



Jr. Animal Scientist

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ANIMALS IN SPACE

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Photo: NASA

Animal experiments teach us a lot!

What would it be like to live in space? Astronauts on the International Space Station live in “microgravity” conditions, which means that they appear to float in the air. Instead of taking steps on the ground, astronauts have to practice “swimming” through the air. It’s a funny way to live—and it can change how the body works!



Scientists want to know how life in space might change how humans stay healthy. For example, astronauts in microgravity cannot exercise normally. After all, it’s hard to go for a run when your feet don’t stay on the ground! If humans are ever going to live on the Moon or travel to Mars, we need to know more about how the body works in space.

So researchers do space studies with animals! Dogs, monkeys, mice, ants, snails and even fish have been to space! Astronauts take care of these animals as we learn from them!



Caption: Astronaut Cady Coleman floats through the International Space Station. Photo: NASA



Word Watch

Look for these terms in this issue of Jr. Animal Scientist

EXPERIMENTAL GROUP: A group of animals studied under new conditions. For space studies, the experimental group is the group of animals that go to space.

CONTROL GROUP: A group of animals studied under normal conditions. For space studies, this is the group of animals that stay on Earth.

RODENT: A gnawing animal such as a rat, mouse, squirrel or hamster.

MODEL: An animal that is used in a research project instead of a human.

WELFARE: Caring for an animal's health and safety.

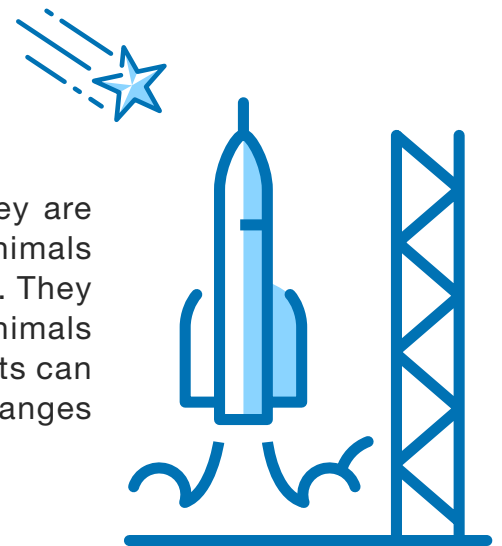




Photo: iStock/ vjanez

Animals in orbit

When a group of animals is taken to the space station, they are called an **experimental group**. Oftentimes, a group of animals stays on Earth. These animals are called the **control group**. They eat the same food and live in the same conditions as the animals in space, but they don't have to live without gravity! Scientists can then compare the two groups to see how life in space changes how the body normally works.



Tadpoles

Does space affect how babies develop? To study this astronauts have actually hatched tadpoles in space! Tadpole experiments have shown that frog eggs do not need gravity to develop normally. However, once they hatch, the tadpoles don't know which way to swim to get air. This means they have to rely on just breathing through their skin and gills. Once back on Earth, tadpoles quickly learn how to swim normally.



Photo: iStock/ Suwatwongkham



Rodents



The National Aeronautics and Space Administration (NASA) has conducted many **rodent** experiments to learn more about health and brain function in space. This research shows that rodents can stay as healthy in space as they can on Earth. Of course, rodents in space must adapt! The rodents are given a mesh to walk on, so that they don't have to just float. But some mice have been seen using their back feet to grasp the mesh while "standing up" more to reach around their tank.

Fish

Fish are another interesting animal **model**. Tiny Medaka fish have been studied in space to learn more about bone health. These fish might help us get closer to a voyage to Mars! After all, NASA needs to know whether humans who go on long space flights can still have strong bones despite not being about to exercise normally. One reason Medaka fish are useful for this research is because they are see-through, so researchers can easily see their bones.

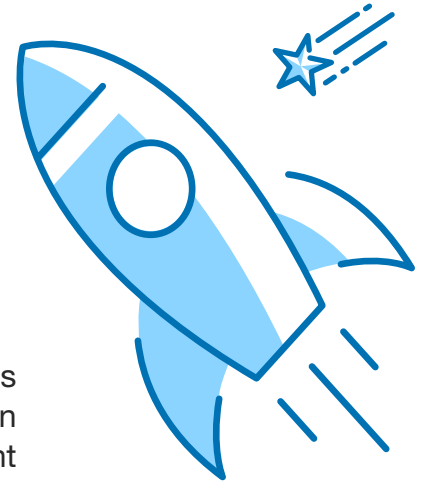
Caring for animals in space

Animal **welfare** is very important in space. After all, if an animal is not kept as healthy as possible, the scientific results will not be useful. Astronauts spend a lot of their day caring for the animals in their experiments.



