Science Content Standards OPT Diagnostic

Content Area: Science Fundamentals

Standard Statement	Test PA	Test PB	Test PC	Test PD	Test PE	Test PF	Test PG
1. The learner will understand and apply the concept of **scientific** thinking by: a) Distinguishing facts from **hypotheses** and **opinions** b) Recognizing **unstated assumptions** c) Identifying **cause-and-effect** relationships d) Distinguishing a **conclusion** from **supporting statements**	□ 5 □ 6 □ 7 □ 8 □ 9 □ 11 □ 17 □ 19	□ 1 □ 8 □ 9 □ 10 □ 12 □ 14 □ 15	□ 13 □ 23 □ 24 □ 25	□ 16 □ 23	□ 2 □ 3 □ 8 □ 16	□ 1 □ 6 □ 7 □ 15 □ 23 □ 24	□ 14 □ 15 □ 25
2. The learner will evaluate **scientific information** by: a) Distinguishing **relevant** from **irrelevant** information b) Determining if there is enough information to support a conclusion	□ 6 □ 21 □ 24	□ 17 □ 20	□ 11 □ 12 □ 22			□ 8 □ 11	□ 14 □ 25
3. The learner will objectively evaluate evidence using the **scientific method**. Steps in the scientific method include: a) Identifying "the" problem b) Collecting information c) Forming a hypothesis d) Testing the hypothesis e) Analyzing results and drawing conclusions	□ 2 □ 13	□ 23	□ 21	□ 2 □ 24	□ 12 □ 22	□ 2 □21 □ 3 □22 □ 5 □25 □ 9 □10 □12 □16 □17 □20	□ 11 □ 25

Content Area: Earth and Space Science

Standard Statement	Test PA	Test PB	Test PC	Test PD	Test PE	Test PF	Test PG
1. The learner will gather, analyze, and interpret information from maps, models, charts, graphs, and other geographical and informational representations. Key concepts include: a) Maps b) Directions, measurements, and distances on any map c) Understanding the concept of **latitude** & **longitude** d) Two- and three-dimensional representations of scientific theories, properties, or principles, such as line graphs, bar graphs, and globes	□ 1 □ 2 □ 5 □ 25	□ 18	□ 2	□ 1 □ 4 □ 6 □ 10 □ 12 □ 19	□ 4 □ 9 □ 10 □ 21	□ 1 □ 4 □ 5 □ 14 □ 18	□ 7 □ 13
2. The learner will examine and comprehend the structure of the Earth, including the **geosphere**, **hydrosphere**, and **atmosphere**	□ 3 □ 4	□ 24	□ 2 □ 13		□ 21	□ 4 □ 14	□ 4 □ 7

Science Content Standards OPT Diagnostic

Content Area: Earth and Space Science

Standard Statement	Test PA	Test PB	Test PC	Test PD	Test PE	Test PF	Test PG
3. The learner will describe basic geologic processes and predict how these processes are factors in the ever-changing face of the Earth. Key concepts include: a) The **rock cycle** b) **Fossils** and the changing Earth c) Geologic processes including **continental drift**, volcanoes, earthquakes, weathering, and erosion	□ 6 □ 8 □ 9 □ 25	□ 4			□ 10 □ 17		□ 2 □ 7 □ 15
4. The learner will interpret basic information from weather maps, charts, & imagery & recognize the effects of **weather phenomenon** and climate on human activities. Key concepts include: a) Influence of the sun on weather b) The water cycle c) Factors affecting climate d) Earth's season	□ 1 □ 5	□ 25	□ 16	□ 1 □ 15		□ 1	□ 5 □ 23
5. The learner will understand that oceans are complex, interactive systems that have a major impact on the **climate**, **environment**, and life of humankind. Key concepts include: a) Effects of the oceans on weather, climate, and the environment b) Tides and currents, such as **El Nino** c) Effects of the oceans on human activities d) Effects of human activities on the oceans				□ 22			
6. The learner will comprehend the basic theories of the origin & characteristics of the Earth & **Solar System**. Key concepts include: a) Formation of the **Universe**, including the **Big Bang Theory** b) Position of the Earth, planets, and other **spatial bodies** in the Solar System c) Relationships among the Sun, Earth, and moon (tides, eclipses, seasons)	□ 3	□ 1	□ 4 □ 19		□ 4 □ 23		□ 23

Science Content Standards OPT Diagnostic

Content Area: Earth and Space Science

Standard Statement	Test PA	Test PB	Test PC	Test PD	Test PE	Test PF	Test PG
7. The learner will compare and differentiate **renewable resources** from **non-renewable resources**. Key concepts include: a) **Fossil fuels** b) Alternative energy sources c) Water & soil conservation, including **watershed** systems such as the Chesapeake Bay d) Recycling, pollution, and **depletion**	□ 14	□ 6				□ 9 □ 18	

Content Area: Life Science

Standard Statement	Test PA	Test PB	Test PC	Test PD	Test PE	Test PF	Test PG
1. The learner will identify the components of **cells**, comprehend the organization of cells, and understand how cellular components function. Key concepts include: a) Structure of cell and its **organelles** b) **Meiosis** & **mitosis** c) Difference between plant & animal cells d) Life functions that are the end result of cellular functions	□ 10			□ 8	□ 1		□ 10
2. The learner will know the characteristics of living things and recognize the basic needs of organisms that must be met to supply energy needed for life processes. Key concepts include: **a) Photosynthesis** **b) Respiration**	□ 20			□ 7 □ 11		□ 8 □ 23	□ 6 □ 13
3. The learner will understand how and why **organisms** are classified, and will apply that knowledge in using a **dichotomous key**. Key concepts include: a) Comparing & contrasting physical traits that scientists use to classify organisms		□ 19		□ 25	□ 25	□ 5 □ 25	

