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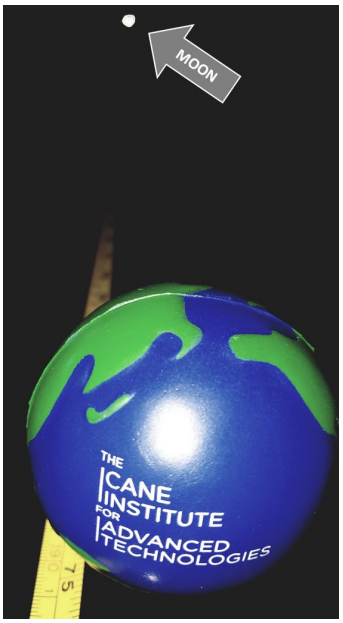
THE CANE INSTITUTE FOR ADVANCED TECHNOLOGIES

Hello ADHUS and FAUHS Students (and Parents)!



The Cane Institute is excited to provide your ninth TCI STEM@Home mailer which is OUT OF THIS WORLD! This mailer focuses on learning more about the moon! You will build a scale model of the Earth and moon and use a balloon and a bright light in a dark room to simulate the phases of the moon. We have also included some QR code links that can be scanned to take you to some short videos. Enjoy!

How BIG is our moon, really? Creating a Scale Model!

The moon's average diameter is 2,159.2 miles (3475 kilometers) which is less than a third the width of the Earth. The Earth's average diameter is 7, 917.5 miles (12,742 kilometers). Let's build a scale model of our Earth and moon to get a sense of how much space is actually between us and our moon! Included in this mailer is a TCI Earth stress ball that is 2.5" in diameter. To represent the moon, we included a white acrylic "pearl" that is a little less than 0.8" in diameter. Using ratios, we can calculate how far apart we should put these two heavenly bodies to accurately represent our moon!

	Actual Average Measurement	**Scale Model**
Earth's Diameter	7, 917.5 miles (12,742 kilometers)	2.5 inches (6.4 centimeters)
Moon Diameter	2,159.2 miles (3475 kilometers)	0.8 inches (2.0 centimeters)
Distance between Earth and Moon	238,900 miles (384,472 kilometers)	75.4 inches (193 centimeters)

So, in our scale model, the moon should be placed 75.4 inches (193cm) away from the Earth! I encourage you to measure this out and hang your Earth/moon scale model in your bedroom at home with some string!

Middle and High School student CHALLENGE QUESTION: If the International Space Station orbits the Earth at an altitude of 408 km, how far away from Earth would the ISS be in our scale model? The majority of Earth's atmosphere can be found in the first 100 kilometers above Earth. How thick would Earth's atmosphere be in our model?

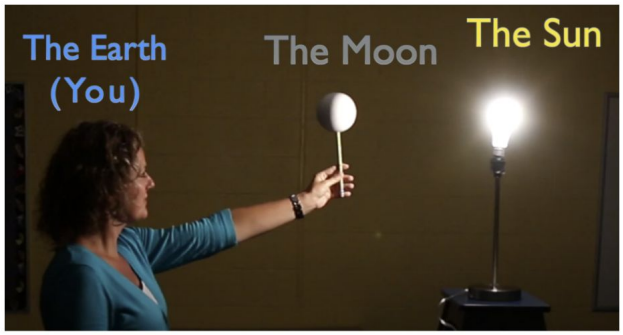
Thinking Critically: Where are the sun, Earth, and moon located during a solar eclipse? During a lunar eclipse? Why do lunar eclipses happen more often than solar eclipses? Use your model to help you visualize the answers to these questions.

Science and Literacy! Read Aloud: Next Time You See the Moon

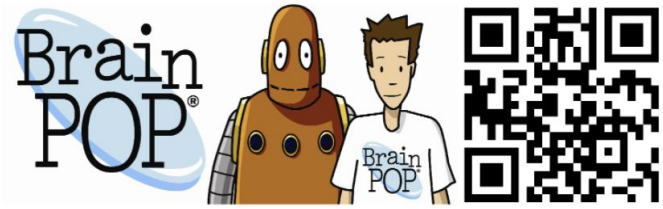
Please scan the QR code to watch a short read-aloud video of the book "Next Time You See The Moon" by Emily Morgan. This short 6-minute video will help prime you for the next activity on the phases of the moon. Please read along with the author as you learn about our moon! Enjoy!

Why does the moon look different? Phases of the Moon Activity!

Please scan this QR code to watch this demonstration to visualize the moon's phases. Included in your TCI STEM@Home mailer is a **latex balloon**. Inflate this balloon until it forms a 4" round sphere and use in place of the styrofoam ball mentioned in the video. Do not inflate the balloon very big or it will become transparent. See if you can replicate the various phases of the moon as seen in the video!



Some more cool videos about the phases of the moon



Observe the Moon with your Monoscope!

Last month, we sent you a mini pocket 8x monoscope as part of the Great Backyard Bird Hunt. You can use this same monoscope to help you observe the moon and complete a Moon Journal! Use the included Moon Journal to document the time, date, and phase of the moon you observe each night. You can use these apps below to help you locate the moon in the night sky. They can be found for free on Google Play or the Apple App store.

Star Tracker - Mobile Sky Map & Stargazing guide

Moon Phase Calendar

FUN with the Moon in The Cane Institute!

Check out this cool LEGO Planetarium Orrery Earth, Moon and Sun Model that we built with some of the LEGO bricks we have here in the TCI STEM Lab! Scan the QR code to see our LEGO model in action! We can't wait to have students back in the Lab!!!

CHALLENGE QUESTION ANSWERS: ISS altitude = 0.2cm (2mm), Earth's atmosphere = 0.05cm (0.5mm) thick