

Pipeline

Purpose – Engineering brief

- Build
- Commission



Objectives

01

Learn how engineers approach large scale problem solving

02

Learn about team works and working in groups

03

Learn about pipes, joins, height, leaks and angles.

Why pipelines?

This is a pipeline in Sarawak being constructed

- 1) What are pipelines used for specifically?
- 2) Why are pipelines shaped like they are?
- 3) Why are all pipelines not completely straight?



Materials needed

- Ping-pong balls - 1 per group
- A3 paper for drawings/design planning – **1 per group**
- A3 newspaper x 20 sheets
- Packing tape or sticky tape – 1 or 2 per group
- Scissors and cutters – 1 or 2 per group
- Tape measure or ruler – 1 per group
- Protractor for measuring angles – 1 per group



Project

- Transport a single table tennis ball the length of the pipe without outside help.
- Pipe length at least 2 metres in length.
- Pipeline must have 3 angles as the pipeline has to go around environmentally protected areas. One must be 90 degrees. The other 2 must be at least 30 degrees. How will they do angles?
- The starting point will be **50cm above ground** and the finish point will be floor level.
- Only materials to be used are newspaper and tape



Build and Commissioning – are different

How do you decide the winning team?

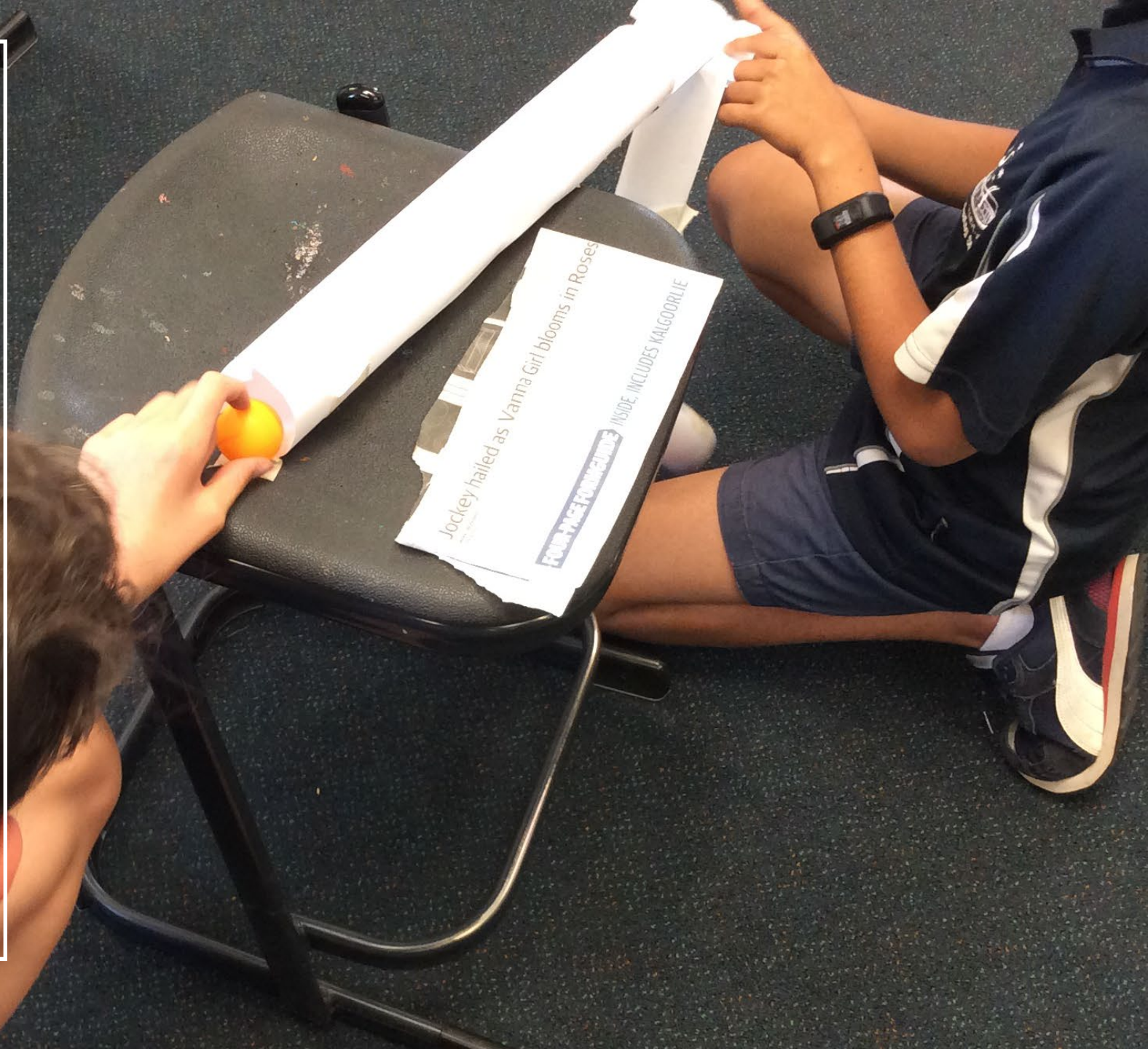
	Build			Commissioning		
Pipeline team name	Length 2 m (2 point/m)	90° angle (3 points)	2 angles > 30° (2 points each)	Table tennis ball (3 points /m)	Ball passes angle (2 points/angle)	Total points
Team A				if longer than 2 m then more marks		
Team B						
etc						

What is collaboration?

