STEM Nau CoP - Learning Design Guide

This document has been designed to support activities associated with STEM Nau Community of Practice professional learning. This template is used as a guide for discussion and is not endorsed by the PNG education systems for broader use across non-participating institutions.

Strand: 12.2 - LIFE	**Unit:** : POPULATION ECOLOGY	**Topic:** POPULATION
Lesson Topic: Environmental Issues: Plastics and Chemical Wastes		

Objectives/ learning outcomes: *(by the end of the lesson the students will …)*	• identify the impacts of plastics on the environment. • identify ways to reduce waste plastic in their school. • design and construct a product from recycle plastic PET bottles that can be sold.

Opportunities for transdisciplinary learning *(what obvious connections exist between other learning areas?)*

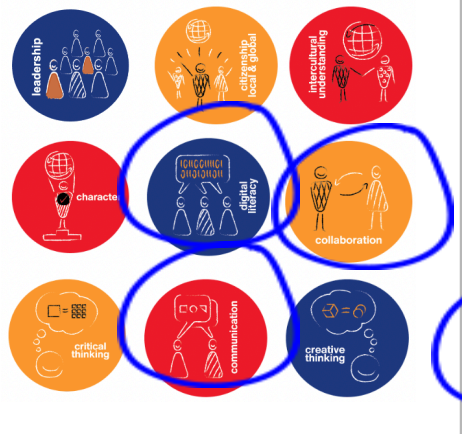
Learning Area:	**CHEMISTRY & PHYSICS**	**TECHNOLOGY & ENGINEERING**	**MATHEMATICS**
Outcomes:	• Chemical reaction • Chemical cycles • Energy	• Usage of Technology tools • Construction of models	• Measurement and calculations. • Collection and presentation of data.

Which **Sustainable Development Goals** best support a real life context and application? (one or two)

Student Profile
Who are these students? What knowledge, skills, interests, and attributes do they bring?

Marker student #1	**Marker student #2**	**Marker student #3**
 **-Strong Content Background in Biology - Creative and critical thinker**	 **Strong Content background in Maths. very good communication skills.**	 **strong content in Technology and creative in drawing and designing.**

Which capabilities would these students most benefit from? *(circle or highlight)*



