ha!
- At the very moment an insight occurs, the brain gives off strong gamma-band waves.
    - Gamma-band waves are the only frequency found in all parts of the brain and are seen when the brain simultaneously processes information across different regions.
    - Gamma-band brain waves signify various parts of the brain forming a new map.

4 Steps to Create Insight – David Rock



Fourth Step of Insight - Action

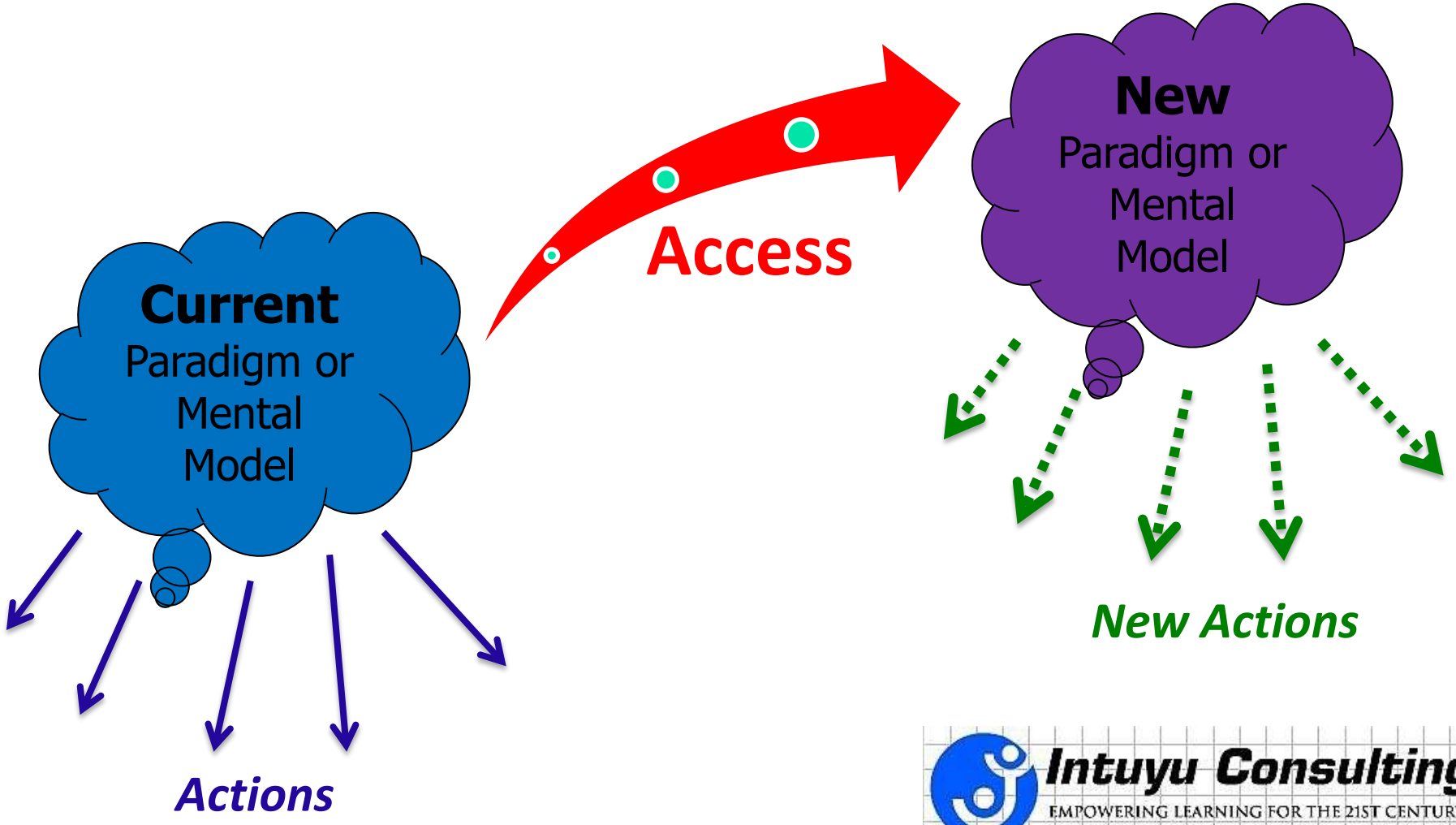
- The intense motivation from having an insight is short term.
- If you can get people to take tangible actions while the insight is close at hand, even just to commit to doing something later, this will be a big help to ensuring new ideas become reality.

