'Preparing our students for the future, one STEM project at a time'.

Grant Jones
Leader of ICT, Innovation and Teacher Delivery
@Jonesyteacher

Wonderings

DISCUSS THIS PICTURE FOR 30 SECONDS

“Change is an opportunity to do something amazing”

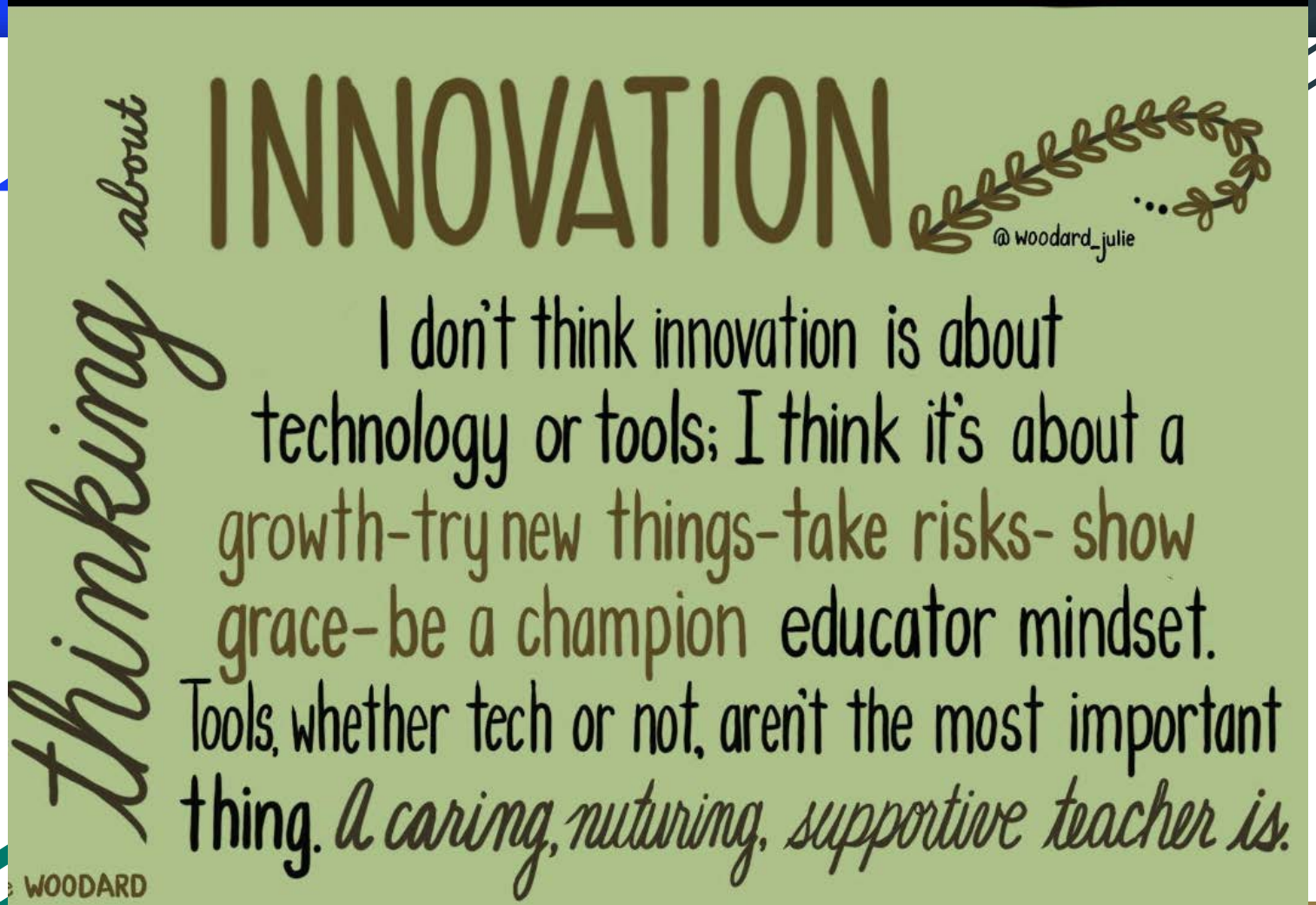
#InnovatorsMindset

It doesn't matter how many resources you have.

