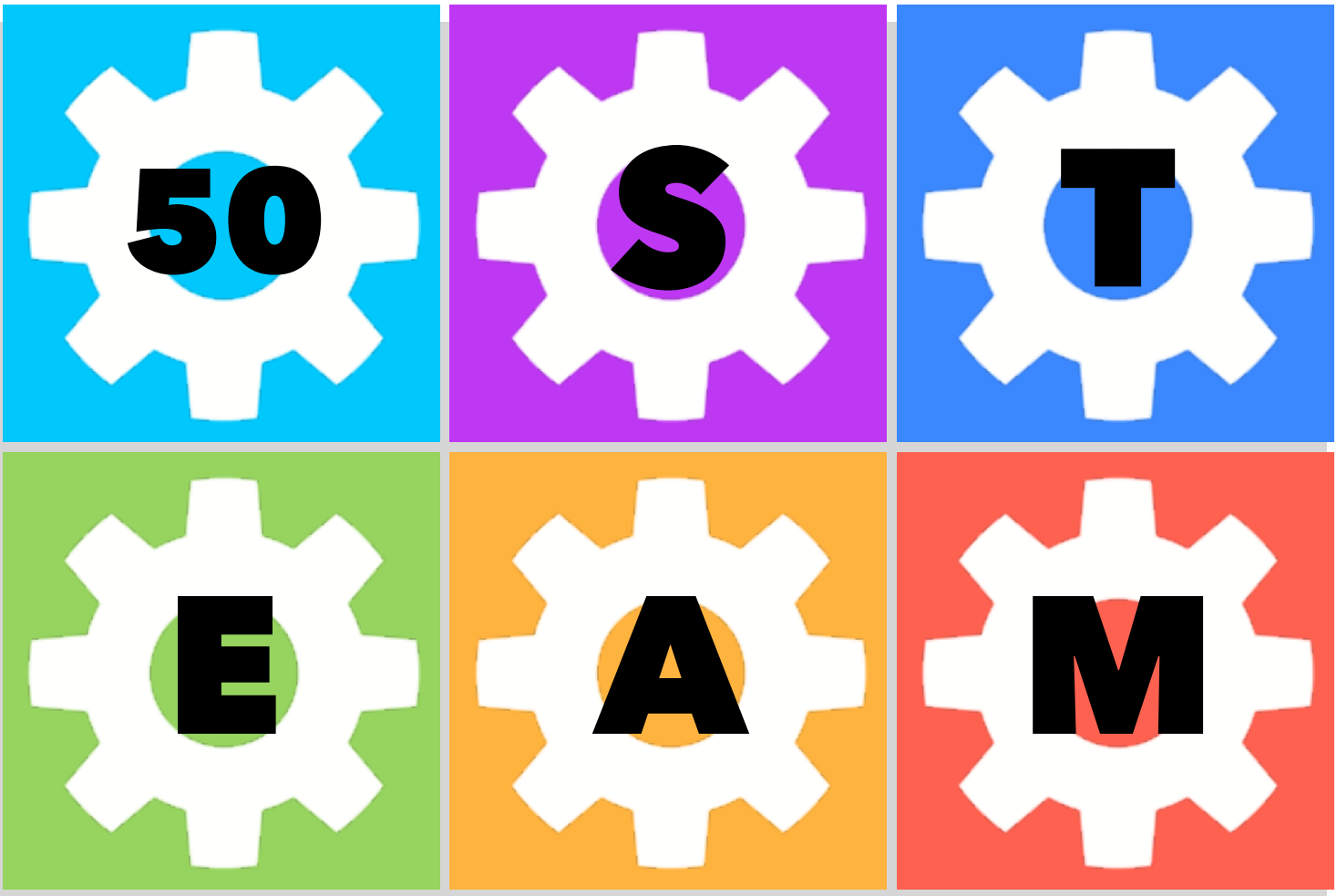


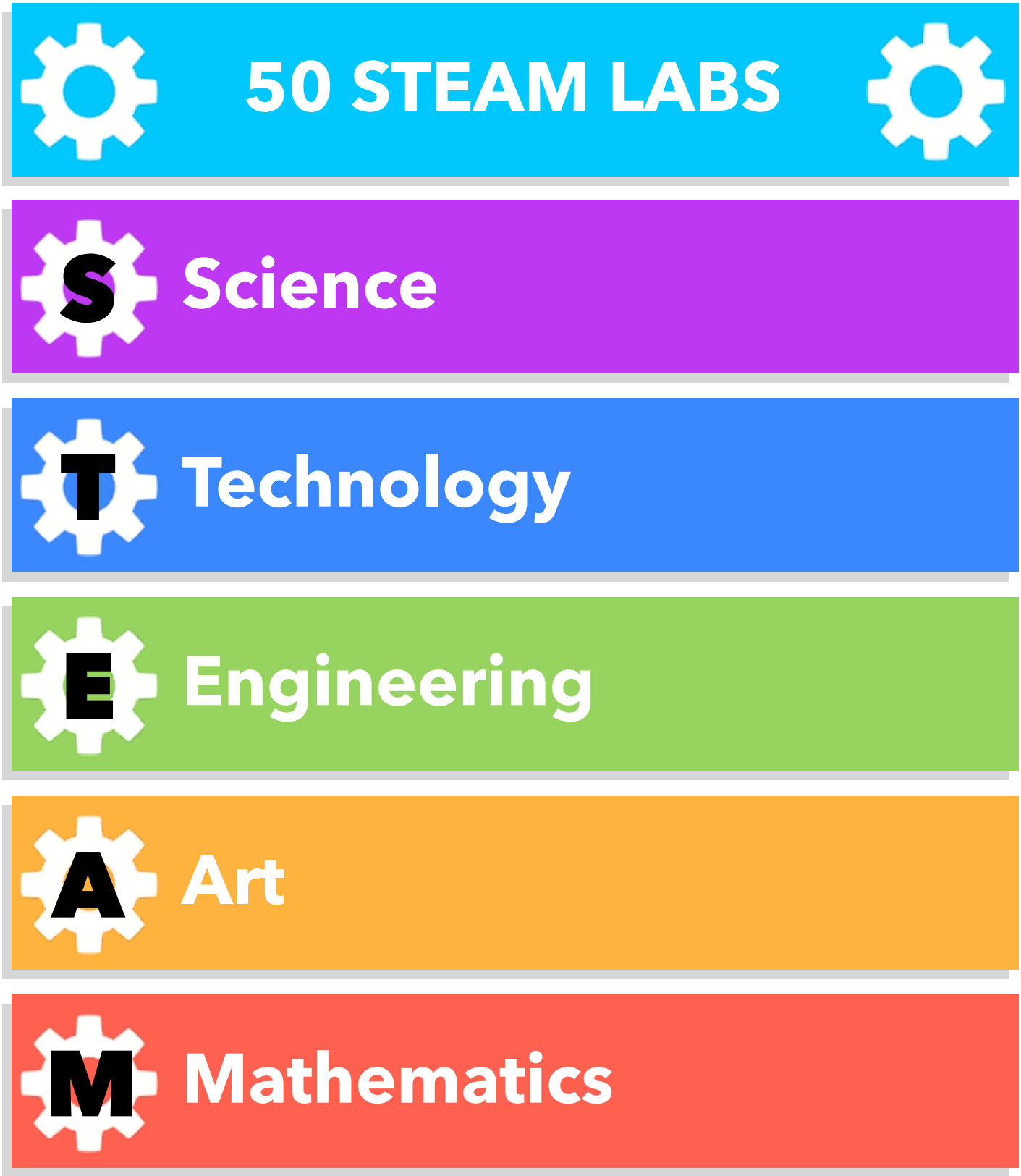
50 STEAM LABS

THEMATIC PROJECTS:

Science, Technology, Engineering, Art, & Math

CREATED BY: ANDREW FRINKLE

MediaStream Press



ABOUT

INTENT & PURPOSE: The projects within are frameworks for STEAM activities for Elementary and Middle School level students. Depending on the ability levels of the students involved, younger or older students might also be able to do these projects with added guidance for younger students or altered expectations for older students.

PROJECTS: Each of the 50 STEAM Labs will include ideas for Science, Technology, Engineering, Art, and Mathematics components for the thematic project. It is not expected that every student will complete all 5 components for each project. Rather, picking and choosing 3-4 of the 5 components. Although, students may very well want to do all 5 parts of the project.

GRADING & STANDARDS: There are no grading rubrics attached to these projects. Nor have standards been included. Because these projects are intended for a wide grade range, it was impossible to denote specific standards for each project. It is best to determine on your own what sort of grades you wish to assign to each project or each component within projects.

Fairy Homes

01

SCIENCE: Learn about habitats. Determine what resources you think a fairy would require in his or her habitat. Make sure to determine what plants or animals/insects the fairy might want to live around. Collect the resources.

TECHNOLOGY: Research your habitat and design ideas. Type up a short story about fairies or your fairy. Incorporate lighting if possible.

ENGINEERING: Design and build the habitat using available resources. Create a 3-dimensional diorama or enclosure from scratch, or use a terrarium, small pet cage, or fishbowl.

ART: Create and decorate the habitat. Optionally. create a fairy language and leave miniature notes or glyphs around the habitat.

