The Food and Agriculture Organization of the United Nations reported three top reasons why over a quarter of a billion do not have enough food. Name these three reasons by decoding the jumbled words below:

One of the tools that we can use to increase food supply is gene editing! Scientists improve the yield of crops, make them resistant to diseases and pests, or make them resilient to stressful conditions.

Answers: events, war, climate

Biotech QuizBox

All About Gene Editing

Writer: Kristine Grace Tome
Illustrator: Steph Bravo-Semilla
Layout artist: Eric John Azucena
Editor: Dr. Rhodora Romero-Aldemita
Proofreaders: Clement Dionglay and Zabrina Bugnosen

Guess the word

predictable

(steven)

conflict or

meat conflict

extremes

Answers: CRISPR, TALEN, meganuclease, zinc finger

Pretend to be a scientist and edit the following words to make them correct.

Just like editing words, scientists can either delete a gene, insert a gene, or silence a gene in the DNA of an organism to make a targeted change.

CRISPER

TALN

MEGANUCLESE

ZINK FINGER

Be a scientist!

It’s time to wear an apron and be a chef for today! In the Philippines, Tropic’s reduced browning banana is now available! This can be used to bake banana bread! If this is unavailable in your place, you may use Cavendish banana. After mashing them, record how long it takes for the flesh to turn brown.

Some people throw away brown-colored bananas, turning them into waste! Scientists developed reduced-browning bananas so that there will be less food waste.

Future chef

Name five (5) differences that you observed:

Check out the following images and spot five differences.

Answers: mosquitoes, less animals, less plants, hotter temperature, dry soils/drought

These differences are the big changes happening on our planet over time that impact our way of life. Scientists use gene editing to help plants and animals cope with these changes.

Procedure

1. Preheat oven to 350 degrees F (175 degrees C). Grease and flour the loaf pan.
2. Lightly roast walnuts in a skillet over medium heat, stirring constantly, until fragrant and lightly browned. Let cool slightly, then chop coarsely.
3. Cream the butter and sugar until light and fluffy in a large bowl. Beat in the bananas and eggs one at a time, then stir in the vanilla.
4. Whisk together the flour, baking soda, and salt in a separate bowl. Gradually add to the wet ingredients, mixing until just combined. Stir in the walnuts and raisins.
5. Pour the batter into the prepared loaf pan and bake for 55-60 minutes, or until a toothpick inserted into the center comes out clean. Let it cool in the pan for 10 minutes before removing to a wire rack to cool completely.

Banana Bread Recipe

Ingredients

- 3 large ripe bananas
- 1/2 cup butter
- 3/4 cup granulated sugar
- 2 large eggs
- 1 1/2 cups all-purpose flour
- 1 tsp baking soda
- 1/2 tsp salt
- 1/4 tsp vanilla powder
- 1 cup walnuts
- 1/2 cup chocolate chips

Bake a Banana Bread

Doing scientific research can be hard, but scientists also say that it is fun!!! Why don’t you enter the world of science by joining a research team for a day? Here’s how you can do this:

1. Contact a nearby research lab and ask if you could visit to find out more about their research.
2. Ask the researchers if you could try out any of their lab equipment or field instrument.
3. Share your experience on Facebook, Instagram, Youtube or any social media platform, tag ISAAA, and get the chance to be featured in one of our campaigns!

Spot the difference

Let’s keep connected

Are you interested to do more activities to learn more about gene editing? Check out the Double Helix magazine and the activities we have prepared for you there. Ask your friends to perform the activities with you so that you can also share the fun and lessons with them. Enjoy!

Be a science champion

Citizen science

Don’t forget to like and share our social media accounts to get more updates on gene editing!

/isaaa.org
/isaaa_org
/user/isaaavideos
How can we help plants provide our needs?

Do you want to know what gene editing is? You got the
improvement is called gene editing.

What is gene editing?

Gene editing is the process of making a
Canola

What are the gene-edited products in the market?

Genomes.

How does gene editing work?

How to use this booklet?

1. Read pages A to H to know the answers to common
2. Flip the booklet and get ready for a fun challenge.
3. Do the tasks on pages 1 to 8.

Do you want to know more?

Gene editing uses different tools and processes.

Are you ready to take the challenge?

Are you ready to learn more?

Gene editing vs. genetic engineering

The most famous tool is CRISPR, which stands for

What can we do to appreciate gene editing more?

Wild plants have changed significantly. At present,

Scientists can modify the characteristics of crops

Is gene editing safe?

Some applications of gene editing have different ways to answer this question. Some

Gene-edited products available in the market today have been

What are the gene-edited products available in the market?

ISAAA, the same team who created this sQuizBox, has a

Dock your smartphone to scan the QR

Do the tasks on pages 1 to 8.

Are you ready to take the challenge?

Take the QR code to the URL below:

www.isaaa.org/subscribe.

Do you want to know more?

What is CRISPR, CRISPRa, CRISPRi?

CRISPR stands for Clustered Regularly

How to use this booklet?

something new. Enjoy!

Hello,

Use your smartphone to scan the QR

Do you want to know more?