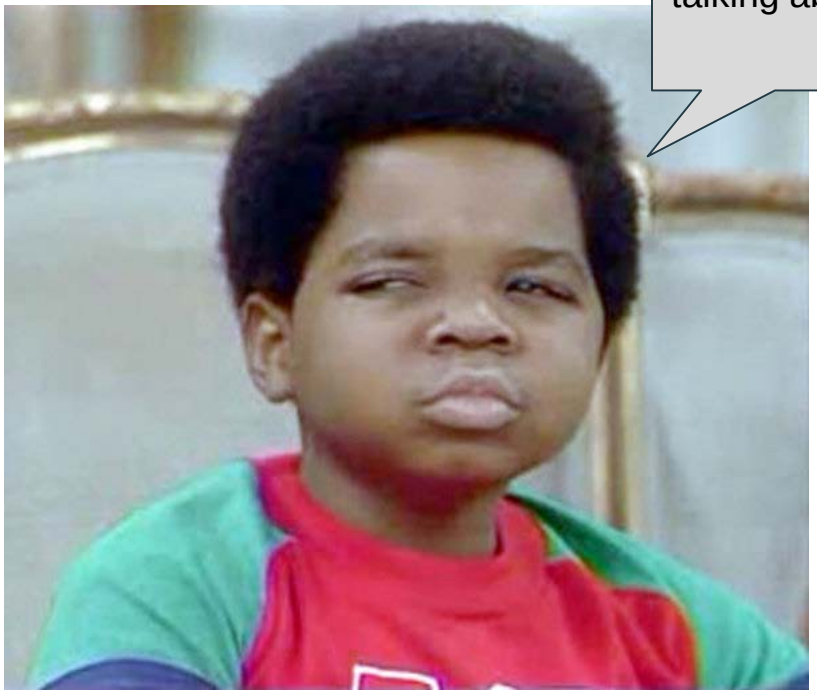
If you don't know how to use them,
it will never be enough.

“We rarely create something different until we experience something different.”

#InnovatorsMindset


thinking about
INNOVATION
@woodard_julie
I don't think innovation is about technology or tools; I think it's about a growth-try new things-take risks- show grace-be a champion educator mindset. Tools, whether tech or not, aren't the most important thing. A caring, nuturing, supportive teacher is.
WOODARD

Future Focused Learning



“While everyone looks at how we could help young people become better problem-solvers, we’re not thinking how we could create a generation of problem finders.”

What are the future focused learning principles?

Collaboration

Communication

Critical Thinking

Creativity

The Big QUESTIONS are

- DO WE KNOW WHAT THEY MEAN?
- DO WE KNOW WHAT THIS LOOKS LIKE?
- HOW DO WE TEACH THESE?

Project Based Learning - using 21st Century Learning* Design Rubric

* The only time I will say 21st Century Learning

Think of a unit that you may have just completed or working on now when I am discussing this rubric

Collaboration

Are students required to share responsibility and make substantive decisions with other people?

Is their work interdependent?

Collaboration: Rubric

In this learning activity,

1

- Students are NOT required to work together in pairs or groups.

2

- Students DO **work together**
- BUT they DO NOT have shared responsibility.

3

- Students DO have **shared responsibility**
- BUT they ARE NOT required to make substantive decisions together.

4

- Students DO have **shared responsibility**
- AND they DO make **substantive decisions** together about the content, process, or product of their work
- BUT their work is not interdependent.

5

- Students DO have **shared responsibility**
- AND they DO make **substantive decisions** together about the content, process, or product of their work
- AND their work is **interdependent.**

Knowledge Construction

Are students required to construct and apply knowledge?

Is that knowledge interdisciplinary?

Knowledge Construction: Rubric

1

- The learning activity does NOT require students to construct knowledge**.** Students can complete the activity by reproducing information or by using familiar procedures.

2

- The learning activity DOES REQUIRE students to construct knowledge by **interpreting, analysing, synthesizing, or evaluating** information or ideas
- BUT the activity's main requirement is NOT knowledge construction.

