

You Could Be A

# SCIENTIST



Module 1

• NIDA •

# MODULE 1: YOU COULD BE A SCIENTIST

## Introduction

Young children are naturally interested in science. They are curious about what things are made of, how they work, why it rains, and countless other questions about the world. Yet, even children in kindergarten and first grade are old enough to have developed misconceptions about scientists and the work that they do.

The purpose of today's lesson is to find out students' ideas about scientists, talk about different kinds of scientists, and identify some characteristics of people who choose this profession. After discussing scientists and what they do, students will be introduced to Corty, the mascot of the *Brain Power! Club*, and to the older members of the club. Students will be able to become members of the club by working on the program's five modules.

## Learning Objectives

- ★ Students discuss who scientists are and the work that they do.
- ★ Students discover their own ability to do the work of scientists.

## Relationship to the National Science Education Standards

The activities in this lesson align with the following standard identified in the NSES: history and nature of science.

### History and Nature of Science

Levels K-4	How Mission is Aligned
Science as a human endeavor	Students begin to understand that science encompasses many disciplines. Because they, too, will be working as scientists, they also start to realize that anyone who asks questions and tries to find the answers to these questions is a scientist.



## Background

By the time children are in kindergarten and first grade, they have already developed many misconceptions about the world. Often, children this age believe that scientists are white, old men who work in a laboratory—like Einstein. One of the goals of this lesson is to dispel this myth and show students that anyone can be a scientist, even kids their age.

Students first explore their current ideas about scientists by drawing a picture of what they think a scientist looks like. Then, they go beyond these stereotypes by looking at pictures of different scientists and developing a list of characteristics that scientists share. These activities set the stage for Module 2, during which students learn about the specific work of scientists involved in research about the brain.

In the United States alone, there are more than 11 million scientists and engineers. Of this number almost 4 million are women; nearly 9 million are Caucasian; 597,100 are African American; 417,200 are Hispanic and 805,900 are Asian. These scientists work in a variety of disciplines, including biology, biochemistry, chemistry, physics, mathematics, engineering, and the earth sciences. As more and more discoveries are being made, additional disciplines in the sciences are emerging. (Source: National Science Foundation 2002)

## Materials

- ✓ Crayons or markers
- ✓ Paper
- ✓ Newsprint
- ✓ Videotape and VCR



## Preparation

- ★ Preview the videotape and lesson before doing this activity. Make necessary adjustments according to the needs and interests of your students.
- ★ Make copies of the black-and-white trading cards found at the back of the Module 1 Teacher's Guide so that each student has a copy of each card.

## Procedure

1. Begin the lesson by asking students to draw a picture of what they think a scientist looks like. Tell them to include details, such as clothes the scientist wears, the setting in which that person works, and the tools and equipment used. Give students about 10 minutes to complete their drawings.
2. Collect the drawings and display them around the class. Do the drawings show a combination of men and women? Are the scientists from different ethnic groups? Are the scientists working in different settings? If students' drawings reflect the stereotype of a scientist as a white male in a laboratory, lead a discussion about the tremendous variety of scientists.
3. Discuss with students the characteristics of scientists. First, ask students for their ideas. What words would students use to describe scientists? Help them understand that such phrases as curious, asking a lot of questions (inquisitive), adventurous, thoughtful, careful, and thorough are good ways to describe scientists. Keep a list of these phrases around the classroom so that students can add to them as they work on the modules in the program.
4. Tell students that all scientists share one thing in common—a desire to find answers to their questions. Ask students how they think scientists go about finding out what they need to know. Keep a list of their ideas.
5. Ask students if they would like to work on solving problems, just as scientists do. Tell them that they will have an opportunity to do so by working with older students, shown in the video; they will have the opportunity to become members of the *Brain Power! Club*.
6. To conclude, show students the Module 1 segment of the videotape. They will see an animated character named Corty. Tell students that Corty will help guide them through the problems presented in the modules.



