

Rochester²STEM

SUSTAINABILITY · SCIENCE · TECHNOLOGY · ENGINEERING · MATHEMATICS

Solid City, Amazing Challenge

Rochester's scientists
at the π Day

Proyectos ambientales
en el Rochester

Ciudadanos
sistémicos en jardín



RocheS²TEM

SUSTAINABILITY · SCIENCE · TECHNOLOGY · ENGINEERING · MATHEMATICS

Edición 4 · Chía,
Junio de 2016

Revista semestral publicada en inglés y español por el Colegio Rochester, Chía, Colombia.

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ISSN: 2422-4413 © ROCHESTER

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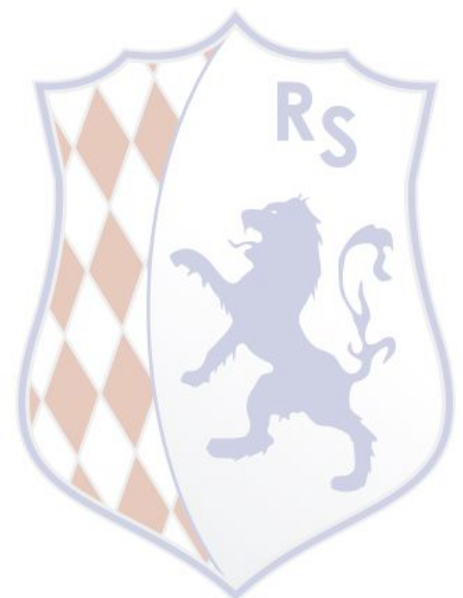
Desde hace más de 45 mil años los Homo sapiens nos hemos caracterizado por evidenciar nuestra hambre por el conocimiento y estamos en constante búsqueda de maneras de evolucionar y mejorar nuestras condiciones de vida. Ahora contamos con grandes avances tecnológicos como computadoras, naves espaciales, robots, microscopios, telescopios, entre muchos otros, con los que hemos estudiado desde los organismos extremófilos hasta la estructura de la luna y la vida en otros planetas, situación que nos ha permitido comprender nuestro entorno. Hemos logrado saciar nuestra "hambre de saber"... ¿Y ahora qué? ¿Cómo podemos poner en práctica ese conocimiento para pasar de ser una especie dominante a una especie sostenible y ética? ¿Cómo resolveremos los impactos ambientales y sociales que hemos causado a lo largo de la historia?

En esta publicación encontrarán algunos ejemplos de cómo en el Colegio Rochester buscamos brindar a los estudiantes las herramientas para que en un futuro lejano o cercano, puedan resolver estas interrogantes y lideren cambios positivos en la sociedad y el ambiente. Durante las clases de ciencias de la computación se cierran brechas entre naciones evidenciando la globalización; en matemáticas se imparten nuevas metodologías de enseñanza como la Harkness; en ciencias naturales se

realizan prácticas sostenibles y científicas; y desde todas las áreas, a través del currículo de sostenibilidad se ponen en práctica aprendizajes sobre eficiencia energética. Así mismo, encontrarán en esta edición que los estudiantes del Colegio Rochester viajan a través del mundo compartiendo su aprendizaje y generando propuestas que benefician la humanidad, y aunque al parecer son aportes a pequeña escala, son estos los cimientos para resolver entre todos grandes problemáticas mundiales.

Estamos reconociendo, tal como se declaró en la Convención sobre el Cambio Climático - COP 21- de Paris, que "el cambio climático es un problema común de la humanidad, por lo que las Partes, al adoptar medidas para hacer frente al cambio climático, deberían respetar, promover y tomar en consideración sus respectivas obligaciones con respecto a los derechos humanos, el derecho a la salud, ... así como la igualdad de género, el empoderamiento de la mujer y la equidad intergeneracional".

María del Pilar Tunarroza Sierra
Coordinadora del Área de Ciencias
Colegio Rochester



Teaching
Kids about

Dinosaurs

By: Juan Felipe Yañez
Science teacher
Elementary school

Turn your classroom into Jurassic World.

Dinosaurs are a clear example of natural fascination for students of all ages.

Education has been evolving ever since it started. New methods of teaching and studying have been developed through time. The ways teachers approach students have changed, but also the way students learn and interact with a given topic has changed as well. Every day new ways to teach a certain topic come out, giving teachers an entire catalogue of activities to enhance their teaching techniques and giving students more tools for them to enjoy and find the class meaningful. The dinosaur topic might as well be one of the most acclaimed topics by kids. Sure, mostly by young kids but even for high school kids, a different approach might come in handy to have one of the best science classes ever.



PLAY
Students were able to play and learn with their dinosaur toys.



MOLD
They use clay to mold their dinosaur figures



PRINT
The final print of their fossil was something they could take home.



Dinosaur “phase”

Who hasn't loved dinosaurs?

I truly believe that pretty much every kid in the world has enjoyed, lived and praised the dinosaur phase. Kids don't

usually praise the lions, the tigers or wolves as they do with dinosaurs. Probably because they can just go to their local zoo and see them. Kids create a passion and interest for things they don't know, for things they can't actually see in real life. Technology has helped for this passion to grow

everyday more. I just wish I had all the information, books, games, apps and discoveries about dinosaurs when I was a kid, that my son has when he tries to explain how the T-Rex isn't the king of the dinosaurs. I remember I read as many books as I could find in my school, everything related to dinosaurs. I drew dinosaurs, played with dinosaur toys and when people asked me about what I wanted to be when I grew up, I would obviously answer; I want to be a paleontologist! Sure, life gives you a lot of options and probably everything you dreamt about when you were a kid didn't come true, but some things just don't change. My passion over dinosaurs is still as vivid as 20 years ago. Passion that I try to pass on to my son and my students. And to my surprise, it was very well received. You see, as a science teacher you really don't need to make a huge effort in presenting Dinosaurs as a learning topic, it is something

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1

USE APPS

BBC's Walking with dinosaurs app helps teachers and students learn more about dinosaurs

2

MAKE FOSSILS

Use clay, plaster of paris and a dinosaur toy and create great fossils

3

PRACTICE WRITING

Students will love to write descriptive paragraphs of their favorite dinosaurs.

kids are going to love, period. But trust me, even though kids are going to be instantly connected to the class and the topic, it is one of those topics that should not be taken for granted. It is not as easy to teach this topic as you think.

“Teaching Dinosaurs = a lot of research and investigation.”

Every day new findings about dinosaurs are thrown right at us. Old beliefs are thrown

away and new theories and information is bombarded to us making this topic one of the most fluctuant when it comes to information. Nowadays, fresh and new information has destroyed most of the myths about dinosaurs. What you knew 10 or 20 years ago about dinosaurs might be completely wrong if you check for recent information.

Surely one of the most debated topic in the dinosaur scene is which dinosaur was the king of all. For many years, and probably for most of you who are reading this article the

mighty T-Rex comes to mind. Huge head, powerful jaw, blazer sharp teeth that could crush bones are just few of the characteristics that this enormous and frightening dinosaur possessed. All these lead scientists and people to believe it was king of the late Cretaceous Period. But that information has changed through time. Paleontologists have found dinosaurs that were even bigger and more powerful than the T-Rex. By 2001 it was known that the Carcharodontosaurus, the Gigantosaurus and the Spinosaurus were larger than the T-Rex. Its is really hard to enter this debate or actually define which was the deadliest dinosaur of all four. All we have are fossils. If they actually met, it is most likely they wouldn't have fought at all. Plus, they lived in very different eras and locations. For instance the T-Rex roamed in what we know now as North America while the Spinosaurus lived in the region of the Sahara desert. Spinosaurus lived in a much earlier era than the T-Rex, not to mention that their physical characteristics are very much different. But the question still remains. Watching the T-Rex and the Spinosaurus fight in Jurassic Park III helps you wonder if there is a new known king of the dinosaurs.

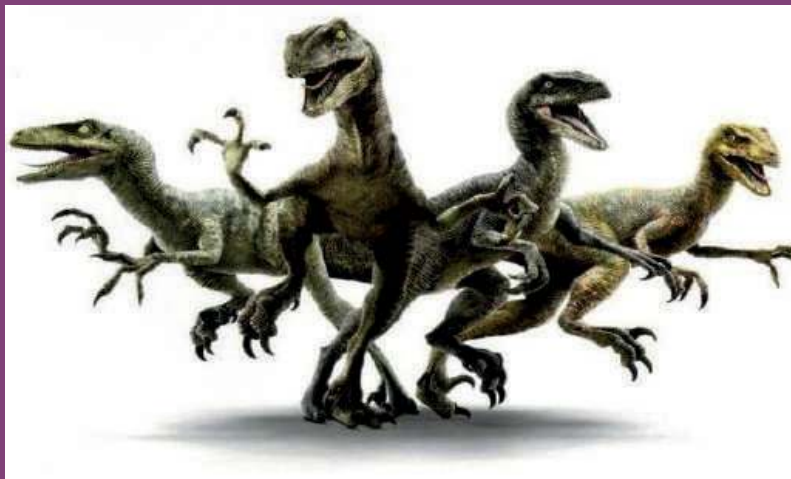
One can keep wondering and speculating if the Spinosaurus was the king of all, and as a matter of fact its one of the most debated topics out there. The only thing we know is that it



from our subjects

HOLLYWOOD MOVIES VS FACTS

Jurassic Park, The lost World, Jurassic Park III and Jurassic World are the blockbuster films you can watch to get inside the dinosaur world. Just be careful. The facts and information you see in these movies may not be accurate. They are movies after all. Teaching students how a velociraptor, one of the most remarkable and well known dinosaur, is anything but similar to the ones found in the movies is something that astonishes them. Teaching and learning how most of the dinosaurs



actually had feathers, has a great impact not only in students but in teachers as well.

was huge. It could even swim. But facts like these are the ones that keep us involved in loving and studying dinosaurs. That is what keeps students using their imagination and their knowledge to compare, contrast and use the information at hand.

Making it even more interesting!

There are just endless activities you can do in class to study dinosaurs. Rochester School has purchased the most important and probably best looking and interactive application for iOS in the market. Walking with dinosaurs not only gives you detailed information about these creatures, but also allows you to virtually interact with some of them. From videos, and interactive scenes to shocking images of these



amazing creatures, Walking with dinosaurs lets students get involve in reading and investigating about a topic that might as well capture their imagination for days. We know students not only want to see and read about dinosaurs. They want to experience at least in some minor extent, what it is to be a paleontologist is. Creating fossils in class was one of the best activities I have been able

to do with my second and third grade students. With basic materials, we were able to create fossils of dinosaurs with the students. They could print the image of their dinosaur toys and transform them into a very detailed fossil. Watching them have a genuine interest in making this project, lead to having a Science Show and Tell. It was more than just an oral presentation of dinosaurs. Everyone has seen that already.