3

- The learning activity's **main requirement** IS knowledge construction
- BUT the learning activity does NOT require students to **apply their knowledge in a new context**.

4

- The learning activity's **main requirement** IS knowledge construction
- AND the learning activity DOES require students to **apply their knowledge in a new context**
- BUT the learning activity does NOT have **learning goals in more than one subject**.

5

- The learning activity's **main requirement** IS knowledge construction
- AND the learning activity DOES require students to **apply their knowledge in a new context**
- AND the knowledge construction IS **interdisciplinary**. The activity DOES have learning goals in more than one subject.

Real World Problem-Solving and Innovation

Does the learning activity require solving authentic, real-world problems?

Are students' solutions implemented in the real world?

Problem-solving involves a task with a defined challenge for the student.

Real-world problems are authentic situations and needs that exist outside an academic context.

Innovation requires **putting students' ideas or solutions into practice in the real world.**

Real-World Problem-Solving and Innovation: Rubric

1

- The learning activity's main requirement IS NOT **problem-solving**. Students use a previously learned answer or procedure for most of the work.

2

- The learning activity's main requirement IS **problem-solving**
- BUT the problem IS NOT a **real-world problem**.

3

- The learning activity's main requirement IS **problem-solving**
- AND the problem IS a **real-world problem**
- BUT students DO NOT **innovate**. They are NOT required to implement their ideas in the real world, or to communicate their ideas to someone outside the academic context who can implement them.

4

- The learning activity's main requirement IS **problem-solving**
- AND the problem IS a **real-world problem**
- AND students DO **innovate**. They ARE required to implement their ideas in the real world, or to communicate their ideas to someone outside the academic context who can implement them.

“Innovation (and enjoyment) flourishes when teachers collaborate to learn and practice new strategies. Isolation is often the enemy of innovation.”

Use of ICT for Learning

Are students passive consumers of ICT, active users, or designers of an ICT product for an authentic audience?

Use of ICT for Learning: Rubric

1

- Students **do not have the opportunity to use ICT** for this learning activity.

2

- Students **use ICT to learn or practice basic skills or reproduce information.** They are not constructing knowledge.

3

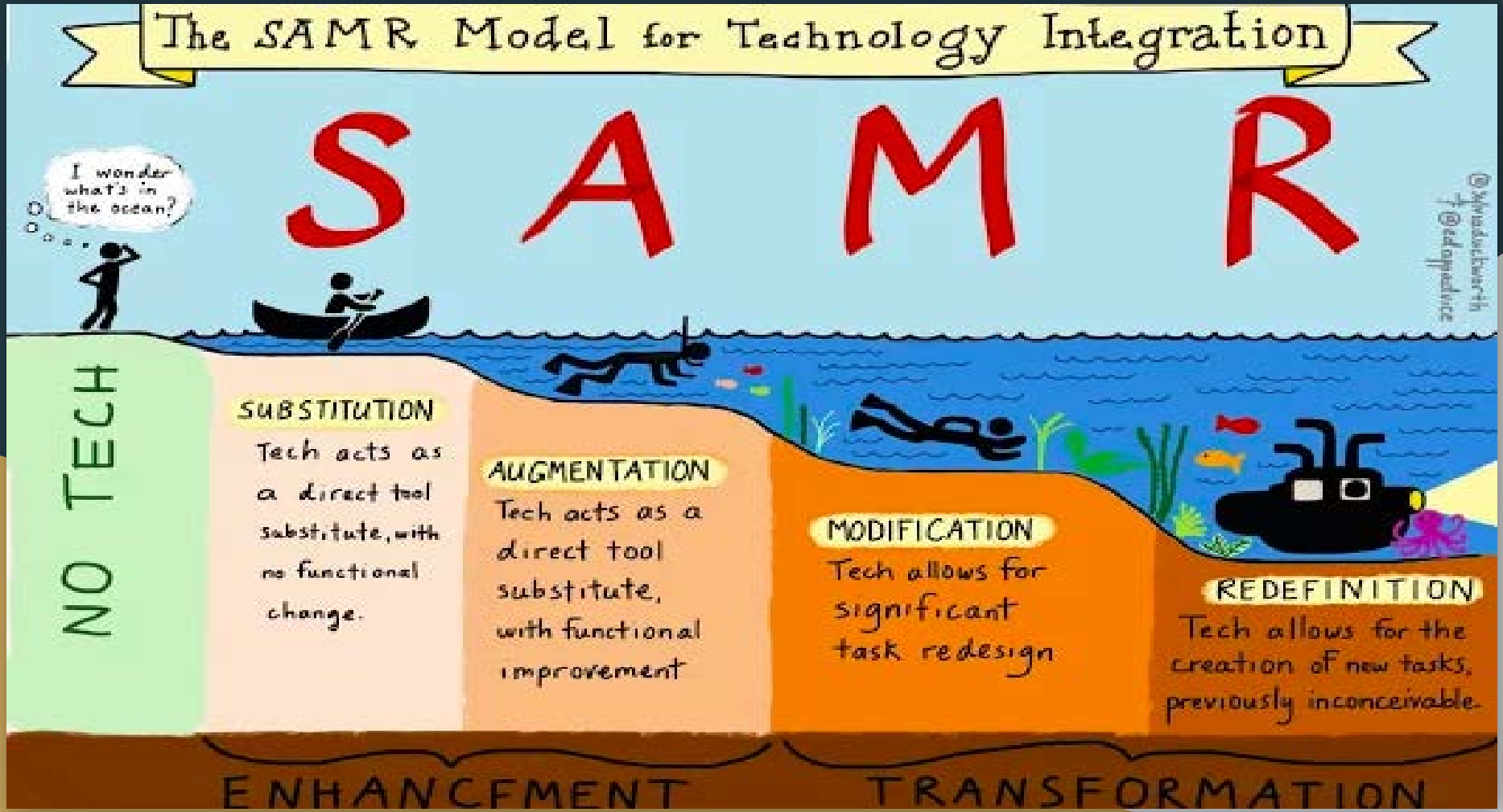
- Students **use ICT to support knowledge construction**
- BUT they could construct the same knowledge without using ICT.

