TRACING THE PAST

In a spectacular new IMAX experience, ***Asteroid Hunters***, the origins of our Solar System will feel closer than you've ever imagined. You'll travel to the outer reaches of space and back to discover what scientists believe is the biggest threat to our planet—and what they're doing to try to stop it.

PART 1 SEARCHING THE SKIES

As you'll discover in ***Asteroid Hunters***, there are hundreds of thousands of rocky, airless objects orbiting the Sun, fragments remaining from the creation of our Solar System 4.6 billion years ago—asteroids. They range in size from grains of dirt to mountains, and can be made of any variety of rock, clay, minerals, and metals. Some even contain water and carbon molecules—the building blocks of life.

Asteroids that orbit within 18.6 million miles of Earth's orbit are called Near-Earth Objects (NEOs). Potentially Hazardous Asteroids (PHAs) are a sub-class of NEOs that pass within 4.65 million miles of Earth or closer, and are large enough to cause considerable damage if they fell through our atmosphere. Although asteroids just 50 meters in diameter can form a crater, PHAs are generally 500 meters or more in diameter. So far, scientists have identified more than 20,000 asteroids close enough to endanger Earth, and that number is growing. NASA estimates that there are almost 5,000 PHAs, but only about 2,000 have been found.

Teams of scientists around the world study asteroids to learn more about Earth's past—and our future. Read the following article from NASA's Jet Propulsion Laboratory to learn more, and use it to answer the questions below: **nasa.gov/feature/jpl/cosmic-detective-work-why-we-care-about-space-rocks**.

1. How did gravity help to form the asteroid belt?
2. What can asteroids tell us about the history of our Solar System?
3. What can scientists learn from the presence of water on some asteroids like Ceres and Bennu?
4. Why is it important to learn about the composition of asteroids, particularly the ones classified as Near-Earth Objects (NEOs)?
5. What opportunities do asteroids present for the future?

PART 2 EVIDENCE ON EARTH

The surfaces of the Moon and Mars are battered with craters from asteroid impacts occurring over millions of years. Scientists have discovered that Earth's surface is battered too—but these craters have been hidden or altered by erosion, plate tectonics, and other shifts in our planet's surface. The discovery of one such crater, in Chicxulub, Mexico, changed the understanding of the dinosaur's extinction.

By studying impact craters on Earth, scientists can learn about Earth's past, and, perhaps more importantly, about what to expect if we were to get hit by an asteroid again. For example, in the Tunguska event in 1908, only very tiny fragments of the asteroid were ever found—scientists know, therefore, that the energy and heat were likely caused by an explosion miles above the ground rather than the asteroid actually crashing into the ground.

Choose one historic crater or impact site to research. Describe how scientists discovered it was a crater and any challenges they faced identifying it. Then use the back of this sheet to write down two to three facts that the impact site can tell us about Earth's history or about what might happen in a future asteroid impact. Here is a link to get you started: **lpi.usra.edu/publications/slidesets/craters/index.shtml**.

ASTEROID HUNTERS
AN IMAX ORIGINAL FILM