The STEM Approach

5nd – 6th August 2016

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Aims

1. to establish a clear, shared vision of a STEM approach.
2. To develop the teaching of three key STEM skills:
    a) identifying STEM problems
    b) deploying suitable approaches to investigation
    c) analysing and evaluating of evidence.
3. to develop a sound and realistic plan for implementing this approach across schools, including lines of communication.

STEM Education Pilot Programme in Vietnam

- Why is it necessary to Promote STEM Education?
- What is the direction for Promoting STEM Education?
  - Guiding principles
  - Aims and Objectives
- STEM Integration
- Organising Learning
- Collaboration and Partnership
- Sharing best practice
- Project Management and communication

GATE A implementation plan

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STEM

- Worldwide trend
- Equipping students to meet challenge of society in a world of rapidly changing scientific and technological developments which impact on economies
- Through Science, Technology (Engineering) and Mathematics Education
  - Enriched curriculum based learning activities
  - Teacher support through CPD
  - Senior management support for implementation and change

MOET Direction for Change

- Learning approaches that are more student centred
- Learning opportunities that Contextualise STEM beyond the classroom
- Building on perceived strengths of the UK system with support from the British Council
- Balancing the interests of students, teachers, school leaders, parents and community stakeholders
- Curriculum review and renewal

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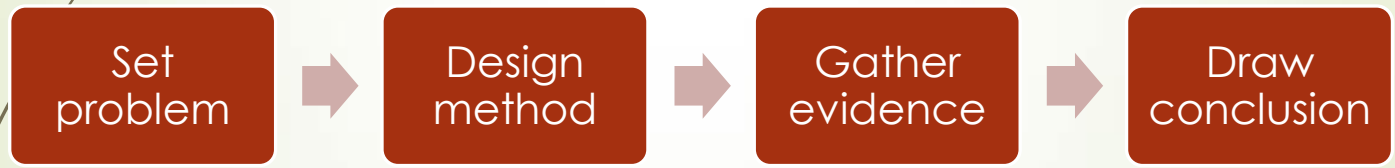
Integration

- Introduction of STEM approaches through integration with existing STEM subject teaching
  - Linking to the social environment of students and their communities to provide relevance and motivation
  - Influence attitudes to STEM through application of knowledge to problems that are seen to be authentic
  - Develop problem solving skills
  - Facilitate career awareness and ambition
  - Nurturing creativity and innovation

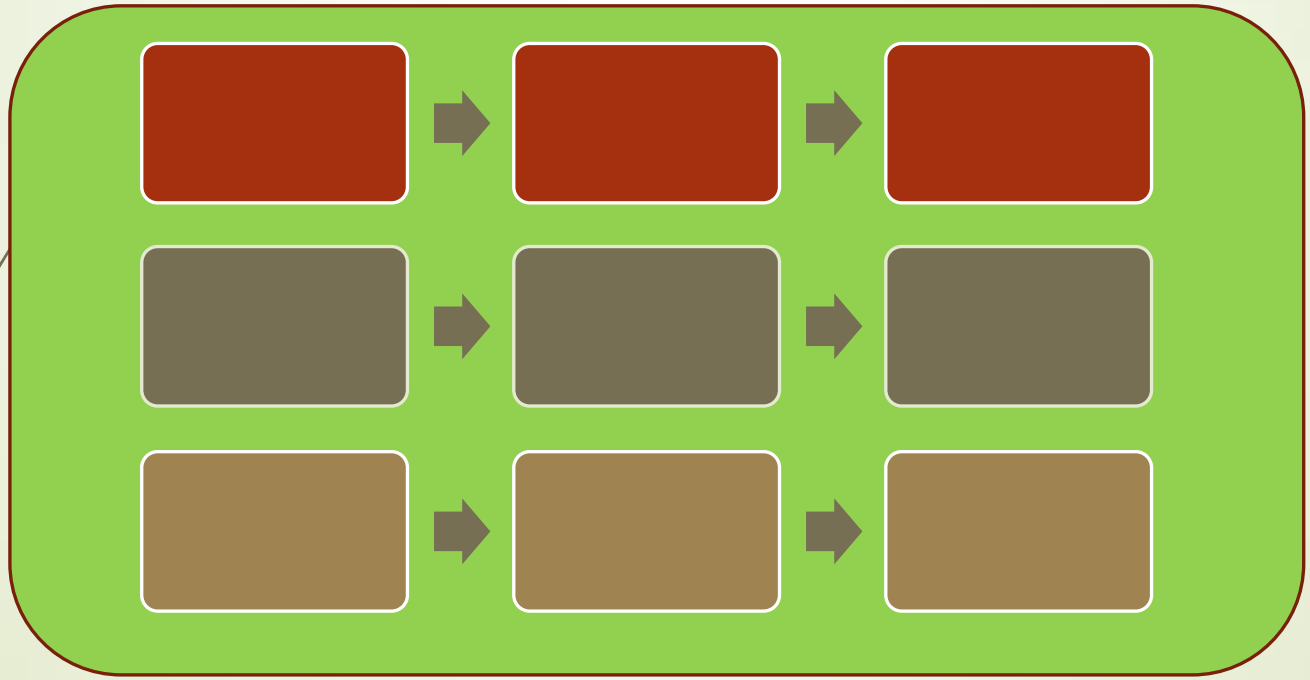
Ways to organise STEM problems in the curriculum.

