

JULY 2022

Appreciate
Everything Local :)

Solve
Fun Puzzles!

WISH UPON A STAR

Learn about
Coral Reefs
and Guppy Fishes!

Discover
Mud Volcanoes!

Enjoy Poetry
& a bit of History!



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About the cover: The cover features our mascot Dr. Dingolay and her trusty sidekick Ramajay. Dr. Dingolay is a very curious iguana who was happy to meet her best friend, the tardigrade. Ramajay is a tardigrade which are microscopic creatures even found in Trinidad and Tobago. They are so tiny that you have to use at least a magnifying glass to find them! So, Dr. Dingolay often loses her pal Ramajay now and then. But together they make a formidable team when it comes to being curious about science! This issue is all about their homeland, Trinidad and Tobago. Fun fact: Dingolay and Ramajay are the names of an exoworld in space named by Trinidadian Dr. Jo-Anne Ferreira.

Cover Illustration: Daena Boodoo

Editorial

Dear Readers,

We are very excited to share this second issue of “WISH Upon A Star” from the WISH (Women In Science for Hope) Foundation. It is only our second year in operation and we have been overwhelmed by the support from our base and the friendships we have forged with the children’s homes we have worked alongside. We currently engage with four children’s homes – Amica House, Christ Child Convalescent Home, Islamic Home for Children and Swaha Vishok Bhavan.

All in all, it is a tremendously fulfilling enterprise where we hope we are able to make a difference in the lives of the children with goodwill, mentorship and academic support with support from our base who have been nothing short of amazing. From time to time we get requests for other support from families due to COVID hardships and other life’s misfortunes such as fire and we have always supported such requests as well.

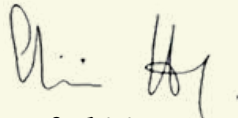
In the past year, we have continued with our events as before and further included another competition. As such, in the past year, we have had our popular Christmas gift drives, library and books upgrade, distribution of science kits to the homes, and the food and needs drive. We often get requests for ‘lessons’ support for some of the children, and persons in the membership have been very helpful in providing this support. Special mention must be made of Upper Level School, who has partnered with us on making this type of support available to the children apart from being a major supporter of our other drives.

We also ran a colouring competition for the observance of “Women and Girls in Science” day which incorporated “Women and Girls in Astronomy” month. We were delighted with the entries we received and share the winning entries with you on page 17. The winning entries got some very cool presents!

This year we also plan on distributing more science kits, local astrophotography posters and astronomy book as part of a venture supported by the International Astronomical Union (IAU).

We have a wonderful team of volunteers on the editorial board of this magazine who are excited to put together this issue, for you our membership and the children in the homes. Each child gets their own hard copy of the magazine. The theme of this issue is the fantastic home we all share – “Trinidad and Tobago” and the amazing science and things of interest right here at home. So, we hope you enjoy the information, the fun and games and trivia among the pages of this issue. And when you have journeyed through all the pages, don’t forget to pull out the poster in the centre pages if you have the hard copy to decorate a wall to enjoy our beautiful country!

With all our love at the WISH Foundation,



Prof. Shirin Haque

Editor-in-chief

CEO/Founder

Anthony N. Sabga Awards Laureate for Excellence in Science & Technology (2020)

Meet The WISH Team!



Prof. Shirin Haque
Astronomer

Prof. Shirin Haque is the founder and CEO of the WISH Foundation. She is the 2020 Anthony N. Sabga Caribbean Awards laureate for excellence in Science And Technology among many other Science and teaching awards. She is an astronomer by profession and has published 18 Science magazines, produced two science television series and hosts her Science based YouTube channel with content for adults ("The Wormhole") and children ("The Enchanted Forest") alike. She also has an MPhil in Psychology which has convinced her of the important role of childhood experiences and therefore mentoring children. She notes, "Our experiences in our childhood go on to mould us as adults – the careers we end up in and the life choices we make. I myself ended up as an astronomer due to childhood influences. It is thus my life's mission to work with underprivileged children who do not always have access and exposure to things we take for granted. When a little child in one of the homes we work with, put a telescope on her wish list for Christmas – it was my total joy and obligation to ensure that home got one."



Mr. Deva Sharma
Architect

Mr. Deva Sharma is a director on the board of the WISH Foundation and is its treasurer. He is an Architect currently practicing in the Caribbean. He has previously practiced in the United States and India. His work is focused on corporate offices, residential, airport development, health care facilities, sporting facilities and schools. He has provided project management services for Early Childhood Care Centers and primary schools in Trinidad and Tobago and with Turner Alpha, project managed the Brian Lara Cricket Academy in Tarouba, Trinidad and Tobago. Also, with Turner International, he was the project manager of the "Evolution Business Park" in Mumbai, India. He has also provided design and master planning services for the development of the Cipriani Labour College and the Centre of Excellence in Trinidad. Mr. Sharma is also a publisher of the "Intellectual Magazine - Art, Science and Architecture" and has participated in several international competitions in Architecture; and has co-authored a cultural paper on Indian Astronomy. He is also a past president of the Rotary Club of Piarcó, Trinidad and a recipient of the Paul Harris Fellow from Rotary International. In 2013, he was a STEM Conference speaker at the University College of the Cayman Islands. He notes, "Being part of the WISH Foundation provides an opportunity for me to make a difference and a lasting impact in the lives of underprivileged young children in homes in Trinidad and Tobago."

Meet The WISH Team!



Ms. Darnelle Hamilton
Teacher

Ms. Darnelle Hamilton is a director on the board of the WISH Foundation and is its secretary. A graduate of BSc with a major in Physics from the University of the West Indies, she is currently a teacher at Corpus Christi College of Occupational Education and Training where she teaches Mathematics and Science. She says, "Being part of the W.I.S.H. Foundation for the past year has been holistically rewarding. It has afforded me the opportunity to assist children in a meaningful manner even those that are in difficult situations. The foundation not only allows me to share the love and joy of science with the children but also allows for us to share our fascinations and enthusiasm with them as their super-science hero of sorts as we impart our collective knowledge. This venture is mutually beneficial and I hope that the W.I.S.H. Foundation and our exceptional contributors can continue to provide for the needs of the children we reach through our various drives each year." One of her favourite quotes is from Jane Goodall - "What you do makes a difference, and you have to decide what kind of difference you want to make."



