



When Nature Breaks the Rules (C1)

A. WARM-UP QUESTIONS

1. Have you ever seen a natural anomaly? Describe it.
2. Which extreme environment would you most like to visit?
3. Are rare events overhyped by the media? Why?
4. What's the difference between scientific laws and models?
5. When have you changed your mind because of an exception?

B. VOCABULARY PREVIEW

Match up as many words and meanings as you can. (Definitions are shuffled.)

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| ___ 1. anomaly | a. something that is different from what is usual |
| ___ 2. paradox | b. arising from many small parts acting together |
| ___ 3. defy | c. a change in genes that can be passed on |
| ___ 4. extremophile | d. a situation that seems impossible but might be true |
| ___ 5. mutation | e. an organism that thrives in extreme conditions |
| ___ 6. resilience | f. not happening often |
| ___ 7. volatile | g. the ability to recover quickly from difficulty |
| ___ 8. cascade | h. a level at which something starts to change |
| ___ 9. threshold | i. a cycle where the output feeds back into the input |
| ___ 10. feedback loop | j. likely to change suddenly and unexpectedly |
| ___ 11. emergent | k. a series of events in which each one triggers the next |
| ___ 12. rare | l. to go against what is expected |

Reading

Beautiful Exceptions

Why the rule-breakers matter

1. Tardigrades—tiny, eight-legged creatures—seem to ignore rules that limit most forms of life. They can survive being completely dried out, enter a state of suspended animation, and endure extreme conditions such as radiation and the vacuum of space. They don't break the laws of physics; instead, they work around them with remarkable chemistry. Such exceptions challenge scientists to rethink their ideas rather than discard them. Often, what appears impossible is really the result of hidden preparation that allows explosive change when the moment comes.

2. Deserts may look lifeless, but after a rare rainfall, they can suddenly erupt into color. Seeds that have waited for years beneath the dust sprout almost overnight, creating what's called a "superbloom." It might seem as if life appeared from nowhere, but in reality, resilience was quietly waiting for the right conditions. These moments remind us that nature often stores potential long before we can see it.

3. Some phenomena remain mysterious, such as ball lightning—glowing spheres that sometimes appear during thunderstorms. These rare events can sound like something out of a tall tale, yet they point to gaps in our scientific understanding. When faced with anomalies, science doesn't rewrite the laws of nature; it updates the models we use to describe them. Exceptions may puzzle us, but they are valuable clues to how the world truly works.





COMPREHENSION

1. What survival skills make tardigrades unusual?
2. How do tardigrades “work around” the rules of physics?
3. What triggers a desert superbloom?
4. Why does ball lightning challenge scientific models?
5. According to the text, what do anomalies encourage scientists to do?

VOCABULARY REVIEW

1. The behavior was an ____ that didn't fit the pattern.
2. An ____ species thrives near boiling vents on the ocean floor.
3. A single error started a ____ of failures across the network.
4. There's a ____ beyond which ice melts faster each summer.
5. The storm made markets highly ____ for a week.
6. The solution seemed like a ____ until we checked the math.
7. Plants showed surprising ____ after the fire.
8. Complex patterns are ____ properties of simple rules.
9. Some animals appear to ____ expectations.
10. The gene ____ increased survival in cold climates.

GRAMMAR REVIEW - INVERSION & EMPHASIS

1. Seldom ____ we (see) such an elegant workaround in nature.
2. Only after the rain ____ the seeds (germinate).
3. Not until the model changed ____ scientists (resolve) the paradox.
4. Rarely ____ a desert (explode) with flowers so quickly.
5. Hardly ____ the storm (pass) when the superbloom began.
6. Little ____ we (realize) that resilience was hidden all along.
7. No sooner ____ the dust (settle) than shoots appeared.
8. Under no circumstances ____ the laws (change) because of one anomaly.
9. At no time ____ the tardigrades (break) physics.
10. Never before ____ researchers (record) such voltage patterns.

DISCUSSION

1. Do anomalies push science forward more than normal results?
2. Which 'rule-breaking' case would you fund to study?
3. How do rare events distort public understanding?
4. What everyday process has emergent properties?



CRITICAL THINKING

Select a natural 'rule-breaker.' Explain the mechanism and how it fits into, rather than breaks, the laws.

