

# STEM TROOPERS

**Level 1**

**STEM ADVANCEMENT INC.  
G. GRANT**

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STEM TROOPERS LEVEL 1



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BY: G. GRANT, N. GRANT, & S. GRANT



STEM TROOPERS LEVEL 1

THROUGHOUT THIS BOOK YOU WILL COME ACROSS SOME OPEN-ENDED STEM CHALLENGES WHICH ALLOW YOU TO PROBLEM-SOLVE AND FIND SOLUTIONS TO REAL WORLD PROBLEMS USING YOUR SCIENCE, MATH, ENGINEERING, AND TECHNOLOGY SKILLS. THE ENGINEERING DESIGN PROCESS SHOWN BELOW HAS 5 STEPS WHICH WILL HELP GUIDE YOUR THINKING AND ABILITY TO EXPERIMENT.





# How To Use This Book

THROUGHOUT THIS BOOK YOU WILL COME ACROSS SOME OPEN-ENDED STEM CHALLENGES WHICH ALLOW YOU TO PROBLEM-SOLVE AND FIND SOLUTIONS TO REAL WORLD PROBLEMS USING YOUR SCIENCE, MATH, ENGINEERING, AND TECHNOLOGY SKILLS. THE ENGINEERING DESIGN PROCESS SHOWN BELOW HAS 5 STEPS WHICH WILL HELP GUIDE YOUR THINKING AND ABILITY TO EXPERIMENT.

**This book is divided into 8 units. Each unit has 3 lessons.**

## Lesson 1:

- **Reading** - students will read a story about an engineer who needs to solve a real-life problem.
- **Group Worksheet** - students will answer questions based on the reading in preparation for the activity in Lesson 2.

## Lesson 2:

- **Lab activity** - students will collect materials from their teacher and complete a lab activity. Students will use the worksheet as they go along.

## Lesson 3:

- **Extension Activity** - students will collect materials from their teacher and complete a STEM challenge on the unit topic.

**THE SYMBOLS ON THE BOTTOM OF THE PAGES WILL TELL YOU WHEN A SESSION CONTINUES AND WHEN A SESSION ENDS.**



The green arrow means keep working and go to the next page.

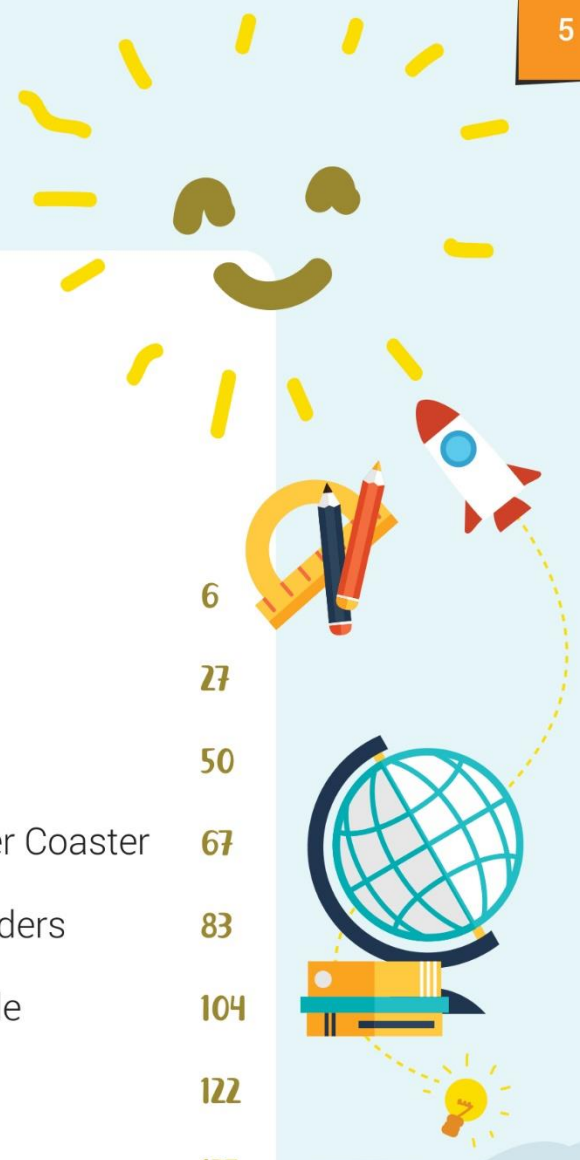


The red stop sign means stop working and do not move on to the next page



The book icon means keep reading.





