

The following Quiz and Best Order list are from the article “Galactic Chicken or Galactic Egg, Which Do You Teach First” in *The Classroom Astronomer* magazine, Summer 2013, Issue #16, by Andrej Favia, © Hermograph Press, Marietta, GA.

For an audience of students or teachers, read the following paragraph as instructions:

“Take a moment to read the following twelve statements. Next to each one, mark which you believe are true or false. If you think they are false, write down when you learned that? Go ahead, I’ll wait...”

All the answers should be false. When done, collect to see how your students did, what their misconceptions are.

If you are doing this with teachers, use the paragraph below to ask them to mark the year with A if this was learned pre-college, C if learned in College, and G (for grown-up!) if after college. Collect and analyze when the teachers learned the false aspects, and see which misconceptions you have to un-teach them.

“Now that you have finished the Galactic Quiz, how many did you check as true? For the false choices, how many were when you were a child, an adolescent, or an adult? Mark with A if this was learned pre-college, C if learned in College, and G if after college.”

The Best Order for teaching topics about galaxies and aspects related to the Sun and solar system is different for children and adolescents versus adults (college or post-college). Use the appropriate lesson order.

- 1. The Milky Way is the only galaxy** True False ⇒ _____
- 2. The solar system is not in the Milky Way (or any other) galaxy** True False ⇒ _____
- 3. All galaxies are spiral** True False ⇒ _____
- 4. The Milky Way is the center of the universe** True False ⇒ _____
- 5. The Sun is at the center of the Milky Way galaxy** True False ⇒ _____
- 6. The Sun is at the center of the universe** True False ⇒ _____
- 7. There are only a few galaxies** True False ⇒ _____
- 8. The galaxies are randomly distributed** True False ⇒ _____
- 9. We see all the stars that are in the Milky Way** True False ⇒ _____
- 10. All galaxies are the same in size and shape** True False ⇒ _____
- 11. The Milky Way is just stars --- no gas and dust** True False ⇒ _____
- 12. New planets and stars don't form today** True False ⇒ _____

Table 2. Order to teach galaxy concepts for children and adolescents (left), and adults.

- i. Show the location of the Sun in the Milky Way
- ii. Show that the Milky way is not at the center of the universe
- iii. Show that the Milky Way is not the only galaxy
- iv. Show that there are billions of galaxies
- v. Teach the various sizes and shapes of galaxies
- vi. Show that the Milky Way has gas and dust in it, which is then used to form planets and stars today
- vii. Demonstrate that the solar system is in the Milky Way.
- viii. Show how many galaxies are spiral vs. how many are of other types (e.g. elliptical, irregular)

- i. Show that there are many galaxies (and not just ours)
- ii. Demonstrate that the solar system is in the Milky Way.
- iii. Teach the various sizes and shapes of galaxies
- iv. Show how many galaxies are spiral vs. how many are of other types (e.g. elliptical, irregular)
- v. Show that the Milky Way has gas and dust in it, which is then used to form planets and stars today
- vi. Show that there are billions of galaxies
- vii. Show the location of the Sun in the Milky Way
- viii. Show that the Milky way is not at the center of the universe

- ix. Show that we cannot see all stars in our own galaxy
- x. Teach the distribution of galaxies in the universe