Repeated use leads to mastery

BUT

they must be operating from the paradigm (way of thinking) you want them to operate from

Learning in its Essence



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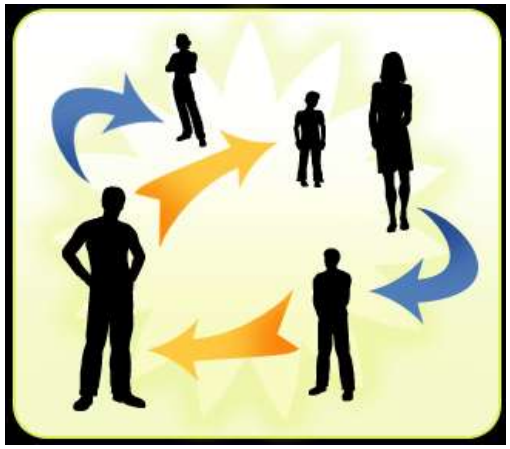
What this points to

You and your students must be aware of how the brain learns and set up structures and systems that not only deals with differing learning styles but how the brain forms mental maps.

Students must develop the skills of being meta-cognitive.



Paired Sharing

What systemic practices and habits do you already use to develop students to think from where we want them to think?

Thinking Curriculum Structures

The ITC Framework for Thinking at Different Levels

HIGHER ORDER THINKING SKILLS

1. Bloom's Cognitive Taxonomy *At which level will the students be thinking?*	2. Thinking Skills Verbs *What do I want the students to be doing (generally)?*	3. Some Sentence Starters *What do I want the students to do (specifically)?*	4. Cognitive/Collaborative Thinking Tools/Strategies *What tools can the students use?*
DESIGN  *acting like Thomas Edison, always improving, designing, planning*	creating, devising, embellishing, extrapolating, forecasting, formulating generalising, generating, hypothesising, improving, inventing, modifying, planning, predicting, proposing, synthesising,	Design an improved...for... Formulate a set of criteria to judge... Compose a song, jingle or rap to... Modify...in order to create a fairer... Develop an argument to persuade people... Generate key questions for... Create a role play/experiment to... Devise a new code for...	1:4:P:C:R (p.176) Y-Chart (p.164) MAS (p.134) Round Robin/Hot Potato (p.158) Image Associated Ideas (p.152) Word Association (p.226) Problem–Solution (p.74)
EVALUATE  *acting like a Judge, based on the evidence*	arguing, assessing, concluding, deciding, critiquing, debating, determining, grading, judging, justifying, prioritising, ranking, recommending, selecting, verifying	To what extent... Which of the two...would be better for... Justify the decision of... Determine which is the more effective... Evaluate the effectiveness of... Select which is the best option...or... Rank the following from...to most... Debate the issue...	Extent Barometer (p.238) Decision-Making Matrix (p.116) Human Continuum (p.250) Round Robin/Hot Potato (p.158) Judge Jury (p.220) PCQ (p.200) Elimination Draw (p.98) Y-Chart (p.164)
ANALYSE  *acting like a Sorting Tray, examining and breaking up an issue into its component parts*	analysing, arguing, categorising, comparing, contrasting, critiquing, debating, deducing, differentiating, discussing, distinguishing, examining, explaining, identifying, inferring, investigating, separating	From at least 4 peoples' viewpoint, analyse... Discuss the similarities and differences between... Compare and contrast... Investigate all the factors that could influence...in... Summarise the reasons for... Deduce how the parts interact in... Conduct research on the issue of... in order to gain a deeper understanding of... List the pros and cons of...	Decision-Making Matrix (p.116) Round Robin/Hot Potato (p.158) Judge Jury (p.220) KWHL (p.140) PCQ (p.200) Icon Prompt (p.212) Double Bubble Maps (p.80) SWOT Analysis (p.122) T-Charts (p.128) Y-Chart (p.164) Jigsaw (p.206)

