

Chapter X Answer Key

GUIDED NOTES

Key Terms

1. Physical Science: The study of non-living systems and the basic laws that govern our universe.
2. Matter: Anything that has mass and takes up space.
3. Energy: What allows things to move or change.
4. Physics: The branch of physical science that studies motion, forces, and energy.
5. Chemistry: The branch of physical science that looks at what things are made of and how substances mix and change.

Main Concept Overview

1. Physical science studies non-living **systems** and the basic laws of our universe.
2. Matter and **energy** are the building blocks that make up everything in our universe.
3. Scientists use physical science discoveries to develop new **technologies** that improve our lives.
4. Materials scientists design and study new **materials** with special properties.
5. Physical science helps us tackle big global **problems** like climate change and pollution.

Matching Section

- | | |
|------------------------|--|
| D 1. Physics | A. Studies objects in space like planets and galaxies |
| B 2. Chemistry | B. Examines what things are made of and how substances mix and change |
| A 3. Astronomy | C. Studies our planet's structure, oceans, weather, and history |
| C 4. Earth Science | D. Studies motion, forces, and energy |
| E 5. Materials Science | E. Combines chemistry and physics to design new substances with special properties |

True/False Questions

- F 1. Physical science only studies living things.
- T 2. Chemistry helps explain why some metals rust in the rain.
- T 3. The same scientific principles that explain why a basketball falls also help explain weather patterns.
- F 4. Physical science discoveries are not used in everyday technology.
- T 5. Engineers use physical science principles to design more efficient buildings and vehicles.

Fill in the Table

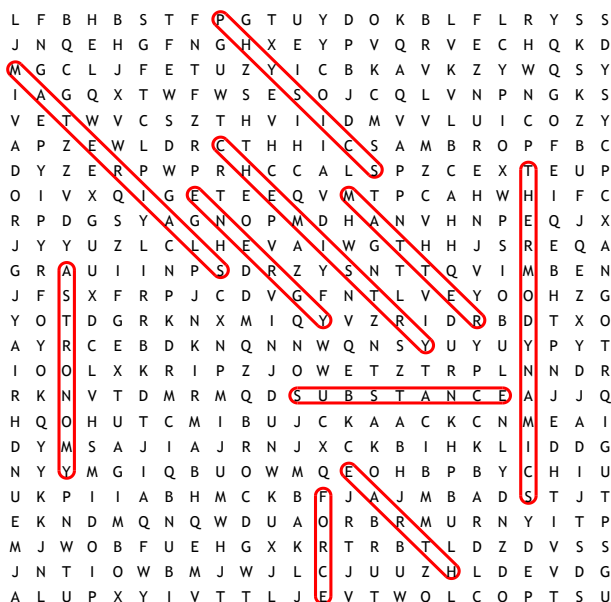
Physical Science Branch	Examples in Your Daily Life
Physics	Skateboarding, playing sports, using touch screens
Chemistry	Cooking food, medicines, baking soda volcanoes
Astronomy	Looking at stars, using satellite-based GPS
Earth Science	Weather forecasts, collecting rocks, studying landforms
Materials Science	Smartphone screens, lightweight bike frames, "smart" materials

Critical Thinking Questions

Sample answers:

- Understanding physical science could help solve problems like:
 - Using knowledge of friction to make slippery floors safer at home
 - Understanding which cleaning chemicals work best for different stains
 - Applying principles of energy transfer to design a better school project
 - Using knowledge of materials to choose the right gear for sports or activities
- If physical science knowledge disappeared:
 - Electronic devices like smartphones, computers, and gaming systems would stop working
 - Transportation systems like cars, buses, and bikes would be unusable
 - Food preservation and cooking methods would be lost
 - Weather predictions would be impossible
 - Medical technologies like X-rays and modern medicines would no longer be available

Physical Science



Thermodynamics	Substance	Physics
Materials	Matter	Force
Energy	Earth	Chemistry
Astronomy		