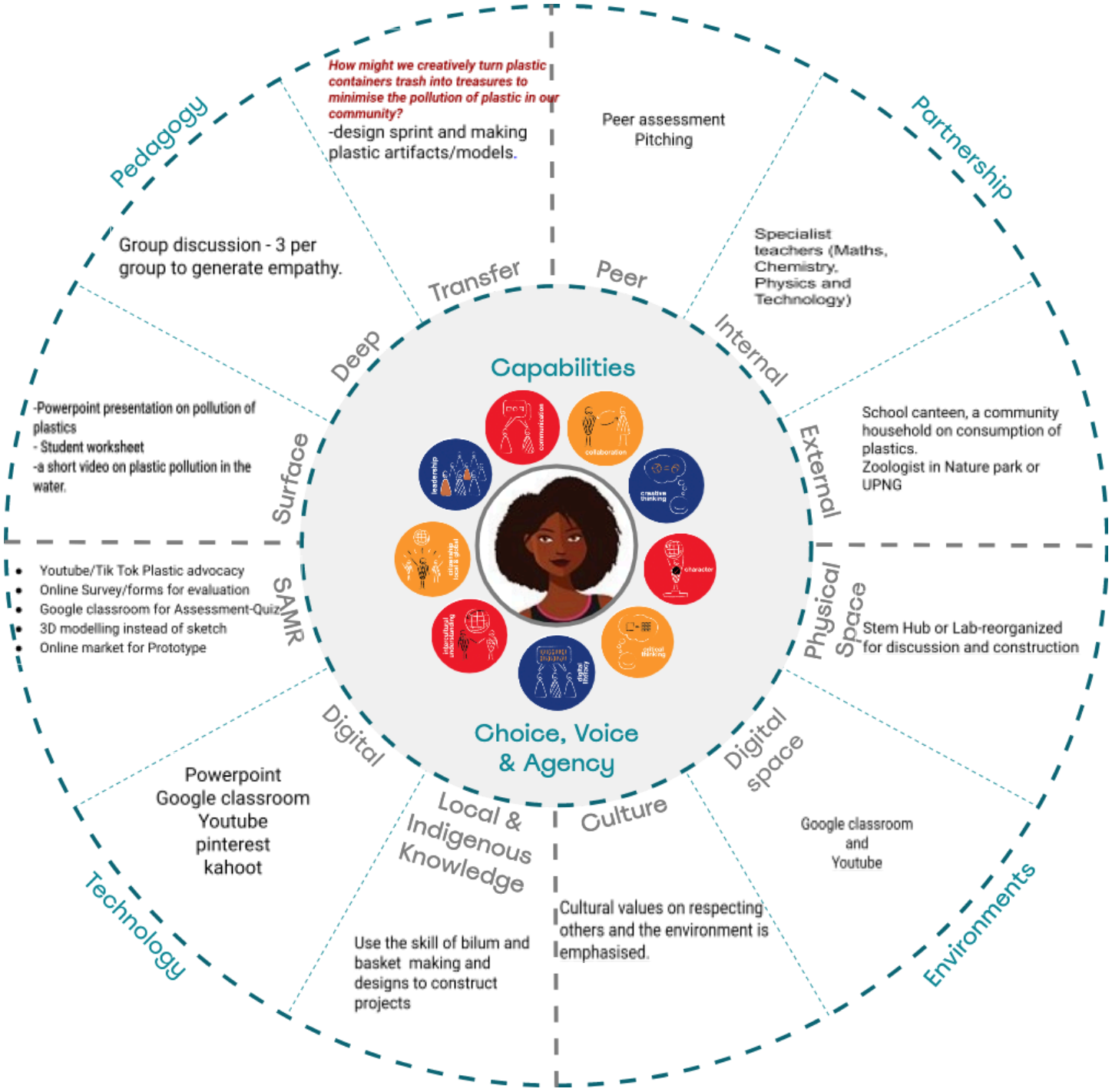
Student engagement *Why do these students care about the content of learning? How does it relate to them and their lives?*
All humans are directly connected to the environment for their survival. The impact on the environment will affect their lives.

How Might We . . . *(example only)*	**Driving question** *What big question/s will frame the learning?*
How might we improve (issue/challenge) in order to promote (topic) which will impact (who) by (what change will occur)?	**How might we turn PET bottles to cash to reduce plastic waste in our school?**

Assessment *How will students show you formative and summative evidence of their learning?*		
Task #1 (formative/summative)	**Task #2** (formative/summative)	**Task #3** (formative/summative)
Formative: • Quiz.	**Formative:** • Making models • Design sprints.	**Summative:** • Test

COURSE LEARNING INTENTIONS

Knowledge Set (what do students need to know)	**Skillset** (what skills will student need to apply and refine)
• Human activities have detrimental repercussions on the ecosystem including water pollution by untreated sewage, inorganic wastes, and the use of insecticides have largely impacted our environment • Human activities threaten the delicate balance of the ecosystem • Conservation is necessary to preserve biodiversity and to maintain balance	• creative thinking • critical thinking • collaboration • communication • citizenship global and local.
Mindset (what mindset will students need to adopt)	**Toolset** (what tools will help students to learn)
• Appreciate what the environment provides to mankind • Develop a caring attitude toward the environment • Value the importance of the environment.	• Smartphones • Data/connectivity • Laptops • Construction materials



STEM NAU LESSON OVERVIEW

Knowledge Set (what do students need to know)	**Skillset** (what skills will the student need to apply and refine)
• **What plastics are made of.** • **Why is plastic not good for the environment and living organism.**	• **Digital skills** • **communicating skills** • **collaborative skills** • **creative skills**
Mindset (what mindset will students need to adopt)	**Toolset** (what tools will help students to learn)
• **appreciate that all living things are connected** • **natural cycles are sustainable and our wastes have to be sustainable.**	• **mobile** • **laptop** • **text books** • **note books and stationary**

/ students' knowledge and skills have progressed? Are these aligned the LG/ intentions)