Unit 8.4: Teacher Background Content Resources

NGSS PE(s) or Subcomponent(s)	Associated Lesson(s) or Unit Challenge	Title of resource with link	Brief Description of Resource
All	Entire Unit	Common Student Misconceptions about Gravity and Space	A list of misconceptions compiled by the Mi-STAR curriculum team.
ESS1.B	L02	"NGSS - ESS1B - Earth & the Solar System" (2013) http://www.bozemanscience.com/ngs-ess1b-earth-the-solar-system	A Bozeman Science video that discusses ESS1.B.
ESS1.B	L02	"How do we know what's in space?" from http://www.qrg.northwestern.edu/projects/vss/docs/space-environment/3-how-do-we-know-whats-in-space.html	A website that explains how space objects are detected and observed.
ESS1.B	L02	"Where can we find asteroids and comets (2019) from https://letstalkscience.ca/educational-resources/backgrounders/where-can-we-find-asteroids-and-comets	A website with lots of concise explanations and definitions about a variety of space objects.
ESS1.B	L02	"The Probability of Collisions with Earth" from https://www2.jpl.nasa.gov/sl9/back2.html	A website with an in-depth analysis of the probability of a catastrophic collision between a space object and Earth.

ESS1.B	L02	"What are Asteroids Made of: the Meteorite Connection." from NOAO http://www.observeasteroids.org/meteorite-connection.php	A website about the composition of meteors (and asteroids). Has several useful links, including one to a more complete introduction to asteroids, tying them to Earth geologic processes.
ESS1.B	L02	How to tell an asteroid from a comet, even when its from outside our solar system" from https://www.popsci.com/difference-between-comet-asteroid/	An article from Popular Science about 'Oumuamua, the first confirmed interstellar object.
ESS1.B	L02	"Observatories Across the Electromagnetic Spectrum" https://imagine.gsfc.nasa.gov/science/toolbox/emspectrum_observatories1.html	A website from NASA with details about how different aspects of space are "seen".
ESS1.B	L02	"Asteroid or Meteor: What's the Difference?"(2019) from https://spaceplace.nasa.gov/asteroid-or-meteor/en/	A website from NASA with lots of useful links. Appropriate for students as well as teachers.
ESS1.B	L02	Center for Near Earth Object Studies from https://cneos.jpl.nasa.gov/orbits/	A very cool website on Near Earth Objects hosted by the Jet Propulsion Laboratory (JPL) at the California Institute of Technology. Lots of links.
ESS1.B	L02	"What is a Comet?" (1994) from http://solarviews.com/eng/comet/whatis.htm	A website/article with details about the size, orbit and composition of comets.
ESS1.B	L03	"Name that Space Rock" from https://www.universetoday.com/100075/	Infographic about differences between asteroids, comets, and meteors.

		infographic-whats-the-difference-between-a-comet-asteroid-and-meteor/	
PS2.B, ESS1.B	L03	"Asteroids, Comets, Meteorites" from https://www.jpl.nasa.gov/asteroidwatch/asteroids-comets.php	A website with information about asteroids, comets, and meteorites.
PS2.B, ESS1.B	L03	"How do objects travel in space?" from http://www.qrg.northwestern.edu/projects/vss/docs/space-environment/zoom-travel.html	A website about orbits.
ESS1.B	L04	"My Solar System" from https://phet.colorado.edu/sims/my-solar-system/my-solar-system_en.html	PhET simulation of orbits of the Sun and planets.
PS2.A	L04, L05, L06	"NGSS PS2A - Forces & Motions"(2013) http://www.bozemanscience.com/ngs-ps2a-forces-motions	A Bozeman Science video that discusses PS2.A.
PS2.A	L04, L05, L06	"Forces and motion: A simple introduction" (2022) https://www.explainthatstuff.com/motion.html	An introduction to different types of forces and motion.
PS2.A	L04, L05	The Physics Classroom, Lesson 1 - Newton's First Law of Motion https://www.physicsclassroom.com/Physics-Tutorial/Newton-s-Laws	Tutorial on Newton's first law (inertia and determining net forces).
PS2.B	L06	The Physics Classroom, Lesson 1 - Motion Characteristics for Circular Motion https://www.physicsclassroom.com/class	Tutorial on the physics of circular motion

		/circles	
PS2.B	L06	The Physics Classroom, Lesson 3 - Newton's Second Law of Motion https://www.physicsclassroom.com/class/circles	Tutorial on Gravity and Newton's Universal Law of Gravitation.
ESS1-2 ESS1.A	L07	A Universe of Galaxies (2019) https://astronomy.com/magazine/2019/02/a-universe-of-galaxies	How many galaxies, what shapes, and how do we know?
ESS1-2 ESS1.B	L07	Windows to the Universe Solar System formation (2012) https://www.windows2universe.org/our_solar_system/formation.html	Solar system formation article.
ESS1.B	L07	"The Most Distant World We've Ever Explored Just Shed Light on How Planets Are Born" (2020) https://www.sciencealert.com/here-s-what-arrokoth-can-tell-us-about-how-baby-planets-are-born?perpetual=yes&limitstart=1	An article about a solar system object that provides information on how planets form.
ESS1.B	L08	Will an asteroid hit Earth? Planetary Defense FAQs https://www.nasa.gov/planetarydefense/faq	NASA's Planetary Defense staff answer common questions about asteroid collisions.
ESS1.B	L08	Handy impact calculator from Purdue scientist https://www.washingtonpost.com/news/wonk/wp/2013/02/08/worried-about-ast	Calculate the damage of a potential asteroid collision!

		eroids-this-handy-calculator-will-assess-the-damage/	