Physical Science

Across

6. A push or pull that can change an object's motion, like gravity pulling a skateboard downhill.

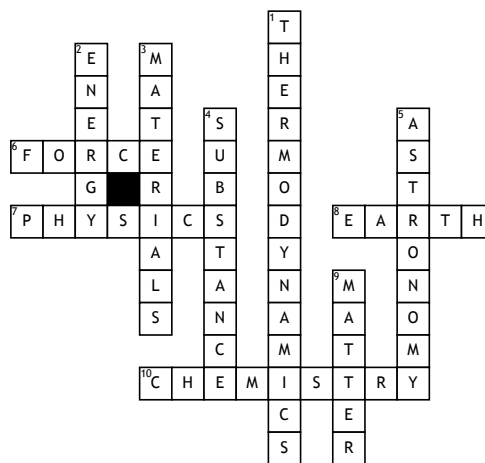
7. The study of motion, forces, and energy that explains how things move and interact.

8. The study of our planet's structure and history, including rocks, oceans, weather, and mountain formation, _____ Science

10. The branch of physical science that examines what substances are made of and how they mix and change.

Down

1. The branch of physics dealing with heat and temperature and their relation to energy and work.



2. What allows things to move or change, such as heat warming hot chocolate or electricity powering video games.

3. The field where chemistry and physics combine to design and study new materials with special properties, _____ Science

4. A specific type of matter with consistent properties, like water, metal, or salt.

5. The study of objects in space, including planets, stars, and galaxies.

9. Anything that has mass and takes up space, from air to books to people.

Chapter X Lecture Notes, Schedule & Resources

Physical Science Lecture Outline

Introduction

- Physical science studies non-living systems and fundamental laws governing our universe
- Provides foundation for understanding our world and developing technologies
- Connects to everyday experiences and future careers
- Emphasizes the importance of scientific literacy in making informed decisions about technology and environmental issues

Key Components: Matter and Energy

- Matter: anything with mass that occupies space (solids, liquids, gases)
- Energy: enables movement and change (heat, light, motion)
- Matter and energy interact through physical processes

Branches of Physical Science

Physics

- Studies motion, forces, and energy
- Relates to everyday activities like sports and electronics
- Includes simple machines, motion, and forces

Chemistry

- Examines composition of substances and how they change
- Examples: cooking, cleaning products, medicines
- Covers states of matter and physical vs. chemical changes

Astronomy

- Studies celestial objects and space
- Includes solar system, stars, and galaxies
- Relates to technologies like satellites and space exploration

Earth Science

- Studies planet structure and processes
- Topics: weather, oceans, rocks, natural resources
- Environmental applications

Materials Science

- Combines physics and chemistry to create new materials
- Applications in technology, construction, everyday objects
- Solves practical problems through innovative materials

Scientific Methods

- Scientists use observation, measurement, and experimentation
- Evidence-based conclusions are essential
- Models and mathematics help understand physical phenomena

Real-World Applications

- Technologies based on physical science principles
- Solutions to environmental challenges
- Careers utilizing physical science knowledge

Class Discussion Prompts

- Which branch interests you most and why?
- How do you use physical science-based technology daily?
- What community problems might physical science solve?
- How might physical science knowledge help your future career?

Interesting Facts

- Atoms in your body were once inside exploding stars
- Same physics principles explain toasters and lightning
- Chemistry of soap making is similar to biodiesel production
- GPS and touchscreens were first developed for space exploration

Common Misconceptions

- Chemistry isn't just about lab experiments but explains everyday processes
- Gravity exists throughout space, not just on Earth
- Physical science and technology are distinct: one studies natural laws, the other applies them

Hands-On Activities (Brief Overview)

1. Kitchen Chemistry Lab

- Test reactions between household substances (baking soda, vinegar, lemon juice)
- Observe and identify physical vs. chemical changes
- Discuss safety considerations: wearing goggles, avoiding skin contact with acids

2. Energy Transformation Relay

- Create energy transfer systems using toy cars, ramps, and balloons
- Identify different energy transformations in team-based design challenges

3. Materials Science Challenge

- Build paper bridges with limited materials
- Test structural strength by adding weights systematically
- Discuss principles of engineering and material properties

Conclusion

- Physical science provides essential understanding of our universe
- Encourages observation of scientific principles in daily life
- Inspires future exploration and problem-solving