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SUMMER FUN

THE SPACE RACE

In 1961, President Kennedy announced that he wanted the United States to send a man to the Moon. The Soviet Union had successfully sent the first man into space just four years earlier. If the United States could be the first to get a man on the Moon, this would put the country in first place for space exploration. This competition between the United States and the Soviet Union is known as the Space Race.

Phases of the Moon

On July 20, 1969, Apollo 11 astronauts Neil Armstrong and Edwin "Buzz" Aldrin landed on the Moon. Upon landing, Armstrong became the first man to step foot on the Moon. When planning the lunar module's landing site, NASA needed a location that would be easily visible for the crew. Scientists had to pick a day where the Sun was positioned just right, so that the crew could easily see the surface of the Moon. This narrowed down the possible days that the crew could land to just one day out of the month. On the day of the landing, the Moon was in its first quarter phase. The Moon phases are the portions of the Moon lit by the Sun that are visible from Earth. The Moon cycles through its phases every 29 days as the Moon, Earth, and Sun's positions shift. Complete the activity below to create a visual of the cycle of the Moon's phases.

Materials: one piece of 8x10 inch paper, 8 sandwich cookies, a spoon, a pencil, a print out of the Phases of the Moon graphic from: https://solarsystem.nasa.gov/resources/676/phases-of-the-moon/

Directions:

1. Draw a picture of the Earth in the center of your piece of paper.
2. Take each of your sandwich cookies and remove one of the cookies, leaving just one cookie and the filling.
3. Look over the Phases of the Moon graphic and observe how much of the Moon you can see as you travel clockwise through the phases. You will now replicate the image of the Moon phases onto the cookies.
4. Use your spoon to remove some of the filling so that the leftover filling represents the part of the Moon you can see for the first quarter phase. Like the graphic, place the cookie directly above your drawing of the Earth and write the label for the phase above the cookie.
5. Take the remaining seven cookies and making each image of the phase onto the filling. Follow the graphic going clockwise (first quarter, waxing crescent, new moon, etc.) until you make your way back to the first quarter phase, placing each cookie around the Earth as you complete them. Remember to label each phase as you place each cookie down.

You can turn this activity into a fun memory game to play with others. Write each phase of the Moon on a piece of paper, mix them up, and with a friend randomly select a phase of the Moon and see if you can remember what it looks like. Take a sandwich cookie and see if you can replicate the phase you chose. See who can remember the most phases of the Moon!

The Moon's Craters

When Apollo 11 landed on the Moon, it was important that the crew land on a smooth surface. Parts of the Moon are covered in several craters which would have made landing in those areas difficult. The Moon's surface is primarily made up of two kinds of features, volcanic mare and impact craters. Volcanic mare are plains created by past volcanic activity that are believed to have once been covered with water. Impact craters are caused when objects like comets and asteroids, strike the Moon's surface. The Apollo 11 crew studied the surface during their time on the Moon by taking photographs and collecting soil samples from some of the craters. Complete the activity below to make your own replica of the Moon's surface.

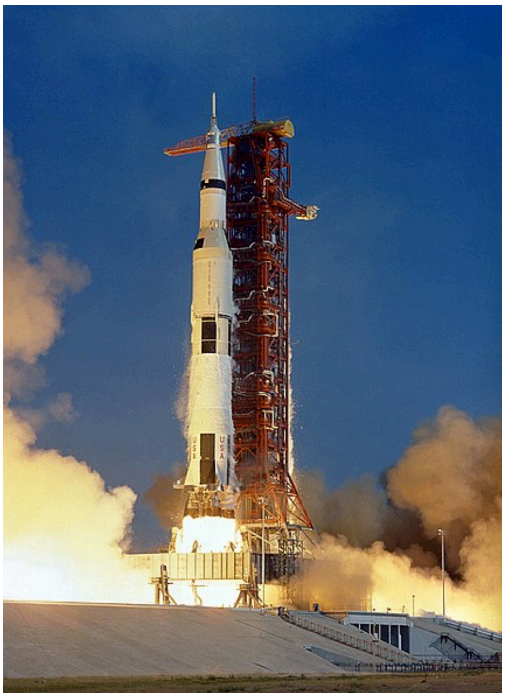
Materials: modeling clay, small objects that you will press into the clay (these can include a cap eraser, a marker cap, etc.), a popsicle stick

Directions:

1. Take your clay and shape it into a ball, this will be your Moon.
2. Take one of your small objects and press it into the ball of clay, remove the object and see the shape it left behind. This process is similar to when space objects hit the Moon's surface and leave behind an impact crater. Repeatedly take objects and press them into your ball of clay to leave marks behind.
3. Use your popsicle stick to create smooth areas on the clay. The smooth areas are similar to the plains of the Moon's volcanic mare.
4. Once you have covered your ball of clay with markings compare it to the photo of the Moon's craters. How are they similar?
5. Try placing a small paper ball or other round object on the different surfaces. Does the ball stay in place? What areas of your Moon surface are better for landing on? Why?

Want to add more to your clay Moon? You can add a mini American flag to your clay Moon like the American flag left behind by Neil Armstrong and Buzz Aldrin. To make your flag collect a toothpick, piece of paper, scissors and markers or colored pencils. Cut a small square out of paper and replicate the design of the American flag onto it. Tape your flag to the toothpick and insert the toothpick into your clay Moon. What other objects would you have left on the Moon to show that you had been there?

3... 2... 1... Liftoff!



In 1963 the first Block II Saturn I rocket was launched as part of the Apollo program. President Kennedy observed this launch and stated that the Saturn model would be the rocket to push the U.S. ahead of the Soviet Union after their launch of Sputnik 1 in 1957. Research and production into this model continued for six years until July 16, 1969, when the Saturn V SA-506 rocket carried the Apollo 11 crew to the Moon. To date, the Saturn model is still the most powerful rocket that NASA has launched and was used for 13 launches that sent 24 astronauts into space between 1967 and 1973.Complete the activity below to create and launch your own rocket!

It is your mission to launch an empty toilet paper roll into the air as though it was heading for the Moon. Challenge your friends and family to participate and see which design is built the fastest and which goes the furthest. The most creative toilet paper roll launch wins.

Materials: Empty toilet paper roll, your imagination, and any other materials you would like to use to craft your rocket.

Directions:

1. Plan how you will launch your toilet paper tube. What method will you use to launch it? What materials will you need? How many people will be needed to conduct the launch?
2. Construct your rocket and its launch system.
3. Test you launch system to make sure it is safe and working properly. The rockets should be launched directly up in the air. They should not be directed at or towards anyone or anything. No fire and/or pyrotechnics. Remember, safety first!
4. Launch your rocket and record the results.

Based on your launch results, craft a second rocket and make changes to its original design to achieve different results.

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