THE MAKING OF AN EINSTEIN

THE NEXT TIME YOUR CHILD ASKS WHY, ENCOURAGE HIS QUESTIONING. INQUIRY AND OBSERVATION ARE THE SKILLS THAT COULD LEAD TO THE DEVELOPMENT OF A WORLD-CLASS SCIENTIST, DISCOVERS **NICOLE NG**

Most of us, unless we have a particular inclination for the subject, don't think too much about equipping our toddlers with scientific knowledge. Yet, science is all about garnering facts about the world we live in. And children have a natural curiosity towards learning about their universe as all parents who've had to answer questions like 'why does it rain' and 'why do birds fly' know.

Realising this, Abbott in conjunction with the Science Centre organised two creative education programmes – Family Science and Operation Discovery -- to spark an interest in the subject among young people. Both programmes were led by Abbott scientists and focused on hands-on experiments and activities.

"Young people learn best through interactive learning," commented Dr Steven A. Nowak, Site Head, Analytical R&D, Abbott in Singapore. "This also helps them to understand that science is a part of their everyday lives." Operation Discovery catered to the older kids (13 to 15 years old) while Family Science was aimed at younger children.

Family Science was led by David Heil, the previous host of the Emmy Award-winning PBS science series, *Newton's Apple*. According to David, children should be exposed to science between the ages of 0 – 5. "Children are born with a natural instinct to learn. If we work with them early enough, we can build a good foundation."

No stranger to the wonders of science, as a child in Oregon, David grew up with a love for the subject and went on to pursue it as a career. Having started out in basic research, David went on to teach in a classroom for gifted children and even conducted science outreach programmes in science museums. After some time, he came to realise that television was a powerful medium and before he knew it, spent the next 10 years of his life as the host of *Newton's Apple*. David now owns a small consulting business, David Heil and Associates, based on developing curriculum, business planning and strategic planning.

Family Science revolves around bringing kids, parents, teachers and scientists together and conducting fun, hands-on experiments. Focused on basic science skills such as observation and problem-solving teamwork, Family Science also builds confidence in science learners. Bearing in mind that confidence is key when it comes to science, David shares that children encounter difficulties when learning science mainly due to fear.

"If they think they don't know the answer, they are afraid to voice their thoughts and uncertainties." He adds, "The act of not knowing is actually a healthy activity in science!" He went on to explain that children have to feel "safe" about science and parents need to feel comfortable about "not always knowing the answers". It is only then that there is the urge to discover and seek answers.

Perched on a high stool in the Science Centre Singapore's Fermi Lab, I was surrounded by 200 or so wide-eyed students from North Vista primary school, alongside their family members and teachers. All eyes were on David who was standing at the front of the lab, poking and

prodding a red inflated balloon with a sharp satay stick. Finally, with a decisive air, he punctured the balloon with the stick, penetrating its rubbery exterior. However, to everyone's complete bewilderment, the balloon remained intact, instead of exploding into a million elastic pieces. That was the first activity of the programme: to insert sharp sticks into the balloons without popping them.

Giggling excitedly, the children carried out the activity with newfound enthusiasm, squealing in delight when they managed to complete the task and even more when the balloon popped. The key to this activity, I discovered, was to insert the stick at the ends of the balloon where the most amount of stress is found. The extra rubber then helps to seal up the hole. "Science needs to be fun and taught hands-on. Children need to be actively involved in an interesting activity to get them engaged and interested. This activity is a perfect example." says David.

The rest of the session consisted of other activities such as Sharing Your Evidence, which required the children to test the validity of a list of statements with the use of a bag of props. An example: air has weight and takes up space. I chanced upon an innovative father-and-son team who carried out the experiment by constructing a makeshift weighing scale and comparing the weight of two different-sized balloons.

"The programme enabled me to interact more with my children as it is usually my wife who helps them with their homework," shared Pang Kim Baan, one of many dads who accompanied their children to Family Science. His two children, Joseph and Grace, both attended the event with him. He commented that Joseph, who doesn't usually take a liking to science, thoroughly enjoyed the activities conducted that day, saying it was "fun" as it was more hands-on and had Dad around as well. Mr Pang admitted that he too found the activities thoroughly engaging and interesting.

David advises: "We should take advantage of the fact that children are spatial by nature. They need to touch things and sounds are also very important in their learning. Facts become less important and instead building skills of the ability to observe and ask questions are more crucial. Parents should always ask their children questions to stir their curiosity."

The initial run of the Abbott science programmes in Singapore reached out to more than 300 participants. Abbott is targeting to run its science programmes twice annually in Singapore.

SCIENCE STRATEGIES:

(Adapted from the book, *Family Science*)

- **Spend time talking and listening to your children:** Children learn to read, reason, and understand better when adults read, talk and listen to them. Storytelling, playing games, and daily conversations provide opportunities for learning from and about each other. You can encourage children's language development as you plan science activities together. Using new vocabulary, writing, verbal sharing and drawing pictures will help children explain their thinking and express their feelings in constructive ways.

- **Demonstrate how science improves the way we live:** Think of examples around the house that show science and technology in action. Go on a science scavenger hunt at home. From the refrigerator to the medicine in your cabinet, help children see how scientific study has led to a world of improvements. Support your children's interest in science and let them know that with proper training they too can help improve the quality of life for all people.

- **Practise using inquiry skills every day:** Observing, comparing and measuring, recording, experimenting, analysing, communicating, reporting, and formulating questions are all important skills related to inquiry-based learning. You and your children can practise using these skills together. For instance, cooking requires measurement, shopping involves comparison, and sharing the day's events uses communication.