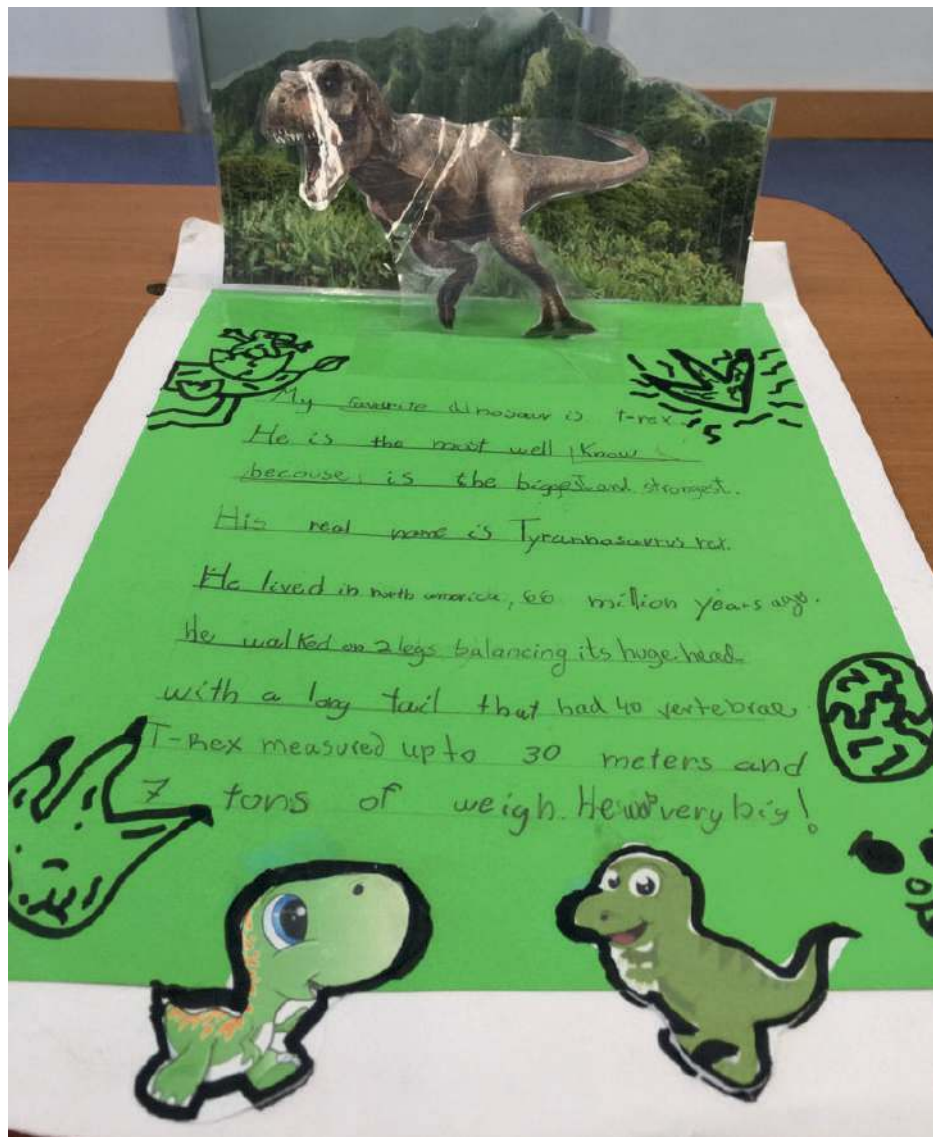
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Students managed to break those presumptuous thoughts that it was going to be yet another dinosaur presentation. But fortunately it wasn't.

With the simple use of an iPad and the dinosaur app, students were able to change a boring and common presentation into something meaningful and interesting to both students and parents. The audience was able to hear the dinosaur roar in the background. They were able to see how dinosaurs attacked, how they lived, what their diet was like and most important to understand the difference and similarities with nowadays animals.

Not everyday, students can amuse other students and parent with topics they learn at school. And by having this experience, students realized that they can teach others about a given topic. All they need is to have the right tools, interest and willingness to extend their knowledge to others.

Dinosaurs may be extinct, but they provide us with so many different learning tools that have just been overlooked. Dinosaurs encourage students to play, sing, imagine, dream and why not improve the phonics too. Just try to get around having young students pronounce Triceratops and many other complex sounds. This topic will allow students to better their oral presentation skills, since they are going to be so excited about choosing their favorite dinosaurs, teachers will just sit down and literally learn



presented by second grade students. They showed things the audience has only seen in movies. Something that doesn't happen quite often.

Getting students into writing descriptive paragraphs may be something most teachers have trouble with. Rest assured this is a life saver topic. Students

will not only want to write about one but maybe two or three dinosaurs. They may even create their own story. Working in groups is a great idea to better relationships between students. It is one of those opportunities that will gather all their thoughts into one big production. ■



Advance Placement in Science

By: Diego Mendivelso, AP Chemistry Teacher;
Andrea Polanco, AP Biology Teacher;
María del Pilar Tunarroza, AP Environmental
Science Teacher;
Wilmer Vanegas, AP Physics Electricity and
Magnetism Teacher.



from our subjects

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Abstract

Advanced Placement courses (AP) have been a great experience for teachers and students who found a challenging way to do science. Students had the chance to choose between four science courses: AP Biology, AP Chemistry, AP Environmental Science and AP Physics Electricity and Magnetism. The courses gave students the opportunity to innovate and propose viable solutions to specific guided problems. They demonstrated discipline and structure and had fun by discovering new ways to learn and be successful.

Resumen

Los Cursos Avanzados (AP) han sido una gran experiencia para los docentes y estudiantes que encontraron una manera retadora de trabajar las ciencias. Los estudiantes tuvieron la oportunidad de elegir entre cuatro cursos de ciencias: Biología AP, Química AP, Ciencias Ambientales AP y Física Electricidad y Magnetismo AP. Los cursos brindaron a los alumnos la oportunidad de innovar y proponer soluciones viables a problemas específicos guiados. Demostraron disciplina y estructura, al tiempo que se divertieron con el descubrimiento de nuevas formas de aprender y ser exitosos.

Advance Placement (AP) courses are rigorous college level classes implemented in the United States and around the world. The purpose of this courses is to allow students to earn credits for college level while still in high school. This program offers students a chance to deepen on the subject they like the most or the one related to their chosen careers. AP courses increase eligibility for scholarships and makes candidates more attractive to colleges.

Creating a successful AP program requires qualified teachers, planning, school's support, teamwork and clear and achievable goals. First the school decides which courses are going to be offered depending on its needs and strategic plan and then teachers selected will work on a syllabus that

will be evaluated by the College Board. Each teacher must develop an individual curriculum for the course, but taking into account some resources, laboratory practices and specificities made by the original program. For taking some AP courses its recommended that students have had a high preparation and knowledge for guaranteeing their success due to their elevated standards.

At Rochester school we implemented four AP courses in science: AP Biology, AP Chemistry, AP Environmental Science and AP Physics Electricity and Magnetism.

AP Biology

This course provide students with a learning experience equivalent to that of a two-

semester college biology course. Students develop analytical skills that allow them to understand the fast changes in biology due to new discoveries and changes in the conditions of the planet.

In AP biology, students learned about DNA, genetics, population and community ecology, transport in membrane, and other relevant topics at the college level. Some of our students are potential doctors, biologist, or environmental engineers who learned in this course how to approach real biology problems. We had the chance to perform many laboratory activities in class and the students developed skills to write scientific articles.

Even though this was the first time an AP biology course was implemented at our school, the experience was successful

and exciting. We believe our students are ready for college and we know they are going to use not only the course credits, but also the experience of using scientific language, developing strategies to study for college level classes, and the advantage of experiencing a college curriculum.

AP Environmental Science

This course is the equivalent of a one- semester, introductory college course in environmental science, through which students get in direct contact with the scientific principles, ecological and sustainability concepts, and methodologies required to understand the interrelationships of the natural world.

For this course, students use skills such as identification and analysis of natural and anthropogenic environmental problems, evaluate their risks and propose alternative solutions for resolving or preventing them. They applied ecological and field techniques for taking samples from the environment in a respectful and ethical way. They used mathematical formulas for determining populations, population growth and coverage. Environmental science include topics from geology, biology, environmental studies, environmental science and chemistry.

This year students did interesting projects and laboratory



APES students taking samples of soil

practices like analyze the water quality of the reservoir to understand why the ducks were not swimming as often, study the soil composition of different areas of the school to analyze the best places to plant, analyze the human impacts in photosynthesis and created a bicycle that could charge their cellphones, this last one worked as a project with AP Physics.

AP Chemistry

In AP Chemistry, the hard work and critical level of

the students is highlighted, as well as their capacity to analyze and synthesise specific data obtained through the laboratory practices. The course demanded time and discipline from the students, inside and outside the classroom, to prepare for the class and write and present their lab reports as expected. The lab practices allowed students to develop an investigative spirit and their skill of prediction, indispensable qualities for a scientist. Some of the relevant researches worked at class were:

- At which level the regular

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APES students analyzing soil samples



cleaning products found at home have a regulation of its pH?

- How much acid is found in commercial fruit juices and soda drinks?
- How can we determine the real percentage of H_2O_2 in a commercial bottle of peroxide used for daily purposes?

In conclusion, AP Chemistry provides students with a unique opportunity to learn various topics about chemistry beyond a competent level.

AP Physics

Electricity and Magnetism course is a one- semester, calculus-based, college-level physics course, designed for students to focus in physical science or engineering. Students explored topics such



APES students measuring the rate of photosynthesis

as electrostatics, electric circuits and electromagnetism. They also learn to describe the behaviour of different elements associated with the phenomena that occur in the interaction of electric charges at rest and in motion with magnetic fields. The laboratory practices performed allow students to learn to manipulate and properly interpret different instruments and verify electromagnetism laws.

AP Physics students are able to apply some of the mathematical skills from AP Calculus, which is required to enter AP Physics. It is a course that requires effort and dedication to resolve problem situations that will provide the necessary skills to obtain the course credits equivalent to college courses.

Conclusions

AP courses are rigorous programs as the result of commitment and a hard work of students and teachers. Students are encouraged to save copies of their lab reports and researches for use in determining college placement.