## Discussion Questions

- ? Ask students if their ideas about scientists and science have changed as a result of working on this module. If so, how have their ideas changed? Do they now have a different image of who scientists are and what they do?
- ? To help students solidify their new ideas about scientists, ask them to draw a second picture of what they think scientists look like, where they work, and the tools that they use. As a class, compare the two pictures. What do the new pictures reveal about students' changing ideas about scientists?

## Extensions

The activities listed below provide a link to other areas of the curriculum.



Language  
arts



Math



Drama



Art



Science



Social  
Studies



Reading

	<p>Have the students talk about what kind of scientist they might want to be. Have them provide as many details as possible, such as the type of scientist, the work setting, the kind of work done, and major findings.</p>
	<p>Take a class survey of the different kinds of scientists that students are familiar with. Then, make a bar graph illustrating class results. Which kind of scientist are students most familiar with? What kind of work does that particular scientist do?</p>
	<p>Make picture cards showing different kinds of scientists and the work they do. Display the cards around the class.</p>



## Assessment

The purpose of this activity is to find out what students' ideas about science and scientists are so that you know what misconceptions students have as they begin these modules. At this point, if students are attentive, engaged by the activity, and participate in class discussions, then they have completed the module successfully.

## Notes:



## Resources for Teachers

National Institute on Drug Abuse (NIDA)

[www.drugabuse.gov](http://www.drugabuse.gov)

301-443-1124

This Web site contains information about drug abuse and a section designed specifically for parents, teachers, and students. Publications and other materials are available free of charge.

National Clearinghouse for Alcohol and Drug Information (NCADI)

[www.health.org](http://www.health.org)

1-800-729-6686

NCADI is the world's largest resource for information and materials concerning substance abuse. Many free publications are available here.

Eisenhower National Clearinghouse (ENC)

[www.enc.org](http://www.enc.org)

This Web site provides useful information and products to improve mathematics and science teaching and learning.

National Science Teachers Association (NSTA)

[www.nsta.org](http://www.nsta.org)

703-243-7100

The NSTA provides resources and information for science teachers.

The Brain Exchange Electronic Mentorship Network (BEEMNET)

[www.beemnet.com](http://www.beemnet.com)

BEEMNET is a research-oriented, educational organization that connects elementary school children and their teachers with research neuroscientists.



## Resources for Students

Want to be a Scientist?

[www.ars.usda.gov/is/kids/scientists/scientistsframe2.htm](http://www.ars.usda.gov/is/kids/scientists/scientistsframe2.htm)

This site describes careers of scientists and presents an opportunity to email scientists and ask them questions.

Lehn, B. *What is A Scientist?* Brookfield, CT: Millbrook Press, 1999.

This book explains what it is to be a scientist by including pictures of children as scientists in the classroom doing scientific experiments and having a great time.

Sabin, F. *Louis Pasteur: Young Scientist.* Memphis, TN: Troll Communications, 1983.

This book focuses on the life of the famous scientist Louis Pasteur. It is informative and easy to read.

Brandt, K. *Marie Curie: Brave Scientist.* Memphis, TN: Troll Communications, 2002.

This book focuses on the life of the famous scientist Marie Curie. It is part of the Easy Biographies series.

Purwin, P. *Grampa's a Scientist.* Los Angeles, CA: Collage Storybook Press, 1999.

This is a story about a visit from a grandfather to his twin grandchildren and their magical, scientific adventure.

Trumbauer, L. *Everyone is a Scientist.* Mankato, MN: Pebble Books, 2000.

This is an elementary book that shows how anyone, even the youngest of children, can be a scientist.



## Introductory Story for Module 1

"Hi, everyone. I'm Juan, and this is a fellow Junior Scientist, Beth. We're in a really cool club called 'Brain Power!' NIDA Mission Control sends us missions to solve. We go on these missions with Corty."

"Hey, what about us?!" ask Max and Julia. "We go on missions with Corty, too."

Beth says, "Of course! We were going to introduce you two. This is Max and Julia. They are working to become Junior Scientists just like Juan and me. Now, where were we Juan?" asks Beth.

