

50 WEEKS OF STEM LABS



**250 EXPERIMENTS FOR
50 WEEKS OF STEM-TASTIC FUN!**

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WHAT IS THIS BOOK ABOUT?

STEM is an acronym for Science, Technology, Engineering, and Mathematics. Recent shifts in education have favored these subjects, primarily because we have a shortage of workforce in these particular areas, which is really quite sad for a number of reasons. These can be some of the most interesting things to study in school, provided they are taught in a fun, interesting, and hands-on fashion. They also lead to some of the best-paying technical jobs, too!

This volume is intended as a companion volume for the 50 STEM Labs Series. It can also be a stand-alone program. These pages are set up 1 week at a time for 50 weeks - an entire year worth of STEM and Science ideas! Feel free to do them in order or in any order you want or skip some of them! Unlike the other books in the series, which featured detailed project ideas with grading rubrics, these are intended to be faster, mini-projects, something you can do every day. Please note, with 250 ideas, there are bound to be some similarities between themes and project ideas! Most projects can be done with readily-available supplies from home, school, or dollar stores.

It is highly suggested that students using some or all of these activities keep track of them in a journal. Predictions, observations, and reflections should be included when possible. Getting students to draw out blueprint designs of their ideas beforehand and revise their designs is a great way to show learning! 50 STEM Labs Journals would work great for this purpose!

DISCLAIMER: Please take adequate safety precautions when doing any science or STEM project.

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Weekly Themes Listing

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4. Marble Madness (**marbles**)
5. Toothpick Terrors (**toothpicks**)
6. Gumdrop Geniuses (**gumdrops**)
7. Balloon Bashers (**balloons**)
8. Eggstravaganzas (**eggs**)
9. Foiled Again (**aluminum foil**)
10. Grasping at Plastic Straws (**straws**)
11. Tubular Times (**cardboard tubes**)
12. Cups Ahoy! (**cups**)
13. Stringing Me Along (**string**)
14. Clippers (**paperclips**)
15. Paper Delivery (**paper**)
16. Golden Arches (**building arches**)
17. Coin Purses (**coins**)
18. Get Musical (**building instruments**)
19. Quit Spooling Around (**thread spools**)
20. Waxy Facts (**wax paper**)
21. Rubber Band Man (**rubber bands**)
22. The Muffin Man (**muffin tray liners**)
23. Bowling Time (**foam/paper bowls**)
24. Claymation Station (**clay**)
25. Cereal Aisle (**breakfast cereals**)
26. Recyclers (**recycled materials projects**)
27. Plasticware Everywhere (**plastic cutlery**)
28. Filtered Down (**coffee filters**)
29. All Taped Up (**tape**)
30. Dish Me Up (**paper plates**)
31. Optical Industries (**lenses**)
32. Chocoholics (**chocolate**)
33. Popsicle Pride (**popsicle sticks**)
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35. All Wrapped Up (**plastic cling wrap**)
36. Ping Pong Powers (**ping pong balls**)
37. Pipe Down (**pipe cleaners**)
38. Tissue Time (**tissue/kleenex**)
39. Water Wizards (**projects with water**)
40. Air Power (**projects with air**)
41. Spongy Logic (**kitchen sponges**)
42. Boating Lessons (**building boats**)
43. Ready, Set, Lift! (**lifting/weight projects**)
44. Heat Waves (**projects with heat**)
45. Glue-rific Guises (**glue**)
46. Going Nuts (**packing peanuts**)
47. Car Wars (**projects with cars**)
48. Fresh Powder (**flour, salt, sugar**)
49. Magnetic Personalities (**magnets**)
50. Crash Time (**projects with crashes**)

THEME: 01

Pasta Power

DAY ONE: Pasta Towers

MATERIALS: spaghetti noodles, gumdrops or mini marshmallows

Make as tall of a tower as you can from the limited resources you are given! Towers may not be attached to any surface.

DAY TWO: Pasta Coasters

MATERIALS: various shapes of pasta, glue, marbles

Design and construct rollercoasters out of pasta noodles. Utilize their different shapes to build tracks for marbles.

DAY THREE: Pasta Bridges

MATERIALS: various shapes of pasta (especially the long ones), and gumdrops or mini marshmallows

Build the longest bridges possible out of the limited resources you are given! The bridge must not be attached at either end, but must span between two tables or stacks of books without bowing too much in the middle or touching the ground. Weight can also be added to the middle as a strength test.

