

A Science Curriculum



PHYSICS



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HOW TO USE THIS CURRICULUM

I'm so excited that you've chosen Rabbit Trails through Science to use in your homeschool! This curriculum is a Unit Study inspired, relaxed curriculum for middle grades. What this means is that it's not designed to have lots of busy work. It's designed to provide quality literature to your children, hands on science experiments and activities, opportunities for copywork, journaling and observation, and other means to learn fun and enriching science material.

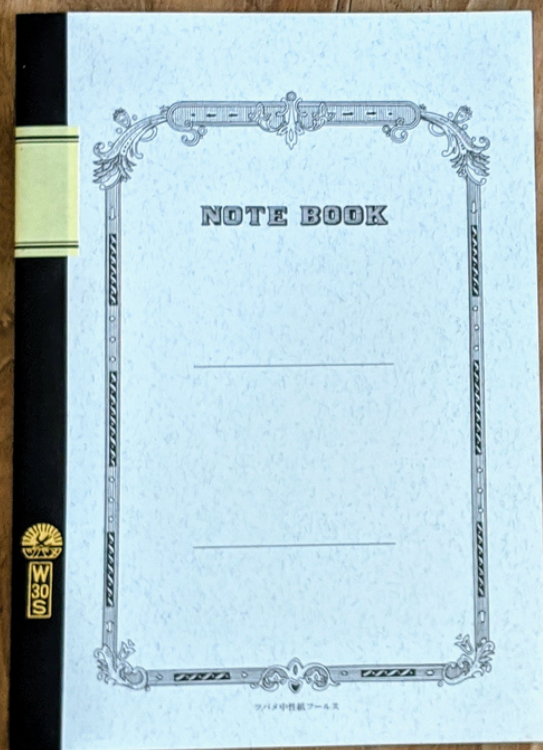
Rabbit Trails through Science was created with homeschooling adventures in mind. Not only will you be learning science, but your children will go on a journey through amazing books while gaining scientific knowledge about the world around them. This curriculum is meant to be used on *your* child's level. It's not meant to have boxes checked off each day, but to do what works for your unique family. When it comes to copywork and vocabulary, there are suggestions given, but take what you need and leave the rest. If your child isn't at the level of the suggestions, then create what works for them. Same thing if they're capable of beyond what is recommended. Make this curriculum your own!

Rabbit Trails through Science is a faith-based curriculum with Bible verses included in each lesson. However, finding quality books that do not discuss evolution can be difficult. Feel free to skip these sections in any books that discuss this, or use it as an amazing learning opportunity and discussion point to talk about your family's beliefs regarding creation.

I encourage you to enjoy reading as many of the books listed in this curriculum as you can! Quality literature is the framework of this curriculum. There is one spine book to this curriculum, with many other picture books recommended. However, don't become overwhelmed with purchasing these books if you don't have the means. Many can be found at libraries, on used book websites, etc. The books listed in the Rabbit Trails and Library Lists are just suggestions. Use what books you have on hand or find at your own library on the topic! If you do choose to buy all of the books, you can access many in my shop. **You can also access all of the links, YouTube videos, and more in the Resource Page in the back of this curriculum.**

NOTEBOOK STYLE CURRICULUM

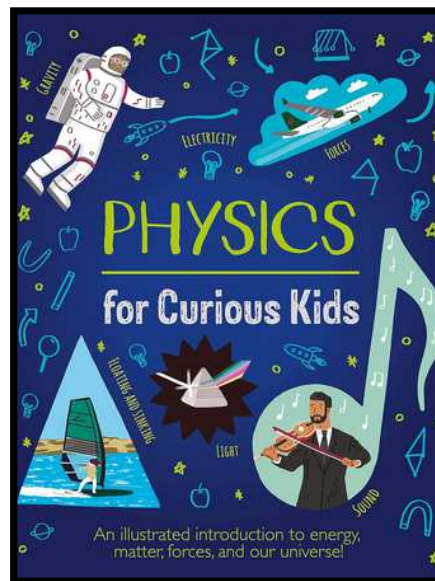
As you may have noticed, this curriculum does not include any kind of workbook for your children to work in. This was designed to all be done in a notebook. You may choose a standard, wide ruled notebook, or you can choose to use our pre-made Companion Journals. Feel free to use whatever method works best for you and your child.