"Let's see. Biologists, neuroscientists, zoologists . . ." says Juan.

". . . immunologists, physicists . . ." Beth continues.

"What are you two doing?" asks Julia.

"We're trying to think of as many different kinds of scientists as we can. Did you realize that there are so many different kinds of scientists and that they perform many different jobs?" asks Beth.

Julia and Max both shake their heads. "No way! We had no idea."

"I've got an idea—let's see if we can find some scientists on the Internet," suggests Juan. "An oceanographer studies the oceans and the fish, plants, and other creatures that live there. Drug abuse researchers do PET scans to find out how some harmful substances affect people's brains and bodies, so that they can help them get well again."

"Wait a minute. Women can be scientists, too?" asks Julia, as she notices one of the pictures on the Internet.

Juan and Beth laugh. "Anyone can be a scientist, Julia—men, women, and people of all races. And scientists work in all kinds of places. The drug abuse researcher does some work in a laboratory and some out with animals," explains Beth.

"The oceanographer works in the water, and other scientists work in fields or forests, or even outer space," says Juan.

"Wow! We didn't know there are so many different types of scientists!" exclaims Max.



"Okay, here's a quiz. What do you call a scientist who studies the brain and all the interesting things your brain can do?" asks Juan.

"A Brainologist?" suggests Max.

Beth and Juan laugh. "That's a good guess, but the real word is neuroscientist!" explains Juan.

"Wow! I would like to do that. It would be fun to study the brain and how it helps us think!" says Max.

"I told you being a scientist is fun," replies Juan.

Corty says, "Okay, I have a question for you. What do these scientists have in common? What makes them all good at being scientists?"

"Do they wonder how things work?" asks Julia.

"Are they curious about things?" asks Max.

"Do they love animals?" asks Julia.

"Do they like to read?" asks Max.

"Stop! You're both right!" says Beth. "Scientists have all those things in common. But most of all, they love to ask questions and find the answers."

"Yeah, and you two are really good at asking questions. So you know what that means?" asks Juan. "You have just earned the title of Junior Scientists. Congratulations!"

"Congratulations, Dr. Max," says Julia.

"Congratulations to you, too, Dr. Julia," says Max.

Max and Julia both take a big bow.



---

# BRAIN POWER NEWS

---

PARENT NEWSLETTER

VOLUME 1, NUMBER 1

---

## Introducing the NIDA Junior Scientists Program

Your child has been working on the first module of the *National Institute on Drug Abuse (NIDA) Junior Scientists Program*. Geared to students in kindergarten and first grade, the program discusses the following topics:

- Different kinds of scientists and the characteristics they all share;
- The research of specific scientists;
- The different functions of the brain;
- How to keep the brain healthy; and
- How to protect the brain.

The overall purpose of the program is to introduce young students to two key concepts—who scientists are and why their work is important, and the many functions of the brain. At the end of the program, students learn about the differences between helpful medicines and harmful substances. This background lays the foundation for a more in-depth study, during second through fifth grades, of the brain and how harmful drugs can affect it.

Although these children are very young, it is not too soon to begin educating them about drugs. Research has shown that having a foundation in the early grades helps children be better prepared to make good decisions when they are older. You will find that your child will be fascinated with what he or she is learning and capable of absorbing the information because it is being presented in a fun, age-appropriate way.

This newsletter is designed to provide you with information so you can reinforce at home what your child has been learning in school. Each module has a parent newsletter that includes the following:

- The content of the module;
- Activities you can do at home; and
- Additional resources.

We hope that you and your child enjoy working on the program together and that the knowledge gained now will serve your family well in the future.



## What Do Scientists Do?

In this first module, students drew pictures of scientists and then discussed their ideas about them. Through this activity, students realized that scientists aren't always white men who work in a laboratory, like Albert Einstein or the "mad" scientists shown in cartoons. Rather, scientists can be men and women from any ethnic group working in a variety of places—in the ocean, in the field, in brain imaging labs, and even in outer space. But all scientists share two key characteristics: curiosity and a desire to find answers to their questions about the world.