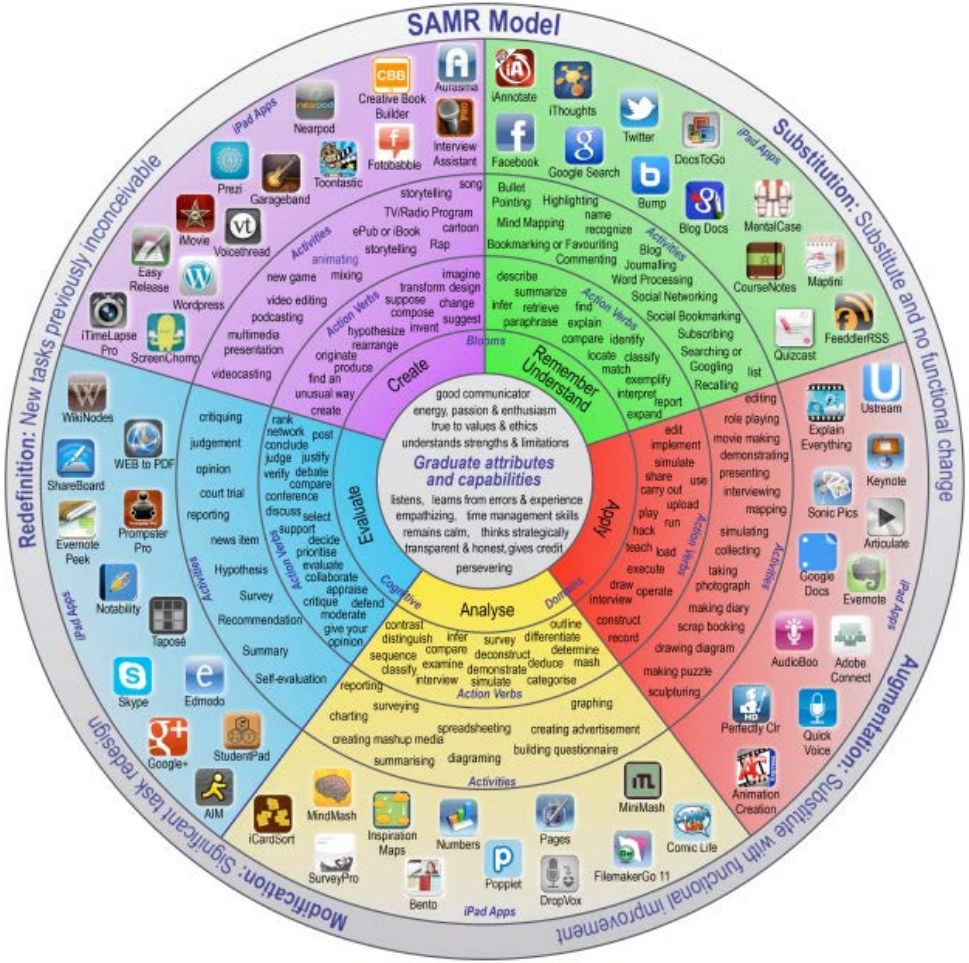
4

- Students **use ICT to support knowledge construction**
- AND the ICT is **required for constructing this knowledge**
- BUT students do NOT create an ICT product for authentic users.

5

- Students **use ICT to support knowledge construction**
- AND the ICT is **required for constructing this knowledge**
- AND students do **create an ICT product for authentic users**.


The SAMR Model for Technology Integration
SAMR
I wonder what's in the ocean?
NO TECH
SUBSTITUTION
Tech acts as a direct tool substitute, with no functional change.
AUGMENTATION
Tech acts as a direct tool substitute, with functional improvement
MODIFICATION
Tech allows for significant task redesign
REDEFINITION
Tech allows for the creation of new tasks, previously inconceivable.
ENHANCEMENT
TRANSFORMATION


SAMR Model
Redefinition: New tasks previously inconceivable
Substitution: Substitute and no functional change
Augmentation: Substitute with functional improvement
Modification: Significant task redesign
Graduate attributes and capabilities
good communicator
energy, passion & enthusiasm
true to values & ethics
understands strengths & limitations
listens, learns from errors & experience
empathizing, time management skills
remains calm, thinks strategically
transparent & honest, gives credit
persevering
Create
Remember
Understand
Apply
Analyse
Evaluate
Blooms
Cognitive
Domains
Action Verbs
Activities
iPad Apps
iAnnotate
iThoughts
Twitter
Facebook
Google Search
DocsToGo
Bump
Blog Docs
MentalCase
CourseNotes
Mapini
Quizcast
FeeddlerRSS
Ustream
Explain Everything
Keynote
Sonic Pics
Articulate
Google Docs
Evernote
AudioBoo
