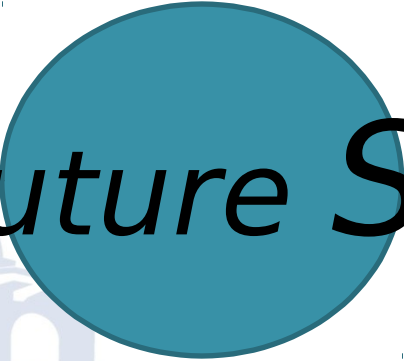


PBL and GRASPS Model

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Future Science Teachers



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The Philippines' K to 12 science curriculum envisions the development of scientifically, technologically and environmentally literate and productive members of society. They must possess effective communication and interpersonal and life long learning skills as well as scientific values and attitudes. These skills will be acquired through a curriculum that focuses on knowledge relevant to the real world and encompasses methods of inquiry. It will be implemented in a learning environment that promotes the construction of ideas and instills respect for others.



***scientifically,
technologically and
environmentally literate
members of the society
scientific values and attitudes***

methods of inquiry



As a future science teacher, how can you address the demands and challenges of the K to 12 science curriculum?



As a PNU science teacher

Content *scientifically, technologically
and environmentally literate
members of the society*

Character *scientific values and attitudes*

PEDAGOGY *methods of inquiry*



Problem-Based Learning

Learning is an **active**, integrated, and constructive process influenced by social and contextual factors (Barrows, 1996; Gijsselaers, 1996).



Students ***work*** with classmates to solve complex and authentic problems that help develop content knowledge as well as *problem-solving, reasoning, communication, and self-assessment skills.*



GRASPS Model

Goal

Role

Audience

Situation

Product/Performance

Standards & Criteria for
Success



GOAL

- Provide a statement of the task
- Establish the goal, problem, challenge, or obstacle in the task

ROLE

- Define the role of the students in the task
- State the job of the students for the task

AUDIENCE

- Identify the target audience within the context of the scenario
- This might include a client or committee



SITUATION

- Set the context of the scenario
- Explain the situation

PRODUCT/PERFORMANCE

- Clarify what the students will create and how they will create it

STANDARDS & CRITERIA

- Provide students with a clear picture of success
- Identify specific standards for success
- Uses rubrics to the students or develop them with the students.



Let's take a closer look ... (Gerpacio, 2011)

Goal	To convince the local government unit (LGU) to support your science investigatory project addressing an environmental problem in the community
Role	You are an environmentalist advocating LGU support for a science investigatory project on an environmental problem in the community
Audience	You will represent your proposal to LGU officials who are looking for a science investigatory project that can be funded
Situation	The LGU is conducting a search of science investigatory projects that can best address any of the following environmental problems in the community: 1. Fish kill 2. Snail infestation 3. Increasing incidence of pulmonary infections among children
Product/Performance	A proposed science investigatory project
Standards/Criteria	Your proposal will be judged based on the following: 1. Understanding of the problem

K to 12 Science Curriculum

Grade 9

Topic: The Mole

Anticipated Length: 1 month

Grade 9 Level Standards

- Learners explain how new materials are formed when atoms are rearranged. recognize that a wide variety of useful compounds may arise from such rearrangement
(chemistry part)

Content Standards	Performance Standards	Learning Competencies
The learner demonstrates understanding that matter consists of an extremely large number of very small particles which can be quantitatively measure by the unit, mole	The learner designs an educational game involving mole concepts	The learner • Uses the mole concept to express mass of substance • Determines the percentage composition of compound given chemical formula and vice versa



Major Points

- Mole is a fundamental unit to express the amount of substance.
- A mole of a substance is equal to 6.02×10^{23} particles
- The molar mass of a substance is the sum of the atomic masses of the atoms in a substance.
- Percentage composition of an element in a compound is equal to the ratio between total mass of an element in the compound and the molar mass of the compound multiplied by 100.

Essential Question

- How is the amount of matter being measured?

Specific Questions

- What is a mole?
- How mole and mass are related?
- What is percentage composition?
- How is percentage composition calculated?
- How mole, mass and percentage composition are related to one another?
- What might be the significance of finding the mole of any substance?

Above Average Students

Role: Event Organizer

Audience: Teacher, facilitator and players

Situation: Students are asked to organize an event called *The Amazing Mole Race*. Students need to conduct meetings for the said event talking on the nature of the event, materials to be needed in conducting the race, the different tasks that need to perform in each designated station, the specific locations of the stations, and other details for the event. They also need to try out tasks at every station before the actual race.

Product, Performance and Purpose: An organized event, a list of tasks for every station, a written report of the event, orientation of the facilitators on the tasks for every station

Standards for Success: evaluation of the event should be very satisfactory, the list of tasks should be reflective of the mole concept, and tasks are easily done without compromising the content.

Goal: To create a set of rules and guidelines for *The Amazing Mole Race*.

Role: Facilitator/Judge

Audience: Teachers and Players

Situation: Students are tasked to come up with a set of rules and guidelines for every task needed in each station for *The Amazing Mole Race*. Students will also need to act as facilitator and judge to signal if the players can move on to the next station.

Product, Performance, Purpose: A list of rules and guidelines for every task in each station and orientation of the players about the mechanics of the race.

Standards for Success: The list met the standards by the event organizer and the team players could follow the instructions accurately.

Goal: To play *The Amazing Mole Race* up to the end of the finish line successfully.

Role: Amazing Race Player

Audience: Teacher, co-players and facilitators

Situation: Students are asked to form a team. Each team will play *The Amazing Mole Race* from the starting station up to the end of the race. Each station is given a certain task (concerning mole concept, mass, percentage composition, etc). Each task in the station must be completed successfully for the players to move on to the next station. Each team is expected to finish all the tasks.

Product, Performance, Purpose: Completed race in a fastest possible time, summary of the completed task at the end of the race.

Standards for Success: All tasks should follow the directions and instructions in each station with accuracy and precision.