This activity aligns with a standard identified in the National Science Education Standards, "history and nature of science." These guidelines were developed in 1996 by the National Academy of Sciences to help schools know what information should be covered in kindergarten through high school. The standards stress the importance of teaching students that science encompasses many disciplines, but scientists in all areas develop questions and then strive to find the answers to them.

### Science at Home

How many different kinds of scientists can you name? Try to think of as many as you can with your child. Examples include: psychologist, biologist, chemist, neuroscientist, physicist, geologist, seismologist, oceanographer, and astronomer. Ask your friends for more examples. See how long your list can be!

### What Does Your Child Think?

Help your child write or draw his or her ideas about scientists and how those ideas have changed as a result of working on this activity.

### Additional Resources

National Institute on Drug Abuse (NIDA) — [www.drugabuse.gov](http://www.drugabuse.gov)  
301-443-1124

This Web site contains information about drug abuse and a section designed specifically for parents, teachers, and students. Publications and other materials are available free of charge.

National Clearinghouse for Alcohol and Drug Information (NCADI) — [www.health.org](http://www.health.org)  
1-800-729-6686

NCADI is the world's largest resource for information and materials concerning substance abuse. Many free publications are available here.



---

# NOTICIAS SOBRE EL PODER DEL CEREBRO

---

BOLETÍN INFORMATIVO PARA PADRES

VOLUMEN 1, NÚMERO 1

---

## Introducción al Programa Pequeños Científicos del Instituto Nacional Sobre el Abuso de Drogas

Su hijo ha estado trabajando en el primer módulo del Programa Pequeños Científicos (*Junior Scientists Program*) del Instituto Nacional Sobre el Abuso de Drogas (*National Institute on Drug Abuse o NIDA*). Dirigido a estudiantes del kinder y del primer grado, el programa explica los siguientes temas:

- Las diferentes clases de científicos y las características que comparten;
- Las investigaciones de científicos específicos;
- Las diferentes funciones del cerebro;
- Cómo mantener saludable al cerebro; y
- Cómo proteger al cerebro.

El propósito general del programa es presentar a los pequeños estudiantes dos conceptos clave: quiénes son los científicos y por qué su trabajo es importante, y las muchas funciones del cerebro. En el módulo final del programa, los estudiantes aprenden las diferencias entre medicinas útiles y sustancias dañinas. Estos conocimientos establecen la base para un estudio más profundo del cerebro y de cómo pueden afectarlo las drogas dañinas, el mismo que se lleva a cabo desde el segundo al quinto grado.

Aunque estos niños son muy pequeños, no es demasiado pronto para comenzar a educarlos sobre las drogas. Las investigaciones han demostrado que cuando los niños tienen una base en los primeros años de la escuela, están mejor preparados para tomar buenas decisiones cuando son más grandes. Debido a que el programa se presenta de un modo divertido y apropiado para la edad, verá que su hijo estará fascinado con lo que aprende y será capaz de asimilar la información.

Este boletín informativo está diseñado para brindarle información para que usted refuerce en el hogar lo que su hijo ha estado aprendiendo en la escuela. A cada módulo le corresponde un boletín informativo para padres que incluye lo siguiente:

- El contenido del módulo;
- Actividades que puede realizar en su hogar; y
- Recursos adicionales.

Esperamos que usted y su hijo disfruten trabajando juntos en el programa y que en el futuro su familia pueda beneficiarse del conocimiento adquirido ahora.



## ¿Qué hacen los científicos?

En el primer módulo, los estudiantes realizaron dibujos de científicos y luego platicaron acerca de las ideas que tienen sobre ellos. A través de esta actividad, los estudiantes se dieron cuenta de que los científicos no siempre son hombres blancos que trabajan en un laboratorio, como Albert Einstein o como los científicos "locos" que se ven en los dibujos animados. Al contrario, los científicos pueden ser hombres y mujeres de cualquier grupo étnico que trabajan en una variedad de lugares: en el océano, en el campo, en laboratorios de imágenes cerebrales e incluso en el espacio. Pero todos los científicos comparten dos características clave: la curiosidad y un deseo de encontrar respuestas a sus preguntas acerca del mundo.