Adobe Connect
Perfectly Clr
Quick Voice
Animation Creation
Comic Life
FilemakerGo 11
DropVox
Popplet
Pages
Numbers
Inspiration Maps
MindMash
iCardSort
SurveyPro
Bento
AIM
StudentPad
Google+
Skype
Edmodo
Taposé
Notability
Evernote Peek
Prompster Pro
ShareBoard
WEB to PDF
WikiNodes
iTimeLapse Pro
ScreenChomp
Easy Release
iMovie
Voicethread
Wordpress
Prezi
Garageband
Toontastic
Fotobabble
Nearpod
Creative Book Builder
Aurasma
Interview Assistant

Self-Regulation

Is the learning activity long-term?

Do students plan and assess their own work, and revise their work based on feedback?

Self Regulation: Coding Rubric

1

- Pre-requisites for self-regulation are NOT in place:

- The learning activity is NOT long-term
- OR students do NOT have both learning goals and associated success criteria in advance of completing their work.

2

- The learning activity IS **long-term**
- AND students DO have **learning goals and associated success criteria** in advance of completing their work
- BUT students DO NOT have the opportunity to plan their own work.

3

- The learning activity IS **long-term**
- AND students DO have **learning goals and associated success criteria** in advance of completing their work

- AND students DO have the opportunity to **plan their own work**
- BUT students do NOT have the opportunity to revise their work based on feedback.

4

- The learning activity IS **long-term**
- AND students DO have **learning goals and associated success criteria** in advance of completing their work
- AND students DO have the opportunity to **plan their own work**
- AND students DO have the opportunity to **revise their work based on feedback**.

