Catch 'em Young

By Ms Chia Hui Min

"When I think of some of my uninterested Biology and Chemistry students from secondary school, I realise that being in primary school gives me the opportunity to inculcate a love of Science in students from a young age, so they don't just see the subject in terms of grades," says Ms Chia Hui Min. Here, a peek at her classes - involving a rap song, Hawksbill turtles and even an alarm clock – to show how she is keeping her students energised about all things STEM.

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Tell us a story that captures the kind of teacher you are.

One day, my P5 student, Kate* said, "I managed to wake up because the alarm clock was so loud!"

From any other student, this would have been an ordinary statement. But from Kate, it was momentous.

Kate was habitually late or absent from school.

I have found that recess is a wonderful opportunity to chat with students to get to know them better. The informal setting lowers barriers and allows them to share aspects of their lives that would not be brought up during formal lessons. It was through recess that I got to know that Kate did not have a strong routine or structure at home to enable her to come to school on time. Some days she would not come at all because she had woken up so late that "there was no point in attending school that day," as she would say. As a result, she was lagging behind her peers academically and her self-esteem was affected.

I decided to get her an alarm clock and insisted that she place it next to her bed. She was taken aback but took it home.

The next morning – Kate was in school on time! And she was on time the next day! Turns out that all she needed was an alarm clock and some encouragement. She started coming to school regularly and punctually, and I acknowledged her effort in doing so, which boosted her self-esteem.

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Now that she was in school, the next step was to build up her confidence in Science and Math. She had always hated Math. In fact, she had been quite vocal about it, saying "Why do I need to do Math?" and never made an effort in class.

So, during recess, I asked her to solve some questions with me. She agreed and once she put her mind to it, she could do it. I praised her effort and told her that not only was she not bad in Math, she was quite good, which was true. After that I did see that Kate was making more effort in class. She did not love the subject still, but I was happy she was trying.

About a year later, Kate sheepishly admitted to me that she had lost her alarm clock. But she had already developed the habit of waking up on time, so she no longer needed the alarm clock. I joked with her, "Hey you better find it. I bought it for you," but inside, I was chuffed that she no longer needed the clock to be on time. I believe that we need to meet the students where they are, then guide them to where they need to go. Every student has a different story to tell. It is up to us as teachers to unpack the complex emotions and issues that students face and journey with them to overcome the barriers, so that learning can take place.

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**Name changed to protect student's identity.*

Chit chat during recess to get to know students better

Describe a teaching method or tool that you have found effective.

I'm going to share this rap song created by a group of Primary 6 students for a Science lesson on organisms and their communities.

> *"Dear Diary, I was exploring the Amazon Forest to research on some organisms when a grey squirrel caught my eye!"*
> *"There are many organisms living here!*
> *There are herbivores, omnivores and carnivores...*
> *You know what I'm talking about… I'm talking about the pond, oh yeah!"*

You don't often hear rap songs in Science class, but a team of us Science teachers designed this lesson to cater to students' specific interests. We wanted to give them the autonomy to choose how they present their work because we know that when students are given choice, they are more engaged and have greater ownership of the task.

So, instead of doing worksheets, we asked students to create any product that would show their understanding of the topic, "Living Together".
The result: Likeminded students worked in groups to create a rap song, a skit, journal entries…

Better still, the work that went on behind the scenes. A parent shared that his son was so invested in the project that he worked harder than usual to ensure that his group's presentation slides were in tip-top condition. Students even arranged Zoom meetings with one another on their own. It was heart-warming to see students, who usually struggled in Science exams, come alive as they acted in a skit, sang a song or wrote a journal entry. Students indeed have many strengths that can be showcased given the right circumstances.

My second point is about curiosity. Inquiry is central to Science. I lead my Science teachers in carrying out Inquiry-Based Learning, which evokes curiosity, rather than telling students what they need to know.

To find out the boiling and melting points of water, for instance, I get them to carry out an experiment with dataloggers and derive the answer by analysing the shape of the graph. Such opportunities of seeing Science in action brings out the innate curiosity in children. They not only remember the concepts better, they are more motivated to learn the subject.

Another energising lesson in the laboratory

I used to teach in a secondary school before I came to a primary school. When I think about some of my uninterested Biology or Chemistry students in secondary school, I realise that being in a primary school gives me the opportunity to inculcate a love of Science in students from a young age, so they don't just see the subject in terms of grades. I am resolved to help as many young students as possible love learning for its own sake, instead of learning for the test. When you have a positive attitude towards learning from young, students will be resilient and purposeful in their education journey. They are motivated to persevere, no matter the challenges.

Which school project or initiative are you especially proud of?

Do you know how effective the Eco-Link over BKE is in connecting organisms between the two nature reserves? Ask the 11-and 12-year-olds in our school.

This was one of the projects students worked on as part of the school's Applied Learning Programme (ALP), Opera Goes Green. I oversee this ALP, which integrates STEM education and environmental sustainability.

The ALP aims to create awareness of environmental issues among students, motivate them to take action and advocate for environmental causes. There are school-wide programmes that enable these.

For instance, to create awareness and inspire action, every P4 or P5 student gets a chance to learn and apply computational thinking to creatively solve real-world environmental problems through the Digital Maker programme.

Students apply the Design Thinking Process and use recycled materials, micro:bit and sensors to design prototypes to tackle various environment-related issues. For instance, one group designed a prototype with a motion sensor to count the number of animals passing through the Eco-Link. Another group studied the problem of just-hatched Hawksbill turtles on the East Coast Beach, which were dying because they were disoriented by intense light, say from cameras, and could not make their way to the sea. Students built prototypes offering solutions.

Along the way, students develop empathy as they put themselves in the shoes of the user that they are designing for. This could be people using the prototype or the animal that you are trying to help. They troubleshoot coding problems and disagreements among themselves about the best solution. For example, one group was not able to get their motion sensor working. After much tinkering, they realised there was a problem in their code and the physical prototype that made it difficult for motion detection. It was a lot of effort, but they were so pleased when they managed to solve the problem.

Designing prototypes in the Digital Maker programme

It is crucial that students see the link between the skills they learn in school and real-world problems. It makes the learning relevant and motivates students to want to learn more deeply, too. STEM education is not just formulas and concepts. It is about helping students understand that they can use what they have learnt to frame the way they view issues and make informed choices.

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Science matters in their everyday life. Science can help you make a difference to the world. I want my students to understand and experience that. When we educate children about environmental sustainability, this will make a difference in the sustainable life choices they make in future, which then contributes to society at large.