1) Keeping STEM problem in single subject (e.g. water quality)



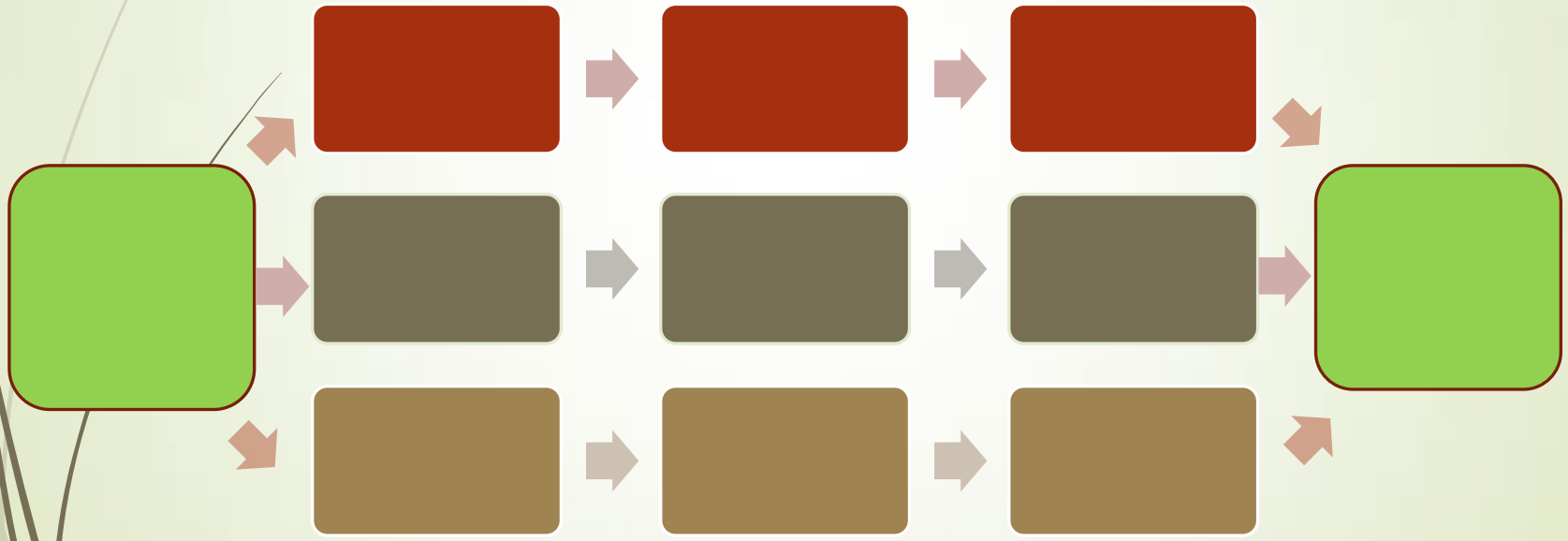
Ways to organise STEM problems in the curriculum.