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# The Little Engineer and the Big Bad Wolf

**UNIT 1: CIVIL ENGINEERING**



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First they tried to build a house out of straw.



UNIT 1: LESSON 1: READER



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But along came the Big Bad Wolf. He huffed. And he puffed. And he blew the house down.



UNIT 1: LESSON 1: READER

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The little engineers were not discouraged. "Let's try something else" they said!



UNIT 1: LESSON 1: READER

STEM TROOPERS LEVEL 1



Then they tried to build a house out of sticks.



UNIT 1: LESSON 1: READER

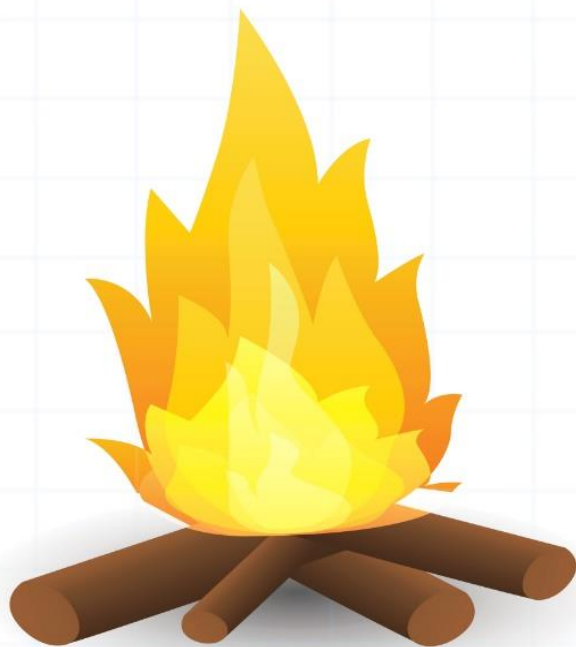


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That didn't work either.



