

Caitlin's Amazing Day

A story about farming and

DNA!



Gayle Hori

Jessica Radovich

Ania M. Wiczorek



University of Hawaii at Mānoa
**Biotechnology
Outreach Program**

This book was developed for the
Biotechnology Outreach Program
under the direction of
Ania Wieczorek, PhD
ania@hawaii.edu

For information about this book contact:
Biotechnology Outreach Program
College of Tropical Agriculture and Human Resources
University of Hawaii at Manoa
3190 Maile Way, St. John 102
Honolulu, HI 96822
(808) 956-7058

See our websites for additional resources:
www.ctahr.hawaii.edu/biotech
www.ctahr.hawaii.edu/geneius-day

Design & Illustrations by
Jessica Radovich & Gayle Hori

All rights reserved, including the right of
reproduction in whole or in part or in any form.
Copyright 2009 College of Tropical Agriculture and Human Resources
University of Hawaii at Manoa



Caitlin's Amazing Day

A story about farming and DNA

Today is an exciting day, class!
We are going to learn about the
double-helix shape of DNA.
This is so cool because...



One day in science class, after
staying up WAY too late playing
video games...



Caitlin is getting sleepier



and sleeper,

and when she wakes up....



"THIS JUST IN FOLKS... WE HAVE WORD THAT ALL...YES, ALL FARMERS DECIDED TO GO ON VACATION!"
WHERE HAVE THEY GONE? ARUBA? JAMAICA?

Hmmmm?
What is going on here?



The Daily Times Honolulu SECTION 3

HEADLINE NEWS

NO FARMERS = NO FOOD!

What will we do? Where will our food come from? Does this mean there are no more snacks? How can we survive? Where did all the farmers go and when will they be back? How are we going to be able to solve this problem? We need help and we need it fast!



Will we Starve?

No food?
We have plenty of food in the kitchen...



What?!?!
No food in the fridge!
Hmmm...that means no
fruits and veggies



No cereal...No chips...No cheezie puffs!
Ahhhh! The snack cabinet is
empty, too!!

OR is it?



and Cookies...
No Cookies?!
How can I survive
with NO COOKIES!



HEY! WHERE DID ALL THE
FOOD GO ?!?!

Whoa...
A Talking Cockroach!



Who are you?

MOCHI

Mochi! Where?
Hey, do you see food?

NO! MY NAME
IS MOCHI



Oh, well, Mochi, I think there
is no food because the farmers
left their farms.