MATHEMATICS: Determine the measurements of your habitat. Calculate volume. Volume of air, plant mass, water, soil, or other materials could also be calculated. Create a graphic or chart displaying the measurement data.

Sports Fans

03

SCIENCE: Research forces and motion. Determine which physical forces are at play in this sport or activity and how. Kinetic and potential energy, as well as friction, drag, wind resistance, and other forces may be a good place to start.

TECHNOLOGY: Create a map of locations where your sport is played, where sports teams are located, or where championship teams have come from.

ENGINEERING: Create a model version of one or more of the materials or gear involved in the sport. Try to make them as accurate as possible, using similar materials when possible.

ART: Design helmets, jerseys, or other athletic equipment for the sport you chose.

MATHEMATICS: Create a list of math facts about your sport, such as: How many pro or semi-pro teams are there? How large is the field? How much does the ball weigh? How long are the skis?

Lunar Calendars 05

SCIENCE: Research the moon phases and how they are involved in different calendars in the world.

TECHNOLOGY: Create a custom calendar. Use our regular 12-month calendar, or create a new one based on the lunar or solar patterns. Additionally, new names for days or months could be created.

ENGINEERING: Print, create, and/or assemble your completed calendar. Binding it with a spiral, glue, or plastic binding comb is a plus.

ART: Decorate a calendar. Seasonal or monthly themes are a plus.

MATHEMATICS: Research and collect statistics about the number of days, weeks, months, hours, minutes, etc... in a year. Find other divisions of time, such as nanoseconds, decades, centuries, and more. Also, statistics about the moon could be collected.

Architects

07

SCIENCE: Research home designs and blueprints, as well as the building process of homes in your area. Are they built from lumber primarily, brick, or concrete block? What sort of storm windows, earthquake, or wind concerns are there to take into effect?

TECHNOLOGY: Take your drawn blueprint or design, scan it in or take a picture of it. Add words and details to it with software. Print it out or share it with your class or peers online.

ENGINEERING: Design a blueprint of your house or of a dream house you might build some day. Try to add all the rooms you will need, doors, windows, closets, stairs, porches, and all of the major requirements of a home.

ART: Decorate and build a 3D model of your house. Try to build landscaping in the yard as well.

MATHEMATICS: Multiply out stats like square footage, lengths of interior and exterior walls, and the area in each room. Using scale units on graph paper can help with this, such as 1 square = 4 sq ft. The amount of flooring, paint, and other materials can also be calculated.

Recycled Gardens 11

SCIENCE: Research vertical gardens, residential gardening, raised bed gardens, and other limited space gardening techniques. Also, check which species of plants compliment each other when grown together. Find a good combination to grow in your garden. Additionally, check the water, spacing, and lighting requirements for each plant you plan on using.

TECHNOLOGY: Research online and find picture to get ideas for gardening with recycled materials. Draw up plans for your own garden. Take pictures and share with peers after it is completed.

ENGINEERING: Using recycled materials as much as possible, build a container garden for a windowsill, a patio, porch, or other limited space area. Design for drainage, careful use of water, sunlight, and growth.

ART: Sketch and draw your garden prior to building. Decorate as you make it and after you finish it.

MATHEMATICS: Calculate the amount of materials needed, especially gravel, perlite, potting soil, water, tubing, etc... After the garden is started, germination rates can be calculated for each seed type.

Blank Templates

Make your own STEAM Labs on the following pages! Five copies have been included. However, you are granted a limited license to reproduce as many of these blank forms as you need for home or classroom use.

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Andrew Frinkle is an award-nominated teacher and writer with experience in America and overseas, as well as years developing educational materials for big name educational sites like Have Fun Teaching. He has taught PreK all the way up to adult classes, and has focused on ESOL/EFL techniques, as well as STEM Education. With two young children at home now, he's been developing more and more teaching strategies and books aimed at helping young learners.

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50 STEAM LABS

50 STEAM LABS offers authentic learning experiences in the STEAM fields of Science, Technology, Engineering, Art, and Mathematics. Each of the 50 labs in this volume is a learning experience with suggested pieces of a whole themed assignment. Learners can tackle all 5 parts for each project, or just a few of them, as their skills, time, and interests allow. A project might take a week or more to complete, depending on the depth each learner goes into their project.

These are NOT projects with each step spelled out for you like a recipe. Each lab requires you to think, plan, design, create, and experience on your own, so you can grow as a STEAM learner. These are NOT rubrics for graded projects, either, but grades could easily be applied to the projects.

So, take the plunge, jump into a project, and see where it takes you! Your results will vary each time you attack a project, because your STEAM skills and knowledge will grow as you go.

Happy STEAMing,

Andrew Frinkle & MediaStream Press