

LEO Art Challenge®

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<https://sites.google.com/site/leoartchallenge/>

<https://spacedge.academy>

Objectives

Students Will:

- Collaborate, cooperate, and create a 'zine' that describes one of the phenomena and/or objects associated with LEO (Low Earth Orbit)
- Engage in critical thinking as a 21st century skill
- Apply knowledge to a creative form of art that provides technical information
- Apply knowledge to write technical information in an artistic way

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Suggested Grade Level

6th – 12th grades

Subject Areas

Space Science, Physics, Language Arts, Creative Arts

Timeline

60-90 minutes

Standards

NGSS Standards (CCSS (Common Core are part of NGSS))

- MS-PS3-5.
- MS-ESS-2.
- CCSS-ELA-LITERACY.W.5.3
- CCSS.ELA-LITERACY.W.8.3
- CCSS-ELA-LITERACY.W.8.3.11-12.3
- CCSS-ELA-LITERACY.W.8.2
- CCSS-ELA-LITERACY.W.6.4
- CCSS-ELA-LITERACY.W.8.4
- CCSS-ELA-LITERACY.W.11-12.4
- CCSS.MATH.CONTENT.7.RP.A.2

Background

What is LEO? LEO stands for Low Earth Orbit. LEO is a region of space located between 150 and 2000 km (99 and 1200 miles) above Earth's surface. Space is classified by the altitude at which a spacecraft can orbit above the Earth, and LEO is a very exciting place in space!

Objects orbiting below LEO, located lower than 150 km (99 miles), experience a very rapid orbital decay rate due to atmospheric friction. Such objects lose altitude quickly. These objects generally burn up as they enter Earth's atmosphere.

There are a lot of phenomena going on and objects to be found in LEO. Such things include space debris, solar wind, space weather, the aurora, satellites, rockets, International Space Station, and spent rocket parts. The LEO environment itself contains and exhibits microgravity, vacuum, radical temperature changes, pressure, sparse atmosphere, radiation, and magnetic and electric fields. Spacecraft and orbital debris can move in different types of orbits in LEO. They include circular, elliptical, polar, and equatorial orbits.



In this activity, participants will choose one of the many objects or phenomena associated with the LEO environment and create a 'zine' using words and artwork. A zine is an 8-page booklet that was once known as a prozine or fanzine. The zine dates back to the Revolutionary War and is a means of portraying an idea, story, or information. The participants will work in groups to produce a zine with a treatment of some LEO concept or connection. The SpacEdge Academy LEO Challenge, open to all students, will be shown as a classroom or enrichment resource.

Vocabulary

Zine, LEO, Orbit, Satellite, Altitude, Geosynchronous orbit, Geostationary orbit, Polar orbit, Inclined orbit, Equatorial orbit, Atmosphere, Ionosphere, Plasma, Wavelength, Electromagnetic spectrum, Solar wind, Space weather, Space junk, Space debris, Micrometeoroid, Environment, Magnetic field, Electric field, Aurora, Radiation belts, Microgravity, Rocket parts, CubeSats

Materials

- Zine template (and sub-template pieces)
- Scissors
- Markers and/or Colored pencils.
- Tape

Lesson

1. Organize in groups of 3 or 4 people.
2. Each person/group is assigned/chooses a zine LEO topic.
3. Each person/group produces 1 or 2, 4 ¼ x 3 ¾ visual interpretation/s of their topic
4. The interpretations are added to the Zine Template
5. The Zines are shared with the workshop groups.

Extensions

Using other media like graphic arts to portray concepts
Used for information dissemination guides

Resources

LEO Art Challenge website:

- This website contains all the information needed along with templates and printable examples of zines.
- It also hosts a contest opportunity where students can submit a zine and gain a certificate.

<https://sites.google.com/site/leoartchallenge/>

SpacEdge Academy

- The academy is an online learning network and repository containing this activity along with many other lessons and activities for both students and teachers.
- The academy is password protected and participants are vetted so that both students and teachers are safe. Please sign up.
- There is no charge to use this site or activities.
- To access this activity, you go to the link, click on the pull-down “Educator Development” and choose “LEO Art Challenge Workshop”.

<https://spacedge.academy>

Zine Template Sample



