Vocabulary in the lesson and definitions
Other terms such as potential energy, conservation of energy and mass, kinetic energy, and density are also defined in the resource, but students should already have had some familiarity with these as these concepts are prerequisites for understanding the science of black holes. Definitions for these as well as the terms below are available as popups throughout the module.

accretion disk Material being sucked down toward a rotating object that has a strong gravitational pull often forms a disk of material around the object. The material gains energy from falling in the gravitational field, often becoming so hot that x-ray radiation is produced.)

Big Bang Theory A variety of scientific evidence has convinced many astronomers that the universe came into being at a definite moment in time about 15 billion years ago. This occurred in the form of a super-hot, super-dense fireball of energetic radiation.

black hole A concentration of matter that creates a gravitational field strong enough to curve spacetime so that nothing can escape, not even light.

blueshift Just as electromagnetic radiation may be stretched, it may also be shortened. Because blue is a shorter optical wavelength, when an object is moving toward an observer its spectrum is said to be blueshifted.

escape velocity The minimum speed needed for an object to escape the gravitational pull of a massive object.

event horizon The event horizon is an imaginary sphere around a black hole where the escape velocity is equal to the speed of light. Inside the event horizon, escape requires a velocity greater than the speed of light. So anything that crosses the border will never get out again (because nothing is faster than the speed of light). Objects outside the event horizon feel the gravitational pull (which depends only on the separation of the object from the black hole and on their respective masses), but escape is still possible.

G (gravitational constant) Newton proposed that the property of having mass gives rise to a universal force of attraction between bodies. This is called gravity. And no matter where in the universe two bodies are or what mass they have, the force they each feel is proportional to the product of their masses divided by the square of their separation. The constant of this proportionality is called the universal gravitational constant. It's amazing that no matter where or what, the gravitational force between two bodies divided by (Mm / r^2) is always equal to the same number — G.

miniature black hole A type of black hole thought to have developed early in the history of the universe. The mass associated with this type of black hole is in the order of magnitude of elementary particles.

neutron star An extremely compact ball of neutrons formed from the central core of a collapsed star, having the mass of a star but smaller than an average planet in size.

redshift Light or other electromagnetic radiation may be stretched, making a wavelength longer. Because red has a longer wavelength within the optical spectrum, the stretching of light as objects move away within the universe is referred to as redshift. The cosmological redshift tells astronomers how fast the universe is expanding.

singularity A point of infinite density where the laws of physics are likely to break down.

stellar black hole The result of a supernova of a star having enough mass so that the compact remnant of the star has collapsed, crushing its content into a singularity.

supermassive black hole This type of black hole is thought to lie at the heart of active galaxies and quasars, providing the gravitational powerhouse that explains the source of energy in these objects. This type of black hole has a mass many times larger than that of a single star.

Schwarzchild radius The radius of the event horizon around a black hole.

white dwarf A star formed from the collapse of a star like our Sun at the end of its life. The mass is condensed into a much smaller size, which greatly increases the temperature.