2) Loosely linked
(e.g. water quality)



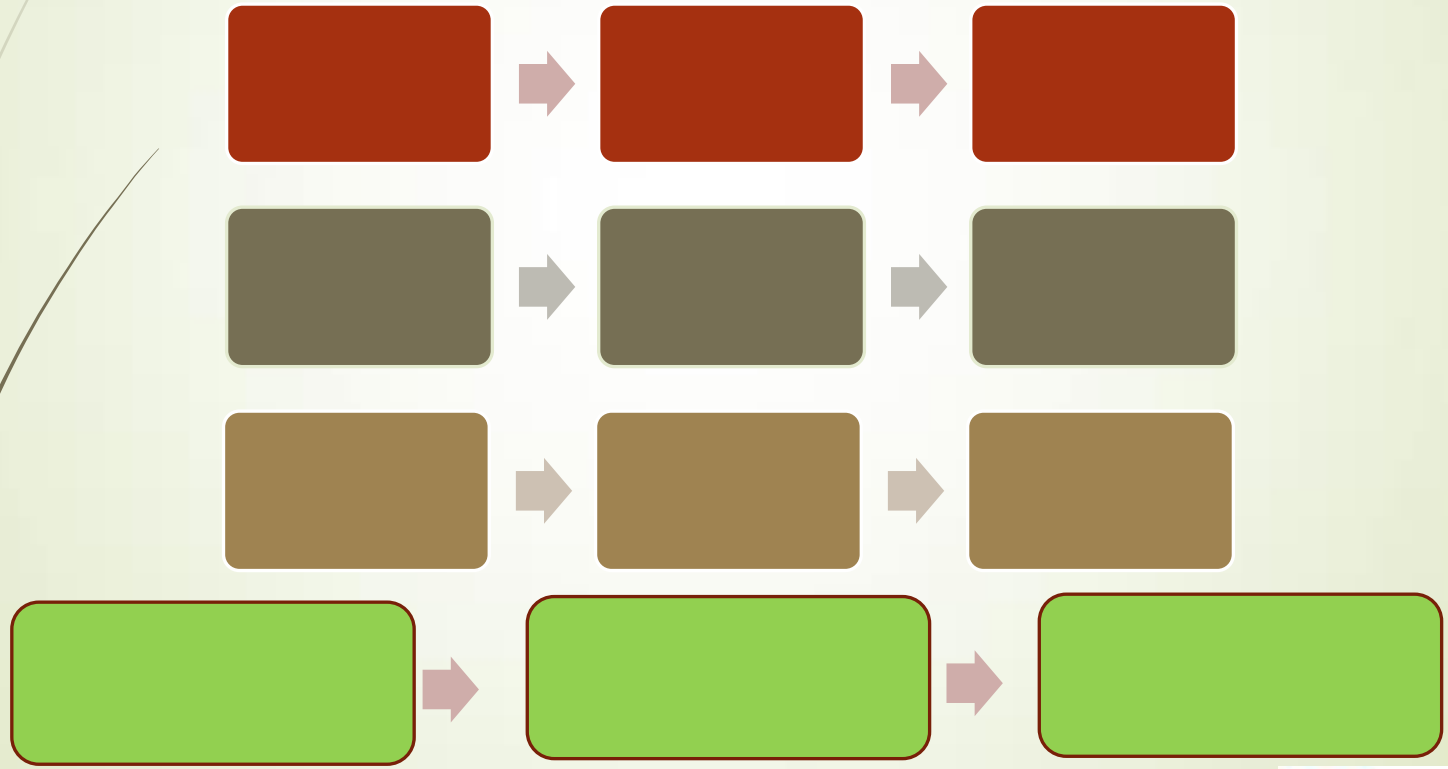
Ways to organise STEM problems in the curriculum.

