

# Pennsylvania

High School

Physical Science, Chemistry and Physics  
(D. Astronomy)

## Starry Night Lesson Plans

*In order of relevance*

### 3.4.10. Grades 8-10

|   |       |       |       |       |       |       |
|---|-------|-------|-------|-------|-------|-------|
| D. Explain essential ideas about the composition and structure of the universe.   | F1-F3 | G1-G3 | H1-H3 | I1-I3 | C1-C4 | D1-D3 |
| 1. Compare the basic structures of the universe (e.g., galaxy types, nova, black holes, neutron stars).                                     | H1-H3 | G1-G3 |       |       |       |       |
| 2. Describe the structure and life cycle of star, using the Hertzsprung-Russell diagram.  | G2    | G3    | F1    | F2    |       |       |
| 3. Describe the nuclear processes involved in energy production in a star.  | F1    |       |       |       |       |       |
| 4. Explain the "red-shift" and Hubble's use of it to determine stellar distance and movement.   | H3    | H2    | I3    | G1    |       |       |
| 5. Compare absolute versus apparent star magnitude and their relation to stellar distance.  | G1-G2 |       |       |       |       |       |
| 6. Explain the impact of the Copernican and Newtonian thinking on man's view of the universe.   | C2    | I2    |       |       |       |       |
| 7. Identify and analyze the findings of several space instruments in regard to the extent and composition of the solar system and universe. | C1-C4 | D1-D3 | I1-I3 | H1-H3 |       |       |

### 3.4.11. Grades 11-12

|   |       |       |       |       |       |  |
|---|-------|-------|-------|-------|-------|--|
| D. Analyze the essential ideas about the composition and structure of the universe.   | F1-F3 | G1-G3 | H1-H3 | I1-I3 |       |  |
| 1. Analyze the Big Bang Theory's use of gravitation and nuclear reaction to explain a possible origin of the universe.          | H1-H3 |       |       |       |       |  |
| 2. Compare the use of visual, radio and x-ray telescopes to collect data regarding the structure and evolution of the universe. | I1-I3 | H1-H3 | F1    | F2    | G1-G3 |  |
| 3. Correlate the use of the special theory of relativity and the life of a star.  | F1    | G2    | G3    |       |       |  |