1. Even as late as the last century, other galaxies were thought of as small _____ nearby within our own galaxy, instead of being thought of as large, separate entities.

2. Galileo first came to the realization that the “milk” patterns in the Milky Way were actually distant bunches of _____ using his refracting telescope.

3. Stars which periodically change in absolute _____ with time, like Cepheids and RR Lyrae, were useful for mapping out the size of our own galaxy as well as for leading to the realization other galaxies exist.

4. Our largest near-neighbor, the _____ galaxy is not only the first discovered after the realization the Milky Way is one, but it is also on a few-billion-year collision course with us.

5. We have thus far observed approximately _____ earth-like (in terms of size and distance from star) planets using the Kepler telescope.

6. Most galaxies probably started out smaller than they are today and _____ attracted small ones together.

7. Galaxies with more dust and rotational energy (spinning faster) are more likely to become _____ galaxies.

8. High-temperature gas produces _____ photons and demonstrates that galaxies extend beyond their visible portions and well into their spherical halos of dark matter particles.

9. The _____ of a galaxy (z), which is determined by studying its spectral lines, tells us not only how distant a galaxy is, but also how fast it is moving with the expanding universe, and how old it is.

MUCH SHORTER SO THAT YOU CAN HAVE AN ENJOYABLE BREAK BUT ALSO DUE EARLIER (Fri MARCH 11)
1. nebulae / nebulas / clouds (you can also write out the definition of nebulae: clouds of gas and dust in space).

2. stars OR star clusters. Although fuzzy, nebula(s) not correct answer.

3. brightness OR luminosity OR "shiny-ness" OR photon output (any word or phrase that means essentially the same thing)

4. Andromeda OR M31 (both names for the same galaxy)

5. 10 (this is the order of magnitude. Since the correct answer is approximate anyway, and subject to some debate based on the exact interpretation of the data, full credit for any number between 5 and 50, inclusive on both ends).

6. Gravity OR gravitational force OR black hole(s) OR gas OR baryons OR (cold) dark matter (only half-credit if you said a specific form of dark matter, like WIMPs, because we are not sure what dark matter is).

7. spiral OR barred spiral or any other form of spiral either discussed in class or mentioned online. Half-credit for saying flat OR disk-like because you got the right idea but used informal term.

8. X-rays (UV produced too probably but can't reach us, and gammas not the answer we were looking for).

9. Redshift OR Doppler red-shift (half-credit for “Doppler shift” because could be either a red shift or blue shift, and galaxies are moving away, so reddened)

TOTAL POSSIBLE: 9 points, 1 point each