

Table of Contents

Suggestions for the Day of the Exam	6
Multiple Choice Test Taking Strategies	7
Strategies for the Oklahoma Examinations for Oklahoma Educators	9
The Oklahoma Examinations for Oklahoma Educators: General Information	13
Learner-Centered Proficiencies	14
Cooperative Learning.....	15
Bloom’s Taxonomy of Levels of Thinking	16
Strides Toward Oklahoma’s Education Goals.....	17
Relevant Oklahoma Legislation.....	19
Oklahoma Criteria for Effective Teaching and Administrative Performance	21
Field 08: Earth Science Test Framework.....	23
Discussion of Competencies.....	30
Subarea I-Foundations of Scientific Inquiry.....	30
Competency 1 -The relationships and common themes that connect mathematics, science, and technology.....	30
Competency 2 -The historical and contemporary contexts of the earth/space sciences and their application to everyday life.	31
Competency 3 -The process of scientific inquiry and the role of observation and experimentation in explaining natural phenomena.....	31
Competency 4 -The processes of gathering, organizing, reporting, and interpreting scientific data; and apply this understanding in the context of earth/space science investigations.....	33
Competency 5 -Types and uses of natural resources, the effects of human activities on the environment, and the need for stewardship to preserve the environmental integrity of the earth’s ecosystems.....	39
Competency 6 -How to create, use, and interpret physical and mathematical models (e.g., maps, charts, graphs, diagrams) commonly used in earth/space science.....	42
Competency 7 -Equipment and materials used in earth/space science investigations, and apply procedures for their proper and safe use	45
Subarea II-Space Systems.....	49
Competency 8 -The structure, composition, and features of the earth, moon, and sun and the role of technology and exploration in obtaining knowledge about the earth, moon, and sun system	49
Competency 9 -The interactions among the components of the earth, moon, and sun system (including energy transmission and absorption)	51
Competency 10 -The scale and organization of the solar system, the role of gravity in the solar system, characteristics of the bodies within the solar system, and physical and mathematical models that describe these objects and their real and apparent motions.	52
Competency 11 -Types of Telescopes (e.g., optical, radio, infrared, ultraviolet) and the ways in which they are used to acquire information on star characteristics	54
Competency 12 -Evidence regarding the size, structure, scale, and motions of the universe, the Milky Way galaxy, and the solar system.	57

Subarea III-Atmospheric Systems	59
Competency 13 -The composition, structure, and properties of the earth's atmosphere and the mechanisms and effects of energy transfer involving the earth-atmosphere system.	59
Competency 14 -The properties of water, conditions in the atmosphere that favor phase changes, and the energy relationships among phase changes, cloud formation, and precipitation.	61
Competency 15 -Characteristics of broad-scale weather systems and local weather, the relationship between them, and the methods and instruments used to collect and display weather data.	63
Competency 16 -The principles and technology of weather forecasting and the impact of weather on humans.	66
Competency 17 -The locations and characteristics of the earth's major climatic regions, and analyze factors that affect local climate and the relationship between weather and climate.	67
Competency 18 -The impact of human activities and natural processes on the atmosphere, theories about the long-range effects of human activities on global climate, and methods of controlling and minimizing these effects.	68
Subarea IV-Geological Systems	70
Competency 19 -Geochemical systems, the processes of mineral and rock formation, the characteristics of different types of minerals and rocks, and the methods used to identify and classify them.	70
Competency 20 -The structure of the earth, the constructional forces that have shaped its surface, theories and evidence of crustal movements, and the effects of crustal movements on landscape.	71
Competency 21 -Erosional-depositional processes that change the earth's surface (e.g., weathering, erosion) and the relationship between these processes and landscape development.	74
Competency 22 -Characteristics of the major geologic time divisions and theories and supporting evidence regarding the earth's geologic history.	75
Subarea V-Water Systems	78
Competency 23 -The processes by which water moves through the hydrologic system, and use this knowledge to analyze local water budgets.	78
Competency 24 -The processes by which water moves on and beneath the earth's surface.	79
Competency 25 -The oceanic system; the structure, composition, and properties of the earth's oceans; and the causes and properties of currents and waves.	81
Sample Problems	83
Constructed-Response Assignment Rubric.....	97
Sample Constructed-Response Assignment	98
Sample Constructed-Response for the Assignment.....	99
Answers to Sample Problems	101
Miscellaneous Solutions to Sample Problems	102
Appendix A: Safety Symbols Examples.....	103
Appendix B: Constants and Formulas	104
Glossary	105

References.....116