Students enjoyed having the experience of a college level class and having the opportunity to earn credits for college. We found that this experience helped students to justify, propose, explain, describe, and pose scientific questions which will be useful



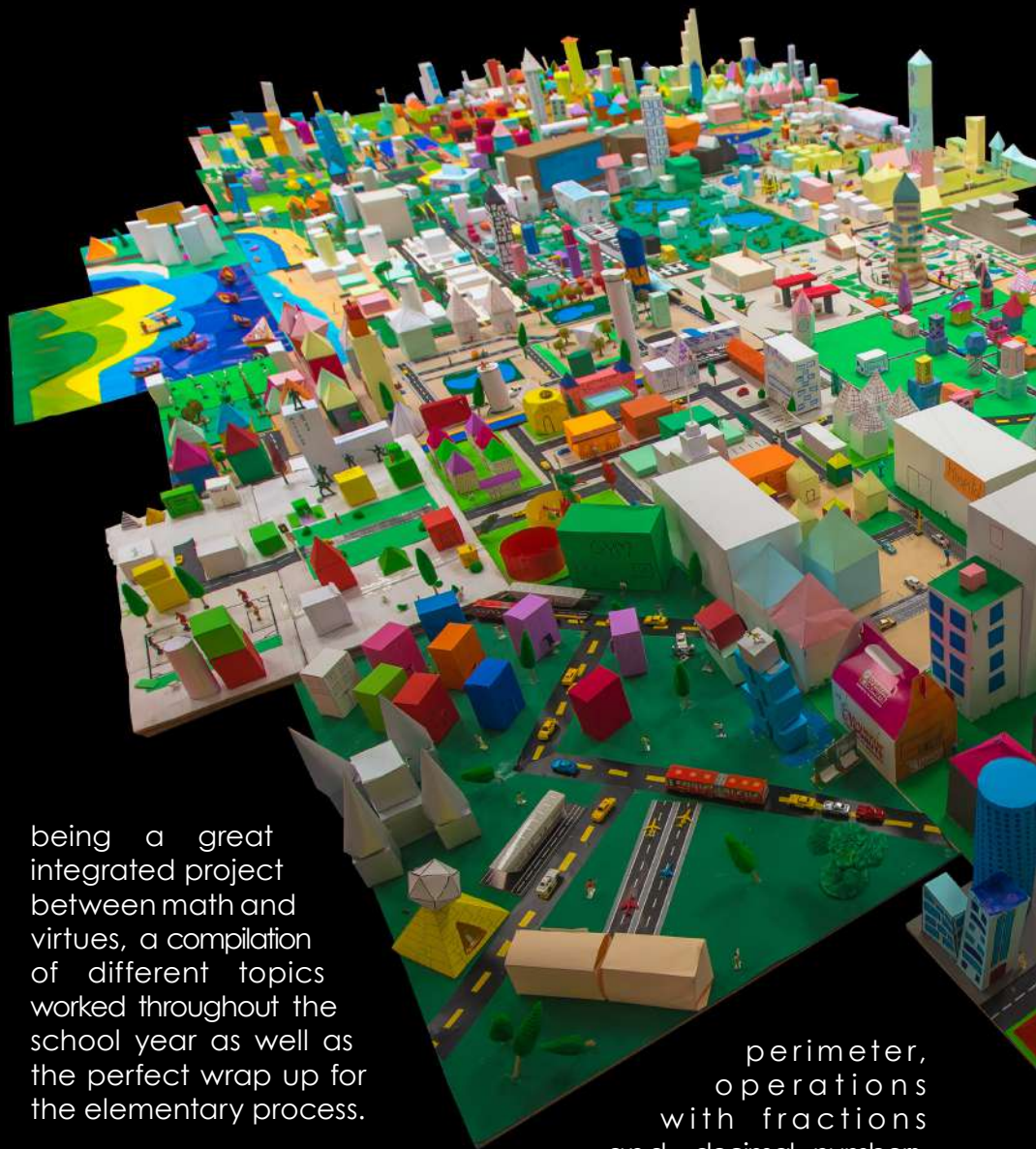
AP Physics and APES students testing a bicycle that could charge their electronic devices.

for them in their careers and the rest of their lives. ■

References:
<https://professionals.collegeboard.org/k-12/assessment/ap>

Solid City, Amazing Challenge

By: Alejandro Patiño
Math Teacher



Teaching math for several years in 4th and 5th grades has been a great challenge for me, especially when it comes to plan interesting and catchy projects in which students don't only learn, review or apply math topics but enjoy and apply virtues and constructive habits at the same time.

Two years ago, after brainstorming for a long while with some fellow teachers and my students we came up with the idea of creating models of cities where they would like to live, including everything they could need and their favorite places and environments.

This project started being a mini geometry project in order to show understanding of the space and concepts of solid figures but ended up

being a great integrated project between math and virtues, a compilation of different topics worked throughout the school year as well as the perfect wrap up for the elementary process.

The first step of the process was agreeing on the criteria and explaining the minimum requirements for displaying their city, then we started reviewing topics such as adding and subtracting, area and

perimeter, operations with fractions and decimal numbers, coordinates, nets and solids and measuring; then students found out how these topics could be applied in geometry and in building different figures. After that students researched about the

ways they could build different figures by using nets, then they made groups of three people and started drawing the map of their dream city. When students had their plan ready they could start assigning the roles of the group and working on the agreements for starting and completing the project successfully.

Mathematics

Within the project, students used and applied all their knowledge about adding and subtracting whole numbers, fractions and decimals to calculate the number of figures and the amount of paper and cardboard needed to fulfill their goal. They also needed to apply area and perimeter calculations to find out the size of the base in relation with the figures they were going to build having in mind that, based on the criteria, they needed a minimum of 30 figures.

Students also applied all the information and nets found on their research to measure, cut, build, organize and paste all their

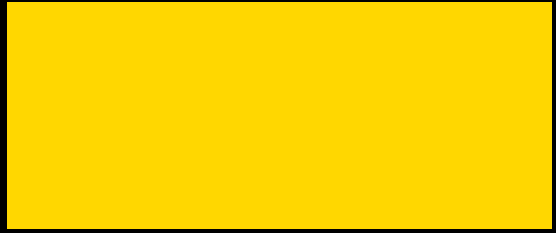
figures in order to present and display their city in the ELA.

Virtues And Constructive Habits

When all the projects were finished, each member of the group self evaluated their work by using the criteria stated at the beginning of the project related with cooperative work, leadership, working systemically, respecting differences, being honest, respecting others' ideas and getting to agreements when necessary, which were included in the integral health item.

At the end, all our project was framed on caring about me, others and context, encouraging others to do their best by using kind and constructive words, negotiating to get the best results by respecting and listening to others and consequently trusting and respecting and listening to their ideas and their team to end up having great results.

Finally the project was a success for them and for me due to the fact that I could power up most their potential not only in math but in virtues and the most important they felt happy and had a lot of fun through the process, fact that is shown when you see the results and ask 5th grade students for the SOLID CITY PROJECT!!! ■



Internship Reports



By: Alethia Bogoya
High School Director

Every year, twelfth grade students have the opportunity to visit for three days a company of their interest according to their future field of study. One of the main purposes we as directives have with this program is to provide students with valuable 'on-the-job' experience as to help our Seniors make an informed decision with regards to their future college studies. We want them to experience what it feels to be an engineer, a lawyer or a doctor.

This year some of the companies our students had

the opportunity to visit were the following: Ministerio de Industria, Comercio y Turismo; Cartoflex S.A.; FOGAFIN; Banco de la República; Hurtado Londoño & Asociados; CNC Láser de Colombia S.A.; LEC LEE; Compensar; Universidad Javeriana; Dramax; Tribunal Superior de Bogota; FOX Telecombia; Notaría 38; Clínica La Colina.

Parents, alumni, and people from the community all have contributed to this program by allowing our Seniors to be in their companies and take on some responsibilities

according to their ages and expertise.

Special thanks to Hernán Varón, the Principal's assistant, who manages all the logistics of this internship program.

Now, it is time to listen to the voices of our seniors and get to know their experiences. Every one of them submitted an Internship Report as to comply with the corresponding graduation requirement.



María Camila Osorio FOGAFIN & Banco de la República

Abstract

When we have to decide what to study, it is really useful to have some experiences to guide our choice and for us to get a better idea about the careers we have as options. One very valuable and enriching experience is the internship we carried out in twelfth grade in our school due to for three days; we went to a company where people, who studied the same career we want, worked and performed with their

knowledge. This opportunity has been really great to obtain a better understanding about what a professional, in that field of study does, and to confirm the decision we have made.

Description of the Organizations

FOGAFIN, stands for “Fondo de Garantías de Instituciones Financieras”. The mission of this entity is to generate a sense of confidence in people's minds regarding the financial sector. Every bank and financial institution must be inscribed in FOGAFIN, so that their customers are protected in case they go into bankruptcy. FOGAFIN is in charge of preventing that these institutions have to be liquidated, and in the case they are, FOGAFIN must pay the customers at least part of their money back.

The main purpose of “Banco de la República” is to control inflation through monetary policy. They have to monitor the country's economic activity and help the government make the best decisions possible

when changing important factors, such as, interest rates.

Journal

I attended FOGAFIN two and a half days. During this time, I met with different people from this organization and they explained what they do and the purpose of the company. The first half of the third day, I also attended some meetings with the same purpose, but in the “Banco de la República”.

I developed several skills by meeting with such professional people. For instance, I really understood what listening carefully means, because they were giving me so much information I had to be really focused to get it all. I also developed my responsibility and autonomy skills further due to I had to be aware of all the meetings I had in order to be in time. Finally, I would like to mention that as I am very shy and I find it hard to communicate in the best way possible with people, but during this time I had to develop social abilities and I improved my communication skills.

FOGAFIN		LUNES 01-Feb-2016	
MAÑANA	8:30 - 9:30	Juan Carlos López - Asuntos Corporativos	Rol Internacional del Fondo y Estrategia de Educación Financiera
	10:00 - 11:00	Andrea Ruiz - Jefe Gestión Integrada de Procesos	SIG (Sistema Integrado de Gestión) - SARD (Sistema de Administración de Riesgo Operativo) - SOSI (Sistema de Gestión de Seguridad de la Información) - SGCN (Sistema de Gestión de Continuidad del Negocio)
TARDE	3:00 - 5:00	Fernan Ulate - Jefe Mecanismos de Resolución	MECANISMOS DE RESOLUCIÓN

FOGAFIN		MARTES 02-Feb-2016	
MAÑANA	8:30 - 9:30	María Elizabeth Guerra - Jefe Contabilidad y Cartera	ESTADOS FINANCIEROS - NIIF (Normas Internacionales de Información Financiera)
	10:00 - 11:00	Dina Olmos - Secretaria General	FOGAFIN - ORIGEN Y FUNCIONES
TARDE	11:30 - 12:30	José Gabriel Sánchez - Jefe Planeación y Presupuesto	PRESUPUESTO Y PLAN ESTRATÉGICO
	2:30 - 3:30	Nián Romero - Reservas y Tesorería	ESQUEMA ADMIN PORTAFOLIO - LINEAMIENTOS
4:00 - 5:30	Camilo Hernández - Jefe Evaluación y Control de Riesgos	MONITOREO SISTEMA FINANCIERO, PRIMA SEGURO DEPOSITOS, NIVEL RESERVA Y COBERTURA, DESEMPEÑO, COMPLIANCE	

BANCO DE LA REPUBLICA		MIÉRCOLES 03-Feb-2016	
MAÑANA	9:00 - 9:45	Edgar Caicedo - Profesional Líder	Departamento de Planeación e Inflación
	9:45 - 10:15	José Fernando Moreno - Profesional Especializado	Departamento de Operaciones y Desarrollo de Mercado
	10:30 - 11:15	Carlos Quicazán - Profesional Especializado	Departamento de Estabilidad Financiera
TARDE	11:15 - 12:00	Carlos Espinosa - Profesional Experto	Departamento de Inversiones Internacionales
	2:30 - 3:30	José Vicente González - Pago Seguro de Depósitos	PROCESO DE PAGO DEL SEGURO DE DEPOSITOS
4:00 - 5:00	Carlos Alvarado - Jefe Operaciones de Tesorería y Pagos	CUMPLIMIENTO OPERACIONES Y VALORACIÓN PORTAFOLIO	

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Analysis

I learned a lot with this experience, because not only I learned about the organizations I went to, but I learned how to manage myself in such a serious and professional environment. I learned about FOGAFIN's history, about their mission, and the purpose of several departments. I also got a glimpse into what working in a big and important organization like "Banco de la República" would be like and in which department I would like to work in.

I was able to appreciate what an economist does and I am glad to know that I still stand by my decision. This opportunity helped me to support my choice of studying economics, but it also helped me to realize that politics play a huge role as well, which is why, I will do a double mayor in economics and government and public affairs.

