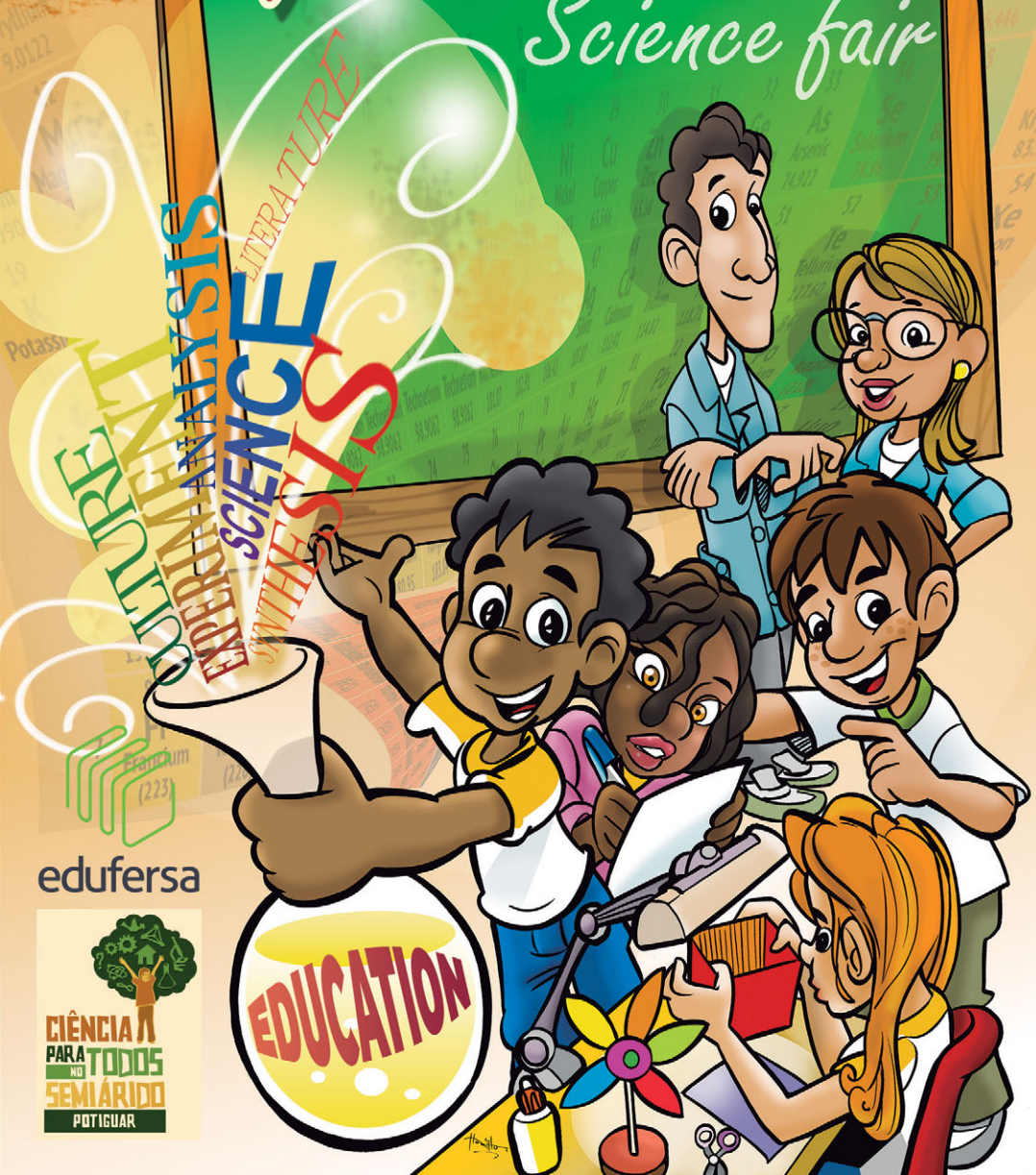


Editor: Celicina Borges Azevedo

# Me, a scientist?

Science fair



LITERATURE  
SCIENCE  
SYNTHESIS

Programa (223)

edufersa



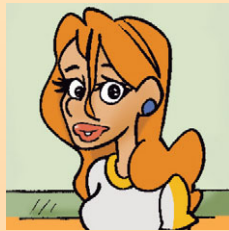
The idea for this comic was to make it easy for children and adolescents in grade schools to understand the scientific method in a simple and playful way. It was originally intended for students in Rio Grande do Norte State, Brazil, who participated in the “Science for All in the Semi-arid Potiguar Region” outreach program. The characters were inspired by students, teachers, and science fair participants that have participated in this program. The text simulates real situations experienced by program staff during visits to the schools involved.



TOMÉ



ALBA



VERA



Profª. ANA



BIA



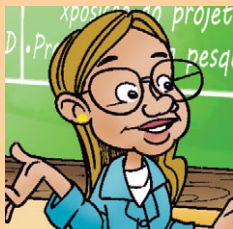
DUDU



ANJINHO



ODIM



Profª. LILI



Prof. IVO



Prof. GIL



# Me, a scientist?

## Editor

Celicina Borges Azevedo

## Autorship

Celicina Borges Azevedo  
Felipe de Azevedo Silva Ribeiro  
Cristiane Carvalho Ferreira Lima Moura  
Natália Rocha Celedonio  
Djair dos Santos de Lima e Souza  
Simone Cabral Marinho dos Santos  
Jailma Soares Costa  
Maria Goretti da Silva  
Aécio Cândido de Sousa

## Illustration

Hamilton Rangel

## Translation

Anna Fiastro

1ª print

Mossoró  
2016

Copyright ©2016. Universidade Federal Rural do Semi-Árido (UFERSA) 2016. Organized by Celicina Borges Azevedo. Wrote by Celicina Borges Azevedo, Felipe de Azevedo Silva Ribeiro, Cristiane Carvalho Ferreira Lima Moura, Natália Rocha Celedonio, Djair dos Santos de Lima e Souza, Simone Cabral Marinho dos Santos, Jailma Soares Costa, Maria Goretti da Silva and Aécio Cândido de Sousa. This work is endorsed by Brazilian laws number 10.994/2004 and 9.610/1998. All rights reserved. Except for the quotation of short passages for the purposes of criticism and review, no part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form, or by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior written permission of the publisher.

**Translated from the original:** Eu, cientista?

**Rector**

José de Arimatea de Matos

**Vice Rector**

Francisco Odolberto de Araújo

**Dean of Extension and Culture**

Felipe de Azevedo Silva Ribeiro

**Boss Editor**

Mário Gaudêncio

**Editorial Board**

Mário Gaudêncio (coordenação),

Walter Martins Rodrigues,

Francisco Franciné Maia Júnior,

Rafael Castelo Guedes Martins,

Keina Cristina S. Sousa,

Antonio Ronaldo Gomes Garcia,

Auristela Crisanto da Cunha,

Janilson Pinheiro de Assis,

Luís Cesar de Aquino Lemos Filho,

Rodrigo Silva da Costa,

Valquíria Melo Souza Correia.

**Technical Team**

Francisca Nataligeuza Maia de Fontes, (Secretary)

José Arimateia da Silva (Graphic designer)

Mário Gaudêncio (Librarian)

Nichollas Rennah A de Almeida (Systems Analyst)

**Ad hoc Team**

**Illustrations:** Hamilton Rangel

**Anna Fiastro** (Translation).

Cataloging in Publication (CIP)  
University Publishing (EdUFERSA)

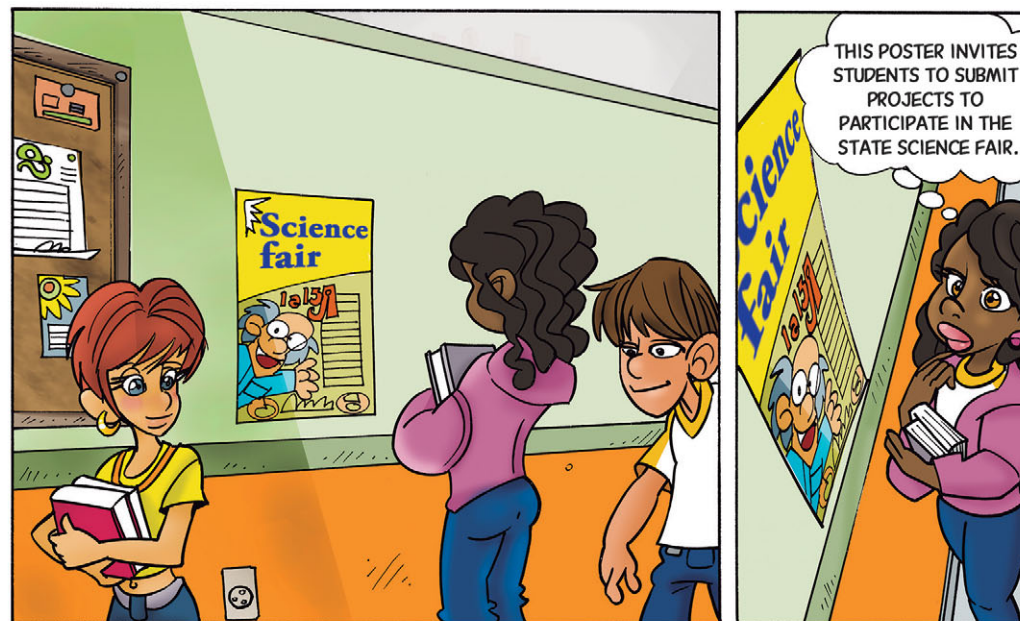
M479 Me, a scientist?/ editor, Celicina Borges Azevedo ;  
autorship, Felipe de Azevedo Silva Ribeiro... [et al]. –  
Mossoró: EdUFERSA, 2016.  
24 p. : il.

ISBN: 978-85-5757-050-4

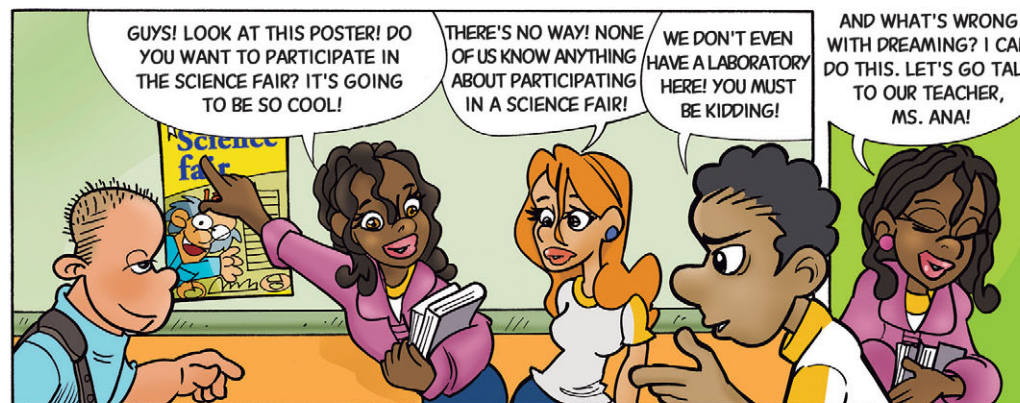
1. Science. 2. Science Fair. 3. University extension. 4. Basic Education.  
5. School. I. Azevedo, CelicinaBorges. II. Ribeiro, Felipe deAzevedoSilva. III. Moura,  
Cristiane Carvalho Ferreira Lima. IV. Celedonio, Natália Rocha. V. Souza, Djair dos  
Santos de Lima. VI. Santos, Simone Cabral Marinho dos. VII. Costa, Jailma Soares.  
VIII. Silva, Maria Goretti da. IX. Sousa, Aécio Cândido de. X. Título.