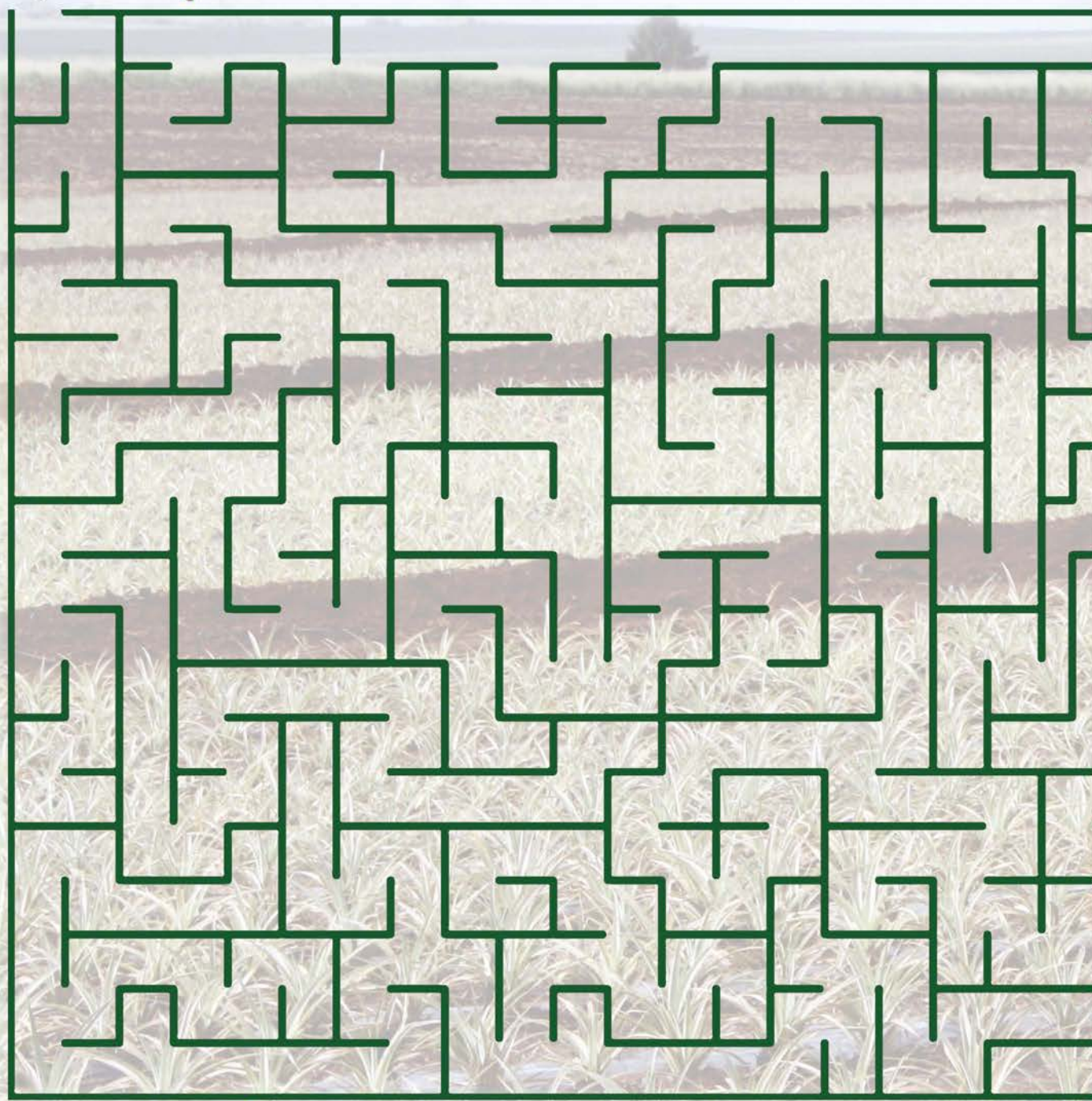
YEAH, WELL I ATE AT A FARM
JUST LAST WEEK. LET'S GET OVER
THERE AND SEE WHAT'S GOING ON!