I would like to conclude by self-evaluating my behavior. I think I treated everyone in a respectful manner, and I was grateful for their time and for the knowledge they shared with me and I think I was able to transmit that to everyone I met with. I believe I gave my best attitude and my best behavior, and I am pleased with the way I presented myself and with the way I represented the school.



Mateo Devia
Cartoflex S.A.

Abstract

This week I went to a company called Cartoflex S.A.S. to accomplish my graduation requirement with regards to the internship. In this brief document, I will share my experience of these 3 days of work. I will talk about the product I developed during this working period, and I will conclude by analyzing all what I learned, and how this experience was useful to me.

Description of the Company

This is a Colombian company, which produces NCP plastic (polypropylene). This is a material similar to the corrugated cardboard, but it is made up of plastic. This allows the material to be more durable, and it is also ecofriendly due to it is 100% reusable. When its lifetime is over, the same company crushes the material as to make new raw material.

Cartoflex also designs some boxes made out of this plastic, which are mostly used for industrial purposes.

Internship Journal

February 1st

On my first day, the head of the system's department, Fernando Niño, welcomed me and told me what I will be doing for the three days I was going to work there. He explained to me that I will develop a short program on excel that will help the administrators of the company. The program will basically show them how much money they have to pay to their suppliers and employees. After that, he started teaching me how to make the program.

I was able to work on my ability to pay attention during a long period of time, I learned new Excel features, and I developed social abilities as I worked with



Figure 1. Cartoflex Headquarters.

February 2nd

I spent the whole day programming: I designed the graphic interphase of the program and the necessary rules and procedures to take the required data from a database.

This day I put into practice all the skills I learned on the first day, and I also developed my autonomy, as I had to manage my own time to achieve the goals set on the previous day.

February 3rd

On the third day, I organized the data in a user-friendly way, and I fixed some minor problems. Then, I helped the CEO to organize some personal files in his computer. The CEO also showed to me how the machinery of the company works, and how the production process was carried out. Then, I got some feedback on the program I designed and I was taught some basic principles about the Colombian Labor Context.

During this last day, I worked on my self-evaluation competency as I looked at the work I did taking into account others' perceptions and I was able to learn some things outside from my field of study.

Analysis

I think that this experience was enriching for me as I learned many new things about programming and Excel I did not know before. In addition, I learned that programming is a very exhausting job, but it is also something that I really enjoy doing, and I feel I am good at it. This experience confirms once again that I really like my career choice, systems engineering, and that I will enjoy doing what I will be doing for the rest of my life. I also think

I did a pretty good job with the program I designed because it is now working fine and it is being used by the company.



Figure 2. Graphic Interphase of the program I designed.



Ana María Zabala
Slow Food

Abstract

This report documents my internship experience. The purpose of this activity is to get a glimpse of the professional and real life experiences one would go through when choosing the career path one has in mind. This experience give us students valuable information

at the time of considering if we are making the right decision for ourselves regarding our educational future. In my case, the internship was carried out with Slow Food: a global, grassroots organizations.

It was an enriching experience that reinforced the confidence I have in the career path I will follow: human ecology.

Description of the Company

Slow Food is a global, grassroots organization, founded in 1989 to prevent the disappearance of local food cultures and traditions, counteract the rise of fast life and combat people's dwindling interest in the food they eat, where it comes from and how our food choices affect the world around us (Slow Food, 2015).

Internship Journal

• Date: Monday February 8th, 2015

Daily Tasks and Activities: attend and participate in meetings regarding earth markets initiatives, web-developing & communications, and the planning and organizing of an event called Terra Madre, which brings together those players in the food chain who together support sustainable agriculture, fishing, and breeding with the goal of preserving taste and biodiversity.

Abilities/Skills/Competencies developed: verbal communication, cooperation, innovative thinking, attention, dialogue, and creativity.

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• Date: Tuesday February 9th, 2015

Daily Tasks and Activities: collaborate with the leader of a new Slow Food chapter: the Medellín convivium.

Abilities/Skills/Competencies developed: verbal communication, cooperation, innovative thinking, attention, dialogue, and reading.

• Date: Wednesday February 10th, 2015

Daily Tasks and Activities: visit Mini-Mal, a restaurant founded by Slow Food partners Eduardo Martínez and Antonuela Ariza.

Abilities/Skills/Competencies developed: verbal communication, cooperation, kindness, attention, and dialogue.

Analysis

From this experience, I learned that even in the world of social service, social justice, and environmental advocacy, there are conflicts common to all humans. For example, the obstacles that might emerge when some individuals want recognition over others, and prioritize their need of power over the achievement of a cause. Fortunately, I did not witness such behavior, but knew it from what the people around me told me.

I can conclude then that we are all humans, and share the same virtues and imperfections. However, what was most important was the motivation I encountered when witnessing the enthusiasm, kindness, and altruism in those that do

overcome self-interest for the benefit of a cause: Good, Clean and Fair food. Julia Tovar (national coordinator for Slow Food Colombia), and Eduardo Martínez (founder of Mini-Mal and agronomist from the National University of Colombia) told me part of their stories, which I found completely encouraging and inspiring.

Also, I learned some about the current state of the sustainable agriculture movement, about how new generations are more enthusiastic and conscious, about the importance of symbolic gestures of kindness in activism, and I learned that it is possible to follow a path dedicated to sustainability and social justice, especially regarding food systems.

Final Comments

Reading again what our senior students learned from these experiences is really enriching as we all can observe how much learning comes from an opportunity like this one.

I am grateful our seniors were able to confirm their career choices or on the contrary rethink what they were thinking.

Learning adequate information and solving real life problems are part of the competencies we want our students to develop and we are surely helping our seniors to make informed decisions about their future. ■

Durante este año escolar han estado implementando varios proyectos donde se busca que la comunidad Rochesteriana se de cuenta de diferentes proyectos que podemos implementar para ayudar a nuestro planeta y a la flora y fauna de nuestro país. Durante este año los estudiantes de servicio social estuvieron ayudando para la realización de estos proyectos a los cuales les agradecemos con mucho cariño todo el esfuerzo y dedicación que empeñaron en estos proyectos.

Como he mencionado anteriormente se han realizado varios proyectos. Uno de ellos fue la protección del oso andino. Se preguntaran por qué es tan importante preservar la existencia del oso andino pues la respuesta es algo muy simple, este animal es el único oso que habita en Sur América. El mayor problema que tiene hoy en día el oso andino es la reducción de su hábitat natural. La intervención humana ha afectado a esta especie ya que estos animales son 90% frugívoro y vegetariano e 10% carnívoro por esta misma razón estos se tienen que desplazar por diferentes zonas para encontrar bromelias que es el alimento favorito del oso. Complementando esto, el territorio del oso ha sido intervenido por campesinos y ganaderos que tienen la intención de deteriorar el bosque para poder obtener de esa porción de tierra alguna

Proyectos ambientales en el Rochester

Por: Diego Andrés Bernal Monroy
Estudiante 11º





recompensa económica y con esto el oso ha estado en un peligro de extinción inminente. La idea que el colegio implemento para ayudar al oso es utilizarlo en el proyecto integrado de varios grados y además fue utilizado en el día de la familia donde un estudiante utilizaba el disfraz del oso y mostraba a la comunidad lo importante que es preservar esta especie.

Otro de los proyectos que se implementaron fue la agricultura orgánica ya que es muy importante demostrar a las nuevas generaciones, lo importante

de preservar nuestros campos sin la intervención de ciertos químicos que llegan a afectar a las fuentes hídricas y siempre están afectando la fertilidad de nuestros suelos. También es importante demostrarles que en el mercado de hoy en día se están utilizando ciertas semillas alteradas genéticamente para que logren tener ciertas características que otro alimento natural no tendría. De nosotros depende el hecho de investigar y buscar maneras de mejorar todo nuestro entorno porque de los estudiantes depende el futuro de este planeta.

El Colegio Rochester logró implementar un Día Vegetariano, la idea de este día era demostrarle a la comunidad como una comida Vegetariana puede ser igual de nutritiva a una comida con carnes. La idea principal fue reducir el consumo de energía por un día de esta manera no habría el mismo gasto que se presenta cada día, se preguntaran que tiene que ver un día vegetariano con la reducción del consumo de energía pues la idea es mostrarles que la cocción de la carne tiene un mayor tiempo para lograr una textura adecuada que una comida vegetariana. Fue muy importante demostrarles a los estudiantes que una comida balanceada no siempre depende de la proteína animal sino que hay diferentes opciones que permiten llegar a una nutrición adecuada. Siempre es importante

demostrarles a todos nuestros estudiantes lo bueno que puede ser probar cosas nuevas y no siempre quedarse en la zona de confort.

Durante este año la experiencia ha sido maravillosa y doy gracias al colegio por darme la oportunidad de implementar todos estos proyectos ya que considero muy útil que todos los estudiantes estén siempre innovando en su conocimiento con respecto con el medio ambiente, y que siempre tengan en mente que el planeta donde vivimos es de todos y depende de nosotros cuidarlo o deteriorarlo. ■

Ciudadanos

sistémicos en jardín

Por: Diana Cristina García
Coordinadora, Jardín A
y Martha Susana López
Coordinadora, Jardín B

Esta experiencia se llevó a cabo con los cursos de Jardín A y B. En ella se involucraron dos asignaturas: Desarrollo de Virtudes y Matemáticas. A través de la actividad los niños de Kinder aprenden qué es ser sistémico como ciudadano y cómo sus acciones afectan los sistemas a los que pertenecen. Aprenden a hacer y comparar mediciones, detectar patrones y hacer gráficas a través del tiempo.

Durante 10 días, realizamos un seguimiento sobre el uso de dos sistemas en los que, con los niños, encontramos dificultades en su funcionamiento, y que eran cruciales para tener una mejor convivencia; el uso del

baño y el sistema de clase. Para ambos sistemas usamos como referente la Constitución del Nivel, en la cual contamos con unos animalitos amigos que nos recuerdan los acuerdos que tenemos:

- **El búho:** el silencio, la escucha y el respeto por la palabra
- **El suricato:** la postura adecuada
- **La jirafa:** el seguimiento de instrucciones
- **La abeja:** la realización de trabajos de calidad
- **La rana:** pensar y actuar responsablemente para cuidar el planeta

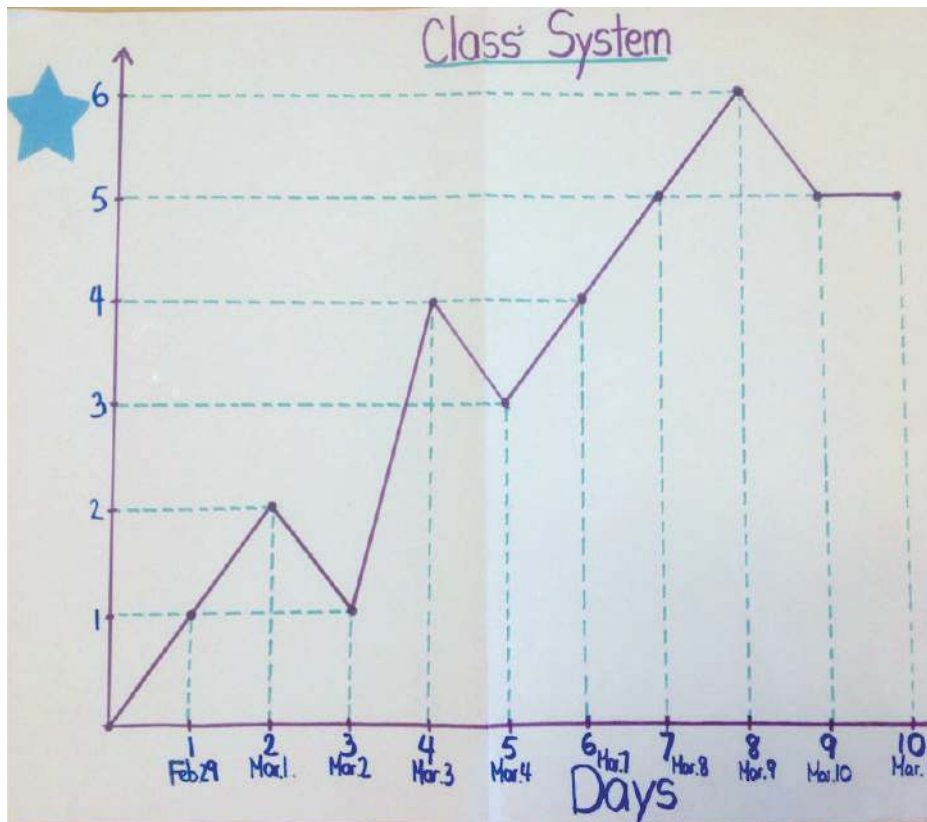
En cuanto al uso del baño, particularmente, recordamos



cuáles son las políticas verdes del colegio referentes a la utilización responsable de los recursos como el agua, el papel, el jabón, las toallas de manos, las toallitas húmedas, los cepillos y crema de dientes.

