West Virginia Science

Grade 8

Adopted 2022

Physical Science DOMAIN

Structure and Properties of Matter

11. Develop models to describe the atomic composition of simple molecules and basic extended structures. 5.8.11
12. Gather and make sense of information to describe that synthetic materials come from natural resources and impact society. 5.8.12
13. Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed. 5.8.13

Chemical Reactions

14. Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred. 5.8.14
15. Develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved. 5.8.15
16. Undertake a design project to construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes. 5.8.16

Life Science DOMAIN

Growth, Development, and Reproduction of Organisms

1. Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively. 5.8.1
2. Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms. 5.8.2
3. Develop and use a model to describe why structural changes to genes (mutations) located on chromosomes may affect proteins and may result in harmful, beneficial, or neutral effects to the structure and function of an organism. 5.8.3
4. Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation. 5.8.4
5. Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms. 5.8.5

Natural Selection and Adaptations

6. Analyze and interpret data for patterns in the fossil record that document the existence, diversity, extinction, and change of life forms throughout the history of life on Earth under the assumption that natural laws operate today as in the past. 5.8.6
7. Apply scientific ideas to construct an explanation for the anatomical similarities and differences among modern organisms and between modern and fossil organisms to infer evolutionary relationships. 5.8.7
8. Analyze displays of pictorial data to compare patterns of similarities in the embryological development across multiple species to identify relationships not evident in the fully formed anatomy. 5.8.8
9. Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment. 5.8.9
10. Use mathematical models, probability statements, and proportional reasoning to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time. 5.8.10

Earth and Space Science DOMAIN

Human Impacts

17. Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems. 5.8.17

Engineering, Technology, and Applications of Science DOMAIN

Engineering Design

18. Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem. EDS.8.18
19. Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved. EDS.8.19