Ms. Bhanumattee
Ramdhanie
Chemist

Ms. Bhanumattee Ramdhanie is an executive member on the board of the WISH Foundation and is an Analytical Chemist who graduated from the University of the West Indies with a BSc in Chemistry minoring in Analytical Chemistry and MSc in Occupational and Environmental Safety and Health. She has been involved in research for a number of years with focus on the environment and continues to work in the field of coastal and environmental science.

She notes, "The WISH foundation is important to me because it broadens the horizon and opens up the window of opportunities for the children who benefit from the work of the foundation." One of her favourite quotes is from Marie Curie -

"Nothing in life is to be feared, it is only to be understood. Now is the time to understand more, so that we may fear less."

NATURAL TREASURES OF TOBAGO

CORAL REEFS



If you look closely at the magnificent structure of a coral reef, you are in fact, gazing at hundreds of thousands of tiny corals, called Polyps. The “hard” corals that build the reef, or better seen as the foundation of the reef, take calcium carbonate from the seawater in order to create a hard exoskeleton. This protects their soft bodies! On the other hand, there are “soft” corals and even though they are not part of the reef building process, they often look like plants and trees, for example the sea whips or even sea fans.

Coral Reefs are considered the “Rainforest of the Sea,” and even though they are found off the coast of Alaska, a freezing country, they mainly thrive in warm, shallow waters. Hence, in order to thrive, they require lots of sunlight and luckily, the Caribbean is showered with lots of sunlight. This is why the Caribbean is blessed with the magnificent masterpiece.

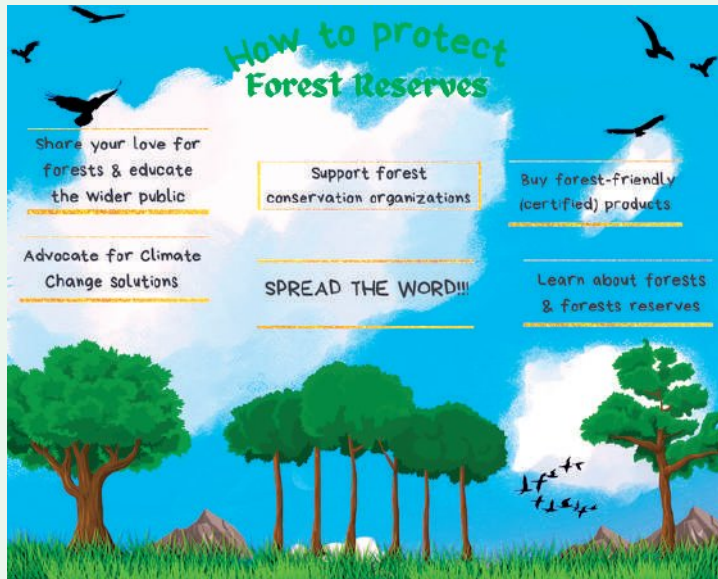
In the beautiful waters of Tobago, it is the home to many corals such as the famous Boulder Brain Coral. And it is one of the largest in the world! It can be found in Kellester Drain, near the island of Little Tobago.

Corals grow for thousands and thousands of years with a small growth rate of only a few centimeters per year. The Boulder Brain Coral of Tobago only grows one centimeter per year and it has been in existence for more than 200 years.

Corals are beautiful but they are more than just a magnificent sight. They are the home and nesting grounds to a wide range of marine organisms such as many species of fishes, sea urchins, oysters and many more! In addition to marine animals, there are many marine plants that live there such as algae and seagrasses.

An ecosystem as vast as coral reefs assists in the management of global warming by taking in lots of carbon dioxide. Also, they protect the coastline from erosion and storms, they provide jobs for many people and they are a huge source of food and new medicine.

FOREST RESERVES



Natural Forest Reserves are forest areas that are protected and are allowed to naturally develop. Forest ecosystems are allowed to thrive without the intervention or interruption of human activities such as deforestation.

There are a number of forest reserves on the twin islands of Trinidad & Tobago. For example, Caroni Swamp and the Central Range in Trinidad. In Tobago, The Main Ridge is not only the largest forest reserve on the island but it is the literal backbone of the island. It is the oldest protected forest reserve that is targeted for conservation purposes. It was established on April 13th, 1776 and is managed by the Department of Natural Resources & Forestry of the Tobago House of Assembly.

Communities such as Charlotteville, Speyside and Roxbourough surround the protected area. With a total population of 11500 people, they are highly dependent on the Main Ridge for hunting, recreation, tour guiding and water.

The reserve is mainly utilized for ecotourism. This includes nature walks, bird watching and even mountain biking. While there are wonderful adventures that everyone should enjoy, the reserve is also exploited for its local wildlife by hunters who harvest the mammals such as the nine-banded armadillo, agouti and even the wild hog for commercial and personal use.

As a result, species are being lost and can become endangered or worse, extinct if the practice continues. Additionally, changes in the environment adds an additional stress on the plants and animals and thus, adds to climate change. This can negatively affect the drought intensity, increase fire risk during the dry season and collectively, these environmental changes affect both flora (plants) and fauna (animals).



Author:

Asad Ali is a graduate of the University of the West Indies with a

Bachelors of Science degree in Environmental and Natural Resource Management.

D Famous Trini Pepper



The Moruga Scorpion pepper is one of the hottest peppers in the world and it is one of the many things we can be proud of as Trinidadians! It is famous the world over and bottles for pepper sauce like the one pictured can be found in countries far and wide. So how did this pepper come to be and why is it named after a place in Trinidad? Let's answer some questions!