RN/UFERSA/EDUFERSA

CDD 001.42



THIS POSTER INVITES STUDENTS TO SUBMIT PROJECTS TO PARTICIPATE IN THE STATE SCIENCE FAIR.



GUYS! LOOK AT THIS POSTER! DO YOU WANT TO PARTICIPATE IN THE SCIENCE FAIR? IT'S GOING TO BE SO COOL!

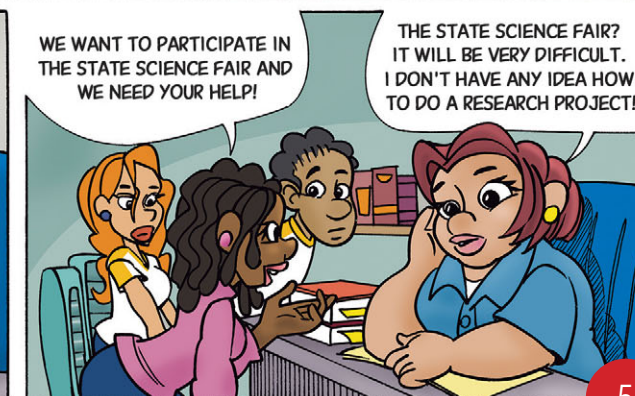
THERE'S NO WAY! NONE OF US KNOW ANYTHING ABOUT PARTICIPATING IN A SCIENCE FAIR!

WE DON'T EVEN HAVE A LABORATORY HERE! YOU MUST BE KIDDING!

AND WHAT'S WRONG WITH DREAMING? I CAN DO THIS. LET'S GO TALK TO OUR TEACHER, MS. ANA!



ALBA GOES TO FIND MS. ANA TO SPEAK WITH HER ABOUT THE SCIENCE FAIR.



WE WANT TO PARTICIPATE IN THE STATE SCIENCE FAIR AND WE NEED YOUR HELP!

THE STATE SCIENCE FAIR? IT WILL BE VERY DIFFICULT. I DON'T HAVE ANY IDEA HOW TO DO A RESEARCH PROJECT!



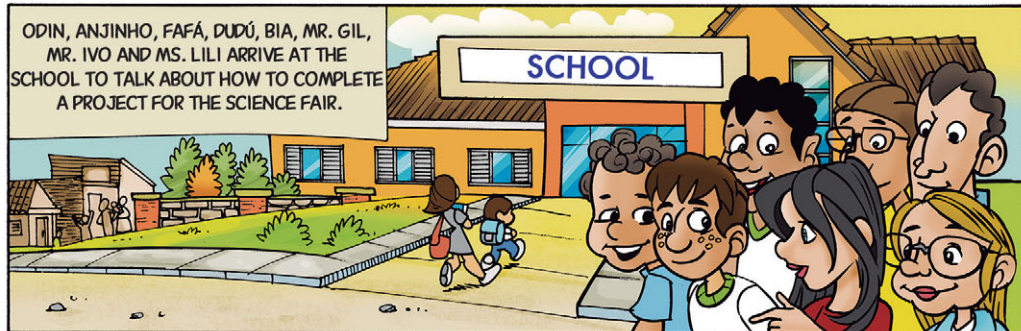
DIDN'T I TELL YOU! WE'RE NOT GOING TO BE ABLE TO DO THIS!



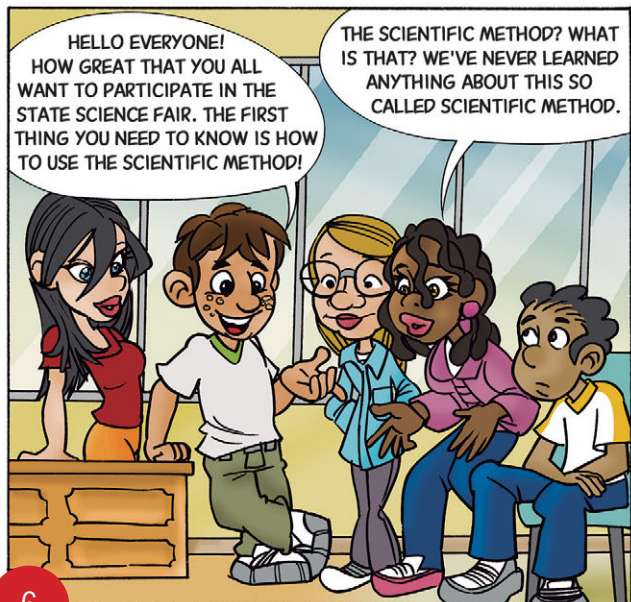
WAIT A MINUTE. I KNOW A FEW STUDENTS AND TEACHERS WHO HAVE BEEN TO THIS SCIENCE FAIR. THEY WILL BE ABLE TO GIVE US SOME TIPS ON HOW TO PARTICIPATE.



I AM GOING TO ASK THEM TO COME HERE TO EXPLAIN HOW IT ALL WORKS.



ODIN, ANJINHO, FAFÁ, DUDÚ, BIA, MR. GIL, MR. IVO AND MS. LILI ARRIVE AT THE SCHOOL TO TALK ABOUT HOW TO COMPLETE A PROJECT FOR THE SCIENCE FAIR.



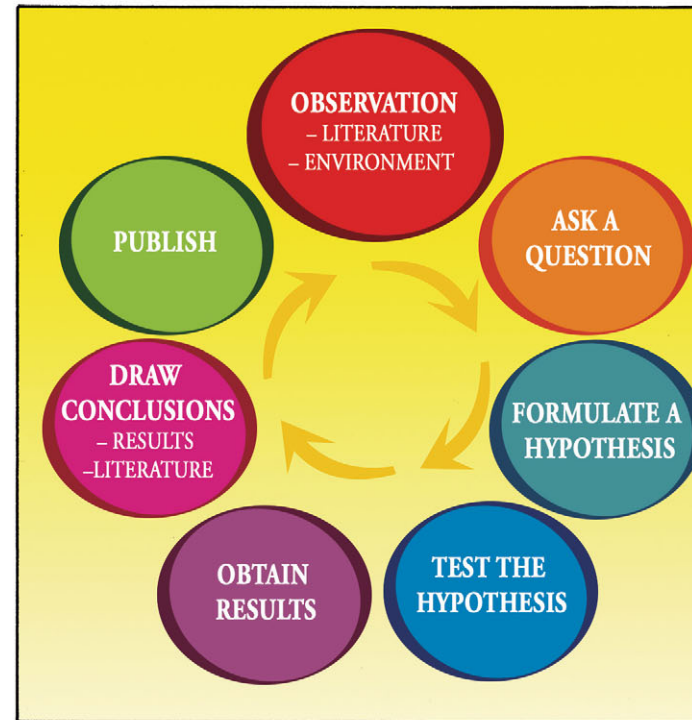
HELLO EVERYONE! HOW GREAT THAT YOU ALL WANT TO PARTICIPATE IN THE STATE SCIENCE FAIR. THE FIRST THING YOU NEED TO KNOW IS HOW TO USE THE SCIENTIFIC METHOD!

THE SCIENTIFIC METHOD? WHAT IS THAT? WE'VE NEVER LEARNED ANYTHING ABOUT THIS SO CALLED SCIENTIFIC METHOD.



IT MUST BE VERY DIFFICULT, I THINK YOU ONLY GET TO STUDY IT IN COLLEGE.

GUYS, IT IS NOT DIFFICULT, IT'S VERY SIMPLE AND LOGICAL. LET'S GO THROUGH THE STEPS OF THE SCIENTIFIC METHOD.

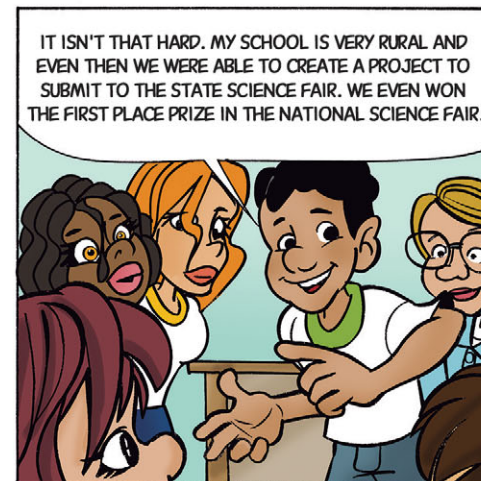


WOW, THAT SEEMS EASY! BUT I WANT TO SEE HOW IT WORKS. HOW ARE WE GOING TO COME UP WITH IDEAS?



HERE IN OUR TOWN NOTHING INTERESTING EVER HAPPENS.

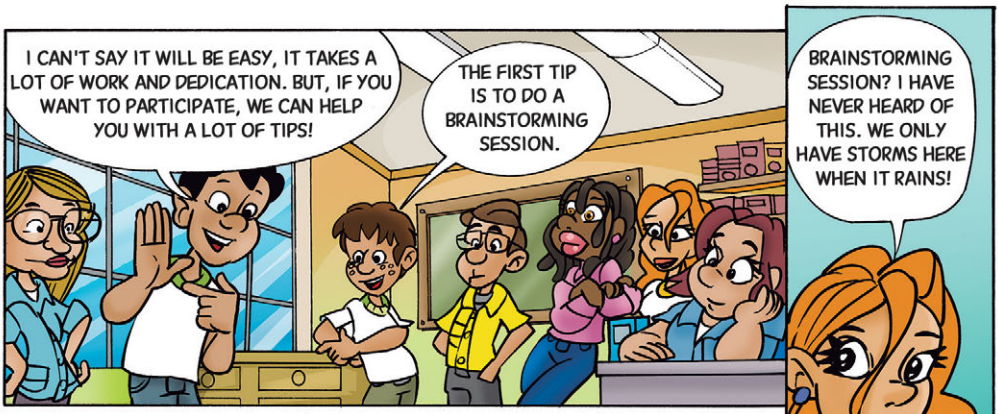
AND WE DON'T HAVE A LIBRARY. IT'S NOT GOING TO WORK! IT'LL BE TOO DIFFICULT. IT'S BETTER TO JUST FORGET ABOUT PARTICIPATING IN THE SCIENCE FAIR.



