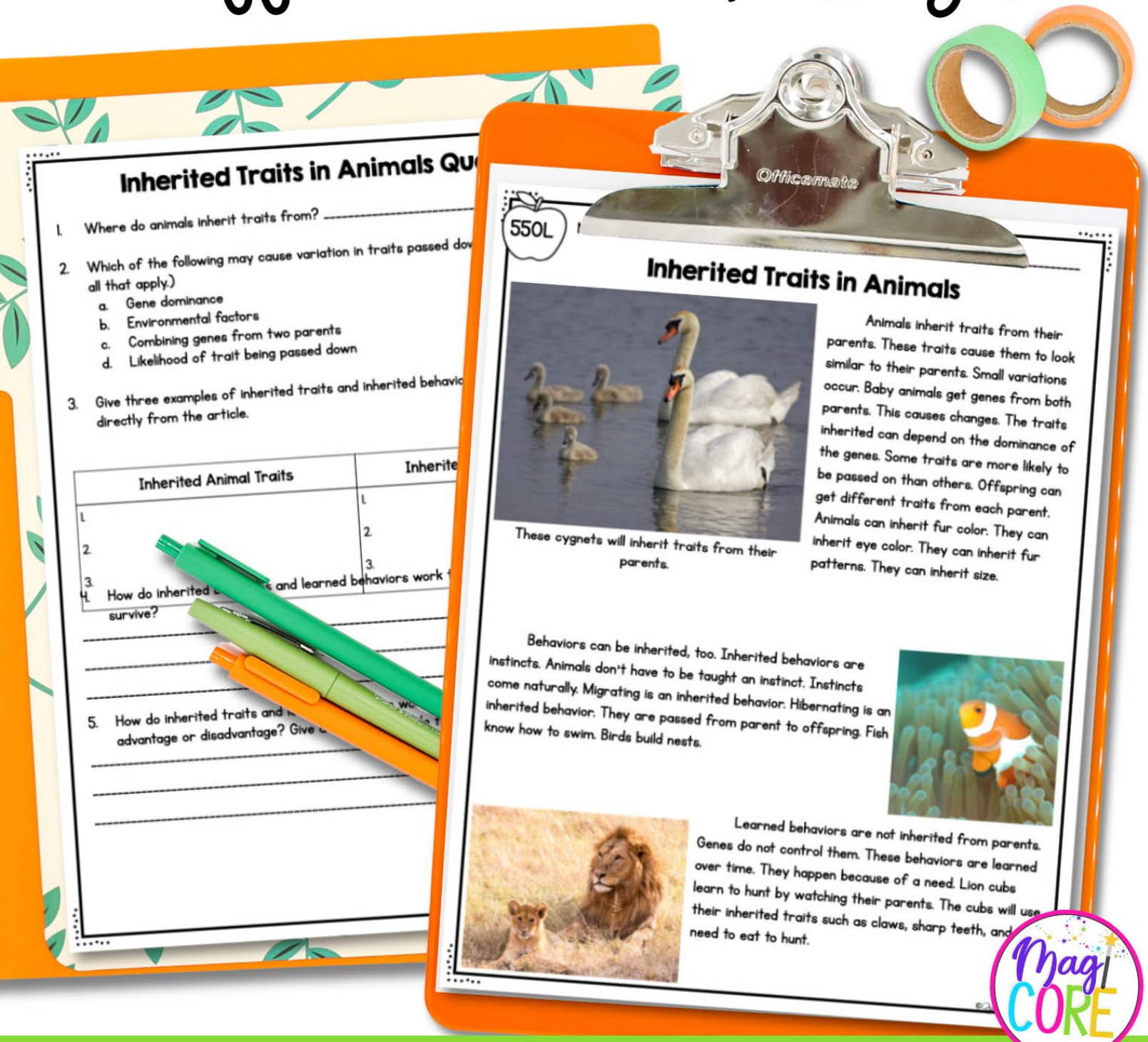
INHERITED TRAITS IN PLANTS & ANIMALS

differentiated passages

LEXILE



MagCORE

3rd Grade NGSS 3-LS3-1

ABOUT LEXILE LEVELS

MagiCore is a certified Lexile® Partner. These texts are officially measured and approved by Lexile and MetaMetrics® to ensure appropriate rigor and differentiation for students.

The Lexile Framework® for Reading measures are scientific, quantitative text levels. When the Lexile of a text is measured, specific, measurable attributes of the text are considered, including, but not limited to, word frequency, sentence length, and text cohesion. These are difficult attributes for humans to evaluate, so a computer measures them.