Skilled Communication

Are students required to communicate their own ideas regarding a concept or issue?

Must their communication be supported with evidence and designed with a particular audience in mind?

Skilled Communication: Rubric

1

- Students are NOT required to produce extended or multi-modal communication.

2

- Students ARE required to produce **extended communication** or **multi-modal communication**
- BUT they are NOT required to **provide supporting evidence** OR design their work for a **particular audience**.

3

- Students ARE required to produce **extended communication** or **multi-modal communication**
- AND they ARE required to **provide supporting evidence**: they must explain their ideas or support a thesis with facts or examples
  OR
- They ARE required to design their communication for a **particular audience**

  BUT not both.

4

- Students ARE required to produce **extended communication** or **multi-modal communication**
- AND they ARE required to **provide supporting evidence**
- AND they ARE required to **design their communication for a particular audience**.

“In our world today, what is a student more likely going to need to be able to write: an essay or a blog post?”

STEM vs STEAM

STEM

According to Ge, Ifenthaler, and Spector, (2016) STEM is defined as “academic and professional disciplines associated with science, technology, engineering and mathematics; typically conceived of separately, with sub-disciplines, although new pedagogical approaches encourage cross-disciplinary learning in areas” (p.5).

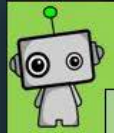
STEM is an interdisciplinary approach to teaching

Interdisciplinary

relating to more than one branch of knowledge.

Therefore, for STEM to be truly effective in the classroom you MUST integrate two or more areas in STEM into your lesson/unit

Application of Computational Thinking Across the Curriculum!



Decomposition

Breaking something down into smaller parts

Primary Terminology – "Break Apart"

Early Years Foundation Terminology – "Pieces"

What equipment do you need for school today?

What were the key events of the 20th Century?

What countries make up Europe?

Write a list of shopping items

Identify the playing positions in a rugby team

Play Charades!

Break the story of Romeo and Juliet down into it's main sections

Break down a word phonetically

Organise a birthday party! What will you need to think about?

Identify the instruments used within a song

Top trumps!

How does your post get to you?

Break down a typical day at school

Identify the different parts of a bike What components make up the wheel?

Build a computer game using scratch. Think about graphics, levels, character…

Pack a bag for your summer holiday

Write down a list of ingredients for a Victoria sponge cake

What characters will you create for your story?

What information do you need to work out the circumference of a circle?

How did Wales do in Euro 2016?

Explain the movements for the different pieces in a game of chess

Application of Computational Thinking Across the Curriculum!

Pattern Recognition

Looking for similarities or trends

Primary Terminology – "Patterns"
Early Years Foundation Terminology – "Matching"

"That word sounds like..."

Critically review an existing piece of work.

Give feedback comparing work to specific criteria

Correct application of Male/Female tenses

Sudoku

Solitaire

Chess tactics

Logic puzzles

Does the star wars and superman theme tunes sound the same?

Preferred playing positions in a sport

What do platform computer games have in common?

Pattern and sequence matching

Spot the difference

Code breaking

Days of the week/Month

Identify gradients /contours in an OS map to measure steepest route

What drawing technique would be best to use for that style of image?

"What tactics worked well the last time we played them?"

Times tables

Identify similar rifts within a song

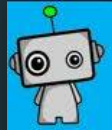
Word search

Sorting and classifying activities

Fit shapes into correctly shaped holes

Maths patterns, e.g. Fibonacci series (1,1,2,3,5,8,13,21...)

Application of Computational Thinking Across the Curriculum!



"What did you learn in todays lesson?"

Write a long term training plan

Write a blurb for your movie

Crosswords

Draw a picture of your family

What noise does a dog make?

Following a subway map

Write a match report

Create a model

What are the key skills you need to be a good Hockey player?

Draw a cartoon

Write a synopsis of your story

Explain your idea in 30 seconds!

Articulate

Draw a concept design

Abstraction

Focusing on what's important, ignoring what is unnecessary

Primary Terminology – "Thoughts"

Early Years Foundation Terminology – "Ideas"

Recreate the image

Explain briefly what will happen in your computer game.

Recreate the Eiffel Tower in Mine craft!

Who is David Beckham?