1. What is a pepper?

A pepper is a fruit. This means that the pepper plant grows from a seed and the pepper grows from a flower on the plant. Like most plants, peppers have a common name and a botanical name. The botanical name of the Trinidad Moruga Scorpion pepper is *Capsicum chinense*. Peppers are native to the Americas and were introduced to the rest of the world after Christopher Columbus arrived in the western hemisphere and carried back samples.

2. How many varieties of peppers are there?

Some estimates say that there are over 50,000 varieties of peppers in this world. Not all are cultivated for human consumption and many new varieties are being created regularly by human intervention.

3. How can we compare how hot different hot peppers are?

The scale we use to compare the hotness of different peppers is called The Scoville scale. It measures the spiciness of chili peppers, based on the concentration of the chemical which makes the chili pepper hot. Capsaicin is the main component of this chemical. The Scoville Scale is named after Wilbur Scoville an American pharmacist. In 1912, while working for Parke, Davis & Co. in Detroit, he published a "Note on Capsicums" which outlined a method for measuring the pungency of peppers in the Journal of the American Pharmaceutical Association. The hotness of the peppers is recorded in Scoville Heat Units (SHU).

4. Did the Trinidad Moruga Scorpion exist in nature?

No, it did not. This pepper was developed by Wahid Ogeer. He is a self-taught farmer who operates a 25-acre farm at Chickland Caparo Road in Freeport. The pepper has been studied by the University of the West Indies since the 1990's. The variety was named after the area of Moruga in Trinidad. The plants thrive in hot weather and the peppers get hotter when the plant is stressed during the dry season and with hot temperatures.

5. How does the Trinidad Moruga Scorpion pepper measure up on the Scoville scale?

The Trinidad Moruga Scorpion pepper is one of the spiciest chilies in the world. In 2012, the New Mexico State University's Chile Pepper Institute determined that the Trinidad Moruga Scorpion was the hottest chili at that time, with a heat of 1.2 million SHUs. Since then other peppers have been developed that have scored higher on the Scoville scale.

6. How hot does 1.2 million SHUs really taste?

1.2 million SHU translates to a pepper that is more than 230-400 times hotter than a jalapeno. Eating a raw Trinidad Moruga Scorpion pepper directly by biting into it can cause extreme physical reactions in the person eating it, including blistering in the mouth. The pepper has been said to have a bit of a sweet taste and the spiciness heat is not felt immediately upon biting into it. The best way to taste the Trinidad Moruga Scorpion pepper is in a pepper sauce where it is blended with other ingredients. We can now say that the Trinidad Moruga Scorpion pepper is yet another thing that makes Trinidad famous the world over!!



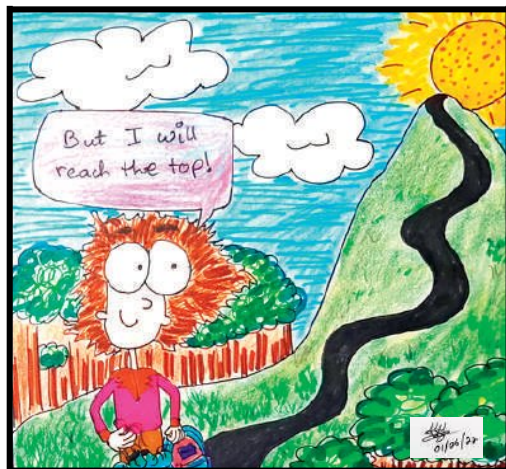
Sharmin Haque recently found a bottle of Trinidad Moruga Scorpion pepper sauce selling at a store in Chicago where she lives. She felt very proud upon stumbling across this bit of her Trinidadian heritage and was inspired to learn more about this amazing pepper.

Before A Mountain



How does one stand before a mountain,
Without being afraid?
Is the view at the top as good as I'm told,
Or is it unreal,
As sacred as one's soul?

I won't know by wondering,
By swaying against the path,
It's a trek upwards, a journey to
make.



Pushing you to sacrifice,
Despite what's at stake.

Faithful wanderer,
Weary traveller, grab your shoes and come
The only way to face a mountain,
Is to see it in the light of morning's sun.



Kassie-Anne Kalloo

Anger – Friend or Foe?

Have you ever experienced those overwhelming out-of-control feelings of hurt, helplessness and/or pain? Have you in response to those feelings ever yelled and screamed, destroyed an object, almost harmed yourself or someone else? That intense emotional state is called "anger".



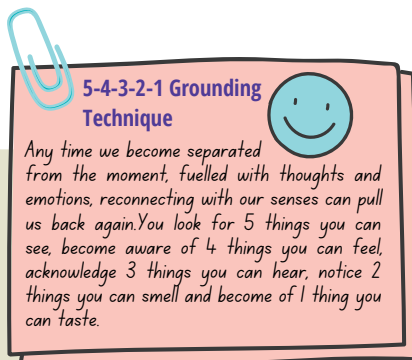
Anger, just like any other emotion such as joy, love and sorrow, is a normal emotion. The catch with anger is how you express and manage it. Anger usually gets a bad rap because when anger is not expressed and managed appropriately, it can result in a negative action or behaviour.

However, imagine if you can control your anger. Can you imagine if you can take your anger and make it more beneficial to you? Can you imagine if we can make our anger more of a friend than a foe? Our world would definitely be a happier place if we learned how to identify our thoughts and feelings, express our anger clearly and respond positively.

Here are a few helpful tips that you can adopt to manage your anger:

1. Notice and Name

First step is to notice what's happening in your body, in your thoughts and feelings and name it. When we put a name to what's going on, we can quickly identify and implement our coping strategies. For example, "My friend gossiped about me and what was said is not true (thoughts), my hands are starting to clench (body signal) and I am angry (feeling). I need to walk away, go to my safe space and listen to music (coping strategy)."