ting
CENTURY

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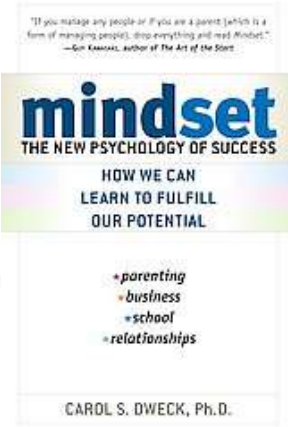
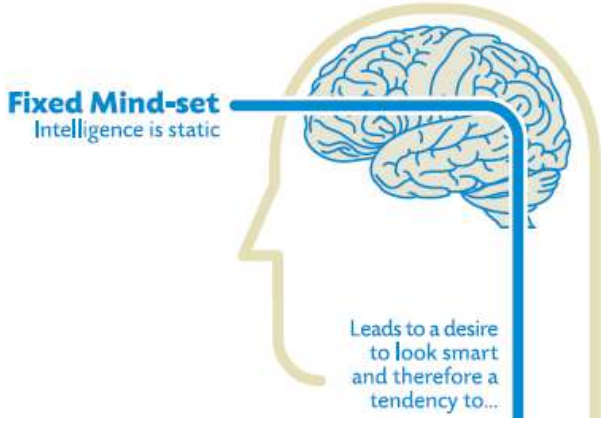


Fixed vs Growth Mindsets – Carolyn Dweck

Fixed Mindset

- Holds the belief that intelligence and talent are fixed traits
- Talent alone creates success. Effort will not make the difference.
- You either **get it** or **you don't**.
- Time is spent documenting intelligence or talent instead of developing them.
- Holds belief that results are ~35% effort and 65% ability
- Teaches in long CHUNKS of time and then CHECKS at the end



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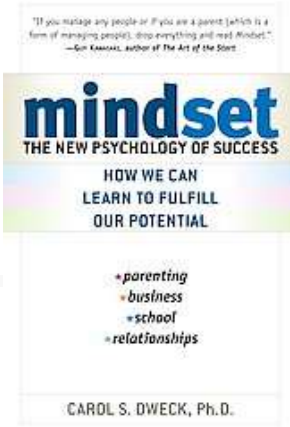


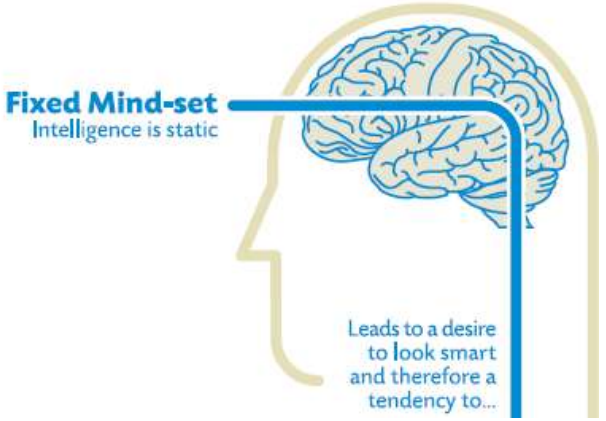
Fixed vs Growth Mindsets – Carolyn Dweck

Fixed Mindset

When confronted with a failure the normal response is HELPLESSNESS and "I can't"

Habits of someone in a Fixed Mindset

- Doesn't pay attention to learning information
- Becomes depressed and de-energised (takes things personally)
- Denigrates intelligence
- Under-represents past successes and over-represents past failures.
- About "looking-good", "going through the motions" but not growth.



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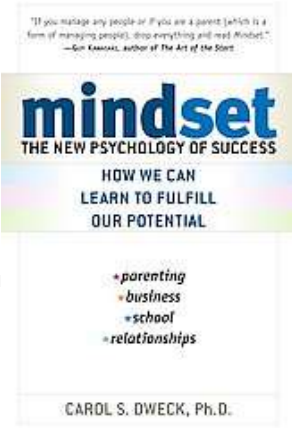
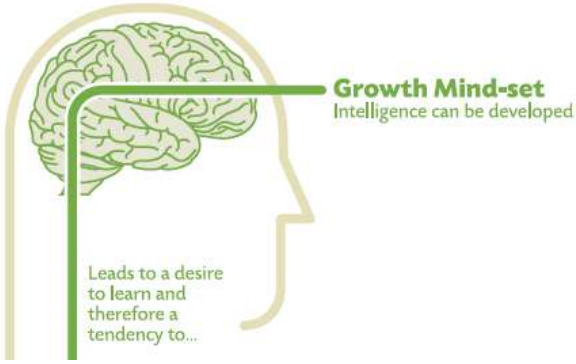