Common Core State Standards uses Lexile level bands as one measure of text complexity. Text complexity ranges ensure students are college and career ready by the end of 12th grade. Lexile measures help educators scaffold and differentiate instruction as well as monitor reading growth.

Grade Band	Lexile® Bands Aligned to Common Core Expectations
K-1	N/A
2-3	420L-820L
4-5	740L-1010L
6-8	1185L-1385L

Keep in mind when using any leveled text that many students will need scaffolding and support to reach text at the high end of their grade band. According to Appendix A of the Common Core Standards, "It is important to recognize that scaffolding often is entirely appropriate. The expectation that scaffolding will occur with particularly challenging texts is built into the Standards' grade-by-grade text complexity expectations, for example. The general movement, however, should be toward decreasing scaffolding and increasing independence both within and across the text complexity bands defined in the Standards."

Inheritance and Variation of Traits

3rd grade

Table of Contents

Each passage set includes two differentiated passages on a third-grade level (one at the beginning of the band, one towards the end) and a question set geared towards comprehension and science mastery. The first question is differentiated to include a fill-in-the-blank diagram (lower complexity) or an open-ended diagram (higher complexity).

How to Use This Resource

This resource was created with the NGSS Science Standards in mind. It includes six differentiated passages aligned to the following standard:

3-LS3-1: Inheritance and Variation of Traits

Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms. (Patterns)

Clarification Statement: Patterns are the similarities and differences in traits shared between offspring and their parents, or among siblings. Emphasis is on organisms other than humans.

Assessment Boundary: Assessment does not include genetic mechanisms of inheritance and prediction of traits. Assessment is limited to non-human examples.

Here are some suggestions for using these passages:

- Use as independent work after you have taught an overview of this standard. Assign the different levels based on the passage students can read and comprehend independently.
- Use as a reading center to reinforce key comprehension and science concepts at the same time!
- Use as a homework or review packet.
- Use as an intervention for students who need to revisit science concepts.

480L

Name: _____ Date: _____

Inherited Traits in Plants

Living things have **traits**. A trait is a characteristic. What something looks like is a trait. Ability is a trait. Traits can be inherited. An inherited trait comes from the parents. It is passed to the **offspring**. Height is inherited. Color is inherited. Shape and size are inherited. A cactus inherits spines. An evergreen tree inherits needles. Plants have inherited abilities. Roots grow down. Stems grow up. Leaves face the sunlight. Inherited abilities help the plants to survive.

The traits that get passed from parent plants to offspring plants depend on the **genes** of the parent plants. Genes carry information. These genes from parent plants combine in the offspring plant. Some traits will be shared between parent plants and offspring plants. Other traits will not. This is why parent plants and offspring plants have **similarities** and **differences**.

Traits may also be **acquired**. This means they are not inherited. Acquired traits happen to the plant. The plant learns to survive. A tree that has been slashed by a saw blade will have a scar on its bark. That scar didn't come from the parent trees. It will not be passed to the next generation of trees. Acquired traits are a response to something that happened in the plant's environment.

We can **analyze** inherited traits. Look at similarities and differences in plants. The plants can be **classified**. They can be sorted into groups based on features. Analyzing traits helps us see patterns. These patterns help us understand plants.

800L

Name: _____ Date: _____

Inherited Traits in Plants

Every living thing has **traits**. A trait is a characteristic. It includes things like physical features and certain abilities. When a trait is **inherited**, it comes from the parents. It is passed to the **offspring**, or the young of a species. In plants, characteristics such as height, flower color, and leaf shape are all inherited physical features. A cactus, for example, inherits spines. An evergreen tree inherits needles. Roots growing down, stems growing up, and leaves facing the sunlight are examples of inherited abilities. These abilities allow plants to survive in their environments.

The traits that get passed from parent plants to offspring plants depend on the **genes** of the parent plants. Genes carry information. The way these genes from parent plants combine in the offspring plant affects the results. Some traits will be shared between parent plants and offspring plants. Other traits will not. This is why parent plants and offspring plants have **similarities**, ways they are alike, and **differences**, ways they are not alike.

Traits may also be **acquired traits**. This means they are received without being inherited. A tree that has been slashed by a saw blade will have a scar on its bark. That scar didn't come from the genes of its parent trees. It will not be passed to the next generation of trees, either. These types of traits are often seen in response to something unexpected that occurred in the plant's environment.