CORE CURRICULUM BOOKS

These books are recommended to be purchased to go along with the curriculum as they'll be a part of each lesson in Rabbit Trails through Science: Chemistry. All other suggested books are listed inside of the individual lessons.

Physics for Curious Kids
by Laura Baker



SUPPLY LIST

Physics requires a lot of experiments, which means a lot of materials are required.

We have included a list of all of the required materials for the main experiments inside of the Some Fun sections. While the More Ideas does also include some experiment ideas, these are all optional to add into your learning and we have only added items you wouldn't typically have at home for these.

Supplies from Home Science Tools:

(Link in Resource Page)

Paper speaker kit

Solar system kit

Telescope kit

Magnet experiment kit

Supplies from Amazon:

(Link in Resource Page)

Electrical circuit kit

da Vinci machine

All other supplies:

String

Pencil

Long ruler

Adhesive putty

Colored sand or plain salt

Plastic bottle

Large sheets of dark paper

Hole punch

Sandpaper

Felt

Chip can with lid

2 AA Batteries

Additional wire

Colored marshmallows

Pipe insulation

Tea bags

Heat safe pan

Pizza box

Shoebox with lid

Wax paper

Small mirror

Laser light

Gelatin

Red, yellow, blue cellophane

Flashlight

Dowel rod

Modeling clay

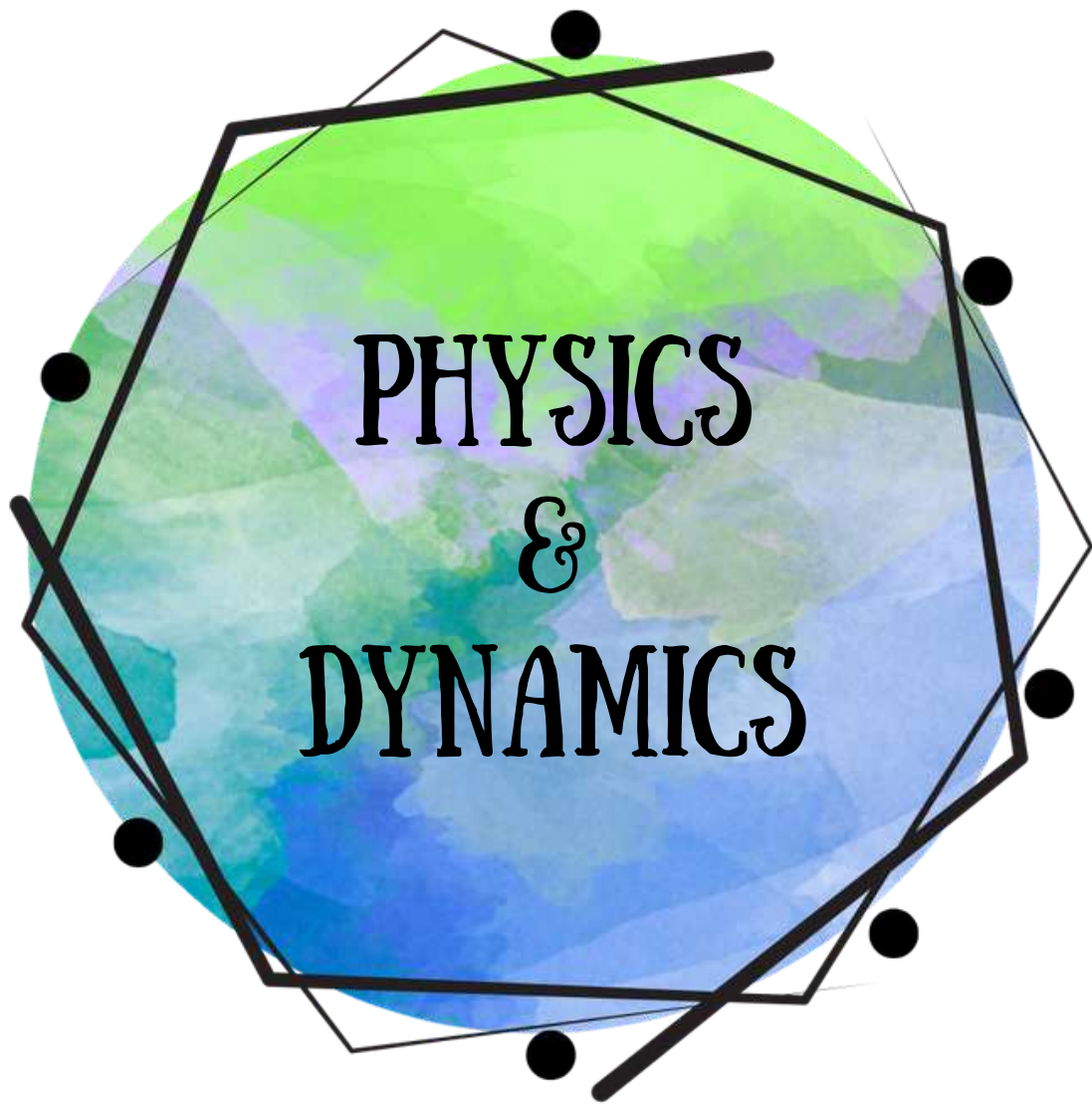
Juice bottle lids

Water bottle

Balloon

Drinking straw

Skewers





Begin by reading pages 5-25 in Physics for Curious Kids over the next few days, stopping to discuss new topics. Physics is such an interesting field that covers a wide range of topics! We will learn about what physics is and dynamics in this lesson, which includes force, motion, gravity, friction, magnetism, and more.

Observation and Journaling: On pages 24-25 of Physics for Curious Kids, there is a great illustration of forces in action. Copy the picture of the crane and building, being sure to identify the lever, fulcrum, pulley, force, elevators, and counterweight.