Durante estos diez días utilizamos un semáforo como herramienta para medir los resultados diarios e íbamos colocando estrellitas verdes para el baño y azules para la clase en la luz roja, amarilla o verde de acuerdo con el cumplimiento o no de estos

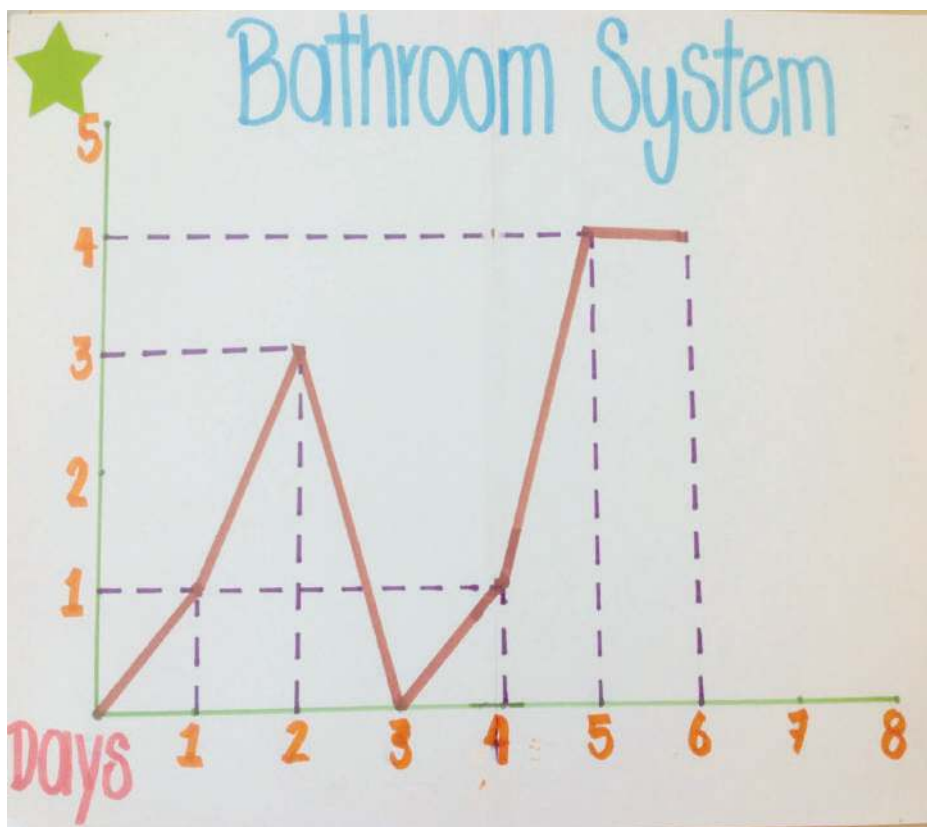
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acuerdos. Posteriormente, procedimos a registrar en una gráfica a través del tiempo estos resultados.

Fue muy interesante llevar a cabo esta actividad pues se vio mejoramiento evidente en ambos sistemas ya que los niños son más conscientes del cuidado del baño y los recursos que utilizan en el. Por otro lado, se percibe un mayor respeto y compromiso por cumplir los acuerdos esperados, los estudiantes tienen un mayor control interior y son conscientes de cómo su comportamiento beneficia a los demás y permite un mejor funcionamiento del sistema. Continuaremos haciendo seguimiento de estos y de otros sistemas que deseamos mejorar ya que encontramos una herramienta muy útil para hacerlo.

Este proyecto fue presentado exitosamente en el Show and Tell de Matemáticas del pasado 15 de marzo de 2016. ■





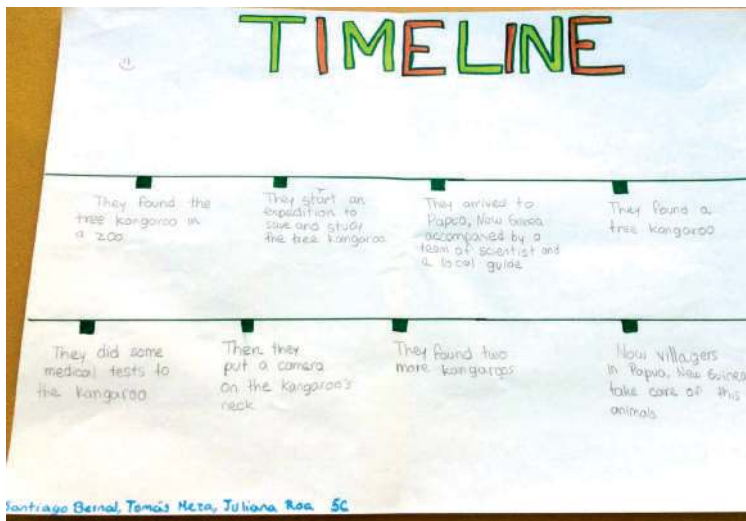
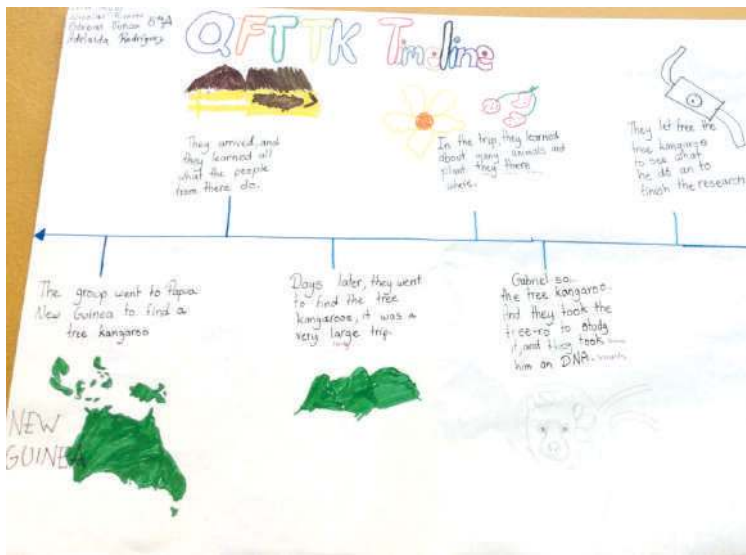
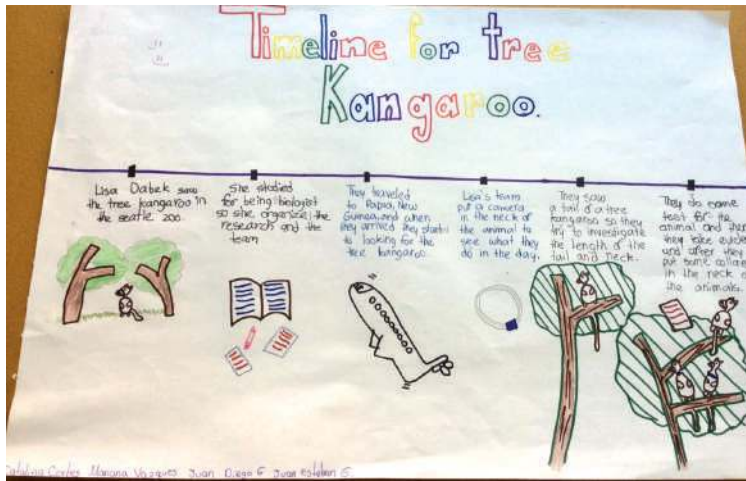
How an endangered animal became a teacher

By Carolina Ramirez
Fifth Grade English

When students were asked what they knew about the Tree kangaroo, most of them drew a blank; they hadn't heard anything about this elusive animal before. They started theorizing about how the animal might look, and where could it live while we got ready to read about it. As part of the "Joy of Reading Program", Fifth Grade students read the book "Quest For The Tree Kangaroo" by Sy Montgomery which provided the opportunity for students to learn about a country called Papua New Guinea, about the work of field researchers, and the life of a not so well known animal.

While reading, the students found out interesting facts about the country - which is half of the island of New Guinea- and why it was so important for field researchers to travel all the way to the South Pacific to study the Tree kangaroo. This animal has a very interesting background; before researchers went to the island, New Guineans hunted, and ate the kangaroos and they were deforesting most of the country for construction and farming. Papua is very rich in flora and fauna, the cloud forest in ancient, and its constitution is perfect as the habitat for the tree kangaroos. Researchers and locals joined efforts to work together towards the conservation of the habitat and the 'roos - as they call them. In villages near the forest, special conservation

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classes are taught alongside the other subjects; construction and farming are regulated, and some of the former hunters became trackers who help researchers in their quest for the tree kangaroos.

With this information in hand, Fifth graders were able to compare conservation policies for different animals, debate about the importance of studying endangered animals and where to do it, and draw timelines of the research. They learned how researchers work with the animals on site and in Zoos, and how children can help protecting endangered species.