Growth Mindset

- Holds belief that most basic abilities can be developed through dedication & hard work – brains and talent are just the starting point
- A love of learning & resilience is essential for great accomplishment (& virtually ALL great people have them)
- Attitude is that you can ALWAYS learn and grow
- Holds belief that results are ~65% effort and 35% ability
- Teaches in short CHUNKS of information and allows time to CHEW knowledge before CHECKING



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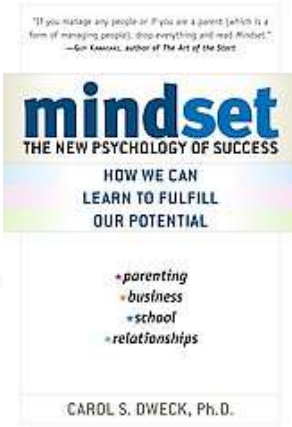
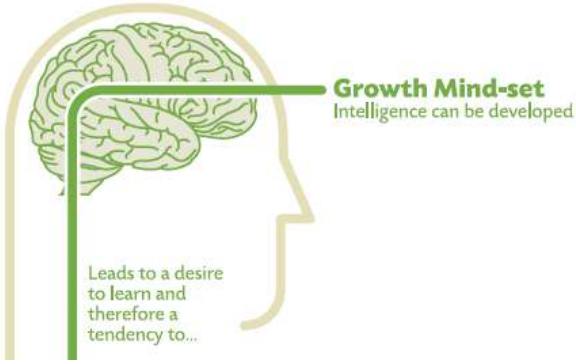


Growth Mindset

When confronted with a failure the normal response is "I've learnt something" and "OK. What now?"

Habits of someone in a Growth Mindset

- Pays attention to learning information
- Focuses on what they are learning not their feelings
- Have a positive self-conversation
- Tries new ways of doing things
- Failure is an opportunity to grow
- Chooses more challenging tasks because it is about growth



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The Effect of Praise

Fixed Mindset praises intelligence and talent

- this increases cheating
- sets performance goals but creates helpless response
- undermines motivation

Growth Mindset praises the effort that led to success

- Allows for growth because it reinforces the behaviour of effort
- Encourages learning goals and a mastery response
- Increases motivation and success
- It empowers students because it allows them to struggle and overcome obstacles

The Effect of Praise - Examples

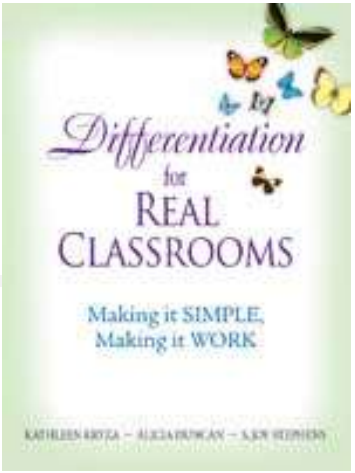
Fixed Mindset Praise

- "You learned that so quickly! You're so smart!"
- "Look at that drawing. Martha, is he the next Picasso or what?"
- "You're so brilliant, you got an A without even studying!"

<u>See if you can hear another message</u>. It's the ones that children hear:

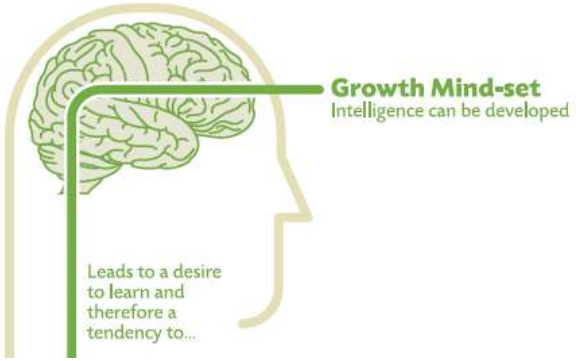
- "If I don't learn something quickly, I'm not smart."
- "I shouldn't try drawing anything hard or they'll see I'm no Picasso."
- "I'd better quit studying or they won't think I'm brilliant."