Copy the Massive Discovery section on page 12 of Physics for Curious Kids.

Humble yourself before the Lord, and He shall lift you up.
-James 2:10

*I bet you didn't expect that the Bible would have anything to say about Newton's Law, did you? In this verse, we see that if we humble ourselves (action), then the Lord will lift us up (reaction). You can see an action and reaction in many of the beatitudes, as well. Read Matthew 5:3-12 and you can see the actions and reactions listed, such as the poor in spirit (action) receiving the kingdom of God (reaction). If you'd like, record all of the beatitudes in your journal, drawing an arrow between the action and reaction to see the great **force** that God is!*



Galileo discovered in the 1580s that a pendulum will swing back and forth in a straight line in the direction in which it is set in motion. Let's have some fun by creating a sand pendulum and making beautiful

patterns using the force of gravity. First, start by placing the bottle cap upside down on some putty and punching a 3mm hole in the middle with scissors. Then, cut off the bottom of the bottle. Try to cut in a straight line. Measure the circumference of the bottle and, using the hole punch, make 3 evenly spaced holes about $\frac{1}{2}$ in from the cut edge. Measure and cut two separate strings (one 10 in and one 7 ft long). Tie the smaller string to two holes in the bottle side by side, then tie the long piece into the third hold, then knot it onto the smaller string to create a tripod knot to create your pendulum. Hang the pendulum from a high point- a tree, hook in the ceiling, etc. Place a few sheets of dark paper under the pendulum, pour sand into the bottle, and remove the putty. Swing it in a circle or other direction to make different patterns.