2. Woosaahh and Ground

Your heart is racing, your blood pressure has increased, your thoughts are all over the place and you just can't catch your breath. Grounding yourself during an intense emotional state can help you connect with your senses and body to slow things down. Take at least three (3) deep breaths and with each exhale count backwards from 10–1.

3 2 1

3. Find your safe space

Now that you've noticed, named and started grounding, move away from the environment that is triggering your anger then find yourself a safe and comfortable place for you to continue grounding and breathing. For example, you can go outside under the mango tree or on the porch.

4. Cope!

You've found your safe place, now what do I do? Coping is something you do to reduce unpleasant emotions and get you through those tough times. The most effective coping strategies are the ones that bring you sense a calm, allow you to clear your mind to understand what's happening and/or a degree of enjoyment. The cool part about coping strategies is that you're not limited by what you can do or how many you can choose!

- | | |
|---|---|
| 1. Prayer - don't hurt to talk to the Big Guy upstairs. | 15. Talk it out - this one is really effective! |
| 2. Clean and organize your space. | 16. Exercise - walking, running, yoga. |
| 3. Put on some music and dance. | 17. Let yourself cry. |
| 4. Build a puzzle - challenge your mind and unwind. | 18. Scream into a pillow - whoosahh! |
| 5. Take a bath. | 19. Write in a journal. |
| 6. Sit outside. | 20. Listen to uplifting music. |
| 7. Take deep breaths - whoosahh some more. | 21. Sing. |
| 8. Listen to an uplifting podcast. | 22. Paint your nails or try a new hairstyle - this one sounds like fun! |
| 9. Watch the clouds or stars - daydream. | 23. Watch your favorite series or movie. |
| 10. Do a crossword or word search. | 24. Read a book - knowledge is power. |
| 11. Look at some recipes, cook a meal. | 25. Paint or draw. |
| 12. Hang out with your pets | 26. Create or build something. |
| 13. Help someone - be kind. | 27. Bike ride in your neighborhood. |
| 14. Play a board game. | 28. Kick ball with some friends. |
| | 29. Shoot some hoops - destress. |

Unexpected Fact!

Did you know anger can actually be quite helpful?



Anger can signal to us when something is wrong, it can help us through a dangerous situation and/or even help us stand up for ourselves when we have been wronged.



5. Find a Solution

Once you're feeling settled, you can work towards a solution to the problem that caused you to feel so intensely. The solution should benefit you and/or any others that may have been involved. This can be a simple gesture of talking it out OR forgiving self and others for the words and actions that were exchanged OR expressing kindness to self and to others OR asking a neutral person to help you find a suited solution. When we work towards finding a solution it says that you want to learn how to respond healthier and more benefitting next time a difficult situation presents itself. It will also help to avoid any build-up of emotions that you are unable to handle resulting in negative responses. Remember, anger is normal, it's a part of us and it doesn't have to be the enemy. So it's okay when we say or do the wrong things and it's okay when we make mistakes but what's more important and defining of who you are is how you rise above!

Be Brave. Be Kind. Be Awesome.

-Crystal Johnson, MHC



Author: Crystal Johnson is a Mental Health Clinician (MHC). She graduated from Nova Southeastern University, Miami, Florida, with a Bachelor of Science degree in Psychology and a minor in Sociology and Counseling in 2007, then attained her Master of Science degree in Mental Health Counseling in 2010. She has twelve years of experience working with adolescents, young adults, adults and families. She is currently the Mental Health Therapist with the Archdiocese of Port-of-Spain and a part-time School Counsellor in a private girls' secondary school.

A Passion For Science: A Conversation With Professor Christine Carrington



Prof. Christine Carrington is Head of the Department of Preclinical Sciences and Professor of Molecular Genetics and Virology at the University of the West Indies in Trinidad and Tobago. She has a BSc in Biotechnology and PhD in Molecular Virology, both from the University of London. Her research focuses on understanding how viruses emerge and spread in human populations and in particular, the roles of virus evolution, changes in the environment and human behaviour. Her work to date includes studies on dengue viruses, Zika virus, Chikungunya virus, yellow fever virus, rabies virus and coronaviruses, including the COVID-19 virus. In 2022, she received the Anthony N. Sabga Award, for Caribbean Excellence in Science and Technology.

Did you always want to be a scientist growing up? Why?

I am a virologist – a scientist who studies viruses. Other than the time when I was about four years old and wanted to be an elephant, I can't recall wanting to be anything else but a scientist. I have always been interested in how things work, and the beauty and diversity of the natural world continues to fascinate me. I got my love for science mainly from my mother who is a retired high school biology teacher and who taught me at St. Augustine Girls' High School from Form 4 to Upper 6. My father is a retired University Professor. His area of specialisation was different, but he also enjoyed learning about science and technology. When my two sisters and I were children, we were always encouraged to be curious and observant, to ask questions and work things out. So now, as a scientist, I do that for a living!

What are some of the challenges you experienced along the way?

My path to becoming a scientist was quite smooth. I had no major challenges. I did well at school. Likewise, the years I spent at University in the UK doing my undergraduate degree in Biotechnology and then my PhD in Molecular Virology were very happy. None of it was easy – I had to work very hard but there were really no external factors hindering me and I had a very active and enjoyable social life. If anything, difficulties came after University

but they were more day to day frustrations of working life than major issues that kept me back - difficult colleagues, a very heavy workload, inefficient systems... and never-ending meetings that keep me away from the part of my job that I love the most, which is doing research and working with my research students. I've also experienced racism and sexism, but I try take each incident as separate and deal with each on its merit, rather than seeing everything through those lenses.

What is a memorable moment in your career that stands out for you?

In 2003, I was awarded a Commonwealth Fellowship which allowed me to spend 6 months in the Department of Zoology at the University of Oxford in the UK, working with the leading (and several up and coming) scientists in the field of virus evolution. I was introduced to a whole new area of research that I enjoy immensely and a network of brilliant and supportive scientists, some of whom I continue to collaborate with. The experience changed the direction of my research and heavily influenced how my career advanced. I am very grateful to all the people involved.