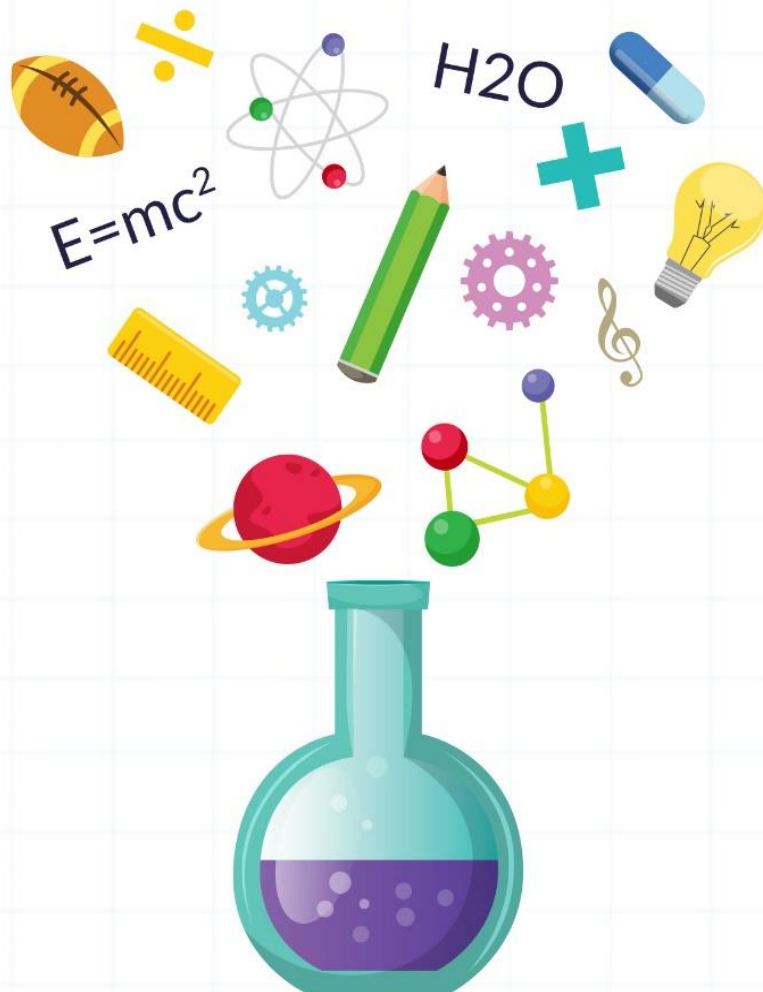
UNIT 1: LESSON 1: READER



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So the little engineers decided to do some research.



UNIT 1: LESSON 1: READER



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A civil engineer knows how to build. Civil engineers might build roads, buildings, or bridges.



UNIT 1: LESSON 1: READER



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Civil engineers know how to keep buildings stable—even in an earthquake.



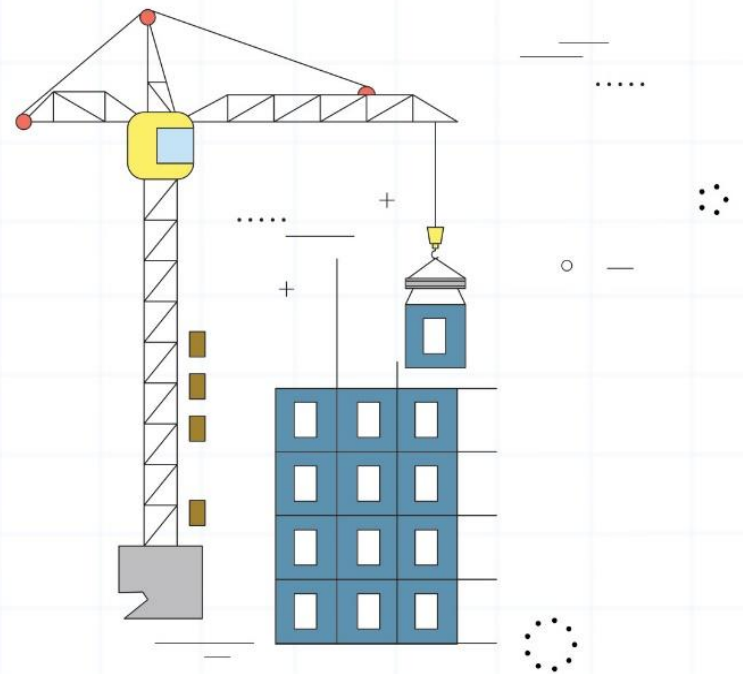
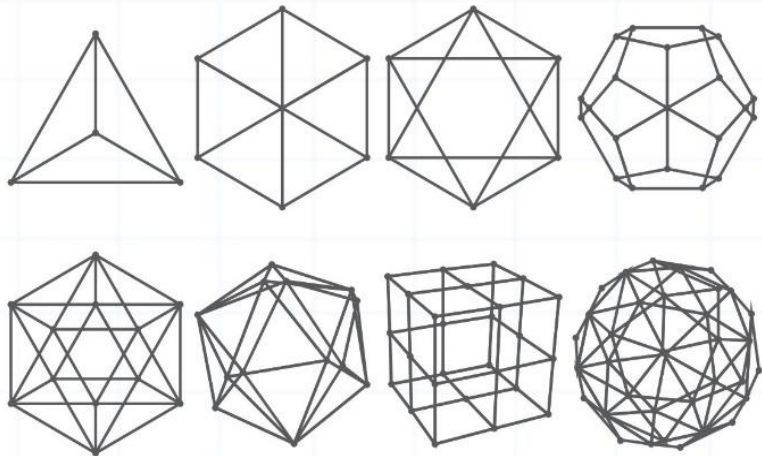
UNIT 1: LESSON 1: READER



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A civil engineer learns about different shapes, size, and structures.



