Near Earth Objects

**Prep Time:** 5 minutes  
**Grades:** 5-8  
**Lesson Time:** 50-60 minutes

**Essential Questions:**
- What are near-Earth objects?
- What is the difference between asteroids, comets, meteoroids, and meteors?
- How is distance measured regarding NEOs?

**Objectives:**
- SWBAT define the difference regarding NEOs.
- SWBAT explain how the distance of NEOs is measured.

**Standards:**
- MS-ESS1-2 - Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system.
- RST.6-8.7 - Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).

**Teacher Prep:**
- Materials: computer with projector (other option is to print out images), different colors of standard sized paper, stapler, pens, markers, ruler.
- Guide your students in building a model of the booklet they are going to make.

**Teacher Notes/Background:**
- NEO: an object in our solar system whose orbit around the Sun would bring it relatively close to the Earth.
- Asteroids: large rocky body in orbit of the Sun.
- Comet: small objects made of ice; come from Oort Cloud & Kuiper Belt.
- Meteoroid: small particle from comet or asteroid orbiting the Sun.
- Meteor: a meteoroid that enters the Earth’s atmosphere and vaporizes.
- AU: stands for astronomical unit a unit of measurement. One AU is equal to the distance from Earth to the Sun.

**Engage (5 minutes)**

**Turn and Talk:**
- Students should get into small groups and discuss NEOs.
- Write down 2 things I know and 1 question I have.
- Share out questions and ideas.

**Materials:**
- Pen or pencil
### Explore (5 minutes)

**Distinctions:**
- Print out images to distribute to small groups or show them on a projector to students.
- Ask the students to identify the images. The images attached are of an asteroid, a comet, and a meteor.
- **Asteroid**

![Asteroid Image](image1.png)

- **Comet**

![Comet Image](image2.png)

- **Meteor**

![Meteor Image](image3.png)

**Materials:**
- Computer with projector or printed out images
  - Asteroid image
  - Comet image
  - Meteor image
Foldable Booklet:
- Layer the papers so that there is space in between them. (Different colors are preferred, or you can use white paper and show the separation as pictured with markers).

- Fold them over so that more layers are created. The fold should slightly above the center of the top paper.

- Staple the inside of the book using an extra-long stapler.

- 3 pieces of paper will make 6 flaps, one for each term. Add more piece of paper if you wish to fill the books with more terms or a cover page.

- The terms included should include asteroid, meteor, meteoroid, comet, NEO, and Astronomical Unit (AU).

Materials:
- Standard sized paper
- Pen
- Markers
- Ruler
- Stapler
## Near Earth Objects

<table>
<thead>
<tr>
<th>Elaborate (5 minutes)</th>
<th>Share Out:</th>
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<tbody>
<tr>
<td></td>
<td>• Have students share out the details they included about NEOs.</td>
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<tr>
<td></td>
<td>• Students should explain the details they chose to include in their illustrations (did they draw craters? A tail for the comet?).</td>
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<tr>
<td>Materials:</td>
<td>• Completed books</td>
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<tr>
<th>Evaluate (5 minutes)</th>
<th>Wrap-up Questions:</th>
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<tbody>
<tr>
<td></td>
<td>• What is the difference between the different types of NEOs?</td>
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<td></td>
<td>• How many miles are in one AU?</td>
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<td>• Have you ever seen a NEO in the night sky? What did it look like?</td>
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<td></td>
<td>• How often do you think meteor showers occur?</td>
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<tr>
<td>Materials:</td>
<td>N/A</td>
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</table>

### Extensions and Enrichment:
- This same activity can be done for the planets in our solar system. Simply add more pieces of paper to the booklet.
- If resources are available, this can also be done as a PowerPoint presentation instead of a physical booklet. This way, students can search for actual images of NEOs.

### Additional Resources:
- [https://www.nasa.gov/audience/forstudents/k-4/more_to_explore/Asteroids-Comets-Meteorites.html](https://www.nasa.gov/audience/forstudents/k-4/more_to_explore/Asteroids-Comets-Meteorites.html)
- [https://dawn.jpl.nasa.gov/Meteorite/explore_asteroids.html](https://dawn.jpl.nasa.gov/Meteorite/explore_asteroids.html)