

Women in Astronomy

Grades 9-12

Taped program with liver interactive component

OHIO Standards

Earth & Space Sciences (unless otherwise marked)

Rating Scale	Grade Level	Benchmark	Indicator
1 (main topic)	12	A	1. Explain how scientists obtain information about the universe by using technology to detect electromagnetic radiation that is emitted, reflected, or absorbed by stars and other objects.
1 (main topic)	12	A	3. Explain how information about the universe is inferred by understanding that stars and other objects in space emit, reflect, or absorb electromagnetic radiation, which we then detect.
2 (covered in detail)	8	A	2. Explain that gravitational force is the dominant force determining motions in the Solar System, and in particular, keeps the planets in orbit around the Sun.
2 (covered in detail)	8	B	5. Explain that the universe consists of billions of galaxies that are classified by shape.
2 (covered in detail)	9	A	3. Explain that gravitational forces govern the characteristics and movement patterns of the planets, comets, and asteroids in the Solar System.
2 (covered in	11	D	15. Use historical examples to show how new ideas are limited by the

detail)			context in which they are conceived; are often rejected by the social establishment; sometimes spring from unexpected findings; and usually grow slowly through contributing factors from many different investigators.
2 (covered in detail)	12	A	2. Explain how the large-scale motion of objects in the universe is governed by gravitational forces, and detected by observing electromagnetic radiation.
3 (briefly discussed)	8	A	1. Describe how objects in the Solar System are in regular and predictable motions that explain such phenomena as days, years, seasons, eclipses, tides, and moon cycles.
3 (briefly discussed)	8	B	7. Examine the life cycle of a star and predict the next likely stage of a star.
3 (briefly discussed)	8	B	8. Name and describe tools used to study the universe
3 (briefly discussed)	9	A	2. Describe the current scientific evidence that supports the theory of the explosive expansion of the universe, the Big Bang, over 10 billion years ago.

6-8

Benchmark A: Describe how the positions and motions of the objects in the universe cause predictable and cyclic events.

Benchmark B: Explain that the universe is composed of vast amounts of matter, most of which is at incomprehensible distances, and held together by gravitational force. Describe how the universe is studied by the use of equipment such as telescopes, probes, satellites, and spacecraft.

9-10

Benchmark A: Explain how evidence from stars and other celestial objects provide information about the processes that cause changes in the composition and scale of the physical universe.

11-12

Benchmark A: Explain how technology can be used to gather evidence and increase our understanding of the universe.

Benchmark D: Summarize the historical development of scientific theories and ideas, and describe emerging issues in the study of Earth and space sciences.

MICHIGAN Standards

Standard V.4 Solar System, Galaxy, and Universe (ES)

Rating Scale	S.C.# (Strand)	S.C.# Grade Level	Indicator
1 (main topic)	4	High School	4. Explain how technology and scientific inquiry have helped us to learn about the universe.
2 (covered in detail)	2	Middle School	2. Describe, compare, and explain the motions of Solar System objects.
2 (covered in detail)	IV.4	High School	3. Describe waves in terms of their properties
3 (briefly discussed)	1	High School	1. Compare our Sun to other stars.

Standard component #1: All students will compare and contrast our planet and Sun to other planets and star systems.

Standard component #2: All students will describe and explain how objects in our Solar System move.

Standard component #4: All students will explain how we learn about the universe.

IV. Using Physical Science Knowledge

4. Waves & Vibrations - All students will measure and describe vibrations and waves.

Rating Scale	L.O.	Grade Level	Indicator
1 (main topic)	Unit III:D	H.S. Int. Science	Demonstrate an understanding of the different regions of the electromagnetic

			spectrum.
2 (covered in detail)	1	8	Examine the origin, evolution, composition, and relationship of celestial bodies.
3 (briefly discussed)			

Grade 8

Learning Objective 1: Understands structure and composition of the universe and the Earth's place through a study of space exploration and the universe.

Unit III: Physical Science

D. Sound & Light - Science Concepts