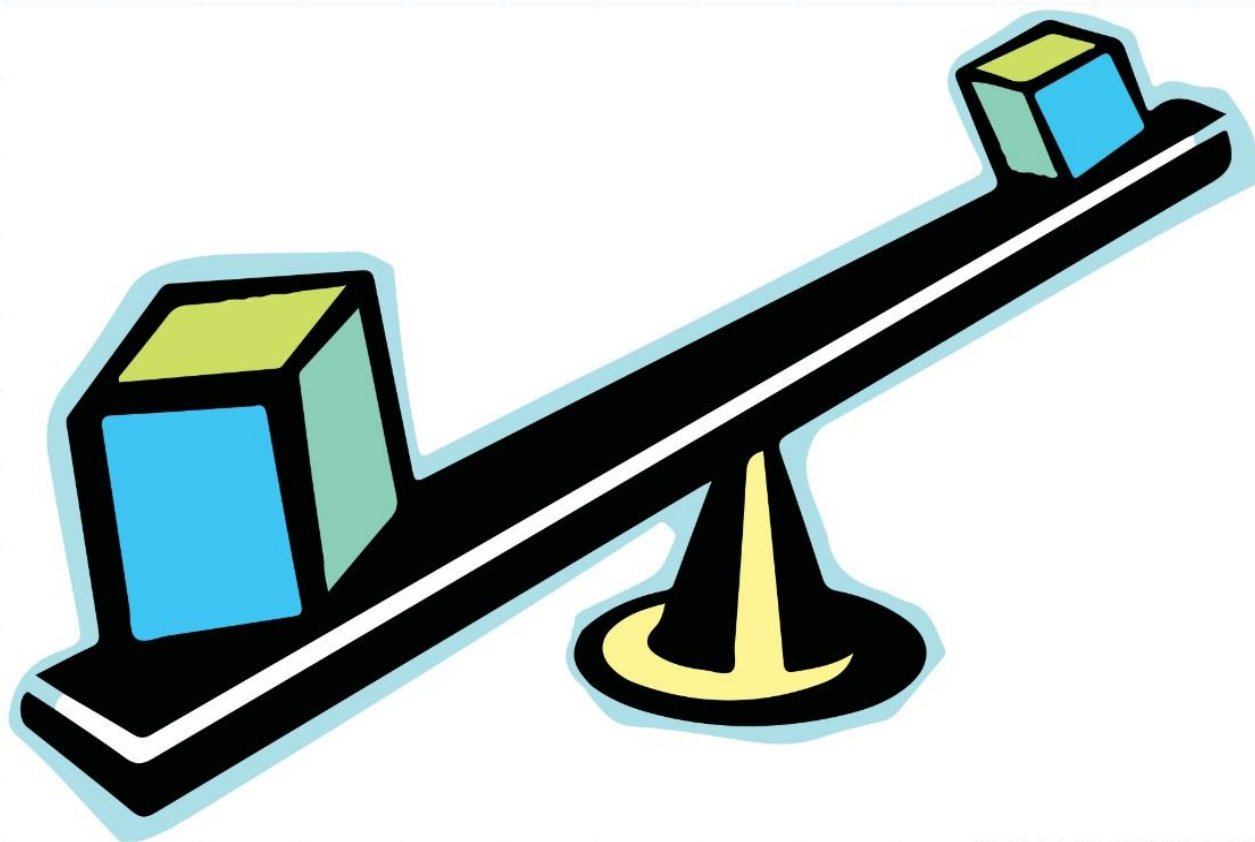
UNIT 1: LESSON 1: READER



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A civil engineer learns about how different objects balance.



UNIT 1: LESSON 1: READER