IT ISN'T THAT HARD. MY SCHOOL IS VERY RURAL AND EVEN THEN WE WERE ABLE TO CREATE A PROJECT TO SUBMIT TO THE STATE SCIENCE FAIR. WE EVEN WON THE FIRST PLACE PRIZE IN THE NATIONAL SCIENCE FAIR.



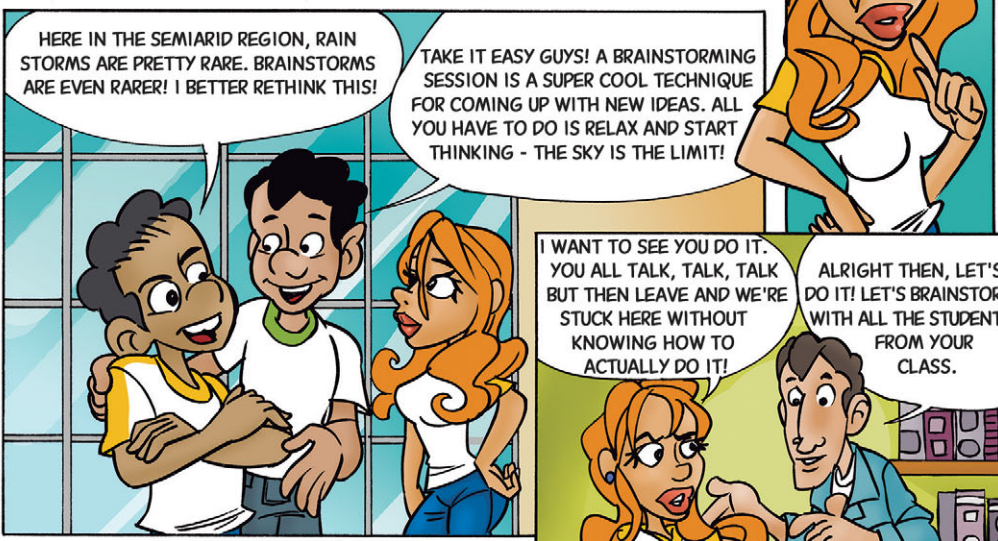
FIRST PLACE? IN THE NATIONAL SCIENCE FAIR? I DON'T BELIEVE IT! WE'VE HEARD ABOUT THE NATIONAL SCIENCE FAIR.



I CAN'T SAY IT WILL BE EASY, IT TAKES A LOT OF WORK AND DEDICATION. BUT, IF YOU WANT TO PARTICIPATE, WE CAN HELP YOU WITH A LOT OF TIPS!

THE FIRST TIP IS TO DO A BRAINSTORMING SESSION.

BRAINSTORMING SESSION? I HAVE NEVER HEARD OF THIS. WE ONLY HAVE STORMS HERE WHEN IT RAINS!



HERE IN THE SEMIARID REGION, RAIN STORMS ARE PRETTY RARE. BRAINSTORMS ARE EVEN RARER! I BETTER RE THINK THIS!

TAKE IT EASY GUYS! A BRAINSTORMING SESSION IS A SUPER COOL TECHNIQUE FOR COMING UP WITH NEW IDEAS. ALL YOU HAVE TO DO IS RELAX AND START THINKING - THE SKY IS THE LIMIT!

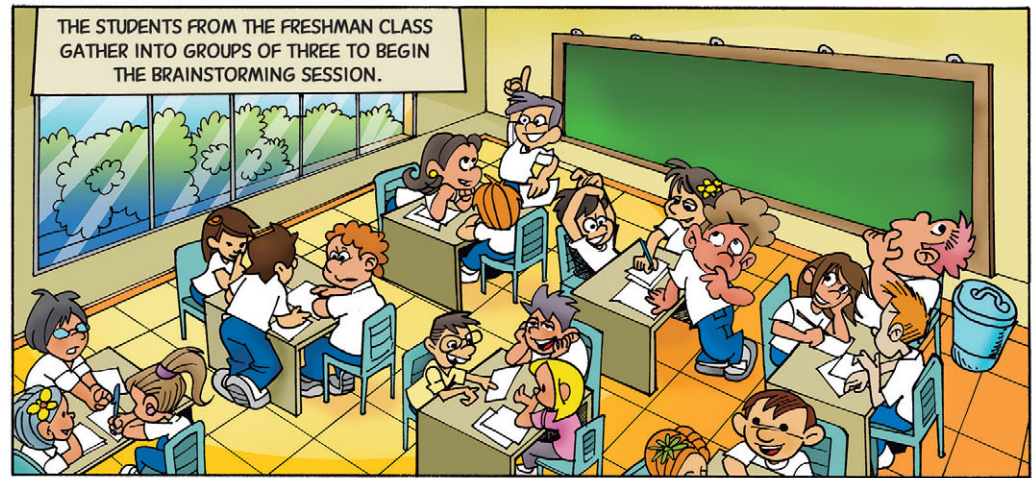
I WANT TO SEE YOU DO IT. YOU ALL TALK, TALK, TALK BUT THEN LEAVE AND WE'RE STUCK HERE WITHOUT KNOWING HOW TO ACTUALLY DO IT!

ALRIGHT THEN, LET'S DO IT! LET'S BRAINSTORM WITH ALL THE STUDENTS FROM YOUR CLASS.

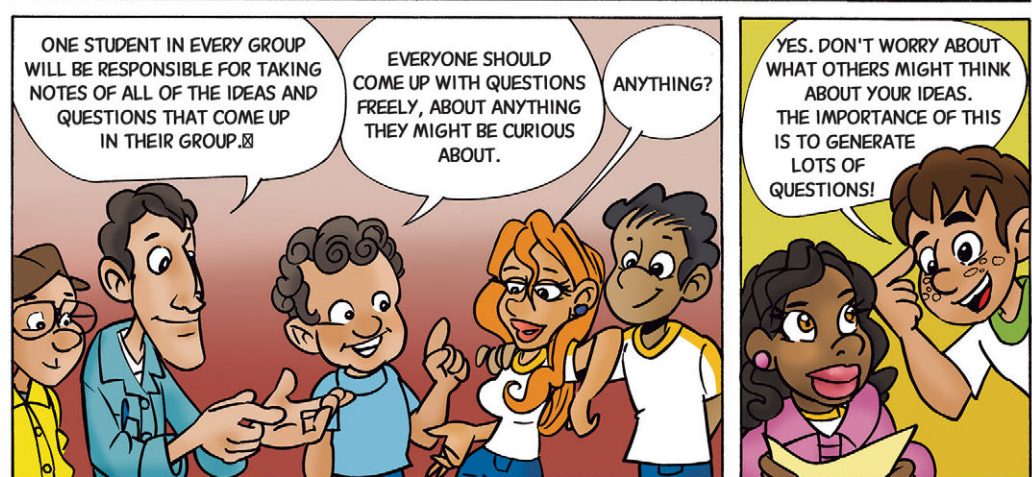


BUT WE HAVE NEVER DONE THIS HERE. DO YOU THINK THE KIDS WILL KNOW HOW TO DO IT?

IT'S REALLY COOL, EVERYONE WILL CATCH ON VERY FAST. ALL YOU HAVE TO DO IS RELAX. LET'S FORM GROUPS OF THREE.



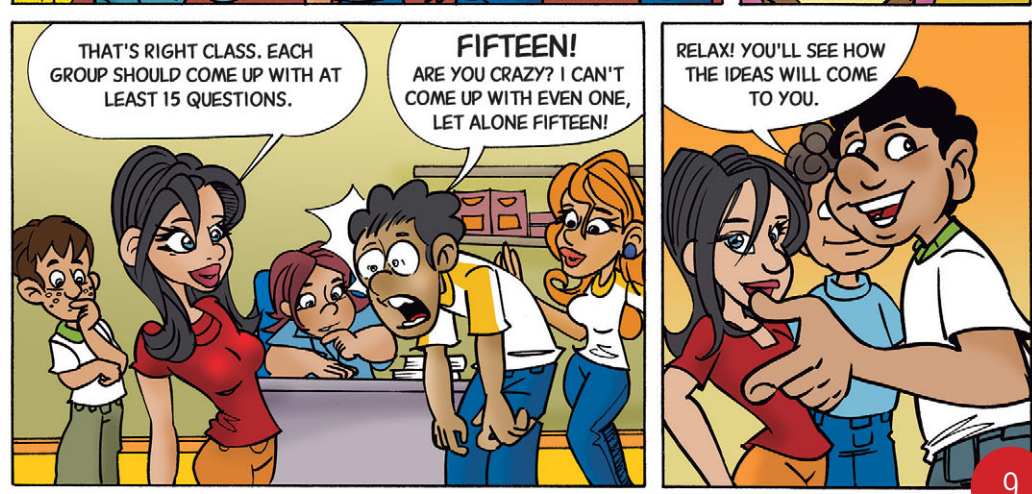
THE STUDENTS FROM THE FRESHMAN CLASS GATHER INTO GROUPS OF THREE TO BEGIN THE BRAINSTORMING SESSION.



ONE STUDENT IN EVERY GROUP WILL BE RESPONSIBLE FOR TAKING NOTES OF ALL OF THE IDEAS AND QUESTIONS THAT COME UP IN THEIR GROUP.

EVERYONE SHOULD COME UP WITH QUESTIONS FREELY, ABOUT ANYTHING THEY MIGHT BE CURIOUS ABOUT.

YES. DON'T WORRY ABOUT WHAT OTHERS MIGHT THINK ABOUT YOUR IDEAS. THE IMPORTANCE OF THIS IS TO GENERATE LOTS OF QUESTIONS!