- ‘Collaboration -the situation of two or more people working together to create or achieve the same thing’ (Cambridge Dictionary)
- In Schools “**collaborative learning** is the use of small groups where students work together to maximize their own and each other's learning”.

Why is collaboration so important?

Collaboration is essential in our classrooms because it is inherent in the nature of how work is accomplished in our civic and workforce lives. Fifty years ago, much work was accomplished by individuals working alone, but not today. Much of all significant work is accomplished in teams, and in many cases, global teams. (NEA, pg. 20)



Your roll is to support the groups and your teachers

- Consider questions which are supportive

So, if a students says 'How do I build this'

You say well 'let's check the design brief what do we need to do?'

Try not to take over



Questions to develop Collaboration – Build Process

What are the goals of this collaboration? What are we trying to achieve? (product, solution)

What is our timeframe for this collaboration?

How will we go about this task?

How will we know if we have been successful or not?

What happens if you cannot agree on a solution or action?

What are the milestones you are hoping to achieve?

How will you know if you have achieved them?

Questions to develop Collaboration – Build Engagement

What should your group look like?

Who will be the leader in the group?

How will you choose what roles each person in the group has?

What roles will each group member have?

How will your group deal with conflict?

How will the group come to consensus?

How will you work together if someone has a different idea to you?

What will you do if you disagree with someone in your group?

How will you deal with conflict?

Questions to develop Collaboration – Act Process

How will you present your ideas to the group?

Are you 'on track'?

What is working?

What isn't working?

What do you need to change?

What is stopping you from achieving your goals?

Are you meeting your milestones?

Questions to
develop
Collaboration
– Review
Process

What would you do differently
next time?

Where might you get help from
next time?

How effectively did we record the
process of the collaboration.

How effective were our
communication methods

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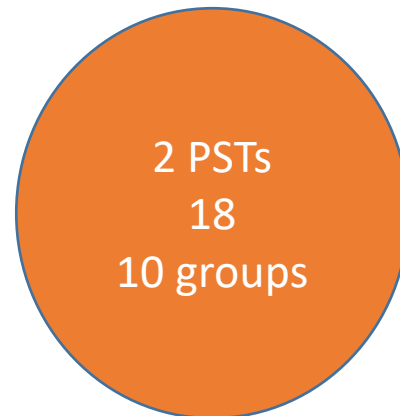
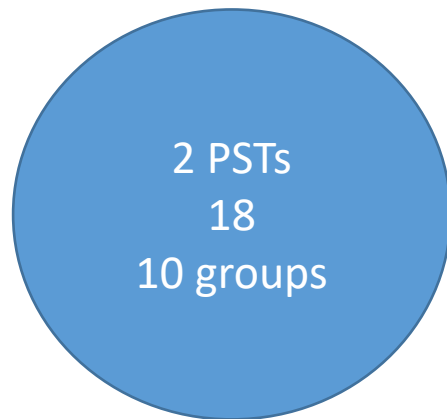
Students

Situation	Fixed Mindset	Growth Mindset	Innovator's Mindset
Challenges	Challenges are avoided to maintain the appearance of intelligence.	Challenges are embraced stemming from a desire to learn.	Challenges are sought out, and seen as an opportunity for growth and development.
Obstacles	Giving up in the face of obstacles and setbacks is a common response.	Showing perseverance in the face of obstacles and setbacks is a common response.	When obstacles arise, the thinking is shifted to look for opportunities and possibilities.
Effort	Having to try or put in effort is viewed as a negative, if you have to try, you're not very smart or talented.	Doing hard work and putting in effort paves the path to achievement and success.	Hard work and effort are continuous, and we look to make time to create new solutions and ideas for growth.
Criticism	Negative feedback regardless of how constructive is ignored.	Criticism provides important feedback that can aid in learning.	Criticism provides important feedback which creates the opportunity to implement new and better ideas for learning from others.
Success of Others	Other people's success is viewed as a threat and evokes feels of insecurity or vulnerability.	Other people's success can be a source of inspiration and education.	Other people's success is learned from, and something we modify and apply in our own context to create our own success.

Logistics

School 1

- 80 school students so in teams of 4 is 20 groups
- 36 CS (19 CS + 18 CS)
- 4 teacher leads (in teams of 2)



School 2

- 93 school students so in teams of 4 is 23 groups
- 37 CS (19 CS + 18 CS)
- 4 teacher leads (in teams of 2)