Inherited traits in plants allow them to be **analyzed**. A viewer can note similarities and differences in plants. The plants can then be **classified**. They can be sorted into groups based on features. This type of study may cause patterns to be observed. These patterns add to our understanding of plants and how their inherited traits help them live.

Inherited Traits in Plants Questions

1. List three traits of the cactus below.

1. _____

2. _____

3. _____

2. Give three examples of acquired and inherited plant traits.

Acquired Plant Traits	Inherited Plant Traits
1.	1.
2.	2.
3.	3.

3. Circle whether each trait is an acquired trait or an inherited trait.

- A tall tree has a wound from being struck by lightning. acquired / inherited
- A flower is red with orange streaks. acquired / inherited
- A spider plant has holes due to an insect infestation. acquired / inherited
- A sunflower has a bent stem due to strong winds. acquired / inherited
- A flower has curved petals. acquired / inherited
- A green apple tastes sour. acquired / inherited

820L

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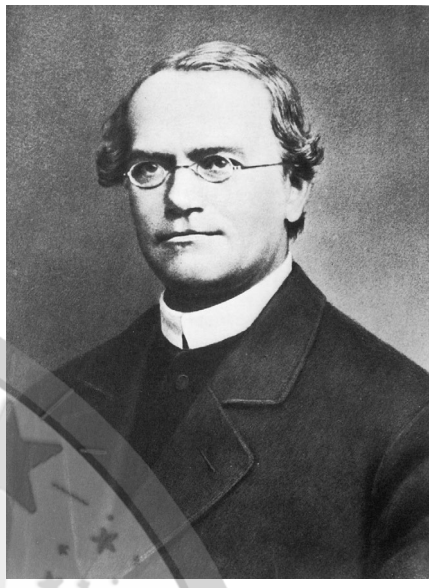
Mendel's Pea Plants



Johann Gregor Mendel

Traits such as eye color, height, and hair color are passed from parents to children. This is called **heredity**. These traits are inherited through genes. **Genetics** is the study of heredity. Much of what we know about genetics is due to a curious monk from the 19th century. Johann Gregor Mendel is known as the "father of genetics." His work allowed scientists to understand how traits were passed from parents to offspring.

Mendel used pea plants to do his research. He chose these plants because they were easy to work with. They can **self-pollinate**. They can also be **cross-pollinated**. A plant is self-pollinated if pollen is transferred to it from any flower of the same plant. Cross-pollination, however, means pollen from one flower on one plant is moved to the **stigma** of another plant. Pea plants also have several traits that are simple to identify. Mendel studied seven traits. He looked at seed color, seed shape, flower position, flower color, pod shape, pod color, and stem length.

Before he began his experiments, Mendel grew pea plants with two forms of a feature. The features might be tall and short or white flower and purple flower. He grew these for several generations until he had **pure-bred** plants. Next, Mendel bred them to each other to create a second generation. Then, he took plants from this second generation with the same traits and bred them again, which produced a third generation. He carefully observed the results.

Pea Plant

Purple-Flowering Pea Plant

These experiments revealed interesting **patterns**. Mendel found that one trait was always **dominant** in the first generation. For example, when he combined a white-flowering pea plant with a purple-flowering one, *all* the offspring had purple flowers. He concluded that the dominant trait was purple flowers. White flowers were hidden. This is called the **recessive** trait. The same thing happened with the height trait.

Another pattern was found when the pea plants with the dominant trait self-pollinated. In this generation, 75% of the offspring showed the dominant trait. Only twenty-five percent showed the recessive trait. This means that of four offspring pea plants, 3 of them would show purple flowers while 1 out of the 4 would be white.

Mendel was able to repeat these experiments. He got the same results every time. Other scientists of the time believed in different theories about inheritance. They thought traits were blended from parents in offspring. Mendel's experiments, however, showed that not to be true. If blending really occurred, purple pea plants bred with white pea plants would have produced pink pea plants. In 1868, Mendel decided to focus more on his duties as a monk than on science. His work wasn't picked up again until 1900 by other scientists studying heredity. They proved Mendel's findings to be correct.

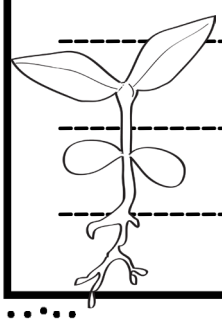
Mendel's Pea Plants Questions

1. What is Johann Gregor Mendel known for?

2. Why were pea plants a good subject to study for this experiment?

3. What two major patterns did Mendel discover?

4. Why are Johann Gregor Mendel's experiments important to the field of science and heredity?



810L

Name: _____ Date: _____

Flower Fields

A field full of flowers is a beautiful sight on a summer day. All the blooms face the sun. No one has to teach flowers to do that because it is an **inherited behavior**. The parent plants pass on the ability to automatically seek out the sun's rays to the offspring plants. This **genetic** information allows plants to survive.