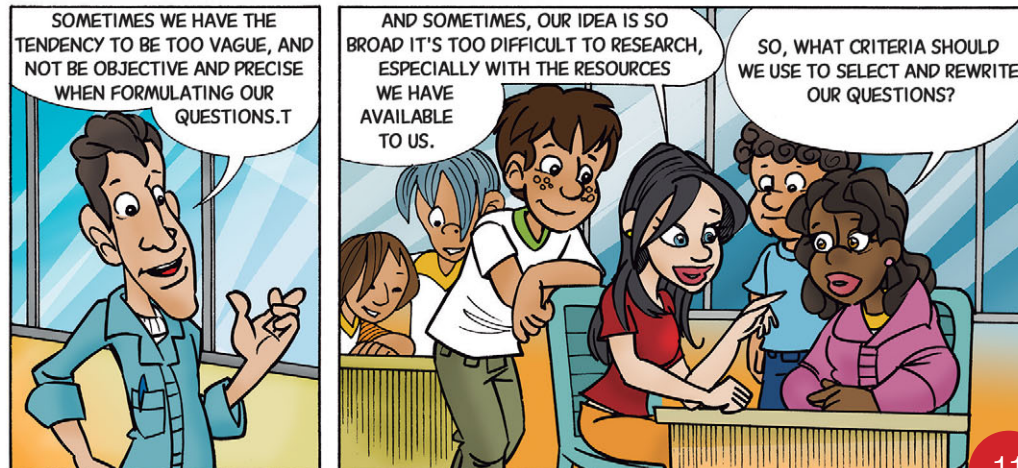
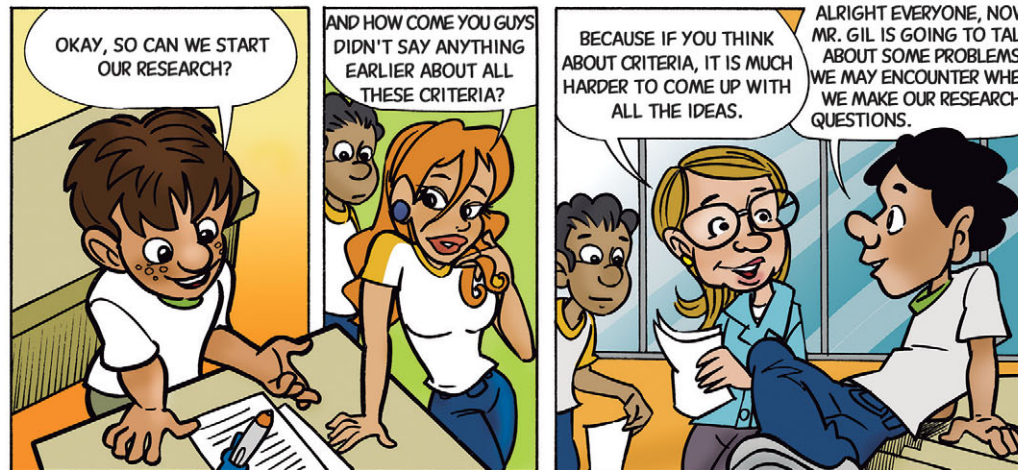
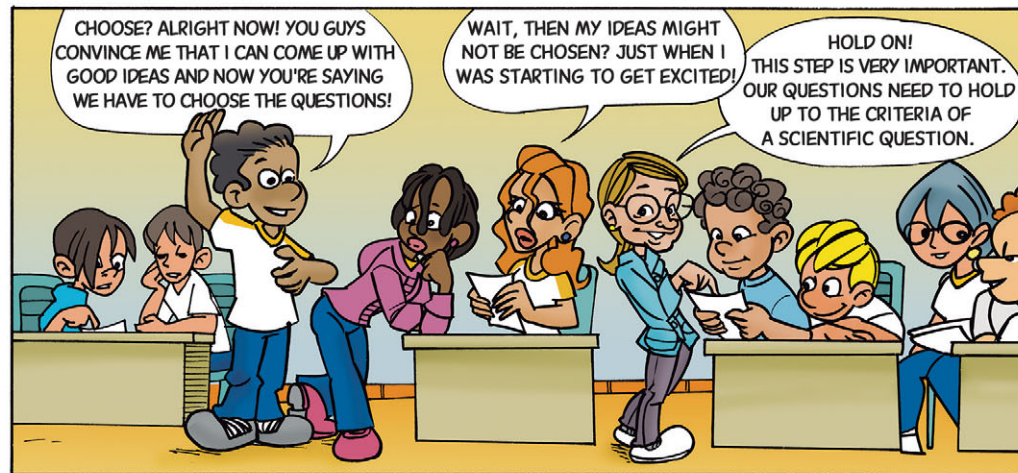
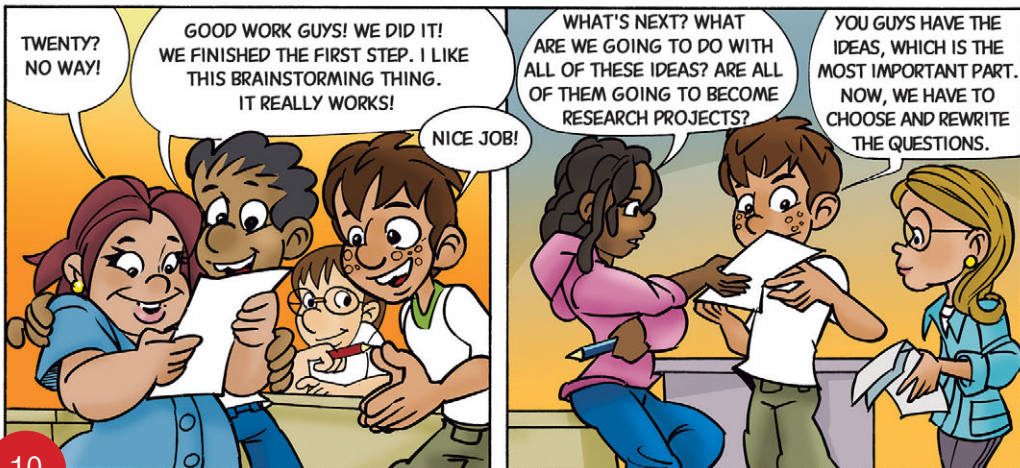
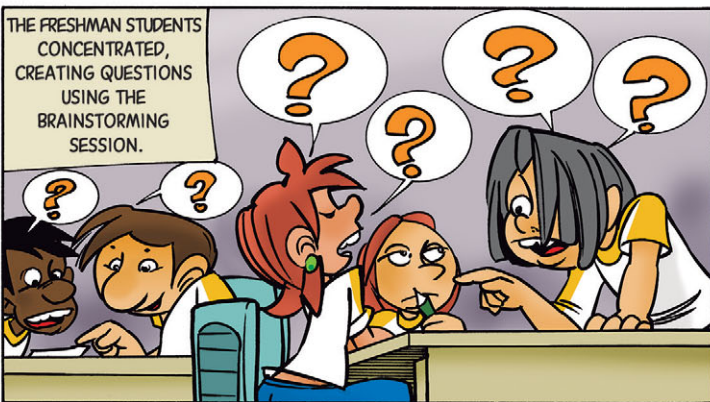


THAT'S RIGHT CLASS. EACH GROUP SHOULD COME UP WITH AT LEAST 15 QUESTIONS.

FIFTEEN! ARE YOU CRAZY? I CAN'T COME UP WITH EVEN ONE, LET ALONE FIFTEEN!

RELAX! YOU'LL SEE HOW THE IDEAS WILL COME TO YOU.

IT'S IMPORTANT THAT YOU STAY OPEN TO ALL KINDS OF IDEAS. AND ALSO, THE STUDENT WHO IS TAKING NOTES SHOULD WRITE DOWN EVERYTHING, DON'T LEAVE ANYTHING OUT, AND THEY SHOULD ALSO WRITE DOWN THEIR OWN QUESTIONS.



- Clear and precise

- Manageable in terms of size and scope (something we can do at our school with the resources we have).

- They can't involve value judgements (like better, or worse).

- They should have a possible answer.

IN A NUTSHELL, THE QUESTIONS SHOULD BE:

HUMM... I WANT TO SEE HOW IT'S DONE!

THE STUDENTS FROM THE FRESHMAN CLASS REWRITING THE QUESTIONS CREATED DURING THE BRAINSTORMING SESSION AND FORMULATING THE HYPOTHESES.

OK THEN, LET'S PRACTICE RIGHT NOW! READ US ONE OF THE QUESTIONS FROM YOUR LIST.

WHAT CAN BE DONE TO PRESERVE FRUIT AFTER THEY HAVE BEEN HARVESTED?

VERY GOOD ALBA. ALL RIGHT EVERYONE, WHAT DO YOU THINK OF THIS QUESTION?

I HAVE AN IDEA TO MAKE THIS QUESTION BETTER. IT COULD BE: "ARE FRUIT BETTER PRESERVED IF THEY ARE COATED WITH WAX OR NOT COATED WITH WAX?"

GOOD VERA, YOUR IDEA TO USE A WAX COATING IS GOOD BUT YOUR QUESTION HAS A VALUE JUDGEMENT.

VALUE JUDGEMENT? WHAT IS THAT?

REMEMBER, ONE OF OUR CRITERIA IS THAT OUR QUESTIONS SHOULDN'T HAVE THE WORDS "BETTER" OR "WORSE" IN THEM, BECAUSE IT MAKES IT DIFFICULT TO SCIENTIFICALLY MEASURE THESE TERMS. SO, DOES ANYONE HAVE A SUGGESTION?

I KNOW! I WILL SUBSTITUTE THE WORD "BETTER" FOR "FOR MORE TIME." WHAT DO YOU GUYS THINK?

VERY GOOD ALBA. SO THE QUESTION IS NOW: "ARE FRUIT PRESERVED FOR MORE TIME IF THEY ARE COATED WITH WAX THAN IF THEY ARE NOT COATED?"

NO! IT NEEDS TO BE MORE SPECIFIC, WE NEED TO SAY WHAT FRUIT WE ARE GOING TO STUDY AND WHAT KIND OF WAX.

COULD WE DO BANANAS? AND BEESWAX?

GREAT, SO THE QUESTION WOULD BE: "ARE BANANAS PRESERVED FOR MORE TIME IF THEY ARE COATED IN BEESWAX THAN IF THEY ARE NOT COATED?"

YES, BUT NOW WE HAVE TO SEE IF THE QUESTION HAS A POSSIBLE ANSWER. WHO WANTS TO SUGGEST AN ANSWER TO THIS QUESTION?

OH, THAT'S EASY! OBVIOUSLY BANANAS LAST LONGER IF THEY ARE COVERED IN BEESWAX.