3) Cross-curriculum start and end
(e.g. water quality)



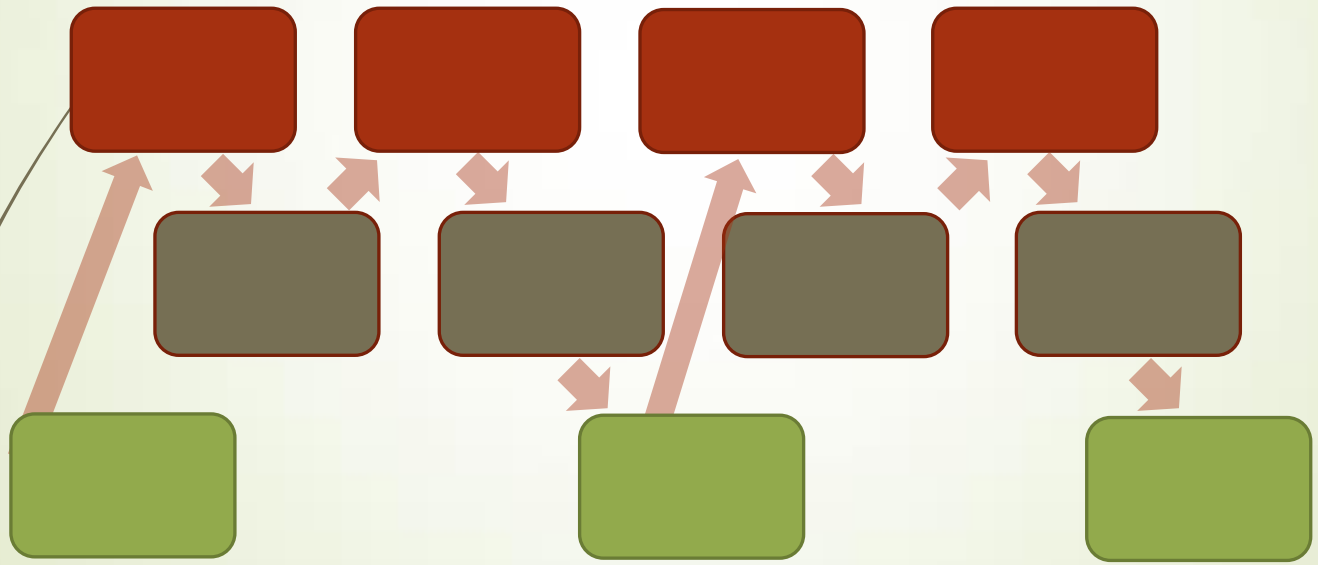
Ways to organise STEM problems in the curriculum.

4) Cross-curriculum sessions in parallel (e.g. water quality)



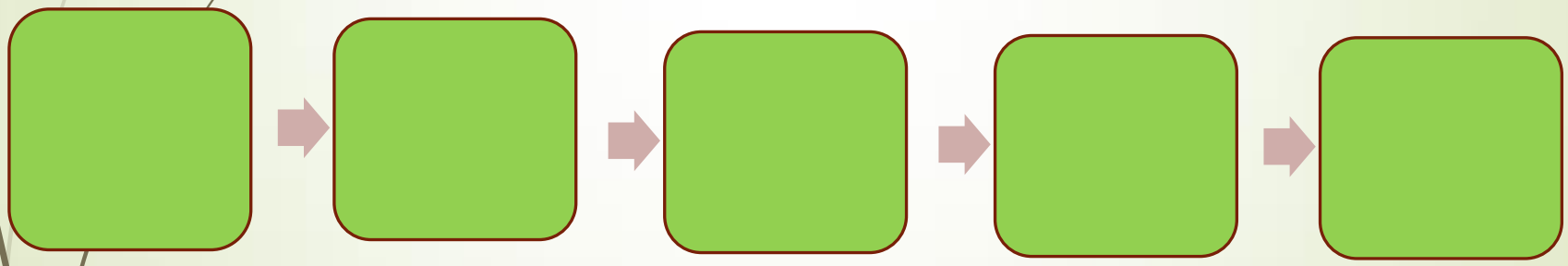
Ways to organise STEM problems in the curriculum.

5) Multiple coordinated subjects
(e.g. water quality)



Ways to organise STEM problems in the curriculum.