DAY FOUR: Weight Tests

MATERIALS: various long types of pasta, graduated weights or a small container to hold pennies

See which way(s) you can align and organize pasta noodles to hold more weight. Set up the pasta across a short span, maybe between two desks or between stacks of books on a table. Add weight to a cup placed on the middle of the pasta layouts. Which way holds more weight without breaking?

DAY FIVE: Flex Tests

MATERIALS: linguini or fettuccine noodles, water, rulers

See how far you can flex noodles soaked in water for different amounts of time before they snap. Measure at the middle of the noodle to see how far they flex from a straight line before snapping.

THEME: 02

Mushy Marshmallows

DAY ONE: Marshmallow Catapults

MATERIALS: plastic spoons, popsicle sticks or small boxes, rubber bands, mini marshmallows

Build mini marshmallow catapults. Figure out which designs can shoot the farthest!

DAY TWO: Marshmallow Crushers

MATERIALS: scavenged office/home supplies, mini marshmallows

Build devices that crush mini marshmallows as flat as possible. Measure the crushing effect with before and after measures.

DAY THREE: Marshmallow Sorters

MATERIALS: scavenged office/home supplies, at least 2 shapes/sizes of marshmallows

Create devices that sort marshmallows of different shapes or size. 3-10 marshmallows will be dropped into a designated spot on the project, and the marshmallows will be sorted into separate bins or holding areas according to shape or size.

DAY FOUR: Marshmallow Family Crash Tests

MATERIALS: scavenged office supplies, mini marshmallows with toothpicks (snowman marshmallows)

Build cars that protect a family of 3-4 marshmallow snowmen in a crash situation. Cars may roll down/off a track into an obstacle or roll off a table. Cars should not completely encage the snowmen, nor should they be taped or glued into their cars.

DAY FIVE: Marshmallow Cannons

MATERIALS: cardboard tubes, large marshmallows, balloons, and other scavenged materials

Build an air-powered cannon to launch your marshmallows! Measure which ones go the farthest. Try different techniques for pushing the air and marshmallow faster.

THEME: 03

Airplanes Ahoy!

DAY ONE: Distance Tests

MATERIALS: paper, measuring tape

Design airplanes that can fly as far as possible. Use a set size and type of paper.

DAY TWO: Hang Time Tests

MATERIALS: paper, stopwatch

Design airplanes that stay in the air as long as possible. Measure hang time. Use a set size and type of paper.

DAY THREE: Airplane Accuracy Tests

MATERIALS: paper, trash can, hula hoop, or other target

Design airplanes that fly as accurately as possible. Try to hit, land in, or go into targets at different distances. Do best out of 3 for each distance.

DAY FOUR: Materials Tests

MATERIALS: different sizes, colors, and types of paper, measuring tape

Design airplanes that can fly as far as possible. Use a variety of sizes, colors, and types of paper.

DAY FIVE: Altitude Tests

MATERIALS: paper, measuring tape

Design airplanes that can fly as high as possible. Use a set size and type of paper. You may need to have some graduated marks on a wall or post to help measure how high airplanes are flying.

THEME: 04

Marble Madness

DAY ONE: Marble Sorters

MATERIALS: scavenged home/office supplies, marbles of varying sizes (at least 2 sizes)

Create devices that sort marbles of different shapes or size. 3-6 marbles will be dropped into a designated spot on the project, and the marbles will be sorted into separate bins or holding areas according to shape or size.

DAY TWO: Marble Coasters

MATERIALS: scavenged home/office supplies, marbles, stop watch

Design and construct rollercoasters out of available supplies. Longer rides for the marbles (in seconds) get more points. Multiple tests may be given to establish an average.

DAY THREE: Marble Catapults

MATERIALS: scavenged home/office supplies, marbles, measuring tape

Build marble catapults. Figure out which designs can shoot the farthest!

DAY FOUR: Marble Ski Jumps

MATERIALS: card stock or heavy paper, tape or glue, marbles, measuring tape

Build a ski jump ramp for marbles. Design the best angle and shape of a ramp from the given materials. Figure out which designs can shoot the farthest!

DAY FIVE: Marble Catchers

MATERIALS: containers, marbles, measuring tape or ruler, and a marble-stopping material of your choice!

Fill a small container with your chosen material. It must be able to stop and contain a marble that is dropped from varying heights from 6 inches to several feet. The marble must not bounce out of the container, and it must not sink all the way to the bottom of your container. Measure how far it sinks in with each test.

