AUGUST EXPERIMENT 1

What's in YOUR Night Sky?

by STEM Powering

The night skies may simply appear to be a collection of dots hanging out on the ceiling of our Earth. However, the reality is much more complicated. Our ancestors imagined different stories as to how the night sky came to look as a landscape of different points. These days, we know there is an entire cosmos behind the formations we see in the sky, with many different objects located at vast distances in space from our humble blue planet. Some of these objects are launched by humans, and we call these satellites. While they do not normally emit enough light on their own to be observed from Earth, if you wait until just after sunset, you can actually see some of these satellites yourself.

Materials List:

None for this experiment!

Procedure:

1. Wait until just after sunset to start observing the night sky
2. Look at the stars, looking for anything moving much faster than the night sky.
3. These objects should not be flashing, instead they should be moving steadily across the night sky with constant brightness.
4. If you've noticed, these objects seem to move much faster than any airplane with a contrail you may have seen during the day. That is because these are satellites, and they're moving much faster than any airplane!

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The Science Behind This Experiment

First of all, the only reason you can see these satellites is because you waited until just after sunset. This is important because we need the sun to be just over the horizon so that there will be enough light reflecting off the satellites, while ensuring the sky in the background is dark.

Also, you may be wondering why the satellites are moving so fast, at least compared to any airplane. This is because the satellites are in orbit. Unlike airplanes, satellites cannot rely on using wings that push on air to keep the airplane flying. Instead, they rely on orbital motion to avoid crashing into the ground.We may illustrate how orbital motion works in a future activity involving coding a simulation, but for now we can illustrate it using the concept of centrifugal force.

Essentially, if an object is being pulled toward another while the object is moving sideways with respect to the pull, it is as if the object is receiving another pull force opposite in direction to the original pull. Alright, that sounds complicated. But basically, if two objects are being pulled toward each other, but one is moving fast enough sideways, one object will end up on a circular trajectory around the other. This is the same reason water remains in a bucket if you were to spin it fast enough above your head.

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