

DESIGN ENGINEERING

Watch the video and answer the questions

1. What key issue did the Shinkansen bullet train in Japan face in 1989 that prompted the redesign efforts?

- A. The train was too slow and inefficient.
- B. The train generated excessive noise when exiting tunnels.
- C. The train was too expensive to maintain.
- D. The train's environmental impact was unacceptable.

2. Which specific bird species inspired the design of the pantograph on the redesigned Shinkansen train?

- A. The Adelie penguin
- B. The owl
- C. The hummingbird
- D. The kingfisher

3. What innovative testing method did the engineering team use to evaluate different nose designs for the Shinkansen train?

- A. They launched scale models down a wind tunnel.
- B. They dropped scale models into water to measure splash patterns.
- C. They built and tested full-size prototypes of the train.
- D. They combined both pipe and water testing to assess pressure and splash.

DESIGN ENGINEERING

Watch the video and answer the questions

4. What were the primary improvements achieved with the redesigned Shinkansen train compared to the original?

- A. It was 10% faster, used 15% less electricity, and remained within noise limits.
- B. It was 20% faster, used 10% less electricity, and was quieter.
- C. It was 15% faster, used 20% less electricity, and had a longer range.
- D. It was 5% faster, used 5% less electricity, and had enhanced safety features.

5. What term is used to describe the process of drawing design inspiration from nature, as exemplified by the Shinkansen train redesign?

- A. Biomimetics
- B. Bioinspiration
- C. Biophilia
- D. Biomimicry

6. According to the passage, what are the three primary ways that designers can mimic nature in their work?

- A. Replicating natural forms, natural processes, and natural functions.
- B. Incorporating natural materials, natural textures, and natural colors.
- C. Studying natural behaviors, natural ecosystems, and natural evolution.
- D. Observing natural aesthetics, natural efficiencies, and natural adaptations.

7. What key advice does Janine Benyus provide for designers who want to benefit from nature-inspired design?

- A. Designers should take biology classes to better understand natural systems.
- B. Designers should consult with biologists when working on design projects.
- C. Designers should dedicate more time to observing and studying the natural world.
- D. All of the above.