Esta actividad se ajusta a un estándar identificado en los Estándares Nacionales de Educación Científica (*National Science Education Standards*), como "la historia y naturaleza de la ciencia". Estas pautas fueron desarrolladas en 1996 por la Academia Nacional de Ciencias (*National Academy of Sciences*) para ayudar a las escuelas a conocer qué información se debe cubrir desde el kínder hasta la escuela secundaria. Los estándares recalcan la importancia de enseñar a los estudiantes que la ciencia abarca muchas disciplinas, pero que los científicos de todas las áreas se hacen cuestionamientos y luego trabajan para encontrar las respuestas.

## La ciencia en el hogar

¿Cuántos tipos distintos de científicos puede nombrar? Con su hijo, trate de pensar en todos los que pueda. Algunos ejemplos pueden ser: psicólogo, biólogo, químico, neurocientífico, físico, geólogo, sismólogo, oceanógrafo y astrónomo. Pídales más ejemplos a sus amigos. ¡Observe cuán larga puede ser su lista!

## ¿Qué piensa su hijo?

Ayude a su hijo a escribir o dibujar sus ideas acerca de los científicos y cómo esas ideas han cambiado como consecuencia de trabajar en esta actividad.

## Recursos adicionales

*National Institute on Drug Abuse (NIDA)* — [www.drugabuse.gov](http://www.drugabuse.gov)  
301-443-1124

Este sitio Web tiene información acerca del abuso de drogas y una sección destinada específicamente a padres, maestros y estudiantes.

*National Clearinghouse for Alcohol and Drug Information (NCADI)* — [www.health.org](http://www.health.org)  
1-800-729-6686

El NCADI es el recurso mundial más grande para información y materiales relacionados con el abuso de sustancias. Aquí se pueden obtener muchas publicaciones gratuitas.



