# Zoe and the Oracle's Garden of Traits

Grade 6 science mythology

Students will be able to explain how traits are passed from parents to offspring through genes and heredity.

Name: _____ Date: _____

**1.** Zoe enters the Oracle's Garden. She sees two olive trees. One tree has silver leaves. One tree has gold leaves. Are leaf color differences an example of a trait? Write TRUE or FALSE. Then write one sentence explaining why.

**2.** Zoe finds a rare find: a scroll listing traits of the god Apollo. The scroll says Apollo has golden eyes and his son Asclepius also has golden eyes. What is the name for passing traits from parent to offspring? Fill in the blank: This passing of traits is called _____.

**3.** Zoe reads a hidden treasure tablet. It says the goddess Athena carries instructions for gray eyes in her DNA. What is the name for a section of DNA that carries instructions for one trait? Circle the correct answer: (A) cell wall (B) gene (C) nucleus (D) protein

**4.** Zoe discovers a unique item ��� a two-sided golden coin. One side shows a dominant trait symbol. One side shows a recessive trait symbol. The god Hermes has one dominant allele (W) for winged feet and one recessive allele (w) for normal feet. Hermes shows the winged-feet trait. What does this tell Zoe about dominant alleles? Explain in two sentences.

**5.** Zoe reads the Oracle's prophecy scroll. It says: 'The goddess Persephone carries two recessive alleles (ff) for flower-crown trait. Her husband Hades carries two dominant alleles (FF) for shadow-crown trait. What will ALL of their children look like?' Use what you know about dominant and recessive alleles to explain Zoe's prediction.

**6.** Zoe reaches the Temple of Traits. She must complete a Punnett square to unlock the door. The god Ares (Bb) and the goddess Aphrodite (Bb) both carry one dominant allele (B) for bronze skin and one recessive allele (b) for pale skin. Complete the 2x2 Punnett square. Then write: what fraction of their offspring will show the recessive pale-skin trait?

**7.** Zoe uncovers a special object — the Loom of Fate. The Fates wove three traits into the hero Achilles: invincible skin (dominant), golden hair (dominant), and sea-blue eyes (recessive). Achilles's mother Thetis has genotype Ii Gg bb. His father Peleus has genotype ii gg Bb. Zoe must predict Achilles's possible eye genotypes. Which parent contributes which eye alleles? What eye genotypes are possible for Achilles? Is any possible genotype recessive for eyes?

**8.** Zoe finally reaches the Oracle's hidden treasure — the Codex of Life. It reveals that myths were early human attempts to explain heredity before DNA was discovered. Modern scientists now know traits are coded in DNA and passed through genes on chromosomes. Zoe notices that some children look very different from both parents. The Oracle says: 'Not all variation comes from parents alone.' Name TWO sources of genetic variation

that explain why offspring can differ from both parents. Then explain why understanding heredity matters for one real-world field today.

# Answer Key: Zoe and the Oracle's Garden of Traits

GRADE 6 | TEACHER & PARENT USE ONLY

Before Q6, pause and have students sketch Zoe's Punnett square on a mini whiteboard. Ask: which myth god trait 'wins'? This ties the dominant vs. recessive concept from Q5 directly to Q6's cross.

**1.** Zoe enters the Oracle's Garden. She sees two olive trees. One tree has silver leaves. One tree has gold leaves. Are leaf color differences an example of a trait? Write TRUE or FALSE. Then write one sentence explaining why.

**Answer: TRUE. Leaf color is a characteristic passed from parent plants to offspring — that makes it a trait. A trait is any observable characteristic of an organism that can be inherited.**

**2.** Zoe finds a rare find: a scroll listing traits of the god Apollo. The scroll says Apollo has golden eyes and his son Asclepius also has golden eyes. What is the name for passing traits from parent to offspring? Fill in the blank: This passing of traits is called _____.

**Answer: This passing of traits is called HEREDITY. Heredity is the process by which genetic information (traits) is passed from parents to their offspring.**

**3.** Zoe reads a hidden treasure tablet. It says the goddess Athena carries instructions for gray eyes in her DNA. What is the name for a section of DNA that carries instructions for one trait? Circle the correct answer: (A) cell wall (B) gene (C) nucleus (D) protein

**Answer: The correct answer is (B) gene. A gene is a specific segment of DNA that carries the instructions for a particular trait, such as eye color. Genes are located on chromosomes inside the cell nucleus.**

**4.** Zoe discovers a unique item ��� a two-sided golden coin. One side shows a dominant trait symbol. One side shows a recessive trait symbol. The god Hermes has one dominant allele (W) for winged feet and one recessive allele (w) for normal feet. Hermes shows the winged-feet trait. What does this tell Zoe about dominant alleles? Explain in two sentences.

