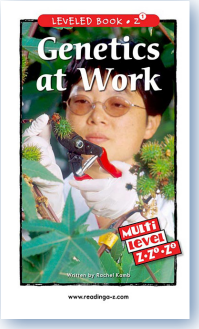
Focus Question:

How has the science of genetics changed over time?



Book Summary

Text Type: Nonfiction/Informational

Genetics at Work explores the role that genetics plays in our growing world. The field of genetics is an ever-changing and rapidly expanding branch of science. From farming to crime fighting and disease prevention, genetics is shaping our future. Students will have the opportunity to learn more about these advancements while practicing the skills of summarizing and identifying main ideas and supporting details.

The book and lesson are also available for levels Z and Z2.

Lesson Essentials

Instructional Focus

- ❑ Summarize to understand text
- ❑ Determine main ideas and supporting details
- ❑ Describe information provided by captions
- ❑ Recognize and use adverbs
- ❑ Place words in alphabetical order

Materials

- ❑ Book: *Genetics at Work* (copy for each student)
- ❑ Main idea and details, adverbs, alphabetical order worksheets
- ❑ Discussion cards
- ❑ Book quiz
- ❑ Retelling rubric

Vocabulary

Boldface vocabulary words also appear in a pre-made lesson for this title on VocabularyA–Z.com.

- **Words to Know**

  Story critical: ***DNA*** *(n.)*, ***genes*** *(n.)*, ***genetics*** *(n.)*, ***hybridization*** *(n.)*, ***inherited*** *(adj.)*, ***selective breeding*** *(n.)*

  Enrichment: ***captive breeding*** *(n.)*, ***characteristics*** *(n.)*, ***diversity*** *(n.)*, ***heredity*** *(n.)*, ***propagate*** *(v.)*, ***traits*** *(n.)*

- **Academic vocabulary:** *effects (n.), evidence (n.), features (n.), potential (adj.), produce (v.), techniques (n.)*

Guiding the Reading

Before Reading

Build Background

- Write the following question on the board and read it aloud to students: *Why do family members look alike?* Have them discuss this question in small groups. Invite students to share their responses with the class.
- Point out to students that characteristics such as hair color, eye color, body shape, and so on are all *traits* that are passed down in families. Write the word *traits* on the board. Explain that the field of science that studies how living things pass down these traits is called *genetics.*

Introduce the Book

- Give students their copy of *Genetics at Work*. Guide them to the front and back covers and read the title. Have students discuss what they see on the covers. Encourage them to offer ideas as to what type of book it is (genre, text type, and so on) and what it might be about.
- Show students the title page. Discuss the information on the page (title of book, author's name).
- Preview the table of contents on page 3. Remind students that the table of contents provides an overview of the book. Ask students what they expect to read about in the book, on the basis of what they see in the table of contents. (Accept all answers that students can justify.)

Introduce the Comprehension Skill:

Main idea and details

- Explain to students that every book has a *main idea*, which is the most important idea of the book. Point out that *details are* the information that supports the main idea. Invite students to review the title and cover pages of the book. Have them turn to a partner and make a prediction about the main idea of the book.
- Have students turn to page 3 and review the table of contents. Point out that oftentimes in a nonfiction book, the text is broken into sections and that

Guiding the Reading *(cont.)*

these sections are listed in the table of contents. Explain that each section of the book contains a main idea and supporting details and that the title of each section is often a good clue about the main idea. Have students work with a partner to predict the main idea of each section on the basis of the information in the table of contents. Invite students to share their findings with the class.

Introduce the Reading Strategy: Summarize

- Explain to students that effective readers pause while they are reading to consider the most important details and to summarize what they have read. Point out that a summary includes information such as *who, what, where, why,* and *when*. Explain that a summary may be created for the entire book or for each section of the book.
- Read the section titled "Introduction" aloud to students. Have students work with a partner to summarize this section. Remind students to include only the most important details in their summary. Have students share their summaries with the class.

Vocabulary

Have students turn to the "Words to Know" box on the title page. Discuss each word with students. Then, have students turn to the glossary on page 24. Explain that the glossary provides definitions for the vocabulary words in the book. Point out the use of each content word and academic vocabulary word in the book, and then use each word in a different model sentence. Have students work in groups to create posters for these words. Have them include on each poster the word and its part of speech, the definition, the word in an example sentence, and a picture illustrating the meaning of the word.

Set the Purpose

- Have students read to find out more about the field of genetics. Write the Focus Question on the board. Invite students to look for evidence in the book to support their answer.
- Have students make a small question mark in their book beside any word they do not understand or cannot pronounce. These can be addressed in a future discussion.

During Reading

Text-Dependent Questions

As students read the book, monitor their understanding with the following questions. Encourage students to support their answers by citing evidence from the book.