Brain Power



JUNIOR SCIENTISTS

• NIDA •

Brain Power



JUNIOR SCIENTISTS

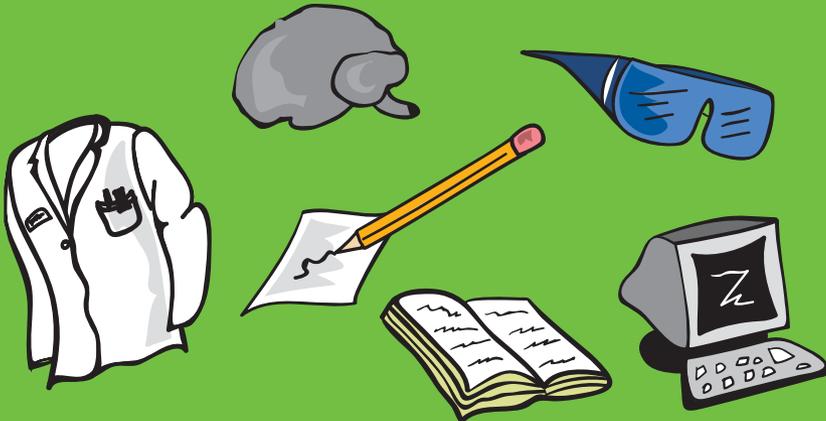
• NIDA •

Julia

◊ N/DA ◊

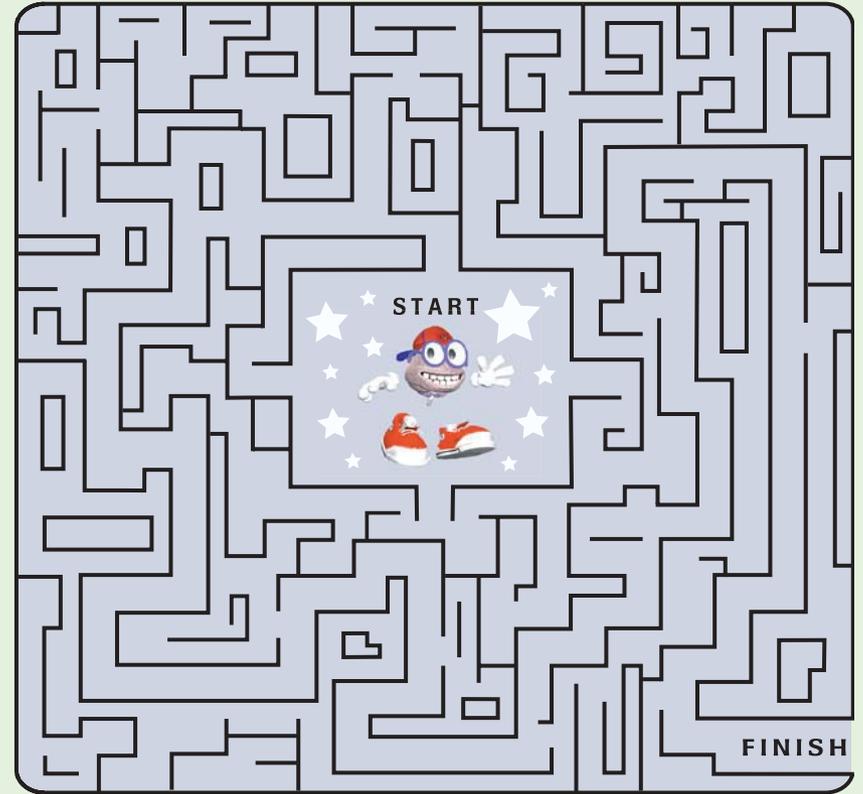


Julia loves science. Julia wants to be a scientist one day. What do scientists use?



Corty

◊ N/DA ◊



Corty is a brain. He helps the club members solve missions. Corty needs you! Help him get out of the maze.

Brain Power



JUNIOR SCIENTISTS

• NIDA •

Brain Power



JUNIOR SCIENTISTS

• NIDA •

## Brain Power! Club House **NIDA**



*Brain Power!* is a club. Kids in the club learn about science. If you want to be a Junior Scientist, you can learn about science, too!

## Who Can be a Scientist? **NIDA**

1. The number after seven   \_\_\_\_\_
2. A holder for flowers   \_\_\_\_\_
3. Dumbo was one   \_\_\_\_\_
4. The shape of a ball   \_\_\_\_\_
5. A toy that goes up and down   \_\_\_\_\_
6. Opposite of in   \_\_\_\_\_
7. A giraffe has a long one   \_\_\_\_\_
8. What you do at dinner   \_\_\_\_\_

Fill in the word puzzle above. Use the first letter of each response to answer the mystery question.

**Who can be a scientist?**

\_\_\_\_\_

Brain Power



JUNIOR SCIENTISTS

• NIDA •

Brain Power



JUNIOR SCIENTISTS

• NIDA •

Curiosity

◀ NIDA ▶

HOW? WHAT?  
WHY? WHO?  
WHERE? WHEN?

All scientists ask questions.  
They want to learn about the  
world. This is curiosity.

Beth

◀ NIDA ▶

Beth is a NIDA Junior Scientist.  
She helps Max and Julia learn  
about science.