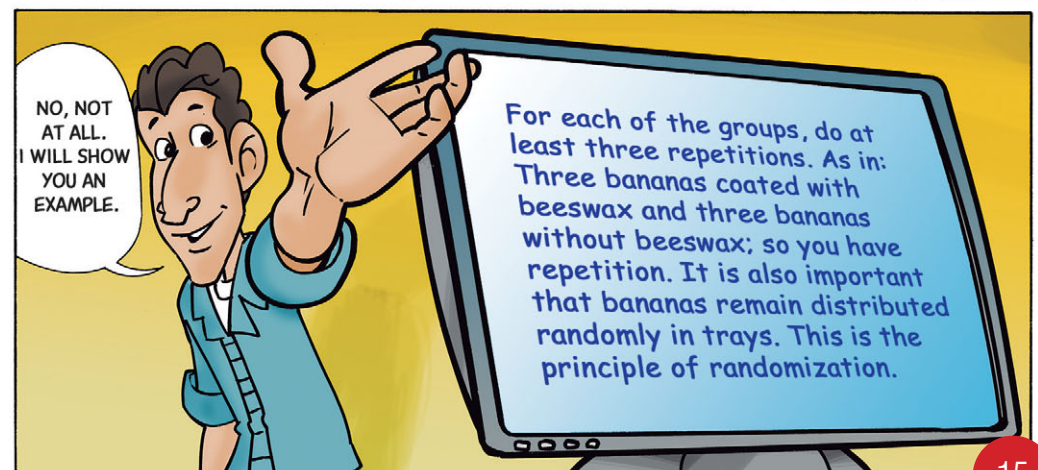
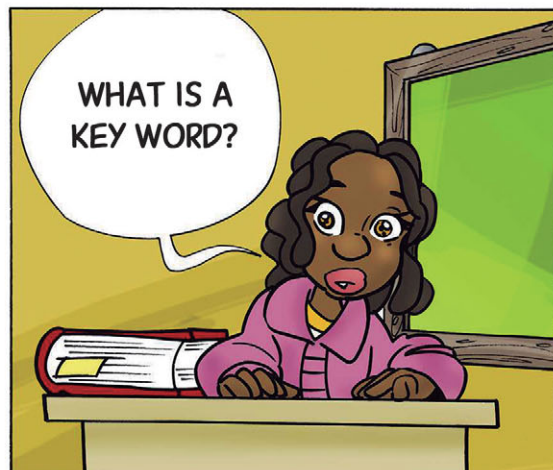
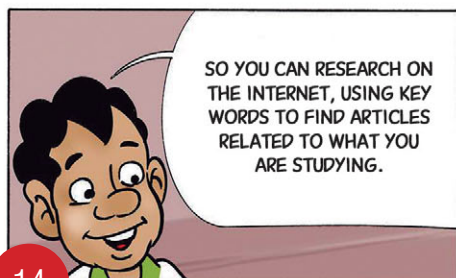
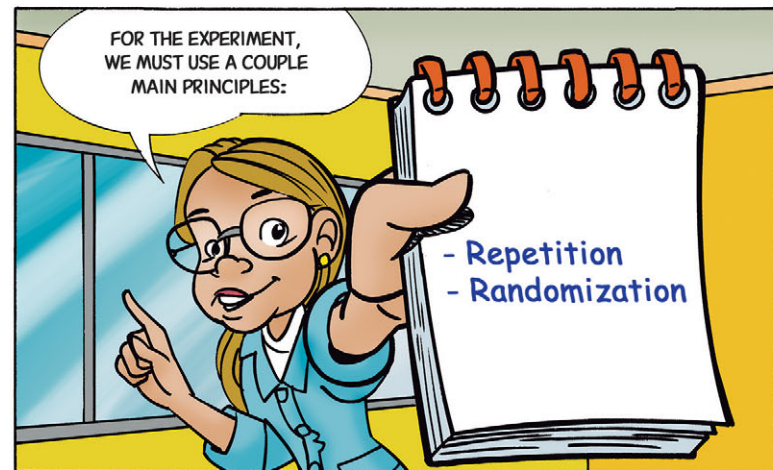
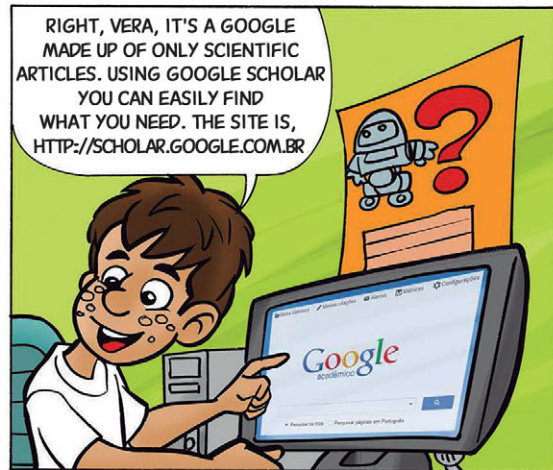
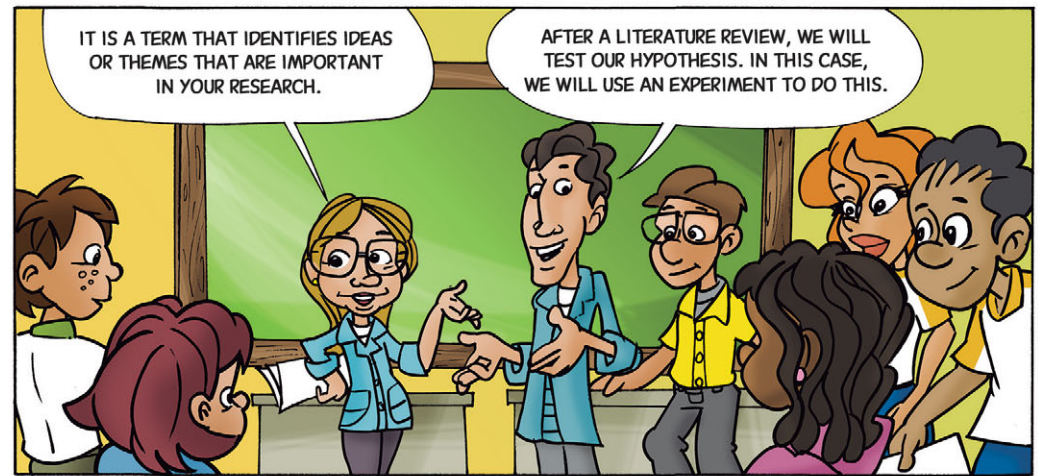
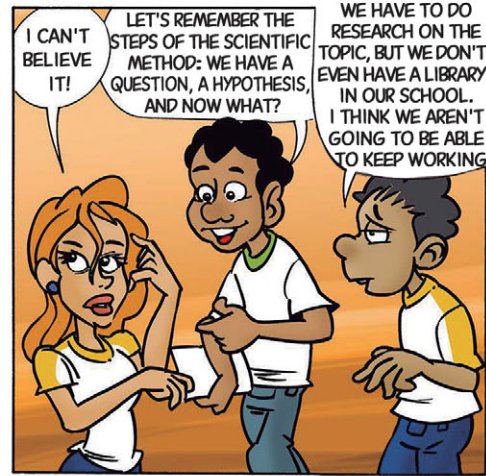
GOOD JOB TOMÉ, YOU ALREADY HAVE A HYPOTHESIS.

HYP... WHAT?

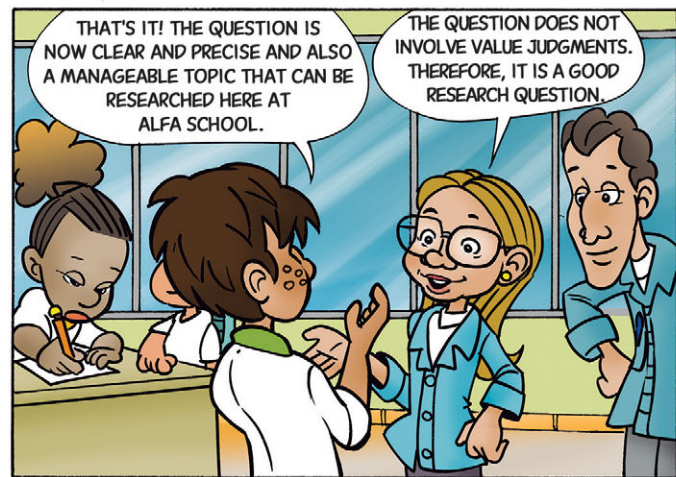
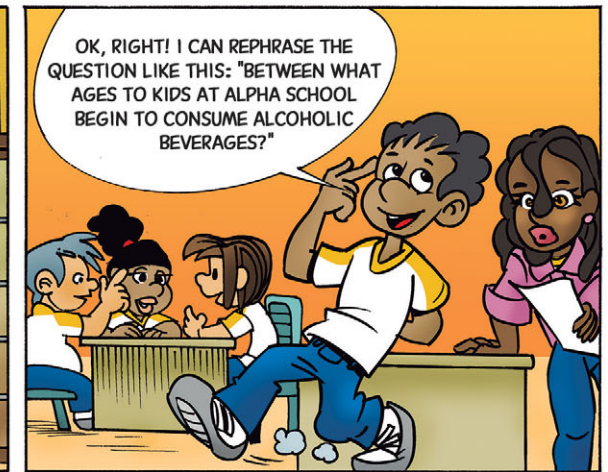
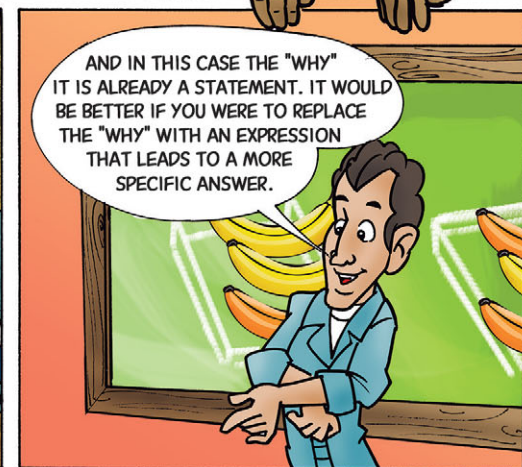
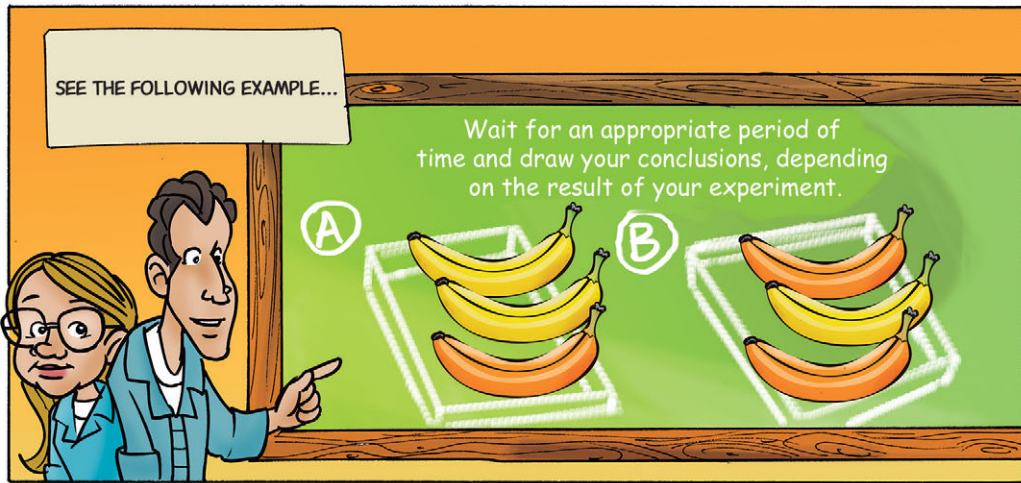
A HYPOTHESIS?

