**5E Template- Science**

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| **Content Area: Science** | **Grade Level(s): 6** | **Topic(s): Astronomy** |

**Standards (SOL)**

6.1 The student will plan and conduct investigations in which

a) observations are made involving fine discrimination between similar objects and organisms;

d) scale models are used to estimate distance, volume, and quantity;

j) models are designed to explain a sequence; and

k) an understanding of the nature of science is developed and reinforced.

6.8 The student will investigate and understand the organization of the solar system and the relationships among the various bodies that comprise it. Key concepts include

a) the sun, moon, Earth, other planets and their moons, meteors, asteroids, and comets;

b) relative size of and distance between planets;

**Objectives (UKD’s)**

*I can investigate the key characteristics of the planets in the solar sytem. And understand the relative size and distance between planets.*

**Materials & Resources**

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| * Adding machine tape (3 meters per group) * Colored Pencils/Markers * Template of the solar system * Access to the internet/textbooks with updated information on planets | * Glue * Index cards (8 per group) * Model of Sun cut to scale * Scotch tape (1 per group) * Meter stick (at least one per group, 2 would be preferable) |

**Safety Considerations**

None

**Engage – Time Estimate 2 minutes**

<http://www.youtube.com/watch?v=BdAqq-wEQV0>

Show the video clip from Bill Nye. This shows a model of the solar system on a soccer field. **Ask students: Talk to table partners, were you surprised how far apart some of the planets are? What about the distance to the next star?**

**Explore – Time Estimate 1 hour 15 minutes**

Build a scale model

* Working in groups of 4
* Have students gather materials
* Tape the ends of adding tape on the floor
* Color the planets and cut them out (leave the names attached at the bottom)
* Each person research 2 planets and record information on index cards
  + Size (diameter)
  + Time of rotation
  + Time of revolution
  + Color
  + Average temperature
  + Number of moons
  + Other interesting information
* Mark left end of adding tape as sun
* Using the conversion chart measure the SCALE distance of the planets from the sun
* Using a glue stick glue the planets in the correct order and the correct distance from the sun

**Explain – Time Estimate 20 minutes**

Give students the following questions to work on individually, allow to work for 5-10 minutes.

1. What do you notice about the spacing between the first 4 planets?
2. What do you notice about the spacing between the last 4 planets?
3. What do you notice about the size of the first 4 planets?
4. What do you notice about the size of the last 4 planets?
5. What would happen to the adding tape if we used INCHES instead of CENTIMETERS for our scale model?
6. What can you conclude about the distance between the planets in real life?

Give the group of students a new sheet with the questions on it. Ask the students to fill out the questions together in the group to turn in.

**Extend – Time Estimate 5-15 minutes**

Students take index cards and write largely planet name on back

Ask students to order the planets in various ways could include

* Diameter of planet
* Distance from sun
* Rate of rotation/revolution

**Evaluate – Time Estimate 5 minutes**

* Hang up the scale models in the hallway (sun should be taped to a wall prior to students’ models being hung)
* Discuss with students if the spacing is correct (teacher could have a key also hanging)

**Plans for Diversity**

Students may have difficulties with measurement and following directions. Be available to clarify instruction.

**Connections**

* Make a scale model of school yard showing the amount of pervious and impervious surfaces.