What are the key calculations required within the formula?

From your research, summarise your key findings.

"What's your plan for the weekend?"

Demonstrate the technique used to ...

Do an impression of...

"What's the weather forecast for today?"

Charades

What happened to Henry VIII's wives?

"How does that song go again?"

Application of Computational Thinking Across the Curriculum!

Algorithmic Design

Create a set of step-by-step instructions to complete a task

Primary Terminology – "Instructions"

Early Years Foundation Terminology – "Plan"

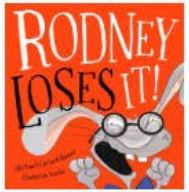
- Draw a map
- Explain the process of photosynthesis
- Write a piece of music
- Write an algorithm to show how your computer game character will move.
- Write a short term training programme
- Create a timeline of events for WWII
- Create a paint by numbers
- Making patterns
- Create a storyboard for an animation
- Create a phrase book
- Write a recipe for ...
- Write out the steps for conducting your experiment
- Choreograph a dance / gymnastics routine
- Create a tactical playbook
- Create an origami
- Dot to dot
- Write a shopping list
- Build a pirate ship out of Lego
- Create a blueprint to design a ...
- Draw a diagram to show the water cycle
- Create a family tree
- Create a flowchart to show how you would ...
- Speed cup stacking!
- Create a how 2 guide so someone else can recreate your drawing
- Create a coaching card for the tennis serve

Picture Book STEM

Activity time – 5 minute challenge

THE BOOK OF THE YEAR: EARLY CHILDHOOD

Entries in this category may be fiction, drama or poetry and should be appropriate in style and content for children who are at pre-reading or early stages of reading. Ages 0-7 years



RODNEY LOSES IT!

Bauer, Michael Gerard
illust: Krebs, Chrissie

Omnibus Books

ISBN: 9781742991900

BOY

Cummings, Phil
illust. DeVries, Shane

Scholastic Australia

ISBN: 9781760277055

I'M AUSTRALIAN TOO

Fox, Mem
illust. Ghosh, Ronojoy

Omnibus Books

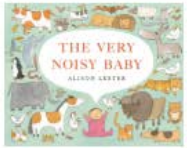
ISBN: 9781760276218

THE SECOND SKY

Guest, Patrick
illust. Bentley, Jonathan

Little Hare

ISBN: 9781760127985



THE VERY NOISY BABY

Lester, Alison

Affirm Press

ISBN: 9781925475616

HARK, IT'S ME, RUBY LEE!

Shanahan, Lisa
illust. Binny

Hachette Australia

ISBN: 9780734416551

THE PICTURE BOOK OF THE YEAR

Entries in this category should be outstanding books of the Picture Book genre in which the author and illustrator achieve artistic and literary unity or, in wordless picture books, where the story, theme or concept is unified through illustrations. Ages 0-18 years (NB. Some of these books may be for mature readers).