If you could do anything differently, what would it be?

My job as a Professor at the University of the West Indies has three parts - research, teaching and administration. I enjoy research the most but these days as head of my department, I spend most of my time on administrative tasks. I would have liked to have spent more time on research and with fellow scientists in my field. Other than that,

it is hard to think of anything I would have done differently. The path I took made me a scientist and gave me a career I enjoy.

What is your advice to young people thinking about a career in science?

Science is about pursuing knowledge and understanding of the world and applying that knowledge and understanding to solve problems. If you are curious, observant, and you enjoy learning and working things out, then a career in science may be for you. It also calls for patience, persistence and resilience - so my advice would be to develop those traits. Science is never easy but it is immensely rewarding.

I also think it's very important for scientists to be well rounded, and to read and engage in activities outside the sciences - whether it's literature, music, art or sport. In addition to bringing balance to your life, it will make you a better scientist.

It is also important to recognise that career options in the sciences are very broad - not all jobs involve working in a lab or at a computer. You can teach, you can go on to science journalism, you can work in industry - developing therapies and new technologies, you can be involved in developing science policy. The list goes on. Some people get involved in science because there is a particular problem that they would like to contribute to solving, others (like me) didn't have a specific problem in mind when we started... we are just curious and love learning new things and understanding how the world works.





The Speyside Waterwheel

The Speyside Waterwheel is a breath-taking sight located at Blue waters Inn road, Speyside, northeastern side of Tobago. This majestic sight consists of the Scottish-made waterwheel preserved by layers of rust, as well as the crumbled remnants of what would have been the walls of the old sugar factory once located at this site.

The Speyside Waterwheel is an easily accessible site which gives a small glimpse into the rich history that Tobago has to offer. It is a remnant of the sugar plantation established prior to Trinidad and Tobago gaining independence, and was used in the provision of electricity.

Photo Credit: Bhanumattee Ramdhanie

The Banwari Burial

Hidden within the Department of Life Sciences at The University of the West Indies St. Augustine there is a spectacular treasure trove, brimming with preserved zoological specimens. This Aladdin's cave is otherwise known as the UWI Zoology Museum (UWIZM), and its collections date back to the 1920's.

The present-day collection consists of more than 70,000 specimens and represents species originating not only from Trinidad and Tobago but also from other parts of the Caribbean and South America. One of the most unusual and precious specimens in the collection is the 'Banwari Burial': a 5000-year-old human skeleton!

Discovered in 1969, Banwari Man or Woman, is often termed "Trinidad's Oldest Resident". The skeleton was discovered lying on its left-hand side in a crouching position at a mere 20 cm below the surface. Two objects were found with the burial: a round pebble by the head and by the hip, a needlepoint. It appeared that he or she was buried in a litter heap of shells and then covered by unwanted shells.



Author: Jennalee Ramnarine is a laboratory technician at the Zoology Museum. She is responsible for caring for the collection thereby ensuring that generations of scientists, students, citizens and tourists can enjoy it for many years to come.

Banwari Man or Woman, is named after Banwari Trace where the remains were uncovered, a site located in south Trinidad in the village of San Francique. The area is one of the first places early settlers would stop, on their journey northward from the South American mainland to the rest of the Caribbean islands. Today, the site provides invaluable clues to help us understand the movements and lives of the early people in the Caribbean.

For example, other objects found at Banwari Trace include spears and hooks made of stone, bone and animal teeth that were likely used in hunting and fishing and large stones that were probably used to grind vegetables.

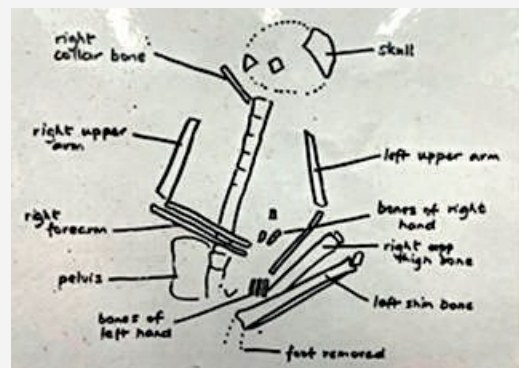
Currently, the Banwari Burial is cased on top of a large steel plate and displayed at the UWIZM, waiting for a keen physical anthropologist to do further research and discover more about him or her. In the meantime, visitors can be "wowed" by seeing such an important piece of local human history and use their imagination to think about what the Banwari person might have been like when they were alive.



The Zoology Room of the University of the West Indies Zoology Museum, Department of Life Sciences.



The "Banwari Burial" on display at the UWIZM.



A schematic diagram showing the different parts of the skeleton.

Winning Entries From The Children For "Women And Girls In Astronomy" Colouring Competition



Women and Girls in astronomy are...ambitious, diligent and powerful...
individuals...not only because they are hardworking but because
they discover the light beyond the view of the eye for all women

Women and Girls in astronomy are...recognise the role of women
in advancing science and encourage girls to consider
careers in astronomy.

Women and Girls in astronomy are...like the stars you wish upon because
of its magical appearance and the wishes you hold within
the stars become more beautiful than when you were five.
To ambitions to just see the stars twinkle a little closer.

Done in conjunction with the International Astronomical Union (IAU)

Geological Wonders Of South Trinidad

The Mud Volcanoes of Trinidad and Tobago



Image shows the Piparo Mud Volcano.

When we hear about volcanoes, we generally think of the volcanoes with lava flowing down the sides and lots of ash spewing into the air. We do have volcanoes like that in the Caribbean for example Mount Soufriere in St. Vincent and the Grenadines which recently erupted in 2021. There is no lava volcano in Trinidad, however we have something called mud volcanoes. As the name implies, the craters of these volcanoes bubble with mud and these volcanoes also have been known to erupt. The last major eruption happened in Devil's Woodyard in Princes Town in 2018. Many years before that in 1997, the mud volcano Piparo had a major eruption where it covered the houses and cattle in the neighbourhood.

