

Biomimicry and Nature-Inspired Entrepreneurship

Entrepreneurship · Answer Key · 15 Questions

1. Which company famously reverse-engineered the structure of kingfisher beaks to solve noise pollution and energy efficiency issues in high-speed rail design?

- A) Mitsubishi Heavy Industries
- B) West Japan Railway Company**
- C) Siemens Mobility
- D) Alstom

2. The concept of the 'Circular Economy' in modern entrepreneurship draws its primary biological analogy from which ecosystem process?

- A) Nutrient cycling in forests**
- B) Competitive exclusion in wetlands
- C) Apex predator population control
- D) Photosynthetic energy conversion

3. The company Sharklet Technologies developed a surface texture that inhibits bacterial growth based on the skin structure of which animal?

- A) Great White Shark
- B) Galapagos Shark**
- C) Blue Shark
- D) Mako Shark

4. Janine Benyus's 'Biomimicry' framework for sustainable business suggests measuring success by the 'Life Principles' observed in nature. Which of the following is NOT one of these principles?

- A) Evolve to survive
- B) Adapt to changing conditions
- C) Linear resource extraction**
- D) Be locally attuned and responsive

5. The adhesive properties of Geckskin, a high-strength commercial material, mimic the setae structures found on the toe pads of geckos. What physical principle does this leverage?

- A) Electromagnetic attraction
- B) Van der Waals forces**
- C) Hydrophobic repulsion
- D) Capillary tension

6. The company 'Interface' pioneered the 'Mission Zero' initiative by looking at how a forest floor operates. What specific design methodology did they adopt?

A) Entropic modularity

B) Biomimetic pattern distribution

C) Photosynthetic carbon sequestering

D) Mycelial network replication

7. Which structural design in desert-dwelling Namib beetles inspired entrepreneurs to create self-filling water bottles that harvest moisture from fog?

A) Hydrophilic bumps and hydrophobic troughs

B) Dense chitinous fur

C) Reflective iridescent scales

D) Oscillating wing vibrations

8. In the field of sustainable packaging, research into the self-assembly of proteins found in which animal has led to breakthroughs in bioplastics?

A) Deep-sea squid

B) Orb-weaver spider

C) Honey bee

D) Antarctic krill

9. The 'Whalepower' corporation utilized the design of humpback whale tubercles to improve the efficiency of what specific hardware?

A) Wind turbine blades

B) Water desalination pumps

C) Hydroponic nutrient delivery systems

D) Aerodynamic cargo ship hulls

10. Which architectural phenomenon observed in termite mounds has been adapted for passive cooling in large-scale commercial buildings like the Eastgate Centre?

A) Evaporative cooling via subterranean water tunnels

B) Continuous airflow via chimney-like thermal flues

C) Light-absorbing outer shell material

D) High-density clay insulation

11. The 'Lotus Effect,' which entrepreneurs utilize to create self-cleaning surfaces, is caused by which specific physical property?

A) Superhydrophobicity

B) Electrostatic repulsion

C) Bioluminescent enzymatic breakdown

D) Rapid cellular regeneration

12. Research into the fluid dynamics of schools of fish has led to entrepreneurial innovations in which sector?

A) Optimizing swarm robotics efficiency

- B) Improving municipal sewage flow
- C) Developing tidal wave energy
- D) Automating vertical farming

13. The company 'Pax Scientific' develops fan and rotor designs based on the 'spiral' flow patterns observed in which natural phenomenon?

A) The movement of whirlpools and nautilus shells

- B) The structure of glacial ice crevasses
- C) The growth pattern of sunflower seeds
- D) The migration path of monarch butterflies

14. In sustainable construction entrepreneurship, the hardening process of abalone shells is studied to develop what?

- A) Self-healing concrete
- B) Transparent steel alloys

C) Ultra-lightweight composite ceramics

- D) Fire-resistant wood treatments

15. The development of 'synthetic silk' by companies like Bolt Threads is modeled after the protein chains found in what biological material?

A) Spider dragline silk

- B) Silkworm cocoon fiber
- C) Marine mussel byssus threads
- D) Sea urchin spines