Did you know ? There are over 7,000 farms



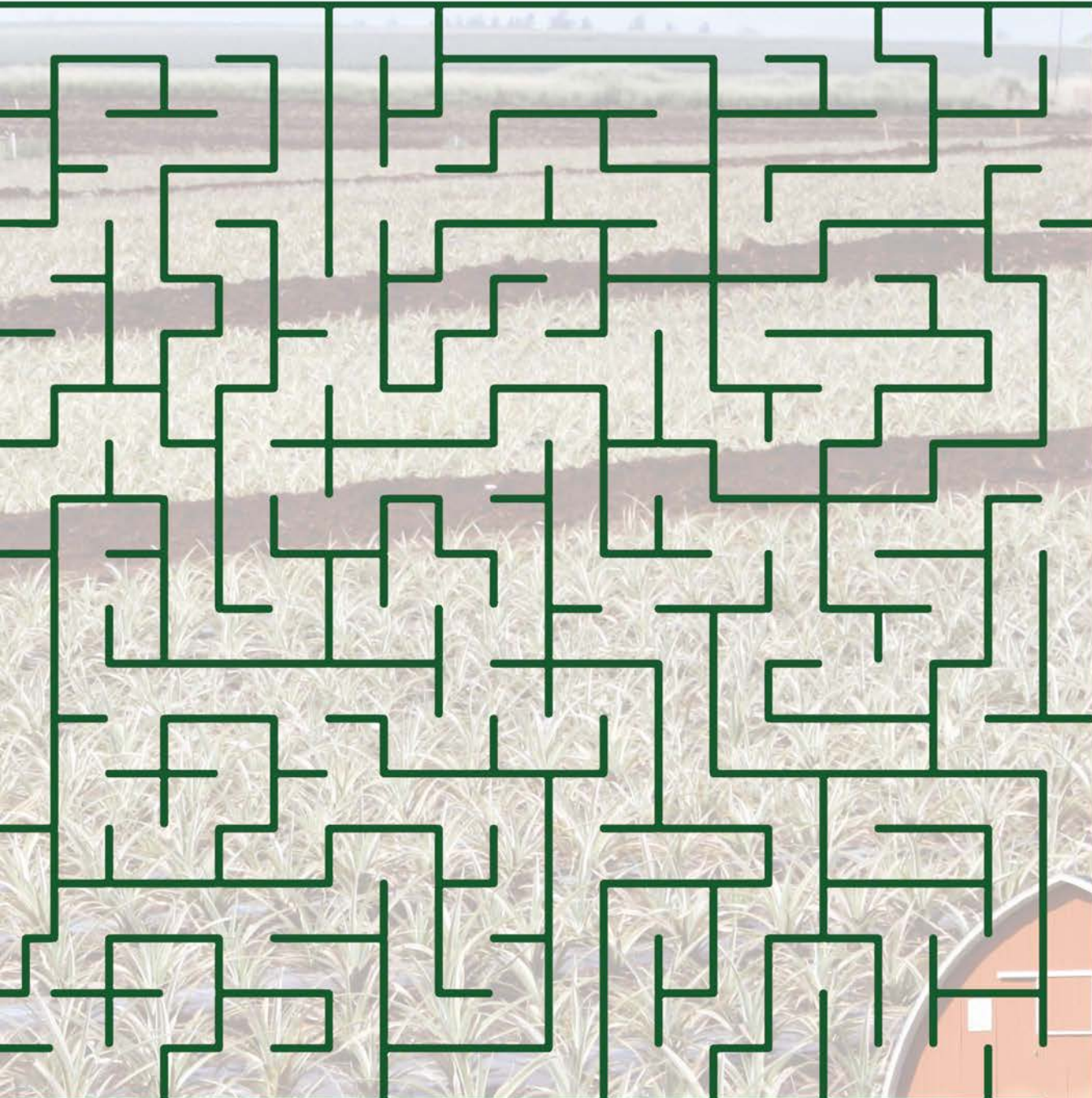
Start Here
grows coffee and macadamia nuts *



about 150 acres * Hawaii is the only state that

Help Caitlin & Mochi Find Their Way to the Farm!

in Hawaii * Seed Crops, Pineapple & Sugarcane are



Hawaii's most valuable crops * Farmland covers

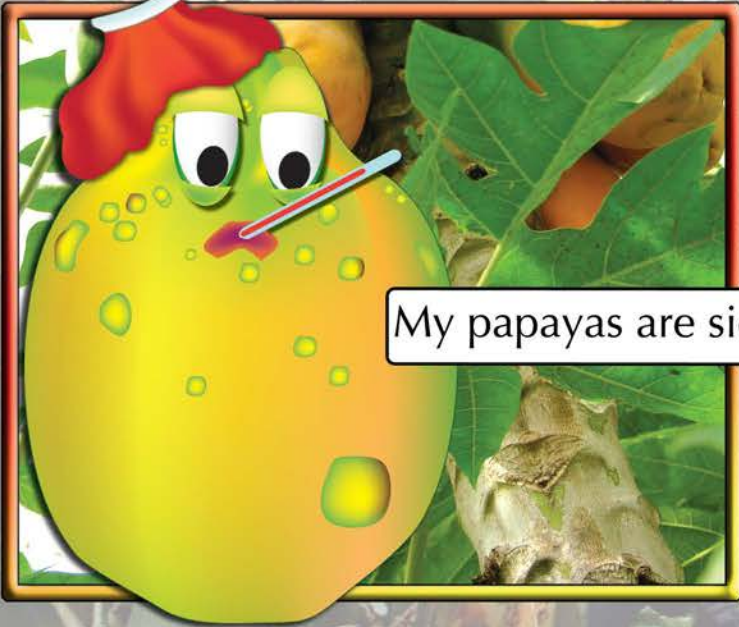
about 40% of Hawaii! * The average farm is

At The Farm!