**Answer: When at least one dominant allele (W) is present, the dominant trait is expressed. The recessive allele (w) is hidden and does not show up when paired with a dominant allele. Hermes's genotype is Ww, and because W is dominant, he shows winged feet.**

**5.** Zoe reads the Oracle's prophecy scroll. It says: 'The goddess Persephone carries two recessive alleles (ff) for flower-crown trait. Her husband Hades carries two dominant alleles (FF) for shadow-crown trait. What will ALL of their children look like?' Use what you know about dominant and recessive alleles to explain Zoe's prediction.

**Answer: Step 1 — Identify parent genotypes: Persephone = ff (recessive), Hades = FF (dominant). Step 2 — All offspring receive one F from Hades and one f from Persephone, giving genotype Ff. Step 3 — Because F is dominant, it masks the recessive f. Result: ALL children will show the shadow-crown trait (dominant). Zoe predicts every child will look like Hades for this trait.**

**6.** Zoe reaches the Temple of Traits. She must complete a Punnett square to unlock the door. The god Ares (Bb) and the goddess Aphrodite (Bb) both carry one dominant allele (B) for bronze skin and one recessive allele (b) for pale skin. Complete the 2x2 Punnett square. Then write: what fraction of their offspring will show the recessive pale-skin trait?

**Answer: Step 1 — Set up Punnett square with Ares (B, b) across the top and Aphrodite (B, b) down the side. Step 2 — Fill four boxes: BB, Bb, Bb, bb. Step 3 — Count genotypes: 1 BB, 2 Bb, 1 bb. Step**

**4 — Only bb shows the recessive pale-skin trait. Step 5 — Fraction = 1 out of 4 boxes = 1/4 of offspring show the recessive pale-skin trait. The other 3/4 show bronze skin (dominant).**

**7.** Zoe uncovers a special object — the Loom of Fate. The Fates wove three traits into the hero Achilles: invincible skin (dominant), golden hair (dominant), and sea-blue eyes (recessive). Achilles's mother Thetis has genotype Ii Gg bb. His father Peleus has genotype ii gg Bb. Zoe must predict Achilles's possible eye genotypes. Which parent contributes which eye alleles? What eye genotypes are possible for Achilles? Is any possible genotype recessive for eyes?

**Answer: Step 1 — Eye trait alleles: Thetis = bb (recessive, sea-blue eyes), Peleus = Bb (one dominant B, one recessive b). Step 2 — Thetis can only pass b for eyes. Peleus can pass B or b for eyes. Step 3 — Possible Achilles eye genotypes: Bb (gets B from Peleus + b from Thetis) OR bb (gets b from Peleus + b from Thetis). Step 4 — The genotype bb is fully recessive — Achilles would show sea-blue eyes. The genotype Bb is dominant — Achilles would not show sea-blue eyes. Step 5 — Zoe concludes: there is a 1/2 chance Achilles has sea-blue eyes (bb) and a 1/2 chance he does not (Bb).**

**8.** Zoe finally reaches the Oracle's hidden treasure — the Codex of Life. It reveals that myths were early human attempts to explain heredity before DNA was discovered. Modern scientists now know traits are coded in DNA and passed through genes on chromosomes. Zoe notices that some children look very different from both parents. The Oracle says: 'Not all variation comes from parents alone.' Name TWO sources of genetic variation that explain why offspring can differ from both parents. Then explain why understanding heredity matters for one real-world field today.

**Answer: Source 1 — MUTATIONS: Random changes in DNA during cell division can produce new traits not seen in either parent. Mutations can be caused by copying errors or environmental factors. Source 2 — GENETIC RECOMBINATION: During the formation of sex cells (meiosis), chromosomes exchange segments. This shuffles allele combinations, creating offspring with new trait combinations. Real-world connection: In medicine, doctors use heredity to predict whether a child might inherit a genetic disease (such as cystic fibrosis or sickle cell anemia) from carrier parents. Understanding dominant and recessive inheritance helps genetic counselors advise families about risk. Zoe closes the Codex knowing that the Oracle's garden was not magic — it was genetics all along.**