

Course Description:

In this course, students will examine the states, properties, and changes that happen to matter. They will also explore the forms of energy, investigate concepts of electricity and magnetism, and describe motion and forces. Knowledge of all these concepts lead to exploring the technological advancements that improve everyone's lives.

The experiments and hands-on elements of the lessons will deepen their understanding of the scientific investigation and testing process, as well as give them practice in collecting and analyzing data. They will be making observations and learning to ask deepening questions in order to better understand the way science impacts our real lives.

Course Objectives:

- Measure how things are by using tools and units that make sense.
- Guess and write down what happens when something changes.
- Describe energy, what it does, how we use it, and some different kinds.
- Tell how energy can move, change, or go between things.
- Make and change a model that solves a problem we have.
- Say if things are electrical or magnetic and put them in groups.
- Explain and use the scientific way to learn new things and tell others about them.
- Guess or tell why things move the way they do because of gravity or other pushes and pulls.
- Connect science ideas we learn with how science grew over time, jobs in science, and things scientists did.
- Look at how natural and human-made things work and see what each part does.
- Look at things we use every day and how they work to see what we need, want, or could make better.

Course Overview:

This course is made up of 6 units. Each unit has five lessons. Lessons are made of up activities that include the following types of learning:

- **Warm-Ups** allow for practice of skills or concepts taught in previous lessons. These are graded activities.
- **Direct Instructions** provide modeling of new skills and concepts. These are not graded activities.
- **Guided Practices** allow for practice of a skill with support. These are graded activities only on a completion basis.
- **Checkpoints** test mastery of skills from lessons. These are graded activities.
- **Unit Reviews** allow for practice of skills prior to taking unit exams. These are not graded activities.
- **Unit Exams** test mastery of skills from the unit. These are graded activities.
- **Projects** provide an opportunity for practice of more complex skills across several activities or lessons within a unit. These activities require a final graded submission.

Required Materials:

Required:

- aluminum foil (1 sheet)
- balls (1 small and 1 large)

- books and cardboard to make a ramp
- bowls (3 of the same size)
- bowl or glass of water
- cake mix (1 box)
- cake pan
- clear glass dish
- colored see-through plastic (1 sheet)
- crayons/markers/colored pencils
- cups (3)
- cooking oil (1 tablespoon)
- eggs (3 slightly whisked)
- felt cloth (1 piece)
- flashlight
- food coloring (yellow, blue, green, and red)
- glue
- letter board
- magnets (2-3 of different sizes)
- magnetic letters
- measuring tape or ruler with standard and metric units
- melted ice cream (2 cups)
- metal coat hangers (2)
- metal object like a tuning fork or metal spoon
- microwave
- mirror
- mixing bowl (large)
- objects that will float (balloon, empty bottle, small hollow ball)
- objects that will sink (quarter, rocks, balled-up clay, soda can)
- objects with different sizes, shapes, colors, weights, and textures that are magnetic and non-magnetic
- oven
- oven mitts (1 pair)
- paper
- paper plate
- pencil
- pencil eraser
- printables (see Course Syllabus for link)
- printer and printer paper (for printables)
- ruler (2)
- shoebox or tissue box
- soap (1 bar)
- spoon (large)
- sunlight
- thick rubber band
- thin rubber band
- tissue paper (colored; 1 sheet)
- tuning fork (optional)
- various small objects, such as crayons and blocks

Optional:

- letter board
- magnetic letters
- paper, markers, and craft supplies