While there are dozens of known mud volcanoes in Trinidad and Tobago, the most famous ones that people can visit are known as Digity in Debe, Penal, Devil's Woodyard In Princes Town, and Piparo off Gasparillo. Do you notice something common about where all the mud volcanoes are located? Yes, they are all in the southern part of the island. There is a major fault line that runs there that the mud volcanoes are located around. These are therefore geological features. The mud volcanoes are not hot, and they can be seen to be bubbling. So, some kind of gas is being emitted. It turns out that this gas is mostly "Methane". Scientists study these features to understand our planet earth and believe it or not, to understand if life could exist on Mars! This is because of the gases they are giving off and how similar they look to volcanic features on Mars. So, now you have visited the mud volcanoes in South Trinidad, what is another cool geological feature there?

The Pitch Lake of Trinidad and Tobago



Author: Prof. Shirin Haque is an Astrobiologist at the University of the West Indies who works on the mud volcanoes and the pitch lake with an international team of scientists to try to understand life on other worlds such as Mars and Saturn's Moon, Titan.

If you drive to La Brea in South Trinidad you will come upon this massive pitch lake. Even before you reach it, you will find the roadways getting uneven as if the land has been shifting. The pitch lake of Trinidad and Tobago is truly a wondrous thing! The villagers nearby refer to it as the eighth wonder of the world. There are very few pitch lakes in the world so we are very famous for ours which is only one of three in the world.



The pitch lake in Trinidad is the largest natural deposit of asphalt in the world, approximately 10 million tonnes, and it is used for roadway construction not only in Trinidad but in other parts of the world as well, including the roadway in front of Buckingham Palace in England! Our oil deposits are also found in the southern part of the island and the pitch lake, mud volcanoes and the oil deposits could all be due to common geological processes underground. These are questions that scientists study. Just like the mud volcanoes, scientists also notice that the pitch lake also bubbles and the gas is mostly methane as well. The pitch lake like the mud volcanoes can help us understand how microbial life in the universe could exist in such toxic environments like the pitch, in other words like Titan, the moon of Saturn which also has similar type of lakes on it. Isn't it just amazing all the scientific wonders right here in Trinidad!

The Glowing River



"Miss Molly, yuh home!" Alice calls out as she enters the yard of a familiar small single-storey house in the small village on the east coast of Trinidad.

A short, stocky middle-aged woman wiping her hands on her apron steps out onto the verandah of the house. "Ah Alice, is you! What yuh doing stand-up dey? Come inside!" Miss Molly calls out to Alice.



Alice enters the verandah and sits on one of the weathered chairs next to Miss Molly, facing the beautiful glow of the sunset.



"Is ah long time I ain't see yuh Alice, how come yuh all the way here? How everything? How yuh liking the big school yuh going now?" Miss Molly questions.



Alice smiles, "I good for now Miss Molly, I came to do some field work for school so I came to see how you doing." Alice turns to look around, "where is Zac, he not around?"

"He does be running around with dem boys from the village. " Miss Molly responds while looking around for her neighbor Zac. "Look'em coming dey!" She says as she spots Zac running up to the house.



"Miss Molly! Miss Molly! De river, Suresh say it glowing!" Zac shouts as he runs up to the house.

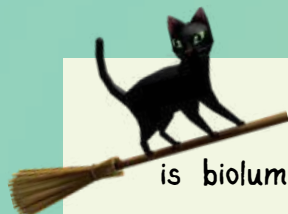


"What nonsense yuh talking chile? The river glowing? What ah tell yuh bout lying boy?" Miss Molly scolds Zac.

"Miss Molly, it really glowing," Zac excitedly exclaims.

"Miss Molly, Zac is right, the river is glowing," Alice interjects, "the field work I'm here to do has to do with that."





"What kinda black magic!" Miss Molly exclaims. "No Miss Molly, science! It is bioluminescent plankton." Alice adds. "Bio-lu-men what. Chile doh use them words yuh learn in the big school." Miss Molly says confused.

"Bioluminescence: 'bio' meaning living organism and 'luminescence' meaning to give out light. So bioluminescence means light produced by a living organism usually through a chemical reaction." Alice begins to explain.



"The species blooming may vary since there are different bioluminescent species around. Here it's most likely the dinoflagellate species of bioluminescent plankton. These types of ecosystems are rare and form in warm-water lagoons with narrow openings to the open sea. The dinoflagellates gather in these lagoons or bays where the conditions have to be just right, a mix of cold salt water flowing up river during the high tide and the warmer fresh water from the lagoon, and it is mainly associated with nutrients being readily available. The narrow openings preventing movement out and results in a concentration growth. This is seen as a light show at night. That's what they saw, that's why the river is glowing." Alice continues. "The glow itself is caused by a reaction with a chemical called luciferin which is also what makes fireflies light up. This is why it becomes visible if you splash around a lot." Alice concludes.

'Aye, that big school teaching yuh plenty!' Miss Molly says astonished. "Miss Molly, can I go with Alice to see the river?" Zac asks since night was approaching. "Alright chile, go ahead." Miss Molly says. "Alice it so nice to see yuh!" She concludes, hugging

Alice before Alice and Zac wander off to see the glowing river.