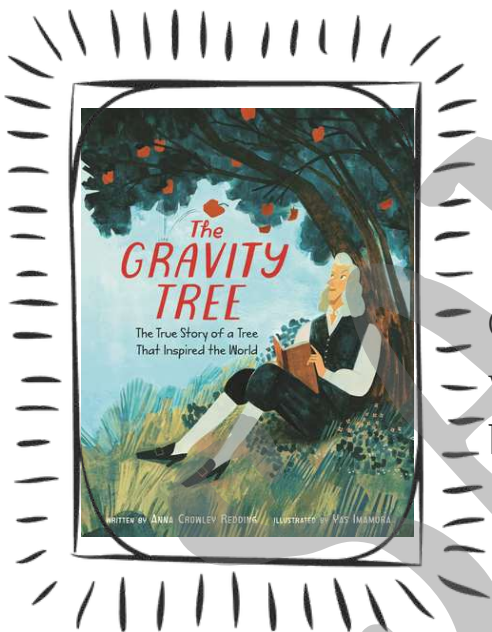
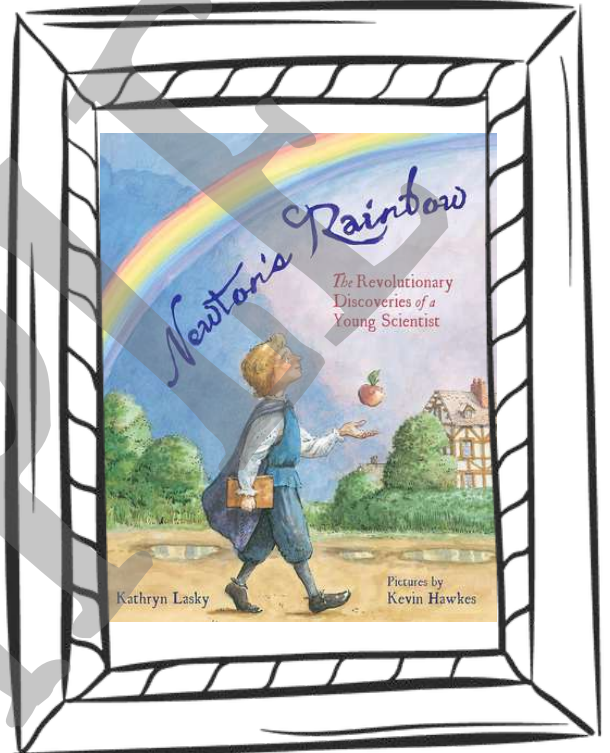
Supplies needed:

- String
- Pencil
- Long ruler
- Adhesive putty
- Colored sand or plain salt
- Plastic bottle
- Scissors
- Large sheets of dark paper
- Hole punch



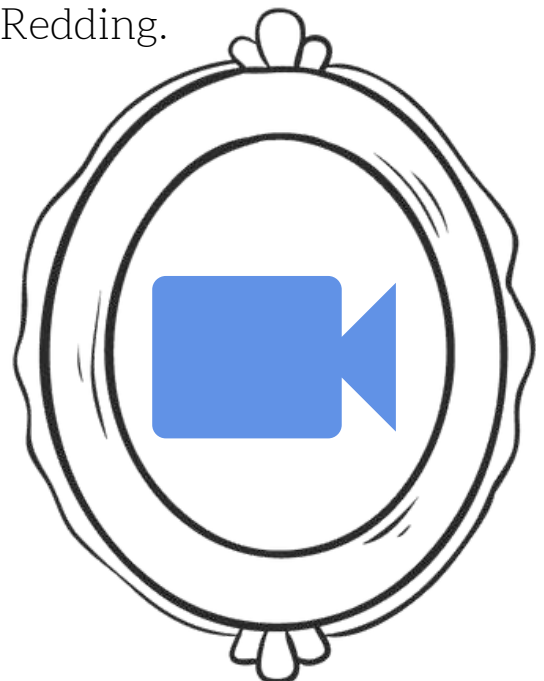


Let's learn more about
Isaac Newton in
Newton's Rainbow
by Kathryn Lasky.

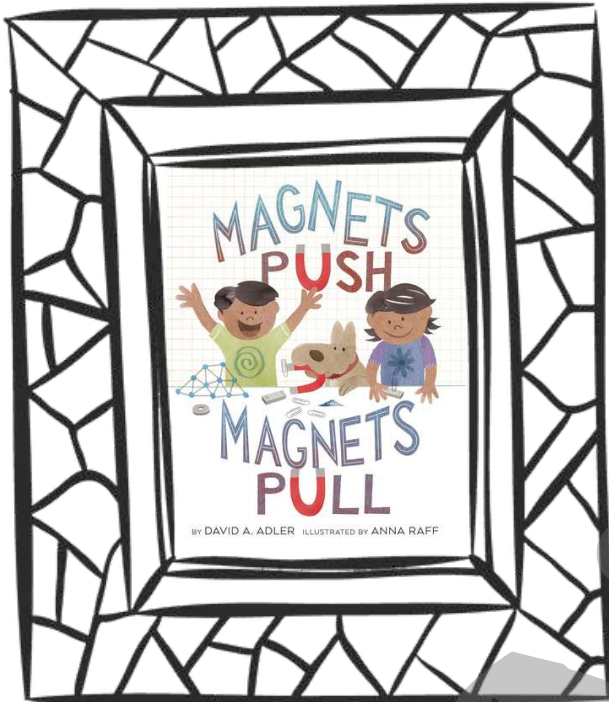


Continue learning
with The Gravity Tree
by Anna Crowley Redding.

