Interactive Exhibit: **Telescopes**

**Description:**
Three different telescopes stand on raised platform and allow participants to examine the Moon Hemisphere Model, located above the curved wall across the Science Quest hall. Careful, patient users may find the marker showing the location of the Apollo 11 landing site in the Sea of Tranquility. These actual, working, scientific instruments demonstrate, compare, and contrast some properties of reflecting and refracting optical telescopes.

**Information:**
- Suitable for all grades
- The telescopes are delicate instruments and should be treated as such. Patience and gentle handling of the focus controls should be exercised.
- Self-guided

**Components:**
- The two-inch-diameter front-mounted lens gathers about 50 times as much light as the unaided human eye. The lens refracts (bends) light from distant objects into the eyepiece lens. The magnification used here is about 70 times.
- Long-focus telescopes give high magnification with dimmer images and a narrower view than short-focus telescopes of the same size.
- The four-inch-diameter rear-mounted concave mirror gathers about 200 times as much light as the unaided human eye. The curved mirror reflects, or "bounces," light from distant objects onto a one-inch flat mirror near the front of the instrument. The flat mirror then reflects the light into the eyepiece lens. The magnification used here is about 15 times.
- Short-focus telescopes give wider, brighter images at lower magnification than long-focus telescopes of the same size.
- The six-inch-diameter rear-mounted concave mirror gathers about 450 times as much light as the unaided human eye. The curved mirror reflects, or "bounces," light from distant objects onto a one-inch flat mirror near the front of the instrument. The flat mirror then reflects the light into the eyepiece lens. The magnification used here is about 50 times.
- Long-focus telescopes give higher magnification with dimmer images and a narrower view than short-focus telescopes of the same size.
Sunshine State Standards Addressed:

**1st Grade:**
1.E.5.3 Explain how magnifiers make things look bigger & allow us to see things not visible to our eyes alone.

**3rd Grade:**
3.E.5.5 Explain that many more stars are visible in a telescope than can be seen with eyes alone.
3.P.10.4 Demonstrate that light can be reflected, refracted and absorbed.

**4th Grade:**
4.E.6.5 Investigate how technology and tools help to extend the ability of humans to observe very small things and very large things.

**7th Grade:**
7.P.10.2 Observe and explain that light can be reflected, refracted and/or absorbed.

**9th – 12th Grade:**
912.E.5.8 Explain how historical tools as well as new observational tools utilize electromagnetic radiation.
912.P.10.22 Construct ray diagrams and use thin lens and mirror equations to locate the images formed by lenses and mirrors

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