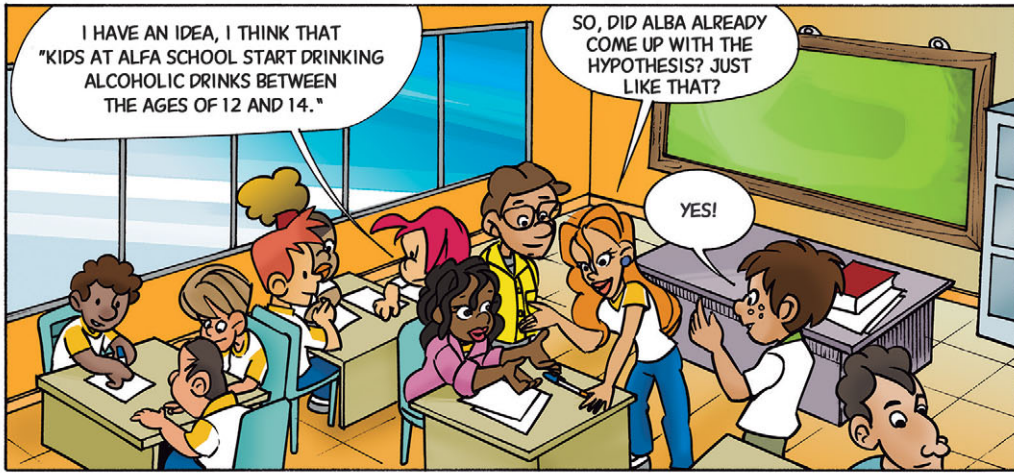
WHAT A CRAZY WORD. I HAVE NEVER HEARD OF THAT BEFORE. IT'S GETTING COMPLICATED AGAIN.

NO IT'S NOT! A HYPOTHESIS IS A POSSIBLE ANSWER TO YOUR QUESTION. SO, A HYPOTHESIS IS WHAT YOU THINK.





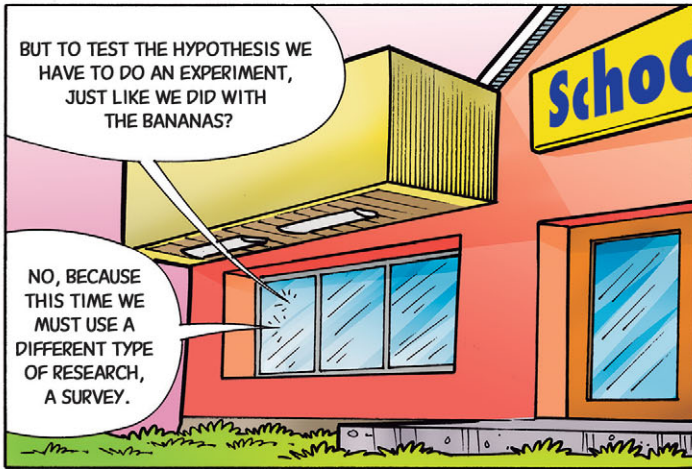




I HAVE AN IDEA, I THINK THAT "KIDS AT ALFA SCHOOL START DRINKING ALCOHOLIC DRINKS BETWEEN THE AGES OF 12 AND 14."

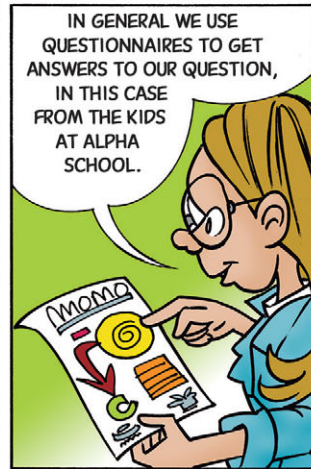
SO, DID ALBA ALREADY COME UP WITH THE HYPOTHESIS? JUST LIKE THAT?

YES!



BUT TO TEST THE HYPOTHESIS WE HAVE TO DO AN EXPERIMENT, JUST LIKE WE DID WITH THE BANANAS?

NO, BECAUSE THIS TIME WE MUST USE A DIFFERENT TYPE OF RESEARCH, A SURVEY.

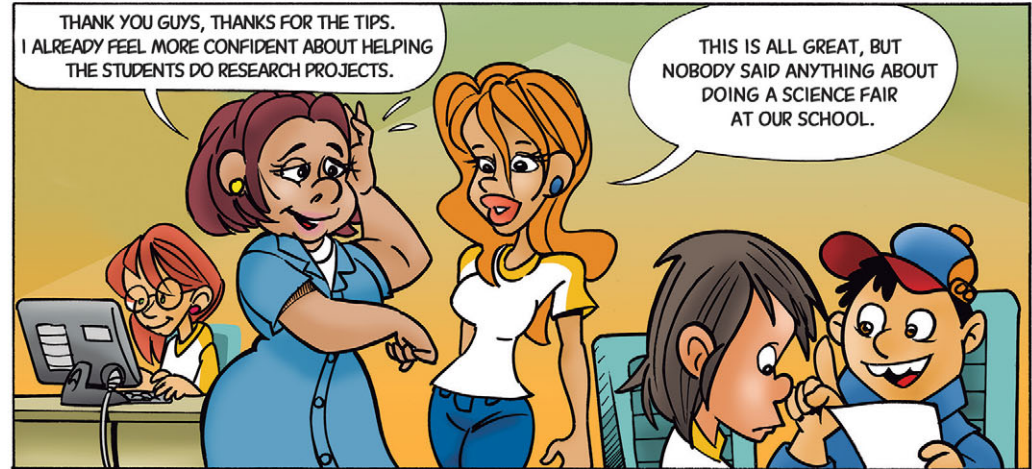


IN GENERAL WE USE QUESTIONNAIRES TO GET ANSWERS TO OUR QUESTION, IN THIS CASE FROM THE KIDS AT ALFA SCHOOL.



AND THESE QUESTIONNAIRES CAN BE ADAPTED TO TEST OUR HYPOTHESIS.

YOU CAN ALSO FIND A UNIVERSITY OR RESEARCH CENTER TO GET MORE HELP.

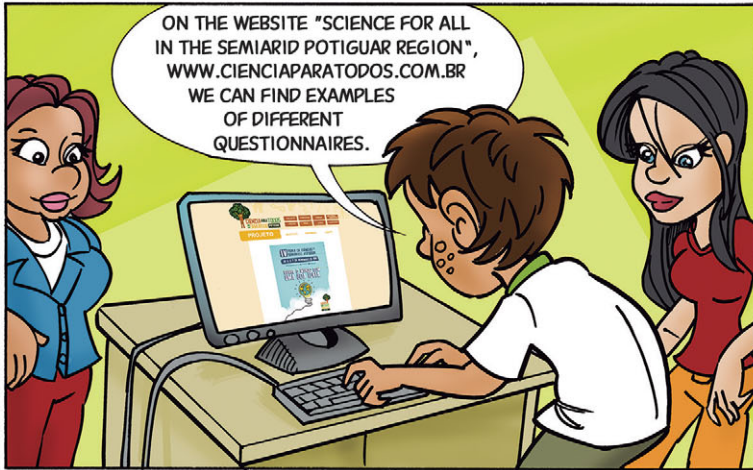


THANK YOU GUYS, THANKS FOR THE TIPS. I ALREADY FEEL MORE CONFIDENT ABOUT HELPING THE STUDENTS DO RESEARCH PROJECTS.

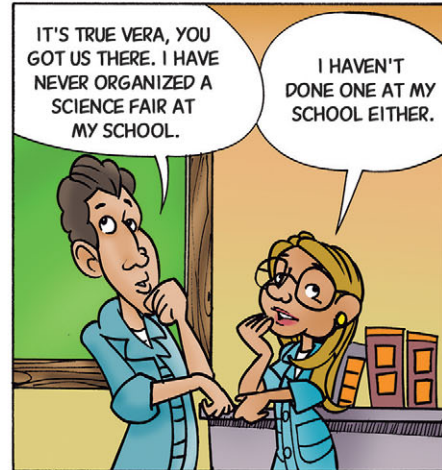
THIS IS ALL GREAT, BUT NOBODY SAID ANYTHING ABOUT DOING A SCIENCE FAIR AT OUR SCHOOL.



WHAT ARE WE GOING TO ASK IN THIS QUESTIONNAIRE?

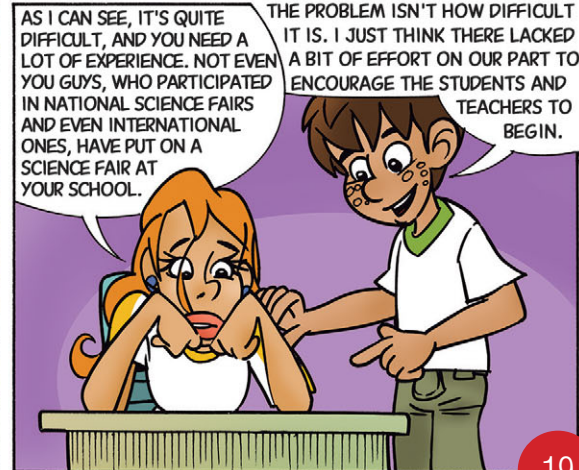


ON THE WEBSITE "SCIENCE FOR ALL IN THE SEMIARID POTIGUAR REGION", WWW.CIENCIAPARATODOS.COM.BR WE CAN FIND EXAMPLES OF DIFFERENT QUESTIONNAIRES.