The wind is blowing my crops down.

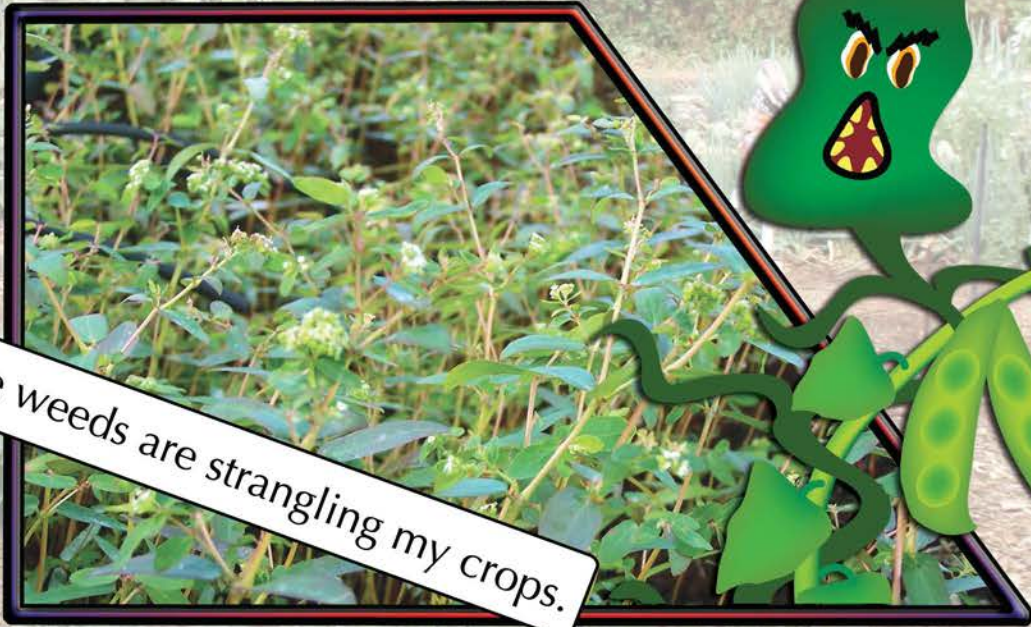




Insects are eating the corn.



The rain is flooding my fields.



The weeds are strangling my crops.

If only we had HELP
to make farming easier!



Did I hear
someone say
they need help?!?!

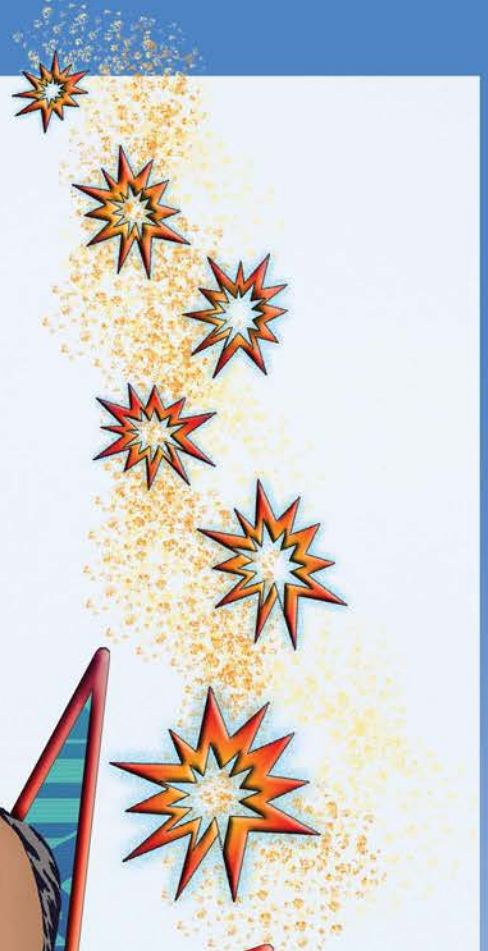
Who are you?