Growth Mindsets – Kathleen Kryza



Growth mindset teachers

- Have a high level of self-awareness
- Are coachable
- Are looking to always develop themselves
- Think about their thinking (metacognitive)
- Praise Effort not Talent
- Develop their students
  - To be self-aware
  - To be metacognitive
  - To be coachable
  - Belief that effort is rewarded
  - To have a growth mindset



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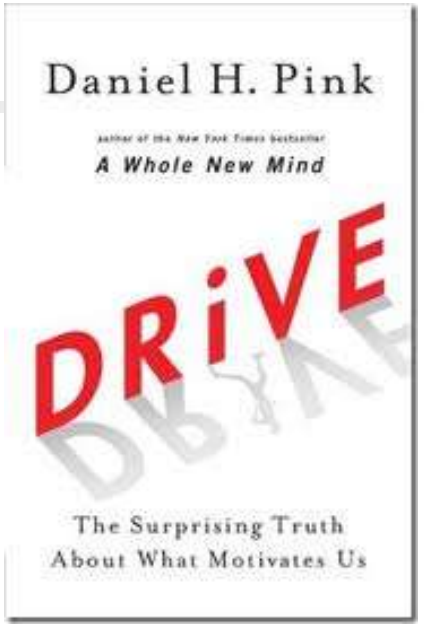
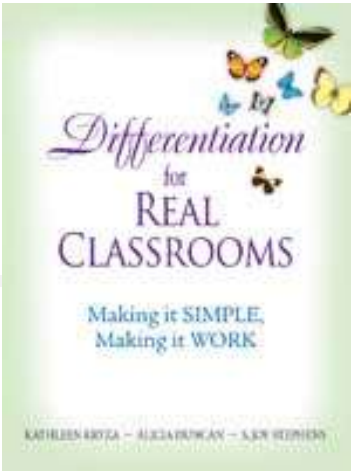
What motivates people



Once people have enough to survive reasonably well, what drives us are three things:

1. Autonomy
2. Mastery
3. Purpose

Growth Mindsets – Kathleen Kryza



Brings the students into the learning process by being

Intentional

- YOU know WHY you are teaching what you are teaching
- Plan first, Save Time:
  - Clearly defined learning targets
  - Big Understandings as well as key facts and skills
  - Made targets visible to students in student-friendly language

Transparent

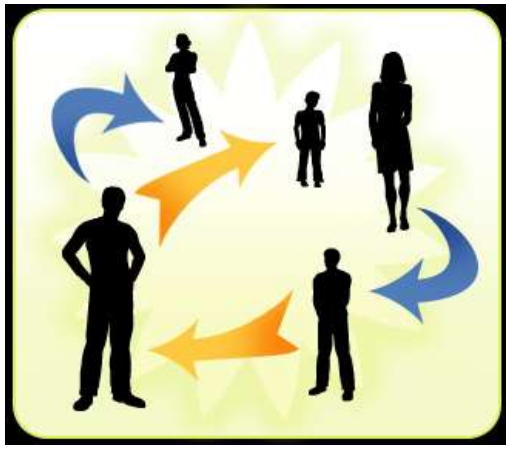
- STUDENTS know why they are learning what they are learning
- Talk the talk! Tell students:
  - What they are learning and why it is important to learn
  - What strategies grow effective learners
  - Reflect on learning with your students
  - Notice and name how they learn and what strategies help them win the learning game.

What this points to

If you want the students to be engaged and inspired to learn then you need to **design a learning environment** that develops **a growth mindset** and gives them autonomy, mastery and purpose.

Paired Sharing

What practices can you now see you use to develop a growth mindset in your students and yourself?



Today's workshop

- WHY: 21st Century Paradigm and Skills
- WHAT: How we learn - 4 Stages of Insight
- WHAT: Fixed vs Growth Mindsets
- HOW: Rituals and Formative Rubrics

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Novelty, Rituals and Formative Rubrics

- While **Novelty** electrifies, **rituals** are needed to unify.
- **Rituals help establish safety.**
- Teachers need to go beyond their normal assessment practices which measure content knowledge.
- We need to develop **rubrics** (*a prescribed guide for conduct or action*) that have the students develop **responsibility** for their own learning and **guide the student** to develop the skills, capabilities and behaviours.
- How can we ritualise skill development?

