



Foundations of Science Semester 1 Review

About Science

Read chapter 1 of the Conceptual Physical Science book, pages 1-12.

Labs and Activities:

Collecting and Interpreting Data Graphing Activity Density Lab
How Do You Measure In Metrics? Pendulum Project

1. List and explain procedures for a safe lab and classroom.
2. Know the two branches of science and name examples of each of the natural sciences.
3. Define scientific facts, scientific theory and scientific law.
4. Distinguish between qualitative and quantitative descriptions.
5. Know the skills of a good scientist and the steps of the scientific method.
6. Define and graph independent variables, dependent variables and a control.
7. Know and convert the SI units and prefixes.
8. Know, calculate and convert numbers using scientific notation.
9. Know how to calculate and solve problems using proper significant figures.
10. Distinguish between accuracy and precision in making measurements.
11. Define and calculate volume, mass, weight, density and percent error.
12. Explain the limitations of science and define pseudoscience-giving examples.

Newton's First Law of Motion-The Law of Inertia

Read chapter 2 of the Conceptual Physical Science book, pages 15-30.

Labs and Activities:

13. Define motion, inertia, distance, time, speed, vector quantity and velocity.
14. Distinguish between speed and velocity.
15. Calculate speed and velocity and know the formula.
16. State, explain and give examples of Newton's First Law of Motion.
17. Define force, net force, support force and Newton.
18. Define balanced forces, unbalanced forces and equilibrium.

Newton's Second Law of Motion-Force and Acceleration Law

Read chapter 3 of the Conceptual Physical Science book, pages 34-48.

Labs and Activities:

Egg Toss Event Egg Drop Project

19. Define and calculate acceleration using the formula.
20. Explain the difference between mass and weight.
21. Define and explain inversely proportional.
22. State, explain and give examples of Newton's Second Law of Motion.
23. Solve Newton's Second Law for acceleration, force or mass using the formula.
24. Define friction, air resistance (drag) and gravity.
25. Define freefall, terminal velocity and weight.
26. State the acceleration due to gravity in meters per second squared.

Newton's Third Law of Motion-Action Reaction

Read chapter 4 of the Conceptual Physical Science book, pages 53-65.

Labs and Activities:

27. Give example of interactions between forces working in pairs.
28. State, explain and give examples of Newton's Third Law of Motion.

Momentum

Read chapter 5 of the Conceptual Physical Science book, pages 69-79.

Labs and Activities:

Rolling Ball Lab

29. Define and calculate momentum using the formula.
30. Define and calculate impulse using the formula.
31. Explain the Law of Conservation momentum.
32. Define and give examples of elastic and inelastic collisions.

Work and Energy

Read chapter 6 of the Conceptual Physical Science book, pages 83-98.

Labs and Activities:

How High Does the Ball Bounce Horsepower Lab

33. Know the definitions and units for Joules, Watts and horsepower.
34. Define and calculate work using the formula.
35. Define and calculate power using the formula.
36. Define energy and list forms of energy other than Potential and Kinetic.
37. Define and calculate Gravitational Potential Energy using the formula.
38. Define and calculate Kinetic Energy using the formula.
39. State, explain and give examples of the work-energy theorem.
40. Explain energy transformations in a system.
41. Explain the Law of Conservation of Energy.

Gravity

Read chapter 7 of the Conceptual Physical Science book, pages 102-112.

Labs and Activities:

42. Using the term tangential velocity, explain what it means to be in orbit.
43. Solve the law of universal gravitation for force, mass or distance using the formula.
44. Describe and give examples of the inverse-square law.
45. Explain why there are tides on Earth.
46. Define and explain the Big Bang, the Big Crunch and dark matter.

Heat Transfer and Change of State

Read chapter 10 of the Conceptual Physical Science book, pages 151-165.

Labs and Activities:

Heat vs. Temperature Phase Changes of Water Wicked Chemistry
Sand, Soil and water Lab

47. Define and explain conduction, convection and radiation giving example of each.
48. List and give examples of the states of matter.
49. Explain the difference between heat and temperature.
50. Explain the kinetic theory.
51. Define evaporation, condensation, sublimation, boiling point and melting point.
52. Describe, on a molecular level, the changes that occur as a solid is heated to a gas.

Atoms and the Periodic Table

Read chapter 17 of the Conceptual Physical Science book, pages 290-303.

Labs and Activities:

Atomic Jungle

53. Define chemistry, matter, atom, element and periodic table.
54. Define and explain atomic symbol, atomic number and mass number.
55. Name and calculate the number of each particle in an atom. (3 particles total).
56. Draw and correctly label models, for any element on the Periodic Table.
57. Understand what chemical formulas represent.
58. Define and locate, on the periodic table, the metals, nonmetals and metalloids
59. Define and locate, on the periodic table, periods and families of elements.

Atomic Models

Read chapter 18 of the Conceptual Physical Science book, pages 305-318.

Labs and Activities:

59. Describe the history of the model of the atom.
60. Define electron shell and valence electrons.
61. Describe the present nuclear model on an atom.
62. Use the Periodic Table of Elements to predict an atom's structure and its reactivity.

Radioactivity

Read chapter 19 of the Conceptual Physical Science book, pages 322-335.

Labs and Activities:

Half-Life Lab

63. Define radioactivity, electric force and nuclear force.
64. List and describe alpha, beta and gamma particles.

Science Is A Verb

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It is much better to understand the Universe as it really is than to persist in delusion...
...no matter how reassuring that delusion may feel to your soul!

Science Is Something You Do!