All in all, reading about the tree kangaroos was a springboard for a series of activities related to the environmental curriculum in which students were able to apply their knowledge, communicate their ideas effectively and synthesize information gathered from different sources. One of the most elusive marsupials in the world sparked discussions and literary circles; it was the topic for cooperative activities and the origin of conservation oriented debates. Cuddly and shy, the Tree kangaroo became an excellent teacher for Fifth Graders. ■

References:

Montgomery, Sy. "Quest for the tree kangaroo: An expedition to the cloud forest of New Guinea" Boston: Houghton Mifflin Company, 2009

Traveling From Your Seat

By: Hugo J Guevara.
English Teacher 7







As all of us know, not everybody has the means or the time to visit all of those far-away places that we daydream about every once in a while. Well there is no need to keep on just dreaming, we can all make these dreams become a reality. All you need to do is find your favorite spot. The best way to do this is to pick up a book such as *To China On a Bike* or *Silent Africa* and begin reading it so you can travel without moving from your seat. This will give you the opportunity to have the experience of a lifetime. You will travel along with the authors, as you let them take you to those wonderful spots, letting your imagination fly. In my case, that is how I began to travel around the world. But as you also know, some of us do not want to settle for that and we begin our quest, we embark on the real thing,

and some of us end up going around the world experiencing some of the things we have read or heard about. So now all you need to do is to get up from your comfortable chair, start investigating about some of those spots, and sooner or later your dreams will come true. Then, you will see the world and the people around you with different eyes. You will see that nature, people and places can provide us with some awesome feelings that are worth everything in life. I would like to share with all of you, where this has taken me so far. On my last visit to one of my favorite spots, I ran into three books that I bought right away. One of them is called *Wild*. I read it in about 12 hours and, believe or not, I felt the pain that the author experienced during her journey. I have been to the places she has visited without actually being there. I have cried my eyes out every

time she ran into trouble. I could go on and on about this book, but then you might not want to read about it yourself. What you might want to know is that I am planning to go hiking this coming summer for a little over 500 miles on the extremely popular “Way of Saint James” in the north of Spain, and the following year I will go on a hike that will take me a little over 4 and a half months to cover the distance between a little town called Springer, north of Atlanta, Georgia and another little town in the north of Vermont. The distance to be walked every single day requires a big effort from whoever undertakes this trail, but regardless of what it takes, I will be there. ■

References:
WILD – Cheryl Strayed
AFRICA EN SILENCIO:
 Manuel Villar

EL PROYECTO

TITÍ:

Pasión por la
Conservación del Tití
Cabeciblanco!

Por: Rosamira Guillen Monroy,
Directora Ejecutiva
FUNDACIÓN PROYECTO TITÍ

Un blanco y erizado copete que hace honor a su nombre, una larga cola que le ayuda a balancearse, y un rostro de guerrero propio de su carácter territorial, el tití cabeciblanco es una de las joyas de nuestra biodiversidad colombiana, que nos llena el corazón de orgullo de patria. Excepto por la diferencia de tamaño, siendo un primate del porte de una ardilla, el tití cabeciblanco tiene más parecido de lo que pensamos con nosotros los humanos. Viven en grupos familiares en donde hay un macho y una hembra dominante. Los críos, quienes como nosotros aprenden todo de sus padres, dejan a su familia cuando se convierten en juveniles o adultos, para crear su propio hogar.
Qué comer?, dónde dormir?



, cómo comunicarse?, cómo cuidar de sus hermanos menores?, todo esto lo aprenden de sus padres y de los hermanos mayores. Crean territorios en el bosque, en los que solo habita un grupo familiar, y siempre hay un miembro encargado de defender ese territorio, y también de cuidar a la familia de los peligros que representan las boas y las aves rapaces que, entre otros, son sus predadores principales.

A parte de todos estos parecidos con nuestras familias humanas, lo que hace mucho más especial a este pequeño primate, es que únicamente lo encontramos, en medio silvestre, en los bosques tropicales del Caribe colombiano; el tití cabeciblanco no habita en ninguna otra parte de Colombia ni del mundo. O sea, es un primate 100% colombiano, y único en el mundo. Qué gran orgullo!

Sin embargo, la supervivencia del tití está muy amenazada por la pérdida de su hábitat natural, es decir, de los bosques que hace décadas cubrían el Caribe colombiano como una gran manta verde. La expansión acelerada y poco controlada de actividades ganaderas y de agricultura, fueron reduciendo poco a poco esta manta verde a "islas" de bosque aisladas y muchas distantes entre sí.

Menos bosque, significa menos hogar para los titíes, por lo cual sus poblaciones silvestres se han ido reduciendo a medida que desaparece el bosque,

quedando en la actualidad un poco menos de 7,400 individuos en alrededor del 2% del bosque que otrora engalanaba los departamentos de Atlántico, Bolívar, Sucre, Córdoba y el Urabá Antioqueño, en la gran extensión del Caribe colombiano.

El fenómeno de estas "islas" de bosque que sobreviven, genera otro riesgo para este pequeño primate. Los titíes se desplazan por las ramas de los árboles, a alturas de entre 5 y 7 metros, y es inusual que bajen al suelo, pues así evitan ser presa de mamíferos terrestres que, entre otros, encuentran en estos primates un delicioso bocado. Al estar aislados los titíes en estas "islas" de bosque, se reduce la posibilidad de intercambio genético, lo cual es otro gran riesgo que puede convertirse en un gran problema a futuro.

La belleza singular del tití, con su hermosa cabellera blanca y su curioso tamaño, ha sido tristemente su mayor pecado, pues es una de las especies víctima del tráfico ilegal de especies silvestres para ser comercializadas como mascotas en nuestro país.

Así pues, la pérdida de bosque y la caza ilegal, son las dos mayores amenazas del tití, y es por ello que tanto a nivel nacional como internacional, el tití cabeciblanco ha sido declarado como una especie en peligro crítico, es decir, que se encuentra a un paso de extinguirse en medio silvestre.

La extinción de una especie significa pérdida de biodiversidad y, por

ende, pérdida de la salud y equilibrio del ecosistema del que hace parte, con implicaciones directas en las poblaciones humanas, que recibimos múltiples servicios de los ecosistemas naturales, tales como provisión (agua y alimento), regulación de ciclos naturales (agua y clima) y beneficios estéticos, entre muchos otros. Solamente esto, debería ser suficiente voz de alarma para todos los colombianos.

Hace un poco más de 25 años, Anne Savage, una bióloga norteamericana, quedó fascinada con la belleza de este singular primate y muy sorprendida al ver lo poco que se conocía sobre la especie.

Vino a Colombia a hacer su disertación de Doctorado y quedó enamorada del tití cabeciblanco, de los bosques que son su hogar, y de la gente colombiana que le ayudó a hacer su primer estudio en campo, sobre la biología del tití.

Así fue como comenzó el proyecto de investigación más importante sobre el tití cabeciblanco, el Proyecto Tití, que hoy se ha convertido en una de las iniciativas de conservación ambiental más importantes de nuestro país, enfocada en garantizar un futuro a largo plazo para el tití cabeciblanco.

Es mucho lo que se conoce hoy sobre el tití cabeciblanco gracias al trabajo del Proyecto Tití, sobre sus hábitos sociales, sus preferencias alimenticias, su comportamiento, su

reproducción, su relación con el bosque que conforma su hogar, y sobre el estado de sus poblaciones y su hábitat en el norte de Colombia.

Sin embargo, el aporte más importante del Proyecto Tití ha sido poder ofrecer todo este conocimiento a las autoridades colombianas, para llamar la atención sobre la urgente necesidad de generar, desde el Estado, acciones de conservación en favor de un bosque que es hogar, no solo del tití, sino de muchas otras especies de la sorprendente fauna y flora de nuestro país.

Es así como hemos logrado proteger más de 1.800 hectáreas y empezar a crear corredores de conexión entre los bosques en Atlántico y Bolívar para el tití, logrando también que éste primate sea utilizado como especie bandera del bosque seco tropical del Caribe colombiano, considerado como uno de los ecosistemas más amenazados de nuestro país y por ende, como prioridad de conservación.

Aún cuando en sus inicios el Proyecto Tití se concentró en desarrollar investigación científica sobre la biología y ecología del tití cabeciblanco, muy pronto nuestro equipo de investigadores entendió que las mayores amenazas provenían de acciones humanas, por lo cual era imperativo trabajar con la gente para buscar soluciones que beneficiarán a ambos, humanos y titíes.

Fue así como el Proyecto Tití creció rápidamente hacia un enfoque integral, que

contempló las necesidades de las personas, en especial aquellas que habitaban en cercanía a los bosques del tití en las áreas rurales del Caribe colombiano, y que, por necesidad de subsistir y proveer para sus familias, hacían uso de los recursos del bosque: madera para construir sus casa y sus cercas, y también para vender a otros como medio de ingresos, y animales para consumo y para vender como mascotas. Las pocas oportunidades de generar ingresos sostenibles y el abandono del Estado en algunas de estas comunidades hacían de los pocos bosques existentes, el único recurso a la mano para subsistir. Por ende, nuestro enfoque desde el Proyecto Tití fue el de proveer alternativas de ingresos que pudieran reducir la necesidad de utilizar los recursos del bosque.

La creatividad, recursividad y profunda motivación de nuestro equipo de trabajo y de las comunidades locales, dio nacimiento a varias iniciativas que se han convertido en insignia de nuestros esfuerzos de conservación.

Las ecomochilas, mochilas tejidas con bolsas plásticas recicladas que se recolectan en las comunidades, benefician hoy a más de 50 familias en las áreas rurales cercanas al bosque del tití. Una asociación de artesanas de la comunidad lidera hoy este proyecto que ya tiene 10 años de funcionamiento, y que, aparte de generar ingresos para estas familias, reduce

la disposición inadecuada de bolsas plásticas que contaminan ríos y bosques en nuestros paisajes rurales, y nos da la oportunidad de conectar a las comunidades con la conservación del tití y del bosque. Hermosas combinaciones de colores y diseños son promovidas a nivel nacional e internacional como una historia de conservación efectiva y con múltiples beneficios.

Los titíes de peluche son igualmente fabricados por estas pujantes microempresarias, con el propósito de comunicar un mensaje de conservación en contra del tráfico de animales silvestres como mascotas y del impacto en el medio ambiente de tener a estos animales en casa.

La más reciente iniciativa se construye sobre estas experiencias exitosas. Se trata de fabricar postes para cercas de fincas y de predios con plástico reciclado, que igualmente contaminan nuestras áreas rurales por falta de sistemas adecuados de disposición de los residuos sólidos. El proyecto genera ingresos para unas 25 familias más en las comunidades locales a través del reciclaje y reduce la necesidad de cortar árboles del bosque para construir cercas, por ende apoyando nuestros esfuerzos de reducir el uso de recursos del bosque que es hogar del tití.

Para el Proyecto Tití ha sido de gran importancia entender, a través de éstas experiencias, que las personas

tienen mayor disposición y compromiso para apoyar esfuerzos de conservación, cuando han podido solucionar sus necesidades básicas de subsistencia para ellos y sus familias. Es un problema de fondo socio-económico, por lo cual es para nosotros imperativo seguir generando alternativas para vincular a más personas, y es crítico que nuestros esfuerzos de mercadeo de estos productos sea exitoso, para lo cual se requiere el concurso de todos los colombianos.

También es importante generar conciencia para motivar acciones de conservación. Era increíble lo poco que los colombianos sabíamos del tití. Por ello, como parte de nuestro enfoque social, y con el deseo de sembrar una semilla de conocimiento y conciencia desde temprana edad, el Proyecto Tití ha construido un modelo de educación ambiental con forma de pirámide, que en la base busca aumentar el conocimiento de las comunidades rurales sobre el tití, las amenazas que enfrentan la especie y su hábitat, y posibles soluciones para su conservación. A medida que los estudiantes de las escuelas objetivo escalan esta "pirámide" adquieren habilidades de liderazgo ambiental con las cuales esperamos construir embajadores comunitarios, técnicos y profesionales que aporten a la causa de la conservación ambiental en estas comunidades y en la región en general.