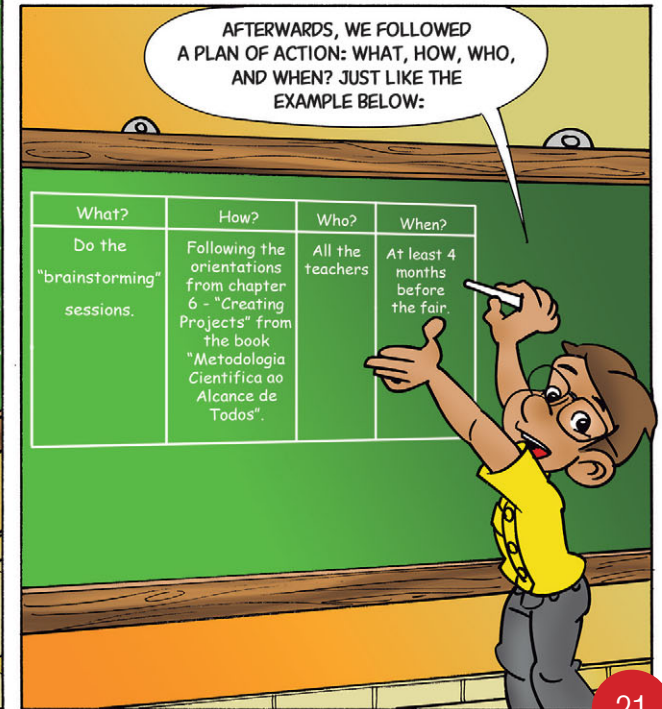
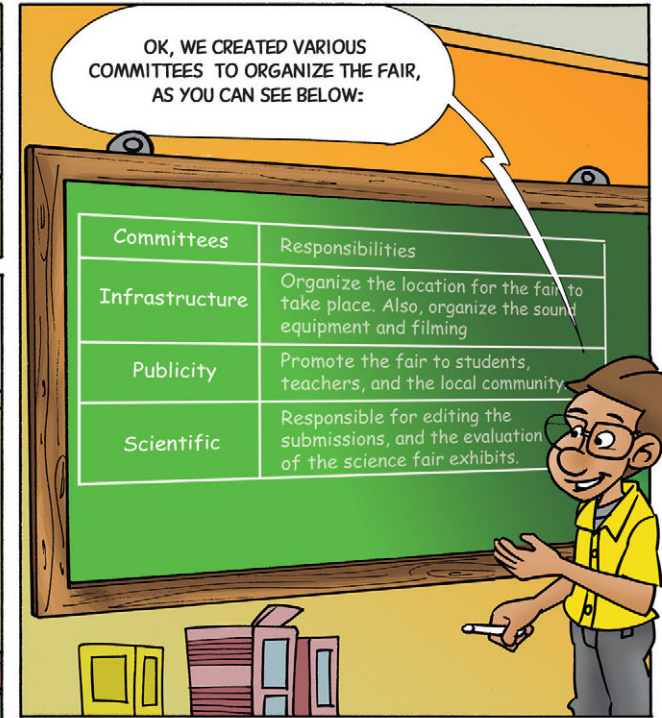
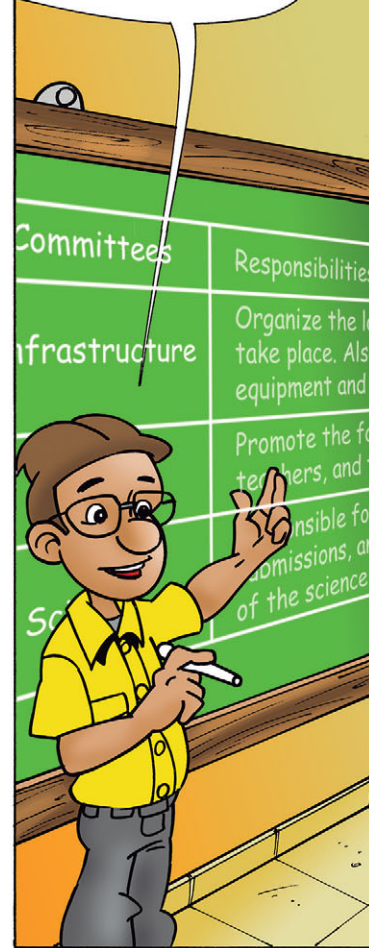
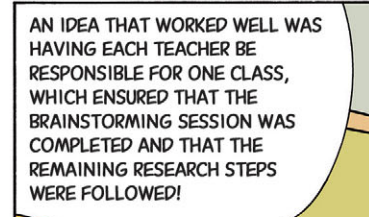
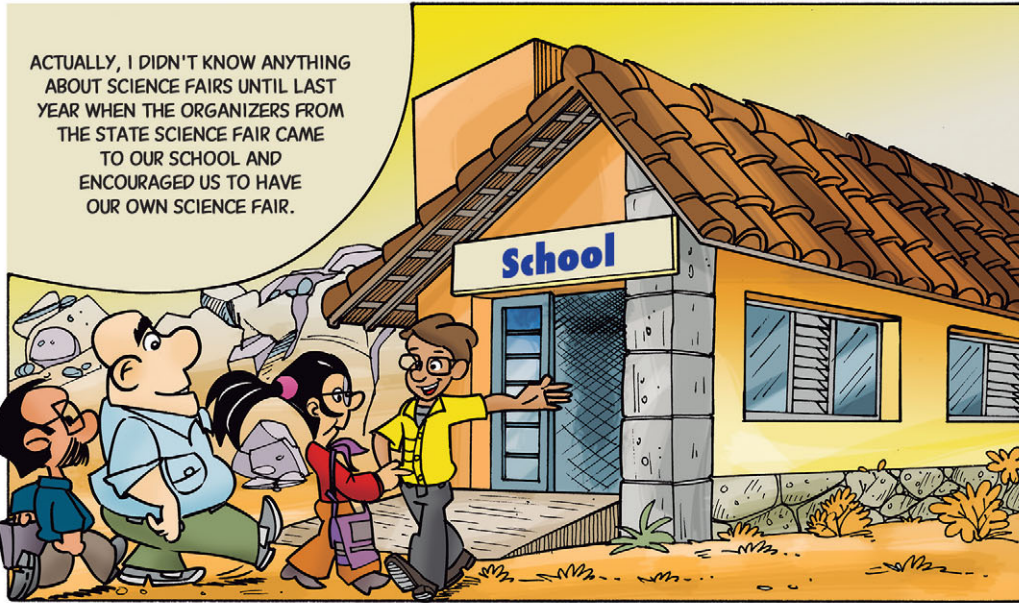
IT'S TRUE VERA, YOU GOT US THERE. I HAVE NEVER ORGANIZED A SCIENCE FAIR AT MY SCHOOL.

I HAVEN'T DONE ONE AT MY SCHOOL EITHER.



AS I CAN SEE, IT'S QUITE DIFFICULT, AND YOU NEED A LOT OF EXPERIENCE. NOT EVEN YOU GUYS, WHO PARTICIPATED IN NATIONAL SCIENCE FAIRS AND EVEN INTERNATIONAL ONES, HAVE PUT ON A SCIENCE FAIR AT YOUR SCHOOL.

THE PROBLEM ISN'T HOW DIFFICULT IT IS. I JUST THINK THERE LACKED A BIT OF EFFORT ON OUR PART TO ENCOURAGE THE STUDENTS AND TEACHERS TO BEGIN.





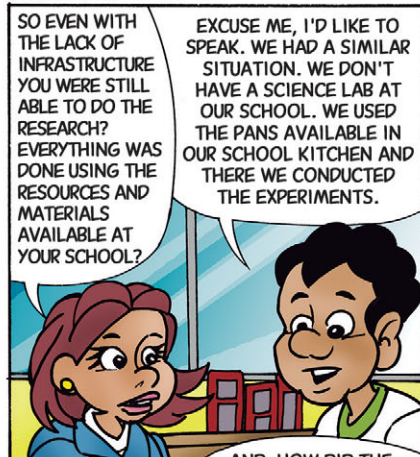
BUT WHERE YOU ABLE TO HAVE A SCIENCE FAIR WITHOUT ANY EXPERIENCE?

YES, WE DID! IT WAS A GREAT SUCCESS. THE STUDENTS WERE VERY EXCITED AND FIVE PROJECTS FROM OUR FAIR GOT TO PARTICIPATE IN THE STATE SCIENCE FAIR.



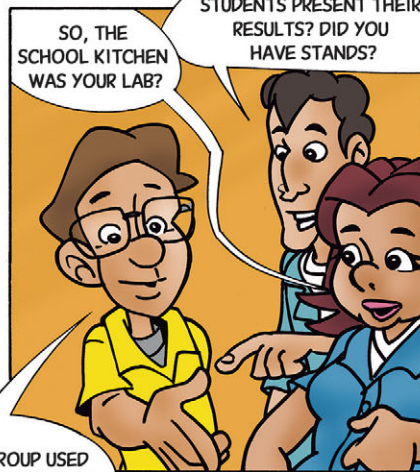
BUT DOES YOUR SCHOOL HAVE LABORATORIES? HOW DID THE STUDENTS DO THE PROJECTS?

NO, WE DON'T HAVE LABORATORIES. THE STUDENTS CHOSE PROJECTS THAT WERE SIMPLE AND CREATIVE.



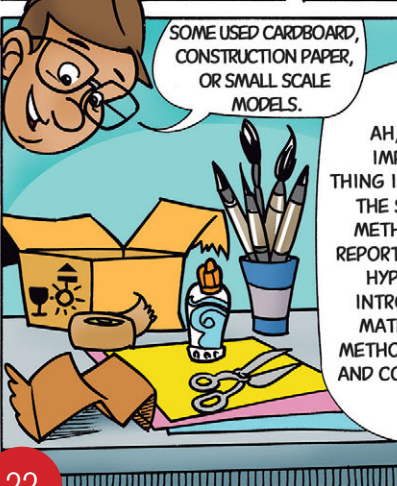
SO EVEN WITH THE LACK OF INFRASTRUCTURE YOU WERE STILL ABLE TO DO THE RESEARCH? EVERYTHING WAS DONE USING THE RESOURCES AND MATERIALS AVAILABLE AT YOUR SCHOOL?

EXCUSE ME, I'D LIKE TO SPEAK. WE HAD A SIMILAR SITUATION. WE DON'T HAVE A SCIENCE LAB AT OUR SCHOOL. WE USED THE PANS AVAILABLE IN OUR SCHOOL KITCHEN AND THERE WE CONDUCTED THE EXPERIMENTS.



SO, THE SCHOOL KITCHEN WAS YOUR LAB?

AND, HOW DID THE STUDENTS PRESENT THEIR RESULTS? DID YOU HAVE STANDS?

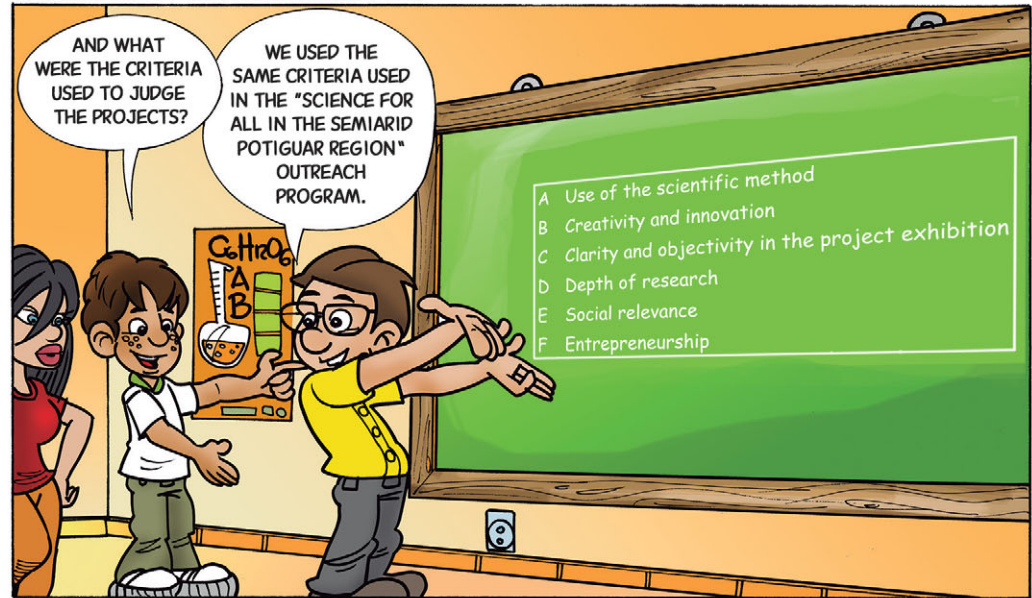


SOME USED CARDBOARD, CONSTRUCTION PAPER, OR SMALL SCALE MODELS.