Formative Rubrics to develop skills – Grade 6

RUBRICS – AUSTRALIANS AT WAR – TERM 2 -2010

SKILLS	high school	grade 6	grade 5 or below	TEACHER PRACTICES / TEMPLATES
NOTETAKING	• Shows main facts • Uses sub headings • Writes down where information comes from • May use drawings or diagrams	• Write some notes in point form and sentences. • Convert information into own words	• Highlight key words in a passage • Requires assistance to write information in own words • Neat handwriting	• Teacher role models approach • WA Steps resource • Mind map • Graphic organisers • Explicit workshop on note taking
RESEARCH	• Uses a wide variety of resources (5+) • Can locate resources independently	• Uses different resources (2-4) • Can locate some resources without assistance	• Uses 1-2 resources • Requires assistance to search for information • Uses only teacher given resources	• Library • Atlas • Wikipedia • Web resources • Google • Encarta
EXTRACT RELEVANT INFORMATION	• Extracts information that directly relates to chosen topic or direction • Write or explain in own words and understands information.	• Extracts basic information that is relevant to topic or direction. • Repeats some information and demonstrates some understanding	• Cuts and pastes information	• Modelling • Explicit teaching • Links • WA Steps resource
FORM A POINT OF VIEW	• Provides relevant and lots of evidence to support a point of view • Addresses others' points of view well	• Provides a number of relevant facts to support point of view • Addresses some of others point of view	• Provides a few relevant facts to support point of view • Does not address others point of view	• Define 'point of view' • PMI • For / Against chart • Thinking strategies

Formative Rubrics to develop skills - Personal

Skill	Very High 5.5	Medium 5.25	Low <5.0	Teacher practices/ workshop/ Templates
Personal attributes				
- shows Initiative	Student suggests new ideas and alternatives (6+) to the group	Student suggests (3-5) new ideas and alternatives to the group Some teacher guidance is used	Student suggests some new ideas and/or builds on others suggestions Student requires a lot of teacher assistance to develop ideas	Brain storm ways; i.e. working at home when you have an idea to bring back; discussing with your group outside of set time
- Independent	Student is able to complete each individual task without requiring prompting Student recognized when to seek assistance with the task	Student is able to complete most of the task without prompting Student requires prompting when difficulties were experienced	Student needs much prompting to complete a task Student requires assistance to complete tasks	Research in own time; complete tasks using a wide range of resources (including people)

Formative Rubrics to develop skills - Research

Skill	Very High 5.5	Medium 5.25	Low <5.0	Teacher practices/ workshop/ Templates
Research - sources	Use[illegible]ide variety of sou[illegible] (7+) Independently selects reliable and appropriate sources to the task	Uses some different sources (3-6) Requires some assistance to select appropriate sources	Uses limited sources (1-2) Sources are not reliable Requires mainly teacher assistance to select appropriate sources	Give rubrics to student focus group to review KWHL chart – i.e. your tool kit Graphics organisers - venn diagrams - mind maps - fishbones - spider map - Y charts - PMI Using: "delicious", NING Double Entry Journal (maths classes) Use different search engines; i.e. google scholar, ENDNOTE(an automatic bibliography)
- analyse	Student(s) critically review the information and draw appropriate and inventive conclusions with supporting evidence	Student(s) show analysis of the evidence collected	Student(s) conclusions require stronger supporting evidence Analysis is basic	
- questioning	Student(s) recognise and pose focus questions, which involve them in challenging research Student(s) recognise when and who to seek advice from, after exploring a range of options	Student(s) construct questions with readily available answers Student(s) recognize when and who to seek advice from, prior to exploring a range of options	Students rely on teachers to create questions, or develop a question requiring little creative thought Students require teacher direction often	

Designing Formative Rubrics - Principles

S Specific

M Measurable

A Attainable

R Relevant

T Trackable

Intuyu Consulting

Website: www.intuyuconsulting.com.au
Email: adrian@intuyuconsulting.com.au

Offerings

Short one-off and/or full day workshops on topics as varied as:

- Developing high performance learning cultures
- Shifting school culture
- Fixed vs growth mindsets
- Skill-based formative rubrics
- 21st Century learning
- Visible Learning
- Differentiation
- Practical Inquiry Learning – planning authentic rich learning tasks
- Beginning Teachers

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