

Fizzing Physics

Discover the Facts Behind Color, Sound & Energy

Grades 3-6 (2 books set w/electronics lab and project)

This collection is gadgets galore! Join Mac and Maya in a comic book adventure and build your own infinity mirror as you investigate optical physics, LED science and virtual images. Wire up endless amazing projects with lights, sound and sensors. Discover all of the incredible facts behind color, sound and energy.

“Physics is crucial to understanding the world around us, the world inside us, and the world beyond us. It is the most basic and fundamental science”

Books in this set: Fizzing Physics, Smart Circuits Electronics Lab, Mac Makerson Interdimensional Locker


Learning Objectives: Students will understand the study of physics, the characteristics of light, sound and color and how physics is applied to everyday life.

Essential Questions in This Unit:

- What is physics?
- Why do we need scientific investigation to study physics?
- How can physics be applied to understanding everyday life?
- How does physics explain change and constancy in the universe?
- To what extent does physics explain cause and effect?

Read to Find Out:

1. How can understanding various physical properties about motion be useful in understanding everyday occurrences?
2. What variables can you manipulate to affect the movement of objects?
3. How are physics and engineering related?
4. In what ways can we measure and predict motion
5. How do forces cause and affect motion?
6. Find examples of simple machines used in *Fizzing Physics*.
7. What is a natural force? Manmade?
8. Why do we need friction?

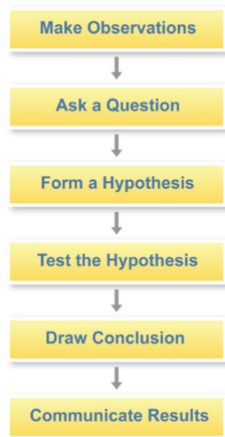
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9. What are the characteristics of light and how does it normally behave?
 10. How can we describe the movement of light as it passes through different substances?
 11. What is transparent? Opaque?
 12. How are lenses used?
 13. What is a prism?
 14. What determines the colors you see in nature?
 15. How does the sun impact light and dark?
 16. Why do we need light?
 17. How is a shadow formed?
 18. What objects reflect light?
 19. Where do rainbows come from?
 20. What is sound?
 21. What are sound waves?
 22. Where do waves come from?
 23. How do sound waves travel?
 24. Why do animals and humans make sounds?
 25. Explain how different organisms and objects vibrate in order to produce sounds.
 26. What is the relationship between the speed at which an object vibrates and the pitch of the sound that is produced?
 27. What is electricity?
 28. What is a conductor? Give examples.
 29. What is an insulator? Give examples.
 30. What are the different ways to generate electricity?
 31. How are matter and energy related?

- 32. How do you observe the effects of energy?
- 33. Describe magnetism.
- 34. What is the law of magnetism?
- 35. Compare and contrast permanent magnets with electromagnets.
- 36. How are magnets used around you?
- 37. Find cause and effect relationships from the texts and experiments.

Activities

- ~ What is “scientific investigation”?
- ~ Why is it so important to the science of physics?
- ~ Why do scientists investigate?

Steps of a Scientific Investigation:



Scientific investigations may take many different forms, including observing what things are like or what is happening somewhere, collecting specimens for analysis, and doing experiments. Clear and active communication is an essential part of doing science. It enables scientists to inform others about their work, expose their ideas to criticism by other scientists, and stay informed about scientific discoveries around the world.

Conduct a scientific investigation on how to:

- ~ Separate salt and pepper using static electricity
- ~ Turn salt water into drinking water

How did science begin with physics?

Physics challenges our imaginations and leads to great discoveries, like computers and lasers. These discoveries in turn lead to technologies which change our lives—from healing joints, to curing cancer, to

developing sustainable energy solutions. Create a PowerPoint presentation on an invention or innovation based on a principal of physics.

What skills does a physicist need to have? How can those skills be used in the work force?

Why has the world gone digital compared to analog?

How do the principles of physics affect your daily life?

Create a rainbow.

Describe something in nature that has become more compelling because of an understanding of physics principles.

How can an athlete in a sport improve their performance using one of Newton's three laws of motion?

Describe everyday occurrences of vibrating systems. What is the frequency of vibration in each system you described? How do know that vibrations carry energy?

Why is knowledge of fluids essential for efficient travel by ground, sea and air?

Why is knowledge of vibration important in understanding the destructive power of earthquakes, the tuning circuit in a radio receiver or the timing mechanism in a digital watch?

Describe the evolution of time keeping.

Create a physics timeline beginning with the Early Greeks.

Explain why physics as a science became stagnant for many centuries. How did Galileo Galilei and Isaac Newton help pioneer the use of mathematics as a fundamental tool in physics?

For more information on this topic, please refer to the books below:

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| 9781682970270 | Fizzing Physics |
| 9780760353462 | Mac Makerson and the Interdimensional Locker |
| 9780760353493 | Smart Lab- Smart Circuits |