I'm the scientist who can
help you with your problems.
Hold on a minute...I have
just the rap for you!

RAP?!

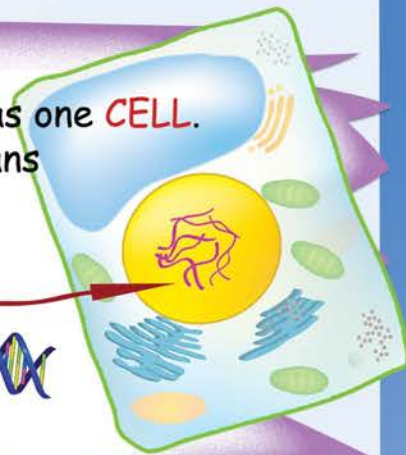
KAZAM!



Well, I'm the Rappin' Researcher
and I'm here to say....
That answers to your problems
are found in DNA!

Every living thing begins as one **CELL**.
That means not only humans
but **PLANTS** as well.

If you look inside the cell
at the **NUCLEUS**
you'll find the **DNA**
that's important to us.



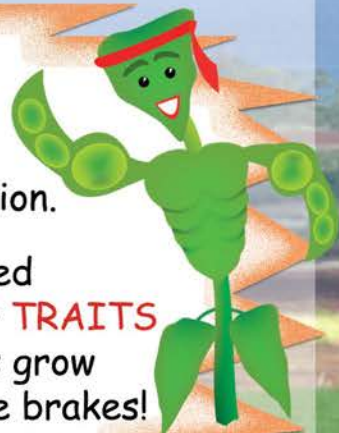
DNA is what makes
all the different **TRAITS**.
It's why we have sweet or sour apples
or red or green grapes.

Traits are cool
and traits are neat
So listen up
and feel the funky beat!

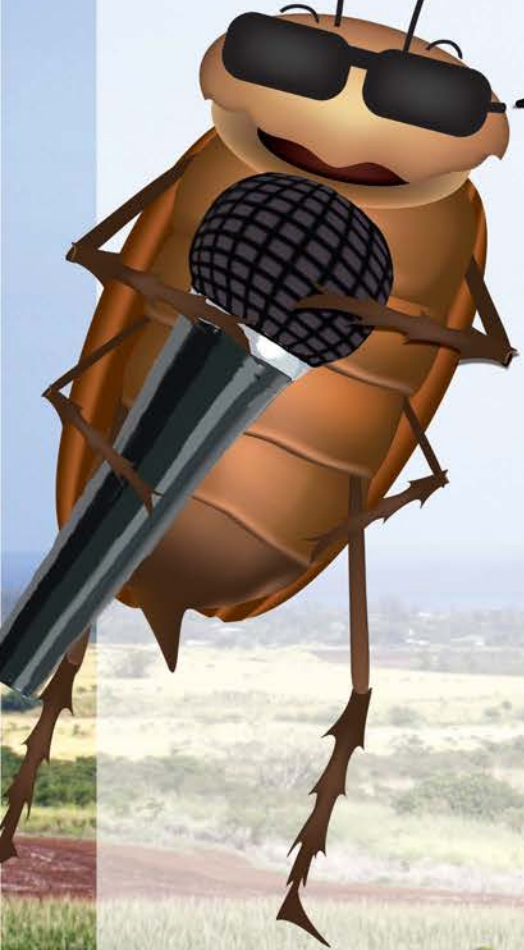


All the farmers
took a vacation
cause' it can get hard
to feed the whole nation.

What our farmers need
are crops with better **TRAITS**
that will let the crops grow
without putting on the brakes!