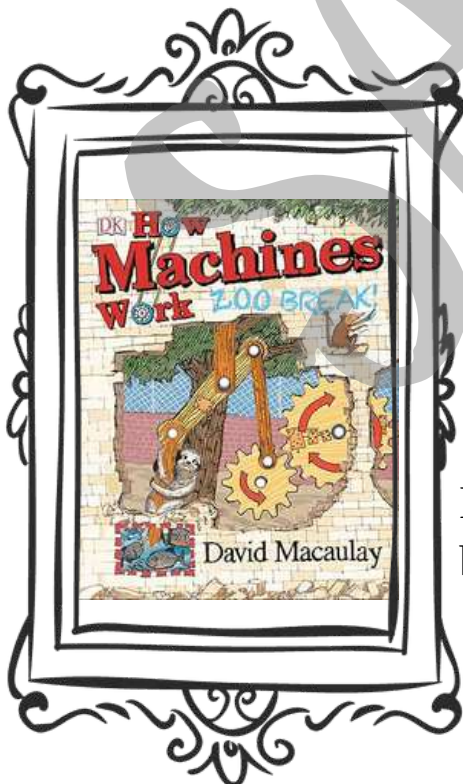
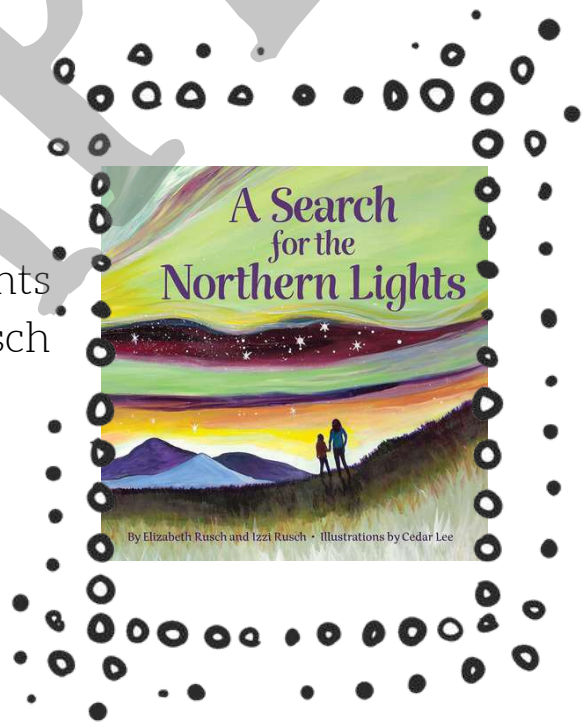
Here is a simple introduction video
explaining just exactly what Physics is in
comparison to other sciences! Check out
What is Physics? by Lukey B. The
Physics G. Let's make physics fun!



Magnets Push
Magnets Pull
by David A. Adler



A Search for the Northern Lights
by Elizabeth and Izzi Rusch



How Machines Work
by David Macaulay



-Vocabulary Words: There will be vocabulary words to add to your child's journal in every lesson. Work where your child is. Younger kids can choose fewer words while older children can find definitions for all.

- | | | |
|-----------------|---------------------|------------|
| -physics | -mass | -buoyancy |
| -dynamics | -gravitational pull | -magnetism |
| -laws of motion | -pressure | -lever |
| -force | -resistance | -fulcrum |

-Conduct the experiment on page 7 of Physics for Curious Kids on testing the force of gravity.

-Over the next several weeks, write a research paper on a famous physicist such as Isaac Newton, Galileo Galilei, or Albert Einstein.

-Grab a magnet experiment kit from Amazon (linked on our Resource page) to see how magnets work up close.

-Head to Science Buddies website (linked on our Resource page) to create your own pulley.

-What are Newton's Laws? Look them up and record them in your journal.