ACTIVITY 10

MOVING ON OTHER WORLDS

Level:	Preparation:	Number of students:	Length:	Place:	Type of activity:
preschool, Grades 1-2	**easy**	**large group**	**5 min.**	**on the move**	**moving activity**

BRIEF DESCRIPTION

Students move around pretending to be on other planets in the Solar System, taking into account the gravitational pull on their surfaces.

MATERIALS

- none

PREAMBLE

You may have seen videos of astronauts on the Moon. They move by hopping because the lower gravity makes it easier to lift themselves off the ground. But what would gravity feel like on other planets? How would we move if gravity were much stronger than on Earth? This short activity lets students explore how gravity works on different worlds, and gets them moving for a few minutes in the process.

PREPARATION

None.

DID YOU KNOW...?

Did you know that some stars turn into black holes at the end of their lives? The Sun, however, is not massive enough to become a black hole.

STEPS

Introduce this activity by showing the astronauts from the **Apollo** missions who walked on the Moon. An Internet search for *astronauts*, *jumping*, and *moon* should yield some interesting videos.

Talk with students about how astronauts hop around on the Moon because its gravity is lower. They feel lighter and can jump much higher than on Earth; about six times lighter, in fact! Now, imagine a world where gravity is much stronger than on Earth. We would feel heavy and find it difficult to move. For example, if gravity were twice as strong, it would feel like carrying a friend on your shoulders —definitely not easy!

Ask the students to imagine themselves walking on different worlds in the Solar System, with the information in the following table, which lists the gravity on each world compared to the Earth.

World	Your weight
Earth	normal
Moon	6x lighter
Mars	3x lighter
Jupiter	2.5x heavier
Sun	28x heavier

Some worlds have weaker gravity than the Earth. This is true of the Moon and Mars, where we would be 6 times and 3 times lighter, respectively. On other worlds, we would feel much heavier. On Jupiter, it would be equivalent to carrying a friend (and a half) of the same weight on our shoulders. On the Sun, it would be equivalent to 27 friends —and that's on top of your own weight!

You can use this activity to get the students moving for a few minutes. It is also a great way to grab their attention and have fun at the same time! Moreover, you can add that on the Moon there's no air and therefore no sound —so, the students need to keep quiet when they are on the Moon!

Note: In reality, it would be impossible to stand on the surface of Jupiter and the Sun, since neither actually have a solid surface. Instead, they are gaseous worlds where the pressure would get higher and higher as we moved down towards the centre. And of course, the Sun would also be far too hot for us to even approach!

INFORMATION

Gravity is the force that keeps us anchored to the surface of the Earth, or any planet, and makes things fall back down. The strength of this force varies from one world to another, depending on its size and mass. Some small objects in the Solar System have such weak gravity —thousands of times weaker than Earth's—that you could actually jump right off them! This is true for Mars' moons, Deimos and Phobos. Imagine trying to keep track of your students on Phobos: one small hop, and they'd float away!

On the other end of the scale, some objects have extreme gravity. Neutron stars, the remnants of certain dead stars, have gravity hundreds of billions of times stronger than Earth's—enough to crush us instantly. And the strongest of all are black holes, where gravity is so intense that not even light can escape.

TO LEARN MORE

- *What Is Gravity?*, *NASA Science Space Place*.