Flower fields have similarities within them. Many of the flowers in the picture have the same basic structure. They have bright yellow centers with individual petals surrounding that center. Those petals are the same shape and length. The plants have green stems and green, spiky leaves. These are all traits the plants inherited from the parent plants.

Flower fields have differences, too. The colors of the flowers in the picture are not all the same. We see two shades of a purplish-pink, a yellow, and a white. Not all the flowers are the same height, either. These **variations** show up because genetic material is passed to the offspring plants from the parent plants. The genes are passed on through **pollination**.

Some traits are stronger than others. These flowers have more of the lighter shade of purplish pink. If we count the number of flowers in the foreground of the photo, there are about 16 blooms. Out of those 16, about 11 are the lighter shade of purplish-pink, making up about 69% of the blooms. This means the gene for that color is **dominant** and more likely to occur. About 3 out of the 16 blooms, or 19%, have the darker purplish-pink..

There is one yellow and one white, which each represent about 6% of the blooms. All three of those colors are not dominant.

Flower Field Flower Colors

Purple-Pink	**69%**
Dark Purple	**19%**
Yellow	**6%**
White	**6%**

Gardeners and farmers often use genetics to produce interesting new plants. They may use different **breeding** techniques, which allows them to combine genetic material in ways that create traits they want. For example, they may wish to have plants with more blooms, hardier stems, or longer petals. Think about genetics the next time you walk by a flower field.

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Flower Fields Questions

1. Give an example of inherited behavior of flowers in a flower field from the article.

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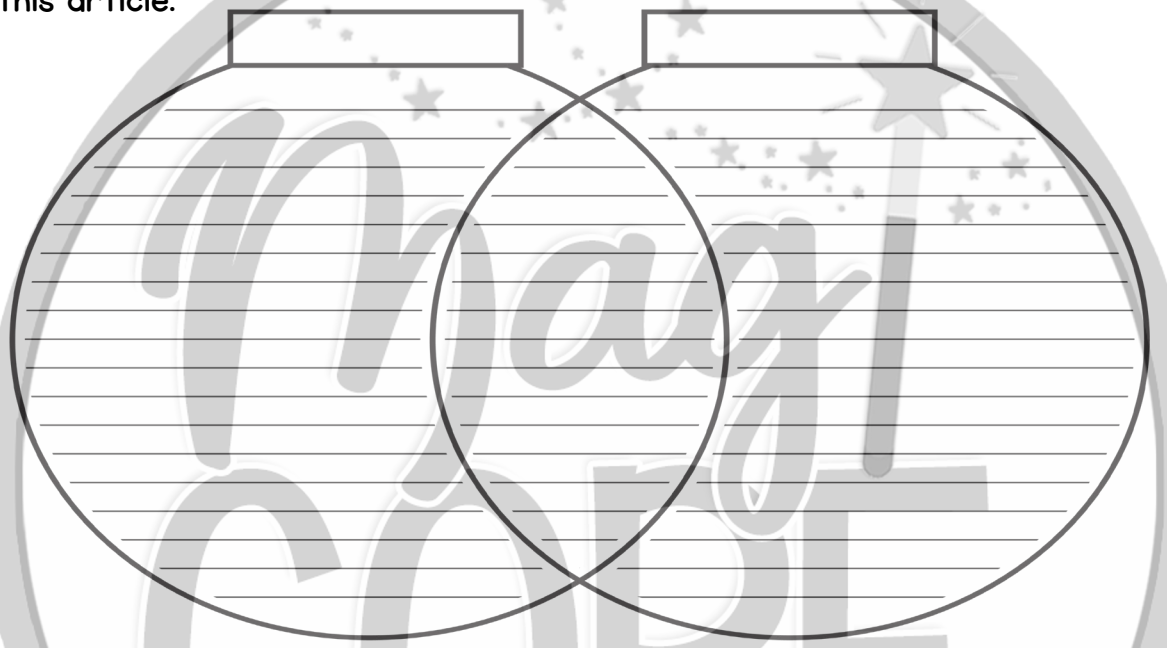
2. Complete the Venn diagram to show the similarities and differences in the flower traits from this article.



3. What is a dominant trait the flowers in this field have? How do you know?

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4. How can farmers and gardeners use genetics to their advantage?

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