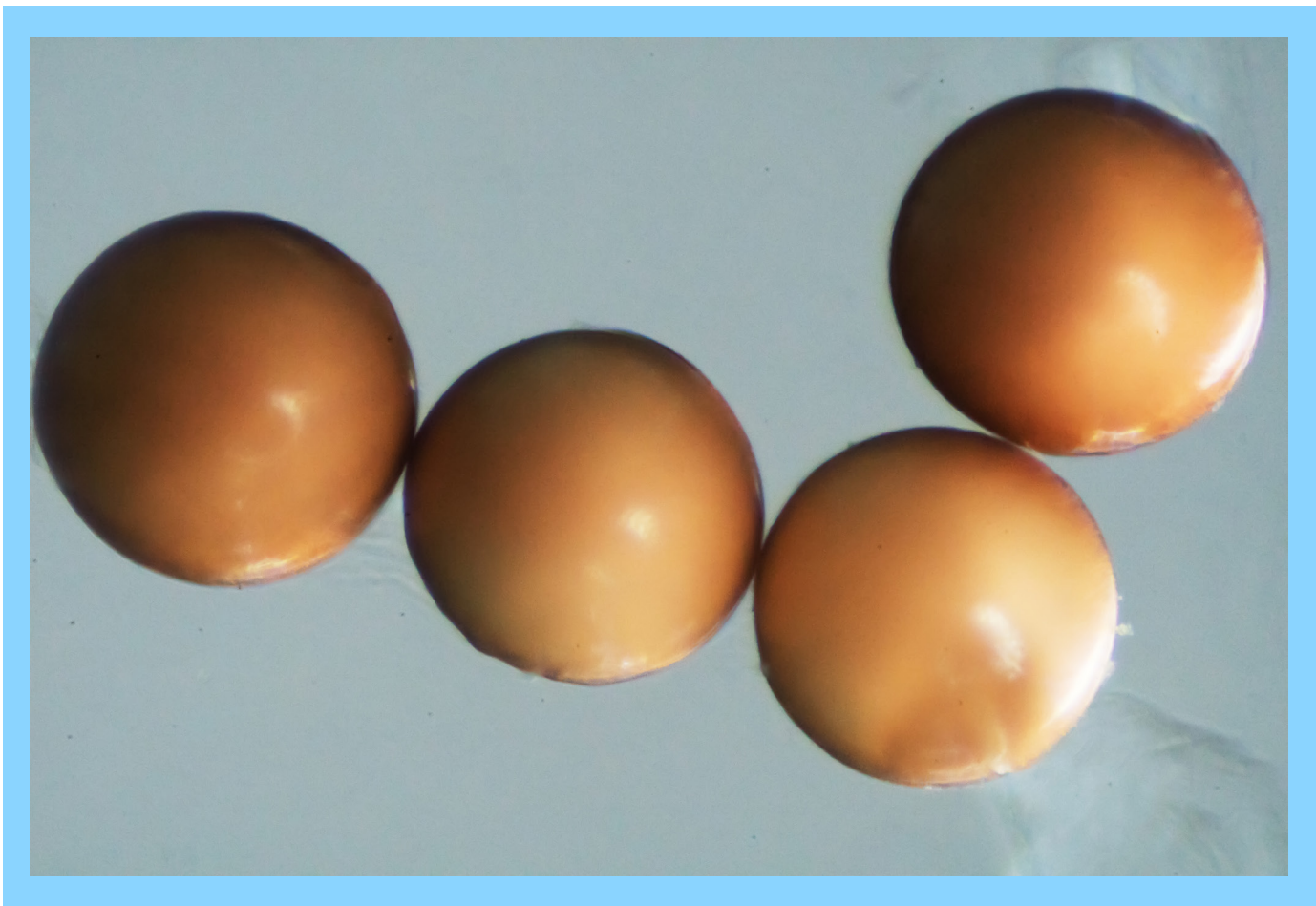


Student science on the Space Station



Kids can do science in space too! The Student Spaceflight Experiments Program encourages kids to design experiments that astronauts can take with them to the International Space Station. Several student experiments are then chosen for each spaceflight!