THEME: 05

Toothpick Terrors

DAY ONE: Toothpick Towers

MATERIALS: toothpicks with glue (or gumdrops or mini marshmallows), and wax paper

Make as tall of a tower as you can from the limited resources you are given! Towers may not be attached to any surface. Wax paper is suggested for work areas.

DAY TWO: Toothpick Bridges

MATERIALS: toothpicks with glue (or gumdrops or mini marshmallows), and wax paper

Build the longest bridges possible out of the limited resources you are given! The bridge must not be attached at either end, but must span between two tables or stacks of books without bowing too much in the middle or touching the ground. Weight can also be added to the middle as a strength test.

DAY THREE: Toothpick Domes

MATERIALS: toothpicks with glue (or gumdrops or mini marshmallows), and wax paper

Make a dome-like, rounded 3D shape out of your toothpicks and adhesive materials. Design them carefully so that they do not collapse. Wax paper is suggested for work areas.

DAY FOUR: Toothpick Pyramids

MATERIALS: toothpicks with glue (or gumdrops or mini marshmallows), and wax paper

Make a pyramid-like, triangular 3D shape out of your toothpicks and adhesive materials. Design them carefully so that they do not collapse. Wax paper is suggested for work areas.

DAY FIVE: Toothpick Coasters

MATERIALS: toothpicks with glue (or gumdrops or mini marshmallows), marbles, and wax paper

Design and construct wooden rollercoasters out of toothpicks and/or popsicle sticks and a minimal amount of paper or card stock. Longer rides for the marbles or ping pong balls (in seconds) get more points.

MISSION:

Andrew Frinkle

BRIEF:

A quick look at the author of this book and the previous volumes (which I hope you have!).

ABOUT THE AUTHOR:

1. Over 10 years of experience in the teaching field with a specialization in math and science education in elementary and middle schools.
2. Award Nominated for teacher of the year.
3. Winner of the Karen Pelz Writing Award for short fiction.
4. Author of over 20 novels books in and over 40 educational books.
5. Black Belt in the Korean Sword Martial Art Geomdo.

SNAZZY PHOTO:



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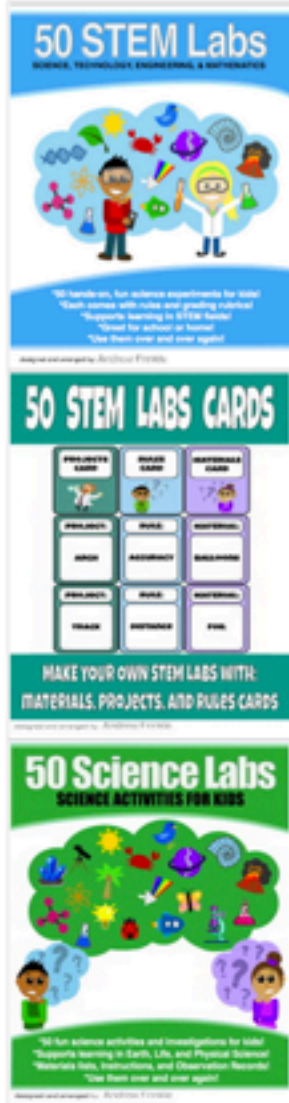
THEME:

Hands-On, Labs, Math, Measurement, Physics, Science, STEM

MISSION:

CHECK OUT THE OTHER COOL BOOKS!

Get the whole series in print on [Amazon](https://www.amazon.com) or download them on [TeachersPayTeachers](https://www.teacherspayteachers.com)!



Make sure to check out the whole 50 STEM Labs Series!

50 WEEKS OF STEM LABS

50 STEM Labs is about teaching kids to think with their hands and minds. It's about problem-solving and completing a task in the fields of Science, Technology, Engineering, and Math.

50 Weeks of STEM Labs is a set of weekly plans focusing on a theme, such as a type of project or a specific material. Each week features 5 quick projects to do with that theme. This is enough projects for a whole school year and more! You can even spend more time on projects that require more learning and exploration.

Included are **250 STEM projects** in **50 fun themes**.

Each theme is based on a concept or material to be used, like:

* Pasta Noodles, Tape, Glue, Cups, Paperclips, or Eggs

* Recycling Projects, Airplanes, or Musical Instruments

50STEMLABS.COM