Learning Target: I can read passages about dichotomous keys and use the information gathered to answer multiple choice comprehension questions.

## Dichotomous Keys Reading for Meaning

Scientists often need a way to identify living things. One tool they use is called a **dichotomous key**. A dichotomous key is a step-by-step guide that uses pairs of questions or statements to sort and classify organisms based on their characteristics. The word *dichotomous* means "divided into two parts."

Imagine you find several insects in your schoolyard. At first glance, they all look alike. However, by using a dichotomous key, you can answer yes/no or either/or questions to narrow down the possibilities. For example:

1. Does the insect have wings?
   - If yes → Go to step 2
   - If no → Go to step 3

2. Does the insect have only one pair of wings?
   - If yes → It may be a fly.
   - If no → It may be a bee or a beetle.

At each step, the key splits into two choices. By following the path, you eventually identify the exact organism.

Scientists also use dichotomous keys for plants, animals, rocks, and even everyday objects like shoes or pencils. For instance, a key might ask:

- "Is the object used for writing?"

- "Does it use ink or graphite?"

These yes/no questions help organize objects into groups.

The strength of dichotomous keys is that they rely on **observable traits**, not guesses. However, if you answer one question incorrectly, you may end up with the wrong identification. That is why scientists often double-check their results.

By practicing dichotomous keys, students learn how to observe carefully, notice details, and make evidence-based decisions. These same skills are important in real scientific investigations.


## Multiple Choice Questions (DOK 3–4)

**1. Which best explains why dichotomous keys are effective tools for scientists?**
A. They organize organisms by size only.
B. They require the use of microscopes.
C. They use observable traits to narrow choices step by step.
D. They automatically generate correct answers without observation.

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**2. A student is using a dichotomous key to identify a bird but answers one question incorrectly. What is the most likely outcome?**

A. The key will skip to the correct bird anyway.　　B. The student may misidentify the bird.

C. The bird will be placed in multiple categories.　　D. The dichotomous key will restart at step one.

**3. Imagine you are creating a dichotomous key for shoes. Which pair of questions would BEST begin your key?**

A. Is the shoe red or blue?

B. Does the shoe have laces or not?

C. Was the shoe made in Georgia or Florida?

D. Does the shoe cost more than $20 or less than $20?

**4. Why would a scientist choose "number of legs" over "favorite food" when making a dichotomous key for animals?**

A. Legs are easier to count and observe.　　B. Favorite food is more scientific.

C. Animals all eat the same food.　　D. The number of legs changes often.

**5. A dichotomous key leads a student to identify an insect as a beetle. Later, they notice the insect actually has only one pair of wings. What should the student conclude?**

A. The key is unreliable and should not be used again.

B. The student misread one step in the key.

C. The insect must belong to more than one category.

D. The beetle adapted to have fewer wings.

**6. Two students use the same dichotomous key but end with different answers for the same plant. What is the BEST explanation?**

A. They started at different places in the key.　　B. Dichotomous keys only work for animals.

C. They both guessed the answers to the questions.　　D. One student observed traits incorrectly.

**7. Suppose a dichotomous key for leaves begins with: "Is the leaf shape simple or compound?" Why is this an effective first step?**

A. It divides leaves into two broad groups quickly.　　B. It measures the leaf's size.

C. It shows the leaf's favorite season.　　D. It tells how old the leaf is.

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**8. Which situation BEST shows a limitation of using dichotomous keys?**

A. A student can use a key to identify a rock.

B. A key requires careful observation.

C. A student answers a question incorrectly and gets the wrong result.

D. A key asks about shape or size.

**9. If a teacher wanted students to create their own dichotomous keys for classroom objects, which skill would students MOST need to practice?**

A. Writing questions based on observable traits.

B. Sorting objects by personal preference.

C. Using microscopes to find hidden details.

D. Measuring objects with exact weight and volume.

**10. A dichotomous key ends by identifying an animal as a frog. Which evidence would BEST support that this identification is correct?**

A. The animal has scales and lays eggs in water.

B. The animal has smooth, moist skin and can live on land and in water.

C. The animal flies and has feathers.

D. The animal breathes with gills its entire life.