- *What is the field of genetics?* (level 1) page 5
- *How is selective breeding of crops today similar to how it was thousands of years ago?* (level 1) page 6
- *How might genetically altering crops and animals affect their genetic diversity?* (level 3) multiple pages
- *What are the pros and cons of genetically modified organisms?* (level 1) page 9
- *In what ways has selective breeding of dogs changed from selective breeding in the past?* (level 2) pages 11–13
- *How do detectives use DNA to help solve crimes?* (level 2) pages 17–20
- *How has the medical field changed with the advancement of genetics?* (level 1) page 21
- *How is the field of genetics growing and changing?* (level 3) multiple pages

Text Features: Captions

Explain that captions are the texts that help the reader understand the accompanying photographs and illustrations. Point out that in *Genetics at Work,* the author provides many photographs with captions to support the reader's understanding of the text. Have students turn to page 7 and read the caption. Ask students the following questions: *How does this caption help you understand the photograph? How does the caption help you understand hybridization of plants? Why did the author choose to include a caption with this photograph?* Invite students to share their responses with the class. Have them work with a partner to read other captions in the text and discuss why the author included that information.

Skill Review

- Have students reread the section titled "Animal Breeding." Guide students in a discussion about the main idea of this section. Ask students how they were able to identify the main idea. Next, have volunteers offer details from the text that support the main idea.
- Have students work in small group and assign each group a section from the book. Explain that each group will identify the main idea of the section and at least three supporting details. Have students share their findings with the class.
- Model identifying key details of the text to create a summary.
  Think-aloud: *As I read a book, I pause often to think about the most important details and summarize what I just read. Effective readers pause at the end of each section of a book to summarize. For example, after reading the section titled "Health," my summary might include the following:* Genetics is used in the medical world to diagnose, treat, and prevent diseases as well as to create new medicines. Genetics is also used to help parents who may pass down genetic disorders to their children. Some of these disorders include cystic fibrosis, Huntington's disease, and breast cancer.
- Have students work in the same groups to summarize the section of the book that their small group previously worked on to identify the main

Guiding the Reading *(cont.)*

idea and supporting details. Remind students that a summary includes only the most important details, including *who, what, where, when,* and *why.* Point out that considering the main idea and supporting details will help them create the summary. Invite each group to share their summary with the class.

- Model and discuss how to complete the main-idea-and-details worksheet, using evidence from the text. Have students discuss the details they noted with a partner.

After Reading

Ask students what words, if any, they marked in their book. Use this opportunity to model how they can read these words using decoding strategies and context clues.

Skill Review

Graphic Organizer: Main idea and details

Review the main-idea-and-details worksheet that students completed. Invite volunteers to share with the rest of the class the section from the book they chose, and have students share the main idea and supporting details of the section. Discuss with students how identifying the main idea and supporting details helps them create an effective and concise summary.

Comprehension Extension

Discussion cards covering comprehension skills and strategies not explicitly taught with the book are provided for extension activities.

Response to Focus Question

Have students cite specific evidence from the book to answer the Focus Question. (Answers will vary but students should include the idea that the field of genetics is a relatively new branch of science and that new developments are being made constantly. Additionally, students should note that genetics has become an integral part of many occupations, including farming, health care, law enforcement, and so on, causing scientists to continue their research in this field.)

Comprehension Checks

- Book quiz
- Retelling rubric

Book Extension Activities

Build Skills

Grammar and Mechanics: Adverbs

- Explain to students that an *adverb* is a describing word that provides details about a verb by telling *how, when,* or *where* an action occurred. Point out that many, but not all, adverbs end in *-ly.* Explain that writers often use adverbs to make their writing more accurate, factual, and precise.
- Have students turn to page 9 and reread the third sentence on the page. Invite a volunteer to identify the adverb in this sentence *(currently).* Have a different volunteer point out the verb that the adverb describes *(experimenting).* Point out that the adverb *currently* tells when.
- **Check for understanding:** Have students look through the book to circle the adverbs and underline the verb that each adverb describes. Ask them to share with a partner four adverbs they found and explain whether each adverb describes *how, when,* or *where* an action occurred.
- **Independent practice:** Introduce, explain, and have students complete the adverbs worksheet. If time allows, discuss their answers.

Word Work: Alphabetical order

- Review or explain the process of putting a list of words in alphabetical order. Remind students that if the first letters of two words are the same, they must compare the next two letters instead.
- Write the words *genetics* and *breeding* on the board. Have a volunteer explain which word would appear first in alphabetical order *(breeding)* and why (because *Bb* comes before *Gg* in the alphabet).
- Write the words *genetics* and *genes* on the board. Point out that these words begin with the same letter. Ask a volunteer to tell which word would appear first in alphabetical order and to explain why *(genes* because the fifth letter in *genes* comes before the fifth letter in the word *genetics).*
- Write the words *gene* and *genes* on the board. Have a volunteer explain which word would appear first in alphabetical order *(gene)* and why. Point out that all the letters in *gene* and *genes* are the same until the final letter *Ss* in the word *genes.* Explain that because there are no other letters at the end of *gene,* it comes first in alphabetical order.
- **Check for understanding:** Write the words *genetic, genes, inherit, endanger, heredity, endangered,* and *selective* on the board. Have students write the words in alphabetical order on a separate piece of paper. Discuss their answers and rationale aloud.
- **Independent practice:** Introduce, explain, and have students complete the alphabetical order worksheet. If time allows, discuss answers aloud after they are finished.

Connections

- See the back of the book for cross-curricular extension ideas.