Julia

•N/DA•

BRAIN POWER  
HEADQUARTERS

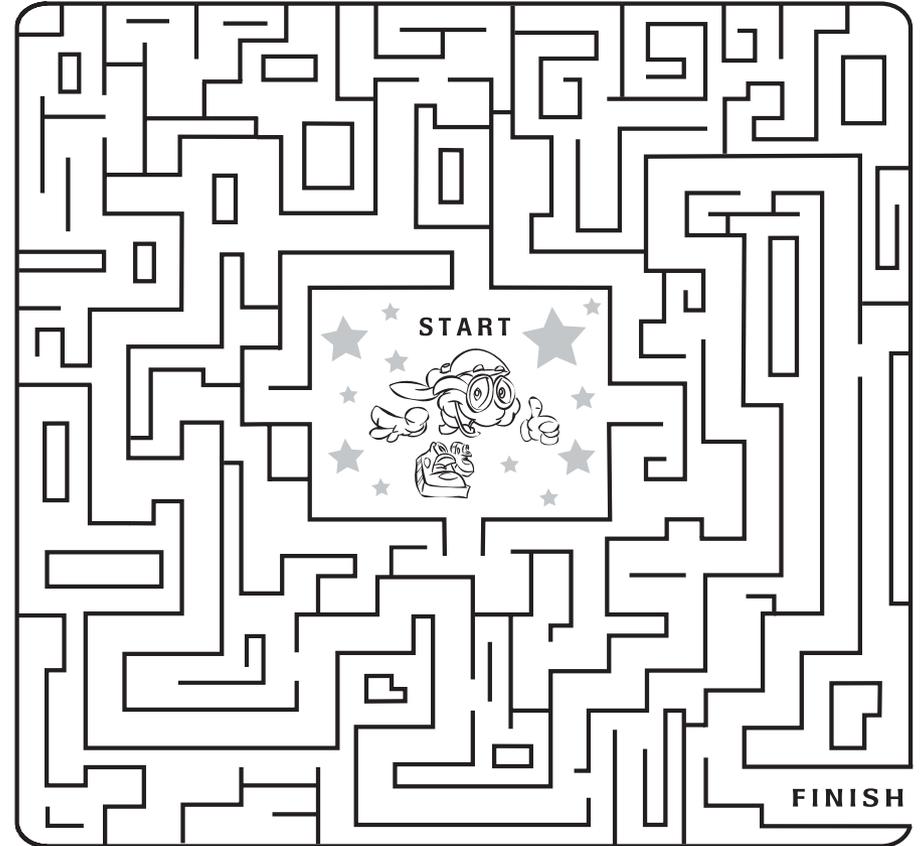


Julia loves science. Julia wants to be a scientist one day. What do scientists use?



Corty

•N/DA•



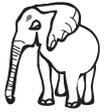
Corty is a brain. He helps the club members solve missions. Corty needs you! Help him get out of the maze.

# Brain Power! Clubhouse **N/DA**



**Brain Power!** is a club. Kids in the club learn about science. If you want to be a Junior Scientist, you can learn about science, too!

# Who Can be a Scientist? **N/DA**

1. The number after seven   \_\_\_\_\_
2. A holder for flowers   \_\_\_\_\_
3. Dumbo was one   \_\_\_\_\_
4. The shape of a ball   \_\_\_\_\_
5. A toy that goes up and down   \_\_\_\_\_
6. Opposite of in   \_\_\_\_\_
7. A giraffe has a long one   \_\_\_\_\_
8. What you do at dinner   \_\_\_\_\_

**Fill in the word puzzle above. Use the first letter of each response to answer the mystery question.**

**Who can be a scientist?**

\_\_\_\_\_

Curiosity

•N/DA•

HOW? WHAT?  
WHY? WHO?  
WHERE? WHEN?

All scientists ask questions.  
They want to learn about the  
world. This is curiosity.

Beth

•N/DA•

Beth is a NIDA Junior Scientist.  
She helps Max and Julia learn  
about science.



You Could Be A

# SCIENTIST

(The Muffin Man)

Are you ever curious?  
About the world,  
That you live in.  
Then, you could be a scientist,  
That's what you ought to be!

Do you care about the world?  
Its people and  
Its animals.  
Then, you could be a scientist,  
That's what you ought to be!

Are you very organized?  
Do you sort,  
And rearrange?  
Then, you could be a scientist,  
That's what you ought to be!

Are questions always on your mind?  
How does that work?  
What makes that fly?  
Then, you could be a scientist,  
That's what you ought to be!

Would you like to take a trip?  
To outer space,  
Beneath the sea.  
Then, you could be a scientist,  
That's what you ought to be!

These are things we like to do.  
We'll study hard,  
And learn a lot.  
So, we can all be scientists,  
Just you wait and see!



**NIDA**