Asteroid Orbits Hands-On Activity

1. ***Goal: Use a model to conceptually understand how an asteroid's orbit could be oriented to the plane of the solar system.***

2. Asteroid's Orbit Activity - Group Activity:
   Materials: umbrella from previous activity. Hula hoop or something similar

3. Recall there are **six things** we need to know about an asteroid's orbit. In the last section we talked about eccentricity (How "squashed" from a circle it deviates, with zero(0) being a circle, and one(1) being a parabola). We also talked about the semi major axis length. We used those two numbers to classify an asteroid's orbit. Three others describe the orientation of the orbit to the ecliptic. The fourth is the position along the orbit at a specific date and time

4. Use the umbrella and a hula hoop (or a good substitute), and the pictures below, to help the students understand all the ways an asteroid's orbit can be oriented. It is almost always a combination of all six.
   Its "horizontal rotation" in the ecliptic plane of the solar system (just rotate it horizontally)

   Its inclination to the ecliptic (inclination to the horizontal, which we have defined as the ecliptic)

Another tilt along the major(long) axis (towards us, the viewer)

The last thing to know is the date of the position we are interested in.

All these numbers are then used to calculate where it will be in the future. We do not have to calculate! A very large database is continually updated with the RA and Dec of the known asteroids. This is what Skynet will use to properly point at a known asteroid.
The purpose of this exercise is to help visualize how the asteroid's orbit is oriented to the earth, which makes determination of its position a challenge.

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