6) Immersion – all subjects taught by all teachers (e.g. water quality)



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Developing STEM projects

- Begin to plan your STEM project. Consider:
  - Making it interesting and genuine
  - The best teaching Approach
  - Resources
  - Assessment
  - Safety
  - Cross-curricular links
  - Links beyond the school
  - How textbooks might be adapted to support it

What do we need to develop as teachers?

teachers	**Strengths**	**Weaknesses**
school / students	**Opportunities**	**Threats**

Agree Objectives and Agenda for a STEM EDUCATION–VN Implementation Planning Workshop

- Aim:

  Develop shared understanding of the STEM EDUCATION -VN Implementation plan

- Objectives:
  - Create a common understanding of the STEM-VN objectives
  - Develop the next level of detail for the STEM-VN implementation plan
  - Establish a robust Monitoring and Evaluation system to underpin the pilot programme

We built a collaborative atmosphere for joint planning

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The introduction session launched the workshop with everyone mobilised & thinking in the same direction

Organisation	• MOET • British Council • Newton Fund	• Stakeholders	• Consultant
Role	• Buyer	• Developer	• Facilitators
Attendees		• British Council • Pilot School Principals • University Representatives • Industry Representatives	• Appointed by MOET/BC

Is any group missing from this?

-Introductions/Agenda/Objectives/Expectations
- Review MOET requirements
- Agree Success Criteria
- Review STEM-VN proposal
- Understand adoption of scoping plan (current state)
- High level work breakdown structure
- High level RACI and Consortium operation
- Assumptions, constraints (Barriers to success)
- Risk register development
- B's & C's

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Review MOET/BC guidelines on Managing the Pilot Programme

The Ministry Of Education and Training acknowledges that working effectively in partnership with Pilot Programme Partners plays a very important part in achieving the overall aim of improving the Ministry's capacity and capability to deliver STEM within the Curriculum of schools in VN.

To achieve a partnership approach to delivery, the Ministry and British Council will work with partners to:

- *share success and agree goals for continuous improvement;*
- *share information and maintain good communication links;*
- *systematically examine all activities to agree who is best placed to carry them out;*
- *ensure regular feedback loops on strategy, plans, delivery and performance;*
- *know, trust and value each other;*
- *recognise and respect each other's agenda, taking account of where they differ;*
- *make explicit the shared vision and objectives and each other's roles in delivery;*
- *work jointly through all stages of policy or product development through to delivery and beyond;*

As the client who is paying for this service, MOET/BC do reserve the right of constructive VETO!

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Reviewed the Requirements of STEM-VN from the MOET and British Council perspective

- The What:
  - Improve quality of STEM Education
    - Pupils
    - Teachers
  - Develop networks to share best practice
  - Make it best in class
    - Pilot for regions
    - World class

- The How:
  - Central Team – managing
  - Pilot Schools – specialist areas
  - Thematic Networks – contextual links
  - Others
    - STEM Ambassadors
    - STEM Clubs
    - Competitions
    - STEM Alliance

This is a leading edge opportunity for the education sector

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-Introductions/Agenda/Objectives/Expectations
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- Understand implementation plan (current state)
- High level work breakdown structure
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We agreed what the success criteria would look like to let everyone know when they have passed the winning post!

#	Core Objective	Key Activities	S	M	A	R	T	Complete ?
1	• Improve quality of STEM education	• Model and scale good practice • Enable new and innovative practice • External advisory panel • Distinguish good, best, innovative practice • Prepare for October, January and May • Use regional network • Use Pilot schools • Incentivise Pilots • Project Office to drive pilot processes • Continuous improvement process	•	•	•	•	•	○
2	• Collaboration across education community	• Incentivising Pilots • Horizontal and vertical links between pilots and between school phases • Identify ➔ incentivise ➔ support	•	•	•	•	•	○
3	• Improve quality of CPD	• Incorporate into personal development and management • Promote new opportunities • Make it easy to use ➔ flexible up-take ➔ innovation on record	•	•	•	•	•	○
4	• Track impact	• Within Pilot schools • Between Pilot schools • On Partners	•	•	•	•	•	○