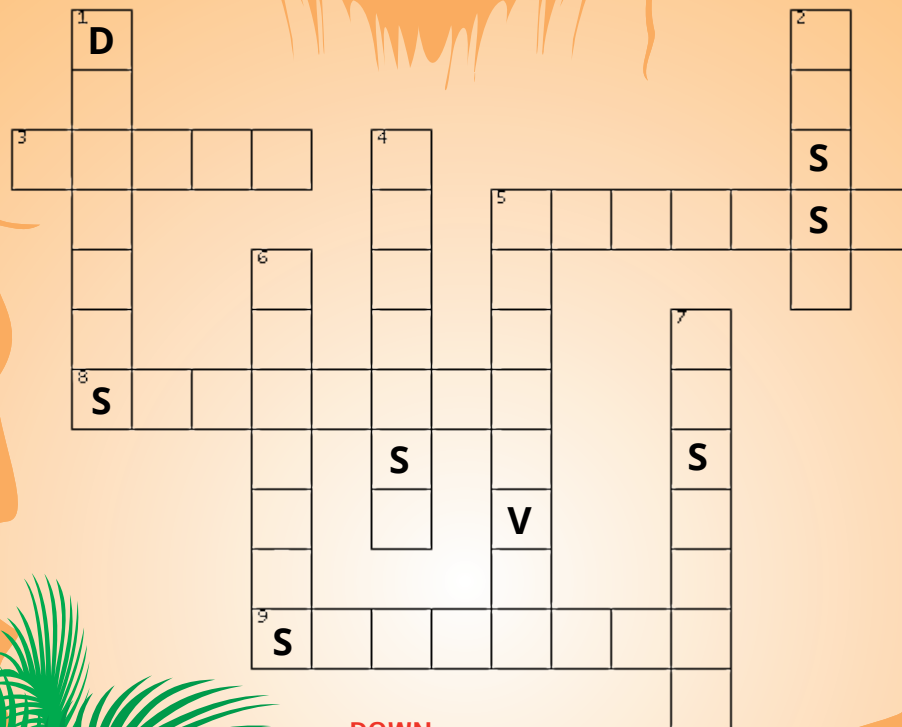
Bhanumattee Ramdhanie



Photo Credit: Richard Charan

Popular Items On Our Island

Use the clues provided to fill in the missing words below.
Words can go across or down.



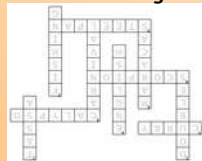
DOWN

1. Our favourite breakfast food
2. A musical instrument played at weddings
4. The language we speak
5. An annual event that thousands attend
6. A popular beach
7. An activity done to catch food

ACROSS

3. A famous type of local food
5. A famous local genre of music
8. Our hottest pepper
9. Our national musical instrument

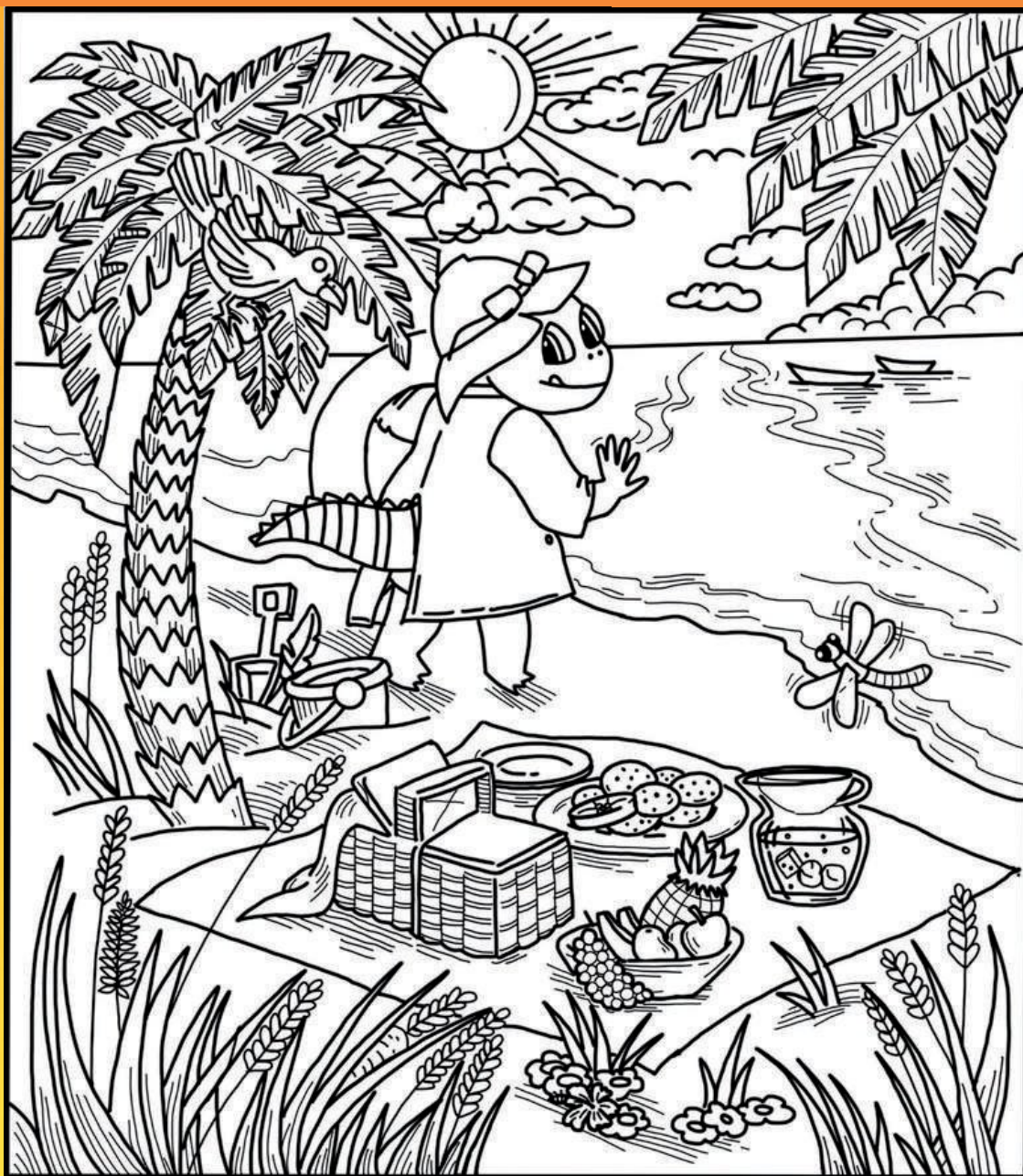
Answer Key:



Gabrielle Motilal

HIDDEN OBJECT PUZZLE

DR. DINGOLAY HAS LOST SOME ITEMS AT THE BEACH, CAN YOU COLOUR IN THIS PICTURE AND HELP HER FIND THEM?