These student experiments include animal studies! For example, the “Brine Shrimp Study” was designed by seventh graders in California. For this study, astronauts hatched brine shrimp on the Space Station to learn more about how to raise these animals in space. The shrimp were then compared with a control group of brine shrimp on Earth to see if they have any differences in how they looked or behaved. Brine shrimp contain important nutrients, so this research could show how to better raise them to help feed animals in other experiments in space.

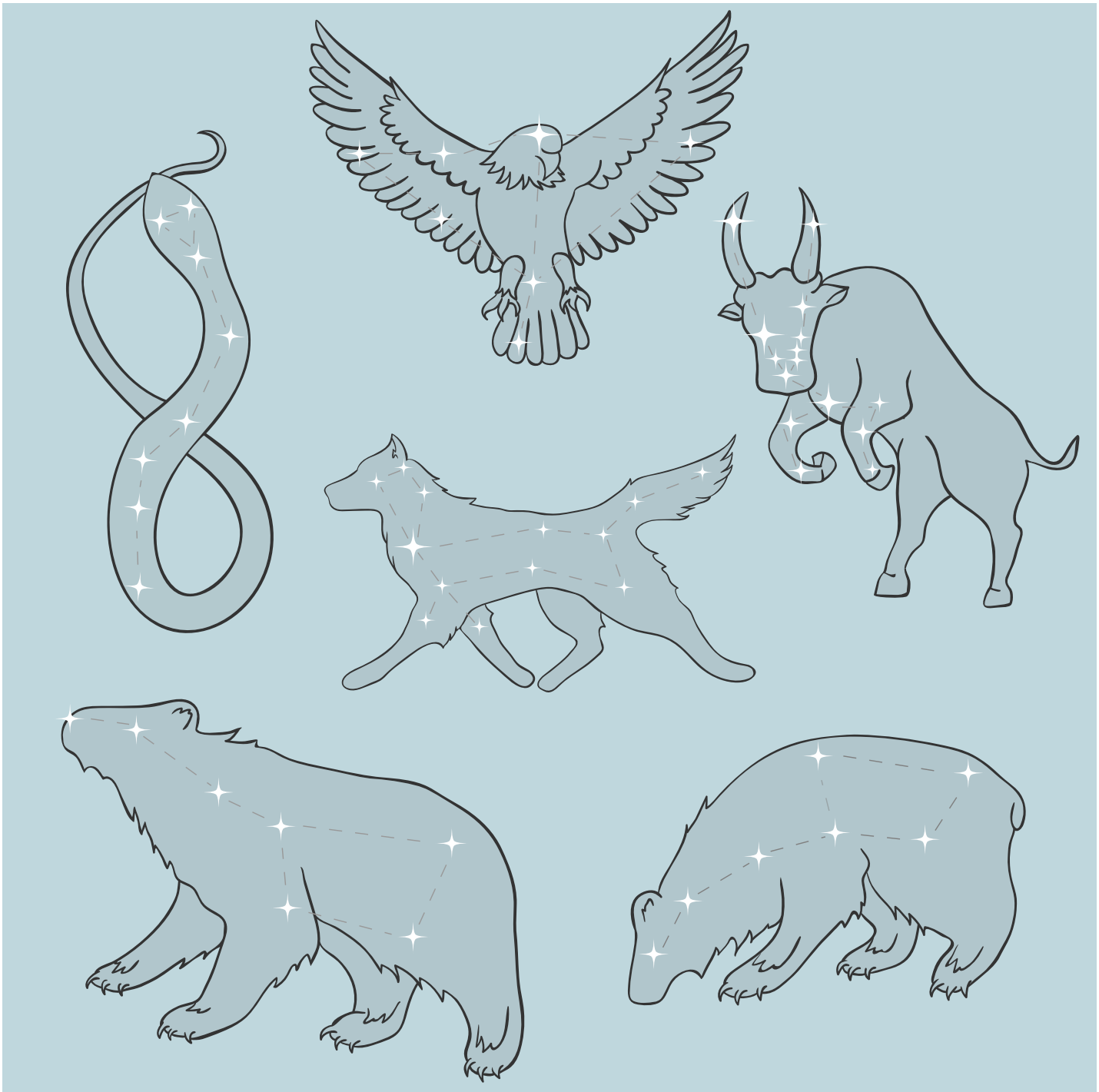


Pictured: Brine shrimp eggs / iStock/ DmitriMaruta

Animals in the stars

Throughout history, people have looked at the stars and imagined seeing animals. Below are star clusters, called constellations, that look like animals we know well!

Trace between the stars to see the animals appear!



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