



# High Touch High Tech®

Science Experiences That Come To You

## Lunar Olympics

### Ingredients & Supplies:

- Bathroom scale
- Measuring tape or yard stick
- Masking tape
- Q-tip

The 2012 Summer Olympics are here! There will be 300 athletic events showcasing the talents of people from 204 countries. The Summer Olympics feature the extraordinary physical capabilities of thousands of athletes across the World!

But, imagine if the Olympics were held on the Moon?! What would change? Would the athletes notice a difference? Yes! The gravity on the Moon is less and there is no air resistance. You can complete these fun experiments to learn more about the science of our Lunar Olympics!

Gravity is a significant factor for the Lunar Olympics. On Earth, we experience gravity. The Earth orbits the Sun due to the Sun's gravitational pull. The center of the Earth, the core, also maintains a gravitational pull. If the Earth did not have gravity, we would fly into Space!

### Weight on the Moon

The Moon is  $\frac{1}{4}$  the size of Earth; therefore, its gravitational pull is significantly less. The Moon's gravity is 83% less intense than the Earth. This means that you could jump very high because your weight would be much less.

Now try this experiment to learn more about gravity. First, you need a bathroom scale. (Ask an adult if you can use his or her bodyweight scale.) Place the scale on the floor. Step on the scale to find out how much you weigh. This is your weight on Earth. Now multiply your weight by .17 (ex.  $50 \times .17 = 8.5$ ) Do you notice a difference? If you weigh 50 lbs on Earth, you only weigh 8.5 lbs on the Moon!

Lunar Olympians could jump extremely high because of the Moon's gravity! Imagine the record-breaking heights the pole vaulters could achieve on the Moon!



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## **Lunar Long Jump**

One of the Track and Field events is the long jump. Olympians run a short distance and leap forward. The running is for acceleration and lift. Then the momentum of their body creates a forward force. However, on the Moon, Lunar Olympians would not experience resistance when leaping forward.

To experiment with your own long jump, you need a measuring tool, such as a yard stick, and masking tape. (This experiment works even better outside if you have room to run and jump.) Measure 1 foot on the floor and mark with the tape. Now measure 2-5 more feet on the floor in a straight line.

Stand at the first marker and jump forward. How far did you jump? If you are outside, stand further away from the markers. Run toward the markers, and jump forward at the first marker. Did you jump farther? This is because you ran forward to accelerate your body. When you leaped forward, your body had momentum. Did you jump 1, 2 or 3 feet? If you jumped 1 foot on Earth, it would equal 28 feet on the Moon!

### **Did you know?**

The long jump World Record is 29.4 feet, held by US Olympian Mike Powell. If he competed on the Moon, he would jump 823 feet! That's a loong jump!

## **Javelin Throw**

The Javelin Throw is another Track and Field event at the Olympic Games. The javelin is an 8ft 2in spear. To complete this event, the athlete runs forward over 90 ft to gain momentum and throws the javelin forward. The running speed of the athlete is very important for the speed and distance of the javelin. In fact, the javelin can reach speeds up to 70 mph!

On the Moon, the javelin would travel even further because there is no air resistance or drag. The minimal amount of gravitational pull would also allow the javelin to speed forward.

Now it's your chance to toss a "javelin." All you need is a Q-tip. To measure your distance, you can use the feet you marked for the Long Jump. Stand at the first marker and throw your Q-tip. How far did it go? Now try running forward and throwing your Q-Tip. Did it go further? If you threw the Q-tip 1 foot on Earth, that would equal 3.6 miles (19,000ft) on the Moon!



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## Did you know?

The Norwegian Olympian, Andreas Thorkildsen, holds the Olympic Record javelin throw at 297 feet! If he was competing in the Lunar Olympics, that would be 1,069 miles! Wow!

The 2012 Summer Olympics are held in London, England. One day, do you think the Olympic Games could be hosted on the Moon? That would be extremely record-breaking!

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