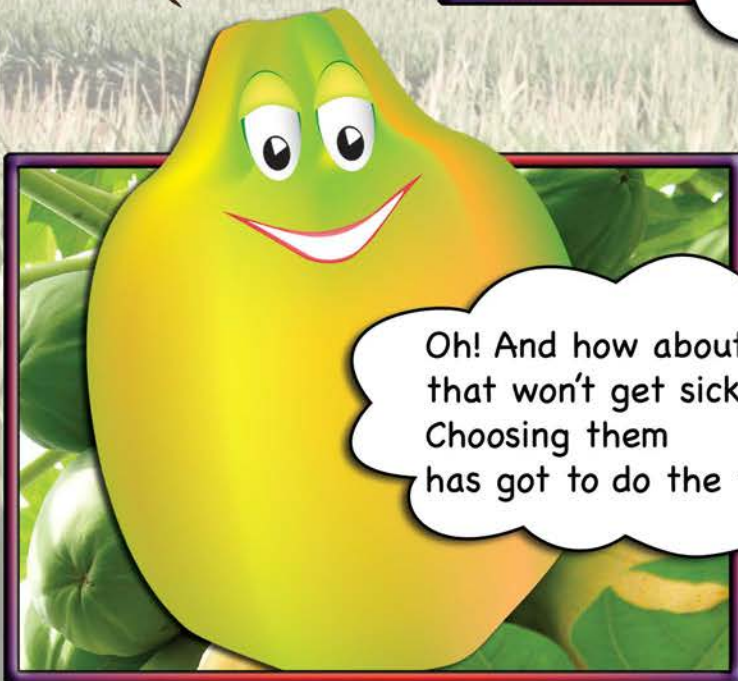
OH! I GET IT!
DNA IS WHAT GIVES
PLANTS DIFFERENT TRAITS.
FARMERS NEED PLANTS
WITH THE BEST TRAITS.



MOVE ON OVER
AND LET ME GRAB THE MIC.
WHAT WE'RE GONNA NEED
IS THE CORN BUGS DON'T LIKE!



Another trait
that a crop needs
is to keep growing strong
while the farmers fight the weeds.



Oh! And how about papaya
that won't get sick.
Choosing them
has got to do the trick!



Wow! You're awesome!
You're right on track.
But there's a few more traits we need
before we all come back...



I know what
you could use!
What about some plants
that won't take abuse
from wind or floods
or dry drought weather...



Now let's get these farmers and scientists
to all work together!



"THIS JUST IN... FARMERS WORK WITH SCIENTISTS TO MAKE FARMING EASIER! ALL FARMERS NOW GOING BACK TO FIELDS! FOOD CRISIS IS OVER!"



Hey! Where are you going?

Now that I know what traits my plants need I'm going back to my fields. I've got food to grow!



Yay! Food! Let's Eat!

YEAH, I'M STARVING!

Wait a Minute!



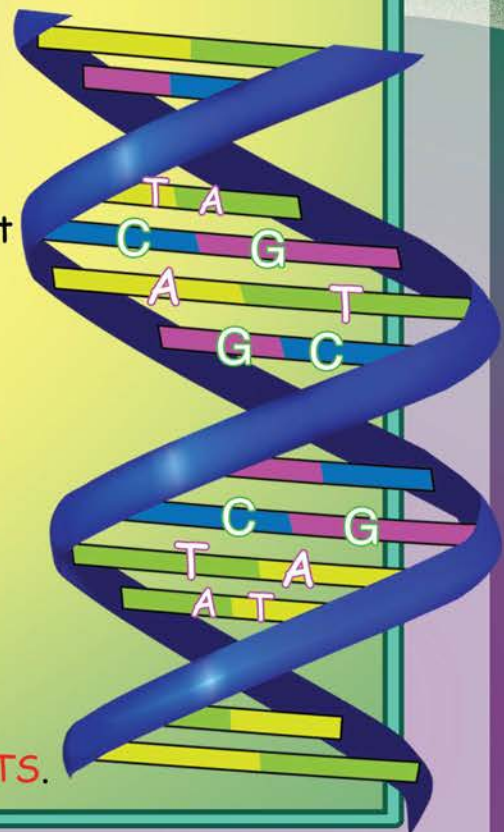
Check out my DNA Decoder Activity on the back page!