We need a common understanding of the performance goals we are aiming for

implementation plan

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#	Core Objective	Key Activities	S	M	A	R	T	Complete ?
5	• Contribute to VN-STEM Education Pilot Programme	• Development of STEM activities in all pilot schools • Negotiate • Don't duplicate • ID activity owners • Apparent Learning Content and Learning Outcomes	•	•	•	•	•	◯
6	• Build in continuous improvement	• Plan to review and frequency of review • External • Internal views • Manage aspiration ➔ communicate ➔ needs analysis ➔ feedback ➔ solicit aspirations • Incorporate quality into all projects	•	•	•	•	•	◯
7	• Quality and evaluation plan	• Internal – external • Define 'quality standards' • Develop quality mark for STEM_VN • Remain within MOET standards • Fit for purpose, 'may not be in time', 'don't stifle innovation' • Create ways of sharing	•	•	•	•	•	◯
8	• Pilot regional model	• Identify students cohorts for pilot • Monitor matched cohorts not part of the pilot • Invite non-pilot school observation • Link to quality and evaluation • Capture experience • Evaluate against other models • Publish • Refresh • Document processes & models for recycling further use • DEvelop collaboration with higher education organisations	•	•	•	•	•	◯
9	• Quality improvements and benefits tracking process	• Do all of the above • If meeting these targets then quality tracking being done • Change of direction in performance rating indicates improvements	•	•	•	•	•	◯

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We discussed what the performance measure might look like to track progress towards completing each objective

#	Objective	Criteria	Next Steps	Data Avail?
1	• Improve the quality of STEM Education	• Monitoring test attainment • Quality of teaching of STEM • STEM targets degree of change as result of STEM programme • Use baseline data • Teacher take-up/volume and coverage of STEM initiatives • Data capture at school level • Impact on high priority students		
2	• Collaborate across educational community	• How good are pilot schools in sharing information baseline • HE community • Independent sector • Further education		
3	• Improve quality of STEM CPD	• Teacher support • Beginning teachers, newly qualified teachers = QA • Leadership in schools – S.M.T. • STEM co-ordinators • Accredited CPD • Identify teachers will advanced skills	• Identify how not to duplicate effort and recycle / improve existing systems • Pathway career • Cohesive – accredited activities for staff	
4	• Track impact on target groups of students	• School level data • Generic MOET data on specific disadvantaged groups • Identifying the potentials (who may be currently 'lost' in the system		

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#	Objective	Criteria	Next Steps	Data Avail?
5	• Contribute to Pilot Programme	• Clear roles and responsibilities with reference to common objectives		• txt
6	• Build in Continuous improvement	• If all other measures are being delivered and improving then this measure will be achieved.	• Plan to review • Decide frequency • Shopping list ref future actions • Quality process and use of during project	• txt
7	• Quality and evaluation plan	• How to define quality debate • Quality: – Process, content, performance (i) – On time, on budget, within scope (ii) – Exceeding customer expectations (iii) – Agreeing a common quality standard (iv) – "Better than what's there already" (v) – Project management discipline and tools (vi) How to measure quality? Have we: (i) created / define a quality standard? (ii) applied it? (iii) evaluated internally & externally (iv) Measured outputs? (v) Measured customers perception ref performance & published?		• txt
8	• Roll out	– Wider STEM participation from schools – …	• Develop model for more regions	• txt

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The Pilot Teacher Group gave BC, MOET and Consultants some feedback on their proposal – high level

Benefits	Concerns
• Team has a good mix of skills • Energetic team members	• How to (H2) • I Wish I Knew (IWIK)

Next Steps

• Review key issues
• Understand planning steps
• Offer advice and tools going forwards
• Apply key project planning Lessons :
  • Do planning up front
  • Don't underestimate resource requirements
  • Have a single point of contact
  • Management continuity is vital

There is still a fair amount of detailed planning to do

We developed a high level RACI to initiate planning for the work stream charters

KEY
*A*ccountable= "Buck Stops Here"
*R*esponsible= Doer"
Consulted= "In the Loop"
*I*nformed= "FYI"