AH, SO, THE IMPORTANT THING IS TO FOLLOW THE SCIENTIFIC METHOD IN THE REPORT: QUESTION, HYPOTHESIS, INTRODUCTION, MATERIAL AND METHODS, RESULTS AND CONCLUSIONS.



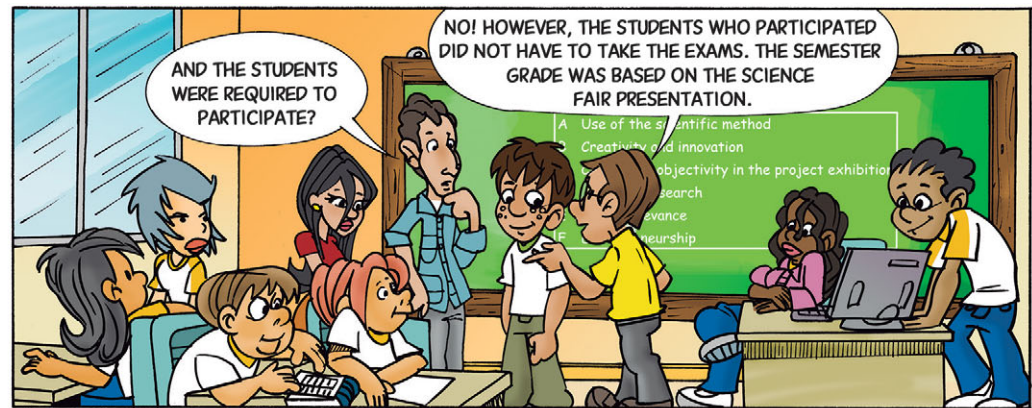
IT CAN ALL BE FOUND ON THE WEBSITE



AND WHAT WERE THE CRITERIA USED TO JUDGE THE PROJECTS?

WE USED THE SAME CRITERIA USED IN THE "SCIENCE FOR ALL IN THE SEMIARID POTIGUAR REGION" OUTREACH PROGRAM.

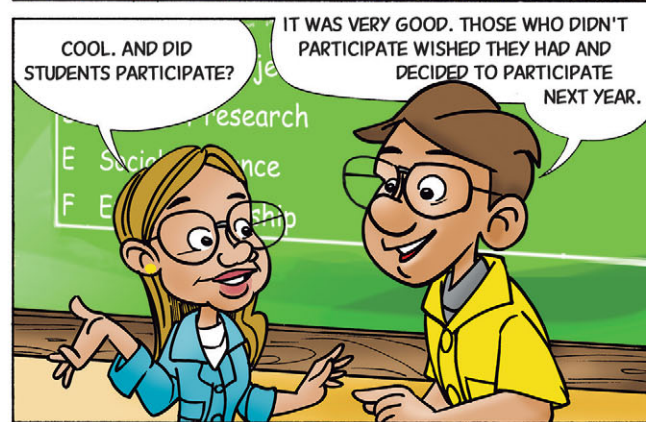
- A Use of the scientific method
- B Creativity and innovation
- C Clarity and objectivity in the project exhibition
- D Depth of research
- E Social relevance
- F Entrepreneurship



AND THE STUDENTS WERE REQUIRED TO PARTICIPATE?

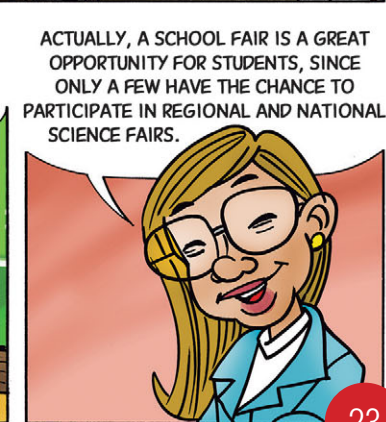
NO! HOWEVER, THE STUDENTS WHO PARTICIPATED DID NOT HAVE TO TAKE THE EXAMS. THE SEMESTER GRADE WAS BASED ON THE SCIENCE FAIR PRESENTATION.

- A Use of the scientific method
- B Creativity and innovation
- C Clarity and objectivity in the project exhibition
- D Depth of research
- E Social relevance
- F Entrepreneurship

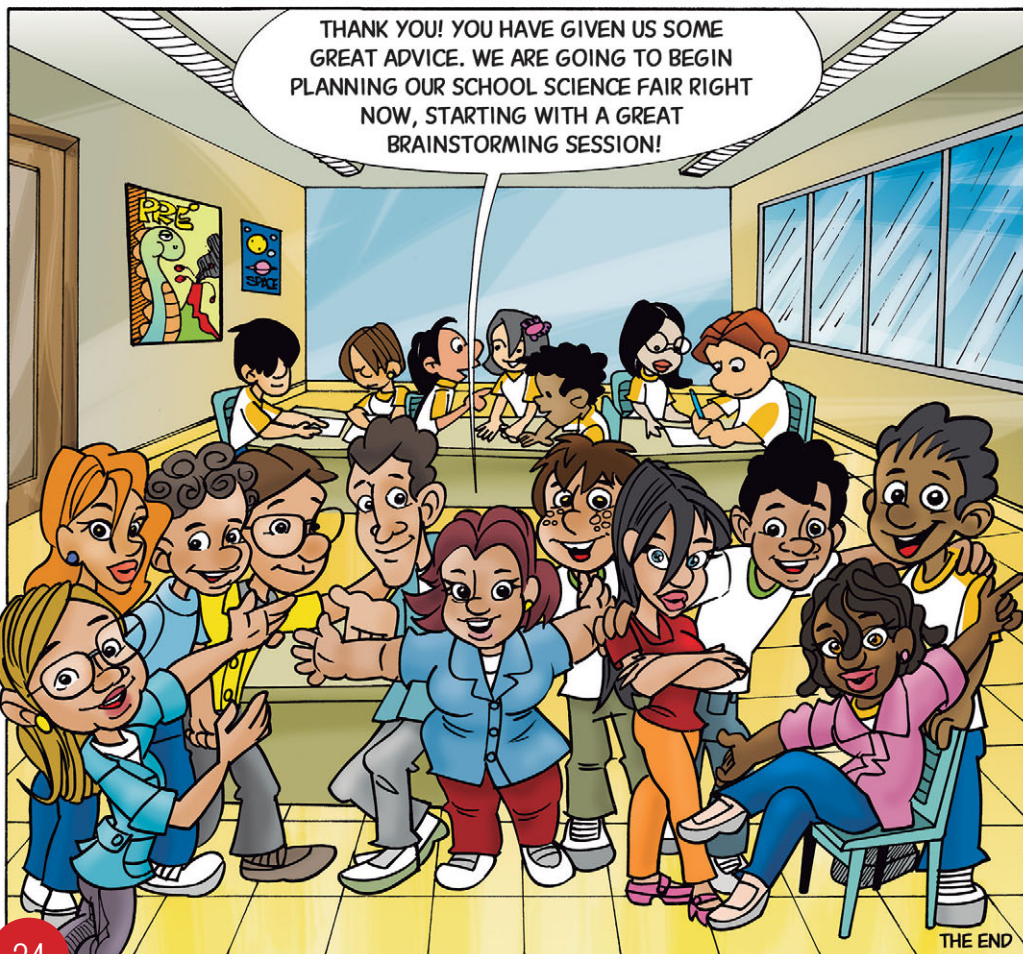
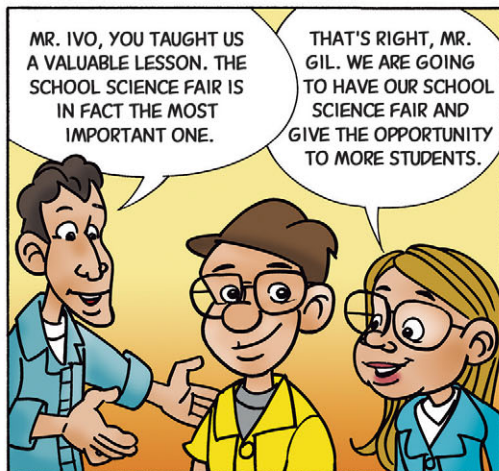


COOL. AND DID STUDENTS PARTICIPATE?

IT WAS VERY GOOD. THOSE WHO DIDN'T PARTICIPATE WISHED THEY HAD AND DECIDED TO PARTICIPATE NEXT YEAR.



ACTUALLY, A SCHOOL FAIR IS A GREAT OPPORTUNITY FOR STUDENTS, SINCE ONLY A FEW HAVE THE CHANCE TO PARTICIPATE IN REGIONAL AND NATIONAL SCIENCE FAIRS.



## REFERENCE

AZEVEDO, C. B. **Metodologia científica ao alcance de todos**. 3. ed. São Paulo: Manole, 2013. 72 p.

RIBEIRO, F. A. S. **Como organizar uma feira de ciências**. Natal: Infinitaimagem, 2015. 91 p..

**Editora Universitária da UFERSA (EdUFERSA)**

Av. Francisco Mota, 572 | Costa e Silva (Centro de Convivência, Campus Leste) | Mossoró-RN  
59.625-900 | <http://edufersa.ufersa.edu.br> | [edufersa@ufersa.edu.br](mailto:edufersa@ufersa.edu.br) | (84) 3317-8267

Unigráfica Gráfica e Editora Ltda.  
Rua Câmara Cascudo, 920, Parnamirim/RN

Composição

Formato: 15 x 21 cm

Papel do Miolo: Couche fosco 150g

Papel da Capa: Couche fosco 230g

Laminação da Capa: Fosco

Número de Páginas: 24 Páginas

cienciarn@gmail.com  
www.cienciaparatodos.com.br

ISBN 978-85-5757-050-4



*Conselho Nacional de Desenvolvimento  
Científico e Tecnológico*

MINISTÉRIO DA  
**EDUCAÇÃO**

MINISTÉRIO DA  
**CIÊNCIA, TECNOLOGIA,  
INOVAÇÕES E COMUNICAÇÕES**

