**5E Template- Science**

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| **Content Area: Earth Sci** | **Grade Level(s): 9th** | **Topic(s): Our Solar System** |

**Standards (SOL)**

**ES1b** TSW plan and conduct investigations in which technologies including computers, probeware, and global positioning systems (GPS), are used to collect, analyze, and report data and to demonstrate concepts and simulate experimental conditions.

**ES4a** TSW investigate and understand the characteristics of the Earth and the solar system. Key Concept: position of the Earth in the solar system

**ES4c** TSW investigate and understand the characteristics of the Earth and the solar system. Key Concept: characteristics of the sun, planets and their moons, comets, meteors, and asteroids.

**ES12c** TSW compare the Earth’s atmosphere to that of other planets.

**Objectives (UKD’s)**

TSWBAT describe the properties of the terrestrial planets and gas giant planets.

TSWBAT identify the unique nature of the planet Pluto

TSWBAT compare Earth with the other planets of our solar system.

**Materials & Resources**

Poster board, markers, colored pencils, paper, scissors, glue, tape, colored paper, compasses

* Text: *Earth Science* *Geology, the Environment, and the Universe*, National Geographic Society Chapter 29.2 & 29.3 pp. 780-792
* Google Earth (sky) <http://www.google.com/> earth/index.htm
* [http://www.nasa.gov/home/index.htm](http://www.nasa.gov/home/index.html)l
* http://www.pics4learning. com/
* <http://school.nettrekker.com/subject/>
* [http://streaming.discoveryeducation.com/ index.cfm](http://streaming.discoveryeducation.com/%20index.cfm)
* <http://nineplanets.org/>
* <http://www.solarviews.com/> /eng/homepage.htm
* <http://science.nationalgeographic.com/> science/space/solar-system
* science.discovery.com/tv/wonders-of-**the-solar-system**

**Safety Considerations**

* No special accommodations/equipment needed to assure student safety.

**Engage – Time Estimate \_\_\_10 minutes\_\_\_\_\_**

1. Review terrestrial and gas giant planets briefly.
2. Explain that students will use knowledge learned about the solar system to a create project and use it to participate in a contest over the next two class periods. (CTA Something to put in your Earth Science teaching toolbox Part 2 –Gini Greenlaw)
3. The winning team will have their team photo and projects displayed on hall wall. (CTA Collaborative Learning - John Strebe)

**Explore – Time Estimate \_\_45 minutes\_\_\_\_\_\_**

The following activity is based on the CTA Something to put in your Earth Science teaching toolbox Part 2 – Gini Greenlaw with influences provided by CTA Collaborative Learning-John Strebe.

1. Divide students into homogeneous cooperative learning groups of 9 students with at least one square student (high) and one circle student (low) in each group and have the team select a group captain to communicate with facilitator/teacher.
2. Have students draw a name of a planet for their project.
3. Students will make a poster of their planet with a chart on the back showing their planet’s diameter, distance from the sun, orbital period, rotational period, number of satellites, surface temperature, and atmosphere’s gases.
4. Students may use the posted resources, the aid of a teammate, and/or the person on the other teams with the same planet to find the needed information. Students should check their information by comparing statistics with the students on the other teams that are researching the same planet.
5. Students will have the rest of the first day to work on their posters. They can finish any work not completed for homework. The first 5 minutes on the second period will be used to verify the accuracy of their information.

**Explain -- Time Estimate \_35 minutes\_\_\_\_\_\_\_**

1. Have students line up according to their planets for each option: first, distance from the sun, second, diameter (smallest to largest), third, length of rotational period (shortest to longest), fourth, length of orbital period (longest to shortest), fifth, number of satellites (least to most), and sixth, surface temperature (coldest to hottest). This is a possibility of 6 points.
2. Each time the option is given, the students will hold their posters out in front of them so the facilitator/teacher can easily see it for verification purposes.
3. When students are lined up, the captain will say “done,” and the facilitator/teacher will check for accuracy.
4. If the students are lined up correctly, the team will receive a point. If the students are lined up incorrectly, they can continue to try to get the positions correct until the facilitator/teacher calls a winner for that option. If necessary after all six options have been completed, the facilitator/teacher will give a tie-breaker option.
5. The team with the most points gets their picture taken and posted with their projects on the hall wall.

**Extend -- Time Estimate \_20 minutes\_\_\_\_\_\_\_**

After a brief discussion of the activity and its implications, the students will write a short reflection in their journal. In the reflection, they will use the information that they have gathered to write a comparison of their planet to Earth. The student with Earth can choose one of the other planets to use for comparison.

**Evaluate -- Time Estimate \_\_?\_\_\_\_\_\_**

* Accuracy of poster information – 60 points
* Observation during the game – 10 points
* Journal entry – 30 points

**Plans for Diversity**

Student(s): Category/Characteristics: Accommodations*:* There are 5 students with special needs in the class, 4 with learning disabilities in reading and 1 with a learning disability in math. LD/math unable to align numbers correctly: as needed, aid of teacher, aide, or peer in aligning numbers, peer collaboration, additional time. 4 LD/reading below grade level reading abilities: as needed; peer collaboration, additional time on assignments, clarifying directions, tests/assignments read to student

**Connections**

Planets and their satellites are taught in the first 6 weeks of the school year. Students are expected to know: there are two types of planets, the inner four planets are comprised mostly of rock; the outer four planets are comprised mostly of gas, the fifth outer planet has an unknown composition, but is thought to be solid; other properties of the planets and their satellites; Earth is one of the nine planets and is third from the sun; Earth’s atmosphere is unique in the solar system being comprised of 21% oxygen, 78% nitrogen, and 1% other trace gases; how Earth compares to the other planets. Teachers are expected to teach students the information using technology, instructional activities, instructional resources, and related Standards of Learning. In the future, this lesson could be built upon by using the same strategies to compare the planets satellites and placement of the moon, sun, earth at various times of the year.