Lesson Plan - ***"Out of this World: Stars and Planets"***
By: Isaiah Tristan - Rice University

Notes:

Objective: Students will be able to talk about stars and identify different types of planets/their characteristics. They will demonstrate this by imagining and creating a model of their own planet.

Length: 50 minutes

Grade Level: 6th - 8th grade

Materials and Preparation:
Presentation Slides
Paper/pencils or markers to use on whiteboards
Play-Doh or another child-safe modeling compound

This lesson was based on the "I Do, We Do, You Do" system that the Splash program uses.
This lesson works best with a more extroverted class, as student who are more introverted may have trouble interacting with other students and interjecting their ideas during the collaborative sections.

Lesson:

INTRODUCTIONS:
Should this be a one time lesson with unfamiliar students be sure to start by setting ground rules for your program, school, and class. Mention that the students are there to learn and if they have fun, it's even better.
Next, introduce yourself and share a little information about yourself, then ask each student how they would like to be addressed (first name or a nickname).
(5 min)

REFRESHERS:
Go over vocabulary the students should know as you deem necessary (e.g. Sun, stars, Moon, planets, solar system, etc.). Doing this will jot the memory of what they have learned before. Afterwards, ask students to define certain terms and correct any misinformation.
(5 min)

PRESENTATION AND DISCUSSION:
Start with a short but visually dramatic video on star formation, planet formation, or protoplanetary disks. Explain that the Sun is a star, inner planets are rocky, outer planets are gas, and how these come to be (size, distance, etc.).
Address any outstanding questions or confusions the students may have before continuing.
After this, let the students know they will be creating their own planets and then modeling them.
(10 min)

ACTIVITIES:
Split your class into groups of 4. Have them count off as you point around the room and try to pair them up with students they are unfamiliar with if necessary. Have them scatter across the room and supply them with paper to write their ideas down and discuss what kind of planet they want.
Give the students about minutes to come up with a team name and planet name. Allow them the option to use the same for both. If any groups cannot agree on a name, supply one for them.

Next, have the students work together to create their own planets. Go around the classroom to each group and help them with their decision. Ask them to explain the science reasons for their planets characteristics. In the end, each group should have at least 5 characteristics of the planet decided (e.g. size, gas/rock, color). Have the students draw what they want their planet looks like and write the characteristics.

Once students bring you their completed planets, give them the modeling materials and have them create a model of their planet. Here, you can also have students interact between groups so they can size the planets relative to each other. Finally, stop all work and have one representative from each group talk about their planet to the rest of the class.
(25 min)

CONCLUSIONS:

Last, design a solar system based on the groups' choices while making their planets. Answer any last minute questions. Congratulate the students for their work and thank them for participating in the class.
(5 min)

Tips:

Have students pick their group representative and ask who it is during the modeling process. This will create a smoother transition to the sharing part.

The solar systems your classes make will be excellent decorations once the modeling material dries up, which can be used around the classrooms. Alternatively you can let students take them home if there is not going to be a problem between who takes what.

Should you need to turn in proof of work, take pictures of the students with their solar systems to show to your supervisors.

Note that while the activities' main goals are to help the students retain the information they have seen and learned, a secondary goal is to inspire students to imagine worlds other than our own and think about the possibilities that exist out in the Universe. In life, a love starts with an interest, and middle school is one of the best times to spark an interest in Astronomy or science in general. In learning about the worlds around them, perhaps the students can come to understand a little bit about their own as well.