Más de 1.000 chicos en las comunidades objetivo del Proyecto Tití en Atlántico y Bolívar participan anualmente en nuestros programas educativos, a través de actividades lúdicas y didácticas, que incluyen visitas al bosque a conocer al tití. Después de 6 años de gestión educativa continúa en 10 escuelas rurales, hoy estamos formando nuestros dos primeros líderes ambientales que se educan actualmente como Técnicos en Gestión de Recursos Naturales en el SENA.

La pasión por la conservación del tití de la Dra. Anne Savage, se contagió a un grupo de colombianos que hoy lideramos la conservación del tití cabeciblanco a capa y espada. Nuestra pasión por la conservación y nuestra dedicación y compromiso con la causa del tití nos hace especiales.

Nuestro trabajo se concentra en la conservación del tití, pero mientras protegemos los bosques que necesita este carismático primate, ayudamos también a conservar a muchísimas otras especies de animales y plantas que comparten hogar con el tití, y a garantizar que todos los colombianos podamos seguir beneficiándonos de los servicios que nos prestan los bosques para nuestra salud y supervivencia a futuro.

Hoy contamos con un nuevo gran aliado en el Colegio Rochester, en sus directivos, en sus docentes y en sus estudiantes, y seguro que

también en la comunidad educativa asociada, con lo cual esperamos seguir, con nuestra profunda pasión, contagiando corazones alrededor de nuestra causa, que busca garantizar un futuro a un pequeño primate colombiano que mucho lo necesita, a la vez que apoyamos a muchos otros colombianos que día a día buscan trabajar en armonía con la naturaleza por ellos, por sus familias y por nuestro país. ■

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Rochester's scientists at the π Day

By: María del Pilar Tunarroza Sierra
Science Coordinator

Every March 14th we celebrate the Pi Day. By definition, pi is the circumference of a circle divided by its diameter, which is approximately 3.14159... with infinite decimals. But its meaning goes beyond this mathematical definition, pi can be used in Science to understand Earth's rotation, calculate the length of time a spacecraft could take to orbit around a planet in a specific space mission or the distance the Mars Rover has driven based on its wheels rotation (Landau, 2015). These are the type of systemic thinking we are preparing the students to make based on scientific inquiry and hypothesis.

On the Pi Day celebration at Rochester students showed interesting and innovative

science projects in every level, challenged their knowledge and had fun. We will present you some of them, hoping next Pi Day you will join us and see for yourself all the wonderful projects students are able to create.

On First grade, through readings, role plays and experiments, kids understood the states of matter and the behaviour of particles under different conditions. After experimenting and using their five senses, kids found out there was something that could not be classified as a solid, liquid or gas...what was it? With the help of their teacher they researched and find out there's something called colloid. Kids were amazed! They not worked with cornstarch and make little balls for playing in class which

helped them satisfy their basic need of fun. During the show and tell students explained how their perception of the world changed by knowing that materials can transform, which is actually, what we expect scientist to do.

Third graders presented a project called "Remembering our heroes". Students watched a documentary of the Challenger and Columbia space shuttles and researched on the mission each shuttle was going to make. They were able to understand the reasons of why each shuttle malfunctioned and realized how humans used them as a mean of transportation into outer space. With this information they were able to express their ideas about the missions in a class discussion and during their show and tell presentations, explained real facts about each space shuttle, describing not only its technical features but also step by step, what went wrong in each case.

Students put in practice the scientific method by analyzing that previous tests before a final experimentation is needed in science to have accurate results. They were also able to understand that through science and technology humans can discover new worlds if they are curious and discipline.

On Fifth grade, students learned how to take advantage of current technology like their cellphones and give them an extra use; they



built a microscope using no more than screws, a lens and acrylics. Students integrated their knowledge on simple and compound machines, cells, and scientific method to make an interesting and useful element for class and the school. During their presentation, the audience learned how to use a conventional microscope and also tested the new one with their own mobiles by observing leafs and fern spores.

Some other fifth graders taught the community the ways to behave before and during an emergency like a tremor or earthquake. Their presentation included basic information of



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the theory of continental drift and movement of tectonic plates, how to prepare an emergency kit, how to reduce threats and risks at home, and how to drop, cover and hold. They practiced some drills with the audience and asked them to create a family emergency plan including the encounter point, possible ways to communicate, and even a plan for their pets. With this project students not only showed how to think systemically but also provided a service by promoting wellness and safety to the community.

In Middle School students researched during Life Science about specific problematics that affect some communities, they found out one of the most

relevant problems of humanity is the lack of potable water in some regions of Colombia. They looked for ways to improve water filters being ecological and using low costs. For this, they reused plastic bottles and pieces of used cloth. They proved their filters and improve their models until obtaining a high water quality for human consumption.

In Physical science, students demonstrated in which percentage the energy consumption could be reduced by using solar panels. They visited the solar panel on top of Block 4 to understand their dimensions and arrangements and had a class with a Mechanical Engineer, expert in solar panels, to had a better understanding of their

operation. After having the whole information, students worked with math students of 11th grade to adapt solar panels in a mechanical game of an amusement park. So not only students used and apply their knowledge about transferring of energy but also relate and work cooperatively with high school graders, improving their social skills.

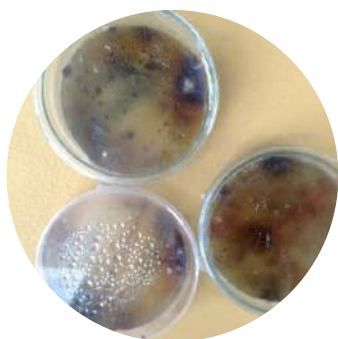
In high school, Microbiology students wanted to find out which were the places with more amount of bacteria according to their previous observation of the student's behaviour in a regular school day. Students researched about the different techniques for cultivating bacteria, made a culture for bacterial growth and organize a methodology for collecting



data. Their hypothesis was that the elevator buttons and the door knobs of each floor will have more amount and type of bacteria due to the people flow in these areas. After weeks of cultivating and monitoring their cultures, the results showed that those two places were actually low on bacterial content. The highest bacterial population was found on the key boards of computers. This was not easy to explained by the students, so after reviewing the routines of

people that used the elevator and the doors, they found out the infrastructure personal cleans these particular places more than one time in one day. By doing this experiments, students not only put in practice their knowledge on scientific method and microorganisms, but also discovered how each person at the school has a relevant job which we need and value. Eleventh and twelve graders were in charge to design

topics. They learned that being a preschool teacher is hard work but the happy faces of the kids worth all the effort and practice. Twelve graders also worked on another project by which they reused oil form the school's kitchen to make cleaning products for washing science material. They learned about



presentations specially for preschool kids. The purpose was to show them that science is fun and amazing in any level, but also that many natural and physical phenomena have an interesting explanation. Two of the projects presented to preschool were "The magic behind chemistry" and "Laser rays, mirrors and fun". In Laser rays, mirrors and fun physics students in 11th grade analyzed the behaviour of laser rays when they are projected through a convex, concave or flat object, with this practice students understood the concepts of refraction and

reflection and the behaviour of lenses in a telescope, microscope or even their optical glasses. The magic of Chemistry showed kids that by combining certain type of elements new and cool stuff was created. They played with magnets, changed the color, smell and texture of some substances and make rubber balls to play with. Since these activities were presented to pre-kinder students, previous to their workshop, eleventh and twelve graders had to practice how to address younger kids in order for them to have fun and understand advanced



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buffer capacity and evaluated the effectiveness of their products versus conventional cleaning soaps found in the market. They found out their products have a high efficiency in cleaning all materials and because they are made with natural elements like lemon, caustic soda, antibacterial gel (made also by them) and natural colorants, their impact on the environment is low. Students integrated their knowledge about chemistry with ecological practices, looking for the creation of a daily product that was according to the sustainability policy the school has. That showed commitment, respect and systemic thinking aside from cooperative learning they practiced during the

whole project.

The Sustainability Committee also participated in the Pi Day by teaching preschool students the importance of worms for the biochemical cycles in nature. Kids had the opportunity to hold worms in their hands and observed their main characteristics, analyzing how their structure help them survive in the soil. Students learned new vocabulary, like compost, invertebrate and nutrients; met new people like our gardeners Bautista and José Juan, and understood the importance of respecting every living form on the planet. In Science, students are applying the knowledge acquired through their classes with the guide of their teachers, proposing ideas for solving

real problems and thinking systemically. We are not only working with literate kids in science, but also with people aware of the environment needs who will to help and become better citizens with expected values and leadership skills. ■

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A black and white photograph of a classroom full of students sitting at desks, looking towards the front of the room. A yellow semi-transparent banner is overlaid on the bottom half of the image, containing the main title.

Una Experiencia en Sostenibilidad para Abordar Problemas Reales de Manera Sistémica.

Por:
Jorge Quintero,
Director Sostenibilidad
Colegio Rochester

Desde hace varios años en el ámbito mundial se observa con mayor frecuencia la importancia por incluir la temática en sostenibilidad en diferentes frentes, entre ellos el sector educativo. Sin embargo, integrar el concepto de sostenibilidad en nuestra educación es un reto, ya que no resulta sencillo poner en acción nuestro conocimiento acerca de cómo afectamos el entorno natural. Por ejemplo, los docentes en ciertas circunstancias no se encuentran capacitados sobre

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cómo abordar de manera sistémica temas relacionados con lo ambiental y muchas veces suponen que basta con reciclar papel, separar los residuos o cerrar la llave del agua al ducharse.

Es aquí donde vale la pena preguntarse desde el sector educativo, si es mejor continuar trabajando de esta manera la educación ambiental en instituciones educativas o es mejor abordarlo desde una perspectiva donde se busque plantear soluciones que mejoren la calidad de vida de las personas sin afectar el entorno natural. Es importante hablar no solo de educación ambiental, sino de educación en sostenibilidad visto desde una óptica holística o sistémica. Solamente de esta forma se podría abordar la complejidad

que representan los impactos que generamos en nuestro entorno.

Lastimosamente desde la divulgación en 1977 de la Declaración de Tbilisi, en la cual se establecieron objetivos claros sobre la importancia de la educación ambiental para la preservación del entorno natural, a la fecha, muchas cosas no han cambiado. La mejor evidencia de esto es que el consumo excesivo y la contaminación de nuestro entorno continúa, sin una clara prueba a corto plazo de que esto realmente va a cambiar. Surge entonces la inquietud, ¿hasta qué punto han sido eficaces las estrategias en educación ambiental en las aulas, para que la sociedad sea consciente que por sus acciones estamos afectando

el planeta? Por lo general, las personas dicen que se encuentran preocupadas por la afectación que generan las actividades antrópicas en nuestro entorno, sin embargo, seguimos contribuyendo para que esto continúe, lo cual es completamente contradictorio e ilógico.

Teniendo en cuenta que el consumo de recursos en forma de bienes y servicios, depende en gran medida de nuestros hábitos diarios, debemos diseñar desde la academia, estrategias basadas en la ciencia, las cuales se constituyan en herramientas para que los alumnos puedan transformar su percepción acerca del consumismo.

La educación en sostenibilidad, no puede ser vista como una asignatura más en los colegios que debe ser liderada por el área de ciencias como habitualmente ocurre en algunas instituciones. Así mismo, no se recomienda que se incorpore a todas las asignaturas en los centros educativos de manera transversal, sin tener en cuenta la relevancia que ésta tiene a la hora de emprender la búsqueda a problemas reales relacionados con sostenibilidad. Tal como lo menciona Martínez (2010), la sostenibilidad es el núcleo, la esencia ética de la actividad de la comunidad escolar que ayuda a gente de todas las edades a comprender mejor el mundo.



