QUESTIONS AND SCIENCE

by:
Elmer P. Santos
Teacher III, Morong National High School

Gone are the days when teachers explain everything about the lesson for the day. As time passed by, the role of teachers has dramatically changed. Education today no more focuses on the teacher, but on the students.

The students in the 21st century want to get involved, dared, and fascinated. And the way we throw questions towards our students might serve as an avenue towards their true engagement--- which facilitates true learning.

In 2003, Weiss et al. wrote “effective questioning is relatively rare in mathematics and science classes”, and Redfield and Rousseau in 1981 wrote “asking higher level questions has been shown to facilitate learning”.

In this context, one of the primary tasks of mathematics and science educators is to formulate higher level questions that would facilitate learning. Educators need to stop asking close-ended questions or questions that could simply be answered with a yes or a no, and start asking open-ended questions that require responses resulting from processing thoughts. It could be implied that if a question requires deeper thought process to answer, a deeper level of learning might be actually taking place.

Penick et al. (1996) suggested asking questions that build on the students’ history, relationships, application, speculation and explanation, as these questions would require deeper thought processes.

In line with this, educators could create questions based on the students’ history or questions that relate to their experiences. With these, students would feel that what they were learning is significant since he has experienced the event himself. An example
of this question is “What did you do…(citing a specific event)?” Educators could also bank on questions about relationships or questions that engage students in comparing ideas, activities, data, etc., like “What do the pictures have in common?” or “What can you say about the relationship of two particular variables like pressure vs. temperature, temperature vs. volume, or pressure vs. volume?”, in the gas laws. It might also be vital to ask questions that require students to use knowledge in new contexts where they could apply what they have learned to new horizons, as “How could this idea be used in the different fields of work?”

A big part of science and our daily living is speculating, testing our speculations, and seeing the results. Speculation questions could give students the chance to think beyond given information. Sample of which is, “What would happen if you changed… (a particular thing or process)?” Also, science always seeks for answers to various questions and the very reasons why things happen, this is why explanation questions never went out of fashion since they aim to unfold underlying reasons, processes, and mechanisms. An example of this question would be, “How does your heart beat?”

Students should be responsible for discovering their own learning; however, teachers play an enormous part in this undertaking. Teachers act as facilitators to guide students in their quests. Questions made and thrown by teachers towards the students might have not gained much attention but might have significant impacts in the learning outcomes of the students’ simple to complex thought processes. As teachers should not take the pencil/pen from the student and complete their work, they should also not be taking their learning and thinking away from them either.
References:

http://realteachingmeansreallearning.blogspot.com/2011/03/art-of-questioning.html