CHACONIA



CARROT



FEATHER



HIBISCUS



DIE



TEACUP



STEELPAN



KITE



PAN STICK



CRICKET BAT



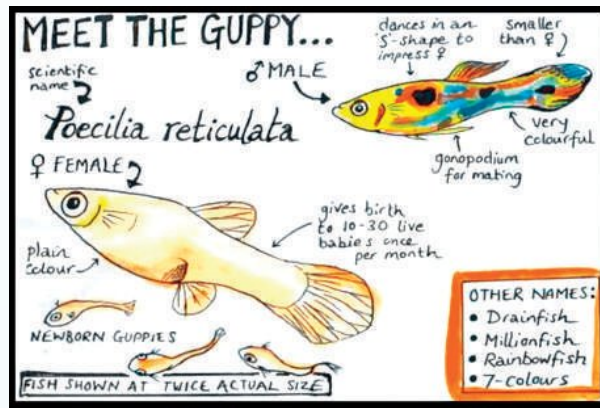
CROWN



Kaylan-Marie Achong

THE FAMOUS TRINIDADIAN GUPPY

Did you know that one of the most famous fish in the world is found here in Trinidad? Known to many as 'drainfish', guppies can be found almost everywhere on the island, from the beautiful mountain streams of Aripo, to the dirty drains of Port of Spain, these little fish thrive wherever they end up. **What is a guppy?**



Their scientific name is *Poecilia reticulata*, and they are live-bearing, which means they give birth to fully-formed babies, instead of laying eggs. Adult guppies are just 2-3 cm long and are usually found in large shoals as protection from their predators, which include bigger fish and birds. Males have colourful patterns of orange, black, yellow and blue, and if you look closely, you will notice that every single male has a slightly different pattern.

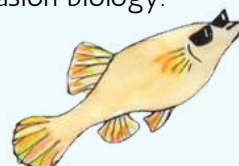


Where do they live? While guppies are native to T&T and parts of northern South America, over the last 100 yrs humans have transported them all over the world and they are now established in more than 70 different countries. The main reasons guppies end up in new places include their popularity as a pet (many escape or are released) and their reputation as mosquito-eaters in countries where malaria is a serious issue.



Why are they famous? As well as being popular pets & mosquito-controllers, guppies are also an important 'model species' in biology. This means they have been used by scientists to answer a wide range of questions, both through observing them in the wild in Trinidad, and by doing more controlled laboratory experiments.

To date more than 5,000 scientific papers have been published on this one species. Just a few of the fields of science that guppies have contributed to include evolutionary biology, genomics, social network research, mate choice, memory, disease, ecosystem function, nutrient cycling and invasion biology.



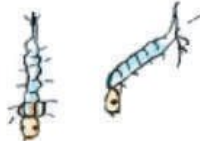
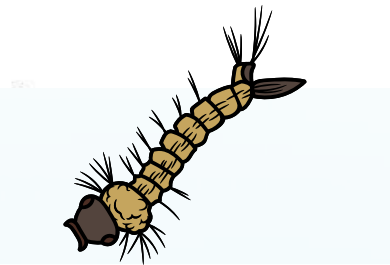
FIVE Facts you might not know about Guppies!

1 – They are named after a Trini, **Mr Robert Lechmere Guppy**, who recorded them in the St Ann's river in POS in 1866



2 – They are the **most popular pet tropical fish in the world!** 100s of fancy varieties have been bred.

3 – They **love to eat mosquito larvae** and are often introduced to other countries for this purpose.



4 – **Females mate with many males**, and one brood can have many different fathers. They can also **store sperm** for more than 9 months!



5 – **Males dance to impress females.** They make their body into an 'S' shape and swim close to the female to convince her they are the best choice.

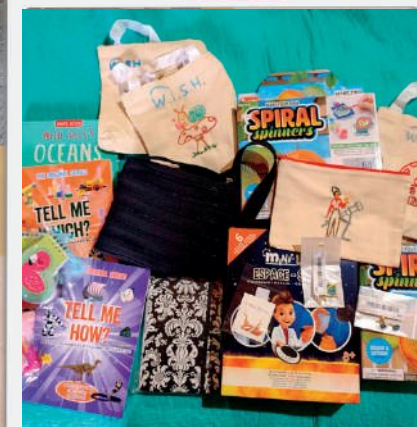


Author: Dr. Amy Deacon is a Lecturer in Zoology in the Department of Life Sciences at the University of the West Indies. Originally from the UK, she first visited Trinidad in pursuit of the famous guppy and has now lived here for more than 10 years. She studies the biodiversity of streams, and the behaviour and ecology of fishes.

"As a guppy biologist myself, I know there is much, much more that we still have to learn from these amazing little fish!"

Artwork: Dr. Amy Deacon

The W.I.S.H. Foundation Activities



The W.I.S.H. Foundation Activities



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Marie Curie was the first woman to ever receive a Nobel prize. It was for her work in radioactivity in Physics. She is still the only woman to receive two Nobel prizes, the other being in Chemistry. She was born in Warsaw, Poland in 1867.

Photo Credit: Public Domain



Jane Goodall was born in United Kingdom in 1934 and is the leading expert on chimpanzees in the world. She is the first person to record human like traits in chimpanzees such as making and using tools.

Photo Credit: Public Domain



Caroline Herschel was the first woman to discover a comet in 1786 and is considered the first female professional Astronomer. This was at a time when women were not encouraged to study especially the sciences. She was born in Germany in 1750.

Photo Credit: Public Domain



She is a scientist.



Illustrator: Daena Boodoo