Science Content Standards OPT Diagnostic

Content Area: Life Science

Standard Statement	Test PA	Test PB	Test PC	Test PD	Test PE	Test PF	Test PG
4. The learner will analyze the complex relationship between the living and non-living elements of Earth's environment by looking at the basic cycles that take place in **ecosystems**. Key concepts include: a) Concept of an ecosystem b) Energy flow that keeps an ecosystem c) Interlinked cycles of nitrogen, water, & carbon	□ 9	□ 13					□ 1
5. The learner will understand that organisms within an ecosystem are dependent upon one another and on the non-living components of the environment, and apply this information to become aware of how man fits into this complex relationship. Key concepts include: **a) Food webs** b) Energy flow in ecosystems		□ 12 □ 13 □ 15	□ 17	□ 5	□ 15 □ 18	□ 3 □ 6	□ 1 □ 8
6. The learner will comprehend the complex relationship between humans and the world they live in, and assess the impact that humans have on the ecosystem. Key concepts are: a) Overpopulation b) Environmental quality c) Human impact and interdependence on other organisms	□ 14	□ 24			□ 15	□ 10	□ 20
7. The learner will examine how organisms pass their **traits** on to new generations, and identify the connection between **genes** and the traits expressed by those genes. Key concepts include: a) **Mendelian laws** of inheritance b) The role of **DNA** & **RNA** in the makeup of genes & **chromosomes** c) The role of **dominant** & **recessive** genes in the expression of physical traits		□ 21		□ 8 □ 14 □ 18	□ 6 □ 19 □ 24	□ 21	□ 17

Science Content Standards OPT Diagnostic

Content Area: Life Science

Standard Statement	Test PA	Test PB	Test PC	Test PD	Test PE	Test PF	Test PG
8. The learner will examine & evaluate the various factors that cause organisms to change over time. Key concepts include: a) Mutation b) Adaptation c) Natural selection d) Extinction	□ 23	□ 2 □ 12 □ 16 □ 20	□ 5 □ 6 □ 7 □ 8	□ 14 □ 21	□ 20		□ 8 □ 18
9. The learner will understand basic **human anatomy** & identify the connection between healthy habits and physical & mental well-being. Key concepts include: a) Basic human biology b) Wellness/ fitness c) Nutrition d) Disease e) Safety f) Affect of choices on human health	□ 12 □ 21	□ 7 □ 17	□ 3 □ 11 □ 12 □ 15	□ 11 □ 12 □ 16 □ 17 □ 20	□ 1 □ 7	□ 11	□ 6

Content Area: Physical Science

Standard Statement	Test PA	Test PB	Test PC	Test PD	Test PE	Test PF	Test PG
1. The learner will explore the composition & interactions of the modern model of **atomic & molecular structure**, and apply that knowledge in understanding how molecular structure affects every aspect of our lives. Key concepts include: a) The **Periodic Table** b) **Protons**, **neutrons**, & **electrons** c) The **Law of Conservation of Matter** d) Basic **chemical bonds** & **formulas**	□ 11 □ 15 □ 22	□ 5 □ 11	□ 14		□ 14		□ 22
2. The learner will utilize the concept of the **modern model of atomic & molecular structure** to demonstrate comprehension of the basic nature of **matter**, **reactions**, & **energy**. Key concepts include: a) States of matter b) Types of reactions, **reactants**, & **products** c) **Law of Conservation of Energy**	□ 4 □ 14 □ 17 □ 19	□ 8	□ 1 □ 10 □ 18 □ 22 □ 25	□ 15	□ 12 □ 13	□ 2 □ 15 □ 19 □ 24	□ 11 □ 14 □ 19 □ 24

Science Content Standards OPT Diagnostic

Content Area: Physical Science

Standard Statement	Test PA	Test PB	Test PC	Test PD	Test PE	Test PF	Test PG
3. The learner will define the **Laws of Motion** & apply these laws in everyday life situations. Key concepts include: a) **Newton's 1st, 2nd, and 3rd Laws of Motion** b) How these laws relate to **mass**, **work**, & **force**	□ 11 □ 18	□ 9 □ 22	□ 9	□ 6 □ 9 □ 13 □ 19	□ 5 □ 11	□ 13 □ 22	□ 3 □ 12 □ 16 □ 21
4. The learner will compare & contrast the basic types of **waves**, their characteristics, and functions. Key concepts include: a) **Amplitude** b) **Wavelength** c) **Crest** d) **Longitudinal**, **transverse**, & **electromagnetic waves**	□ 16 □ 20					□ 16 □ 20	
5. The learner will understand the basic principles of electricity and magnetism, and apply this knowledge to daily life situations. Key concepts include: **a) Static electricity** b) **Current electricity** c) **Circuits** d) **Voltage** e) **Magnetic fields** f) **Conductors**	□ 22	□ 3	□ 20			□ 7	