Note: Picture Books are listed by the illustrator, followed by the author

TEN POUND POM

Anelli, Liz
text. Wilkinson, Carole

Walker Books Australia

ISBN: 9781925381214

THE GREAT RABBIT CHASE

Blackwood, Freya

Scholastic Australia

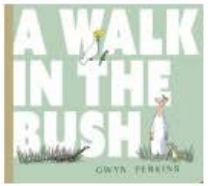
ISBN: 9781743811641

MOPOKE

Bunting, Philip

Omnibus Books

ISBN: 9781742991658

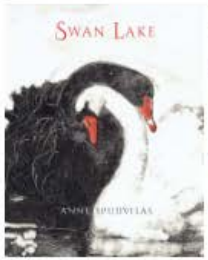


A WALK IN THE BUSH

Perkins, Gwyn

Affirm Press

ISBN: 9781925475531

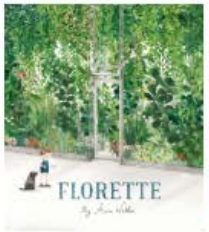


SWAN LAKE

Spudvilas, Anne

Allen & Unwin

ISBN: 9781743318454



FLORETTE

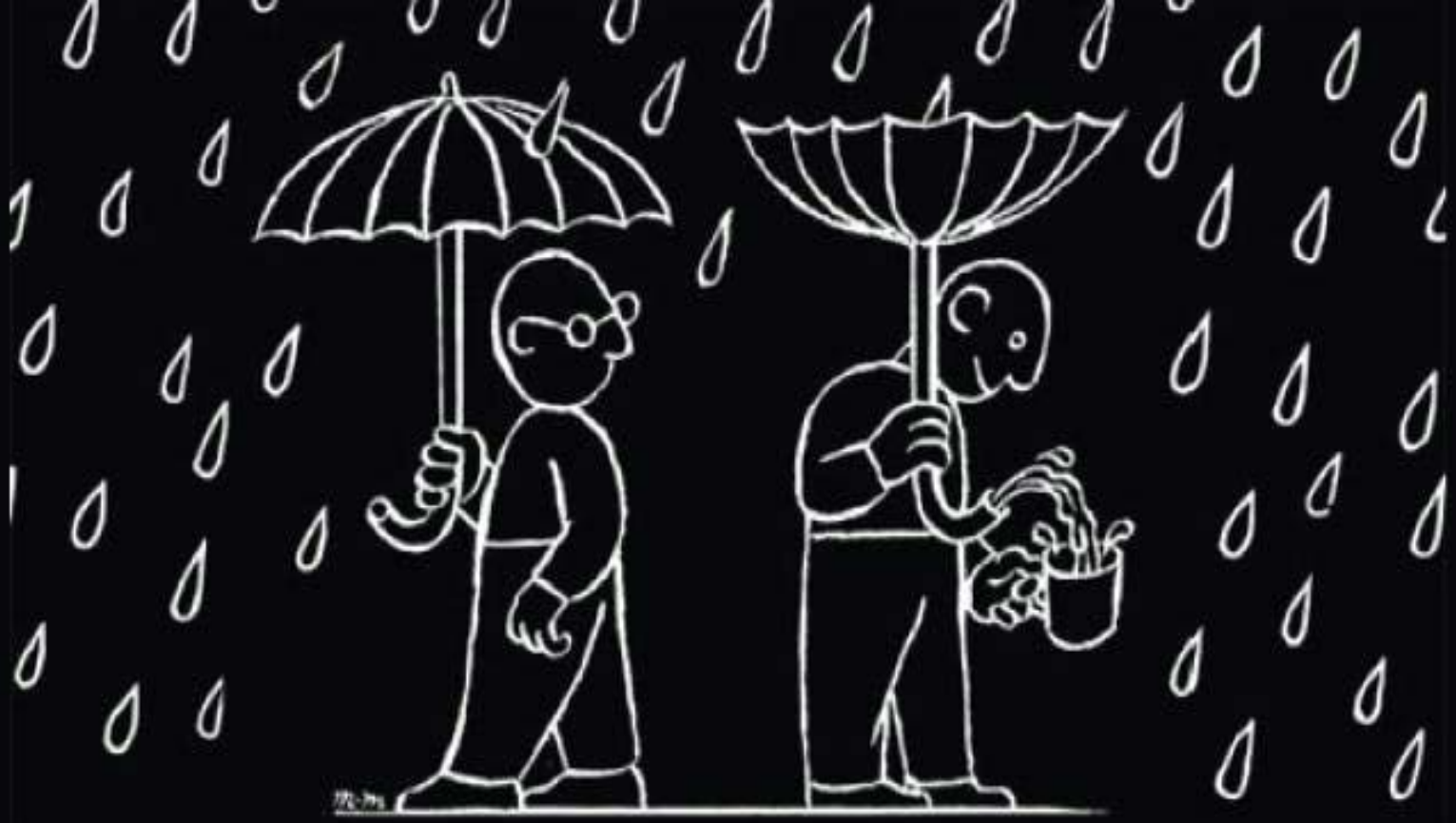
Walker, Anna

Penguin Random House Australia

ISBN: 9780670079414

“Any time teachers think differently about who they teach and how they teach, they can create better learning opportunities. Questioning what we do and why we do it is essential for innovation.”

“Our role is to empower students to see themselves as innovators who take responsibility for their own learning and leading.”



INNOVATION IS A STATE OF MIND