There's one more thing I'd like to say. There are four **BASES** inside of **DNA**

These **BASE** pairs are the secret to all those special **TRAITS**. The order that they come in decides what's on our plates.

The bases are the **MOLECULES** called **A, T, G, and C**. They join to form a code that is read in groups of three.

The code is like a language that the **CELL** translates into things called **PROTEINS** that combine to make the **TRAITS**.



Hey, do you hear something?



BBRRRRRING!!!
Okay everyone, that's the lunch bell. That means you too Caitlin. Wake Up!



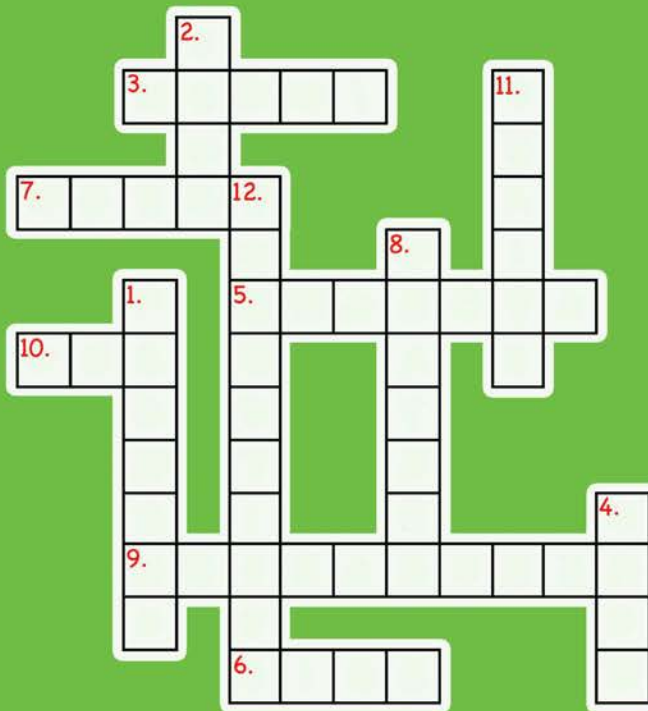
Whoa... What a cool dream!

Caitlin's Crossword

Help Caitlin tell her friends about her dream by filling in the blanks and entering the words into the crossword puzzle.

I fell asleep in class today and had the weirdest dream! In my dream the (1)_____ had all gone on vacation so there was no (2)_____. When I looked in the cupboard for something to eat there was nothing but a talking cockroach named (3)_____. We went to a farm and talked to the farmer. He said that it is hard to (4)_____ food because (5)_____ eat the crops, plants get (6)_____, (7)_____ choke the fields and sometimes there is bad (8)_____ with too much wind and rain. Then this weird Scientist, the Rappin' (9)_____, shows up and starts rapping about (10)_____. He says that DNA is what makes all the different (11)_____. Different traits in plants tell whether or not a plant will get sick or can stand up to weeds. So, Mochi and I figured that the (12)_____ should work with the farmers to choose plants with traits that make them easier to grow. Then the farmers went back to work and we all had food!

THE END!



Food for Thought!

Think about what kinds of food farmers need to grow so that Mochi can grind his Ono-licious Saimin.....



This project is supported by grants awarded to Dr. Ania Wiczorek by these organizations:

College of Tropical Agriculture and Human Resources

USDA - Agricultural Research Service

DNA Decoder Activity

Answer this silly question by using the decoder key to figure out which letter goes with each coded set of 3*

Question:

Why did Mochi eat at a Bank?

Answer:

agc ttc ctc gtc ccg tca ttc gtg

tca cac ttc gtc tca

att ggg cta agc aac cac cac gtg !

*The base "+" changes to "u" in transcription, when the DNA is read in the nucleus.

Decoder Key:

A B C D E F G H I
gtc aaa cta gtg ttc aac tag agc ggg

J K L M N O P Q R
tga tcc aat aca ccg cac aga taa att

S T U V W X Y Z
ttg tca caa aag ctc ttt atc ccc