Name: _____

Jellyfish Genius

John Dabiri is a **bioengineer** at the California Institute of Technology. A bioengineer borrows ideas from nature to design new technologies. Dabiri has created many things, including underwater vehicles and medical tools, by studying the movement of one unlikely animal: the jellyfish! Read the following interview with Dabiri. Then, writing in complete sentences, answer the questions.

Q: Why study jellyfish?
A: Jellyfish came on the scene 500 million to 550 million years ago. They were the first animals to swim. Around 250 million years ago, 95 percent of the world's fishes went extinct. Jellyfish survived. They must be doing something right!

Q: How do jellyfish move?
A: Jellyfish are bell-shaped. The bell is surrounded by muscles. As they squeeze the muscles around the bell, they push water down and out. When they push water one way, they go in the opposite direction. It's similar to what a rocket does. Jellyfish squeeze their muscles and then relax. As they do that, they generate doughnut-shaped swirls of water called vortex rings. They push off the vortex rings to move forward.

Q: How has jellyfish movement inspired your designs?
A: (Using vortex rings), it takes less energy to move from point A to point B. We built underwater vehicles that generate vortex rings. They use 50 percent less energy (than traditional underwater vehicles do).

Q: What are your goals for the future?
A: Our goal right now is to design things that are as good as nature. Someday down the line, maybe we'll be better than nature.

1. What does a bioengineer do?

2. What happened on Earth about 250 million years ago?

3. How does the jellyfish use its bell-shaped body to move?

4. What are vortex rings?

5. How is an underwater vehicle that moves by creating vortex rings better than a traditional underwater vehicle?

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Answer Key:

1. A bioengineer borrows ideas from nature to design new technologies.
2. About 250 million years ago, 95 percent of the world's fish became extinct.
3. A jellyfish squeezes the muscles around its bell, pushing water outward to move itself forward.
4. Vortex rings are doughnut-shaped swirls of water generated by jellyfish as they move.
5. Vortex-ring vehicles use 50 percent less energy than traditional vehicles do.