Workstreams	*STEM-VN*									
	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
Owning and driving project										
Project management										
Stakeholder management										
Mobs and Comms										
Defining content requirements										

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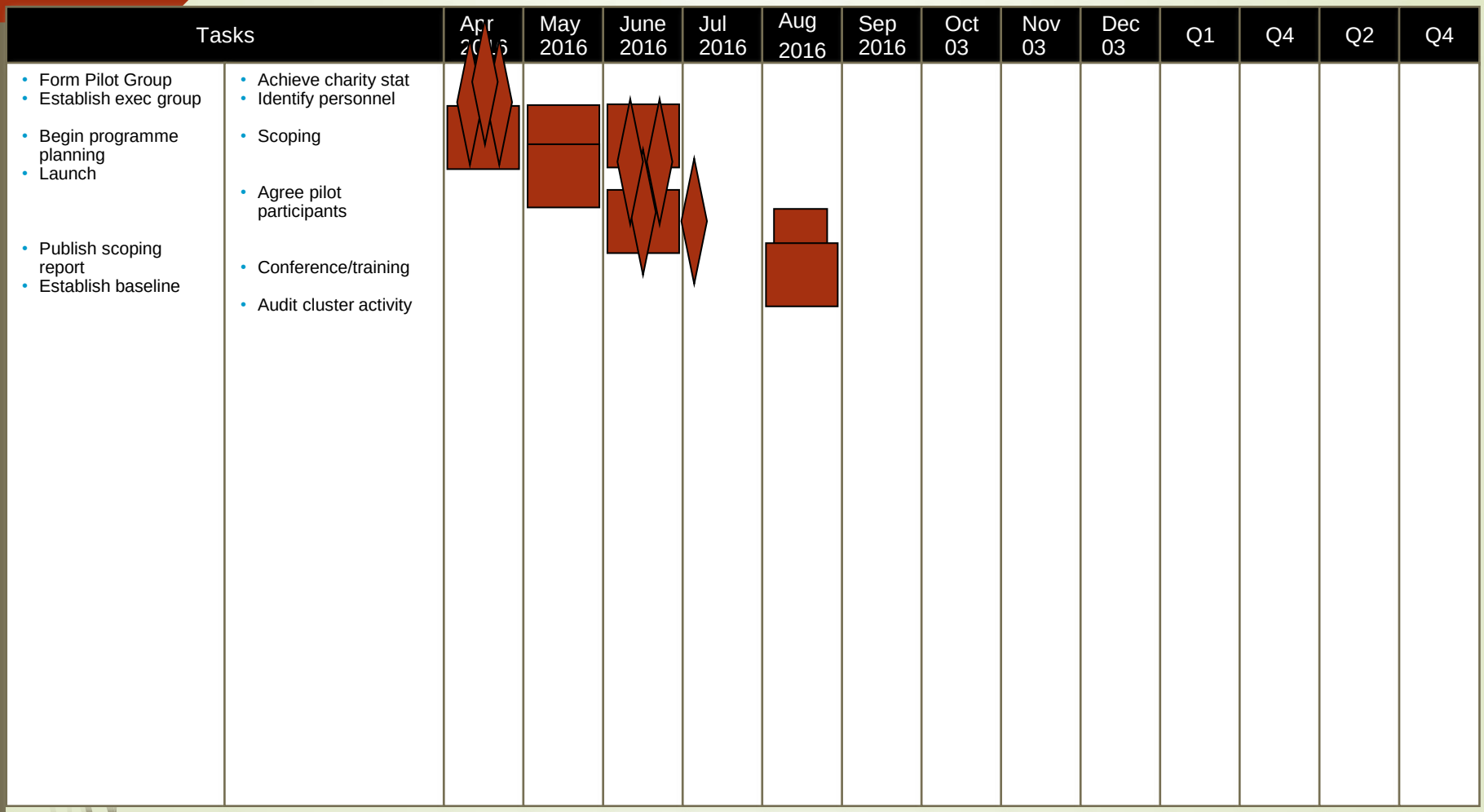
We plotted the key dates/milestones to start the Critical Path Analysis



We need to overlay workstream plans on this to get a full picture