Así mismo, Martínez (2010) afirma que como educadores no conocemos todas las respuestas sobre como abordar la complejidad que implica estos temas asociados a la manera como nos relacionamos con nuestro entorno, pero si es importante preparar a los alumnos para los retos que les depara el futuro, aportando estrategias y habilidades que necesitarán para participar en la toma de decisiones sobre sostenibilidad.

Considerando lo anterior, el Colegio Rochester al poseer una certificación por parte del Consejo de Construcción Sostenible de los Estados Unidos, cuya infraestructura no únicamente posee estrategias de mitigación, pero también de adaptación al cambio climático, es modelo en el país por ser una institución que avanza hacia la sostenibilidad gracias a que aborda su desarrollo y mejora, teniendo en cuenta un enfoque desde lo global, hasta

aspectos relacionados con la eficiencia en el manejo de recursos energéticos, hídricos, materiales y conservación de la biodiversidad.

Igualmente, su compromiso no se limita solamente a disminuir los aspectos e impactos en el ambiente, pero también sobre cómo participa en la mejora de la comunidad tanto escolar como circundante, logrando con ello proveer experiencias directas de cómo funciona el colegio y su entorno.

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En otras palabras, en este momento somos la única institución del país que de manera integral (conexión entre infraestructura y academia) se preocupa por preparar nuevas generaciones de alumnos que puedan desempeñar un papel activo en la búsqueda de soluciones puntuales a temas específicos con conexiones globales en aspectos relacionados con sostenibilidad.

En este proceso en el que nos encontramos, la educación en sostenibilidad juega un papel importante dentro de lo que se espera por parte de los docentes a la hora de diseñar un currículo que busque facilitar la comprensión y aplicación en temas ambientales, sociales y económicos a los estudiantes. Este proceso no tiene un final, puesto que cada día que pasa, seguimos profundizando acerca de cómo es el ideal de una institución y comunidad sostenible. Por esto, el Colegio Rochester mejora e innova constantemente buscando nuevas formas de interactuar con el entorno.

A pesar del aporte que hacemos al interior de nuestra comunidad escolar, constituida por el alumnado, profesorado, familias, exalumnos, personal administrativo e infraestructura, no podemos desconocer el papel que desempeñamos en el sector educativo del país, ya que somos un modelo a seguir, no solamente por nuestra gestión, políticas y el reflejo de nuestras

metas en sostenibilidad, sino porque somos una institución preocupada por transmitir y compartir nuestras experiencias. Sabemos con certeza que cada institución del país debe hacer su propio viaje hacia la sostenibilidad, tomando en cuenta sus realidades y aspectos específicos, con sus progresos y errores. Sin embargo, desde la Dirección de Sostenibilidad del Colegio Rochester durante el presente año lectivo se vio la necesidad precisamente de planear y ejecutar un evento en sostenibilidad que pudiera constituirse en un reflejo de lo que somos como institución, así como brindar el apoyo a centros educativos tanto públicos como privados de Bogotá y Municipio de Chía.

Es así que se organizó por primera vez el ECOTRIAL, el cual consistía en diseñar cuatro retos plasmados en una plataforma virtual (www.ecotrial.org) relacionados con temas en biodiversidad, diseño sostenible, soberanía alimentaria y ciudadano sistémico. Al ECOTRIAL se invitaron diferentes instituciones educativas del Bogotá y del Municipio de Chía, finalmente participando alrededor de 500 estudiantes desde cuarto de primaria hasta undécimo grado de los colegios Nueva Granada, San Jorge de Inglaterra, Santa María, Fusca y Rochester entre los días 19 al 22 de abril. Con los retos en sostenibilidad esperábamos que los jóvenes que participarán usarán sus

conocimientos en busca de un mundo sostenible, proponer soluciones y empoderarlas como embajadores de cambio. En otras palabras, tal como se menciona en WWF-UK (2006), se promovió el aprendizaje en sostenibilidad, con el cual se desarrollaron competencias como la capacidad para imaginar, investigar, planificar y actuar.

El cierre de este evento se realizó durante el 3 y 4 de mayo, durante el segundo ECOSUMMIT, al cual asistieron a parte de los estudiantes que hubieran demostrado los mejores resultados durante los cuatro días de retos, organizaciones líderes en sostenibilidad. Entre estas organizaciones podemos mencionar WWF, Fundación Tití Cabeciblanco, Fundación Manantial la Laja, Pontificia Universidad Javeriana, ProCat, Consejo Colombiano de Construcción Sostenible, Colmundo Radio, Universidad de la Sabana. El fin de realizar esta clausura, a parte de de celebrar los logros obtenidos, era que los jóvenes pudieran desarrollar relaciones interpersonales, tomar decisiones informadas y construir una cultura en sus centros educativos acorde con los objetivos en sostenibilidad de la ONU, con el apoyo de las organizaciones invitadas.

Por último, es claro que el sector educativo ofrece una oportunidad clara para poder abordar los objetivos en sostenibilidad plasmados por la ONU, además de brindar



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un espacio que requiere profundizar en el aprendizaje y habilidades inherentes de esta temática. Es importante, que las entidades gubernamentales empiecen a mirar cada vez más a los centros educativos no solamente por su relevancia para brindar una educación de calidad, pero también como una estrategia real en la que se puedan abordar aspectos relacionados con comportamientos a favor de la sostenibilidad. ■

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El Osito de Anteojos y Sus Amigos Sabaneros

Proyecto Integrado Grado Segundo

Por: Karen Martín, Diana Marcela Vanegas,
Carolina Moreno, Patricia Muñetón, Mayra V
Medrano

En una vereda del municipio de Chía se materializó un sueño: donde los niños toman consciencia sobre la importancia de conservar los recursos naturales de nuestro país. Rodeado por flora y fauna nativa inimaginable, el Colegio Rochester dio inicio a una nueva etapa de existencia.

Este espacio nos ha brindado a los maestros una oportunidad para soñar, crecer y construir proyectos en los que nuestros niños desarrollan competencias útiles para la vida.

En este contexto los niños de segundo siguieron las huellas del osito de anteojos paso a paso, cautelosamente, informándose óptimamente para construir el proyecto Integrado "El Osito de Anteojos y Sus Amigos Sabaneros" que cobró vida durante el año escolar al materializar una serie de procesos que describiremos a continuación.

En primer lugar, el proyecto integrado ha sido el eje central el aprendizaje útil en las diferentes áreas, por lo tanto cada una de las asignaturas ha enfocado algunos aprendizajes en el estudio del oso de anteojos, sus problemáticas y la manera óptima de informar a la comunidad sobre las mismas, con el propósito de ejercer roles activos como

ciudadanos sistémicos y seres planetarios.

En segundo lugar, la columna vertebral de este proyecto es el currículo del área de desarrollo de virtudes y en este sentido la realización de las actividades busca siempre usar y desarrollar las siete virtudes que hacen parte de la propuesta pedagógica del Colegio Rochester.

En tercer lugar, las presentaciones de aprendizaje de los estudiantes han sido oportunidades para que los padres de familia conozcan y aprecien evidencias de los trabajos que se han realizado en el marco del nuestro proyecto integrado. Adicionalmente los niños hicieron una presentación integrada en el Show and Tell de Idiomas y Sociales, llamada "Defendiendo el bosque andino". En esta presentación los niños realizaron una puesta en escena mostrando que el Oso Andino se ha visto afectado por la destrucción de hábitats y la caza ilegal, y destacando cómo nuestros antepasados preservaban la vida y los recursos naturales, haciendo así un llamado a que nuestra sociedad actual sea sensible a estos problemas.

La primera muestra que la comunidad rochesteriana pudo conocer fue



nuestra Novena de Navidad, en donde se evidenció la integración de las asignaturas con el proyecto transversal. Los niños presentaron una pequeña obra para compartir las noticias con respecto a los osos de anteojos asesinados en el Parque Nacional Chingaza y en la zona cercana a Junín Cundinamarca. Igualmente, compartieron su preocupación frente a esta situación, destacando la importancia de tener un rol activo como ciudadanos sistémicos, preservando no sólo esta especie en peligro, sino también los ecosistemas

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naturales en general. Finalizaron la presentación con una hermosa canción llamada "Osito de Anteojos", autoría de Charito Acuña.

Nuestro proyecto fue compartido no sólo con padres de familia en la novena sino también con el resto de estudiantes de primaria en una izada de bandera. Los estudiantes que se destacaron por su compromiso hacia la preservación del ambiente, recibieron un reconocimiento especial. Gracias a esto, logramos abrir un espacio de sensibilización para que los estudiantes conozcan esta problemática.

Por otra parte, en el último encuentro de Ecosummit, liderado por nuestro colegio, tuvimos la oportunidad de compartir la realización de nuestro trabajo a través de una puesta en escena donde los niños narran la problemática de la cacería ilegal del oso de anteojos en el territorio colombiano y proponen soluciones viables. El principal propósito de esta obra fue informar a la comunidad para fomentar el amor y la preservación de esta especie y su hábitat. Mediante la presentación del noticiero "Rochester Kids News", los niños expusieron los conflictos basados en

hechos reales, compartieron párrafos informativos que desarrollaron en la asignatura de Inglés y cantaron la canción mencionada anteriormente. La puesta en escena se realizó con una ambientación ecológica junto con modelos de animalitos que habitan el bosque altoandino, elaborados con materiales reciclados en la clase de ciencias, dando uso lo que se había aprendido en la asignatura de Colombia sobre las regiones naturales. Durante toda la presentación, se pudo evidenciar el desarrollo de virtudes.



La culminación de este proyecto se realizará en las presentaciones de aprendizaje de cuarto bimestre, evento en que los niños mostrarán una ciudad del futuro basada en un sueño de perfecto equilibrio con los ecosistemas, donde prima el respeto por la vida y el uso responsable de los recursos naturales. A través de esta actividad se pretende evidenciar la conexión y participación de cada una de las asignaturas de este grado, mostrando la utilidad de los aprendizajes de las asignaturas de Math, English, Science, Colombia, Música y Danzas.



Agradecemos al Colegio Rochester por permitirnos ser partícipes de este movimiento que no solo inquieta a las mentes, sino estremece corazones para hacer realidad nuestra existencia en un mundo sostenible. ■



A close-up photograph of a large, glossy green leaf with prominent veins, surrounded by ferns. A semi-transparent yellow text box is overlaid on the leaf, containing the text:

**“Our own landscape:
photographic record”**

This project is based on a landscape design project made originally by Pamela Ospina for Rochester School's new site. This photographic record is focused on a visual journey through each of the species from Rochester School's gardens and the story behind each one of them.

With this project, one can understand the relationship between Choice Theory's constructive habits and real life situations represented in the gardens. It is also a scientific booklet where each of the species is thoroughly described and classified.

All of this is told through the story that I have written and people from all ages can relate to it. All of the species research, photographs, booklet assembly and project planning were done by me as part of my Final Graduation Project course in my last year at school. The text can be found in both English and Spanish so that both visitors and parents can use it and take advantage of it. I like to think of this project as a gift to the School and that it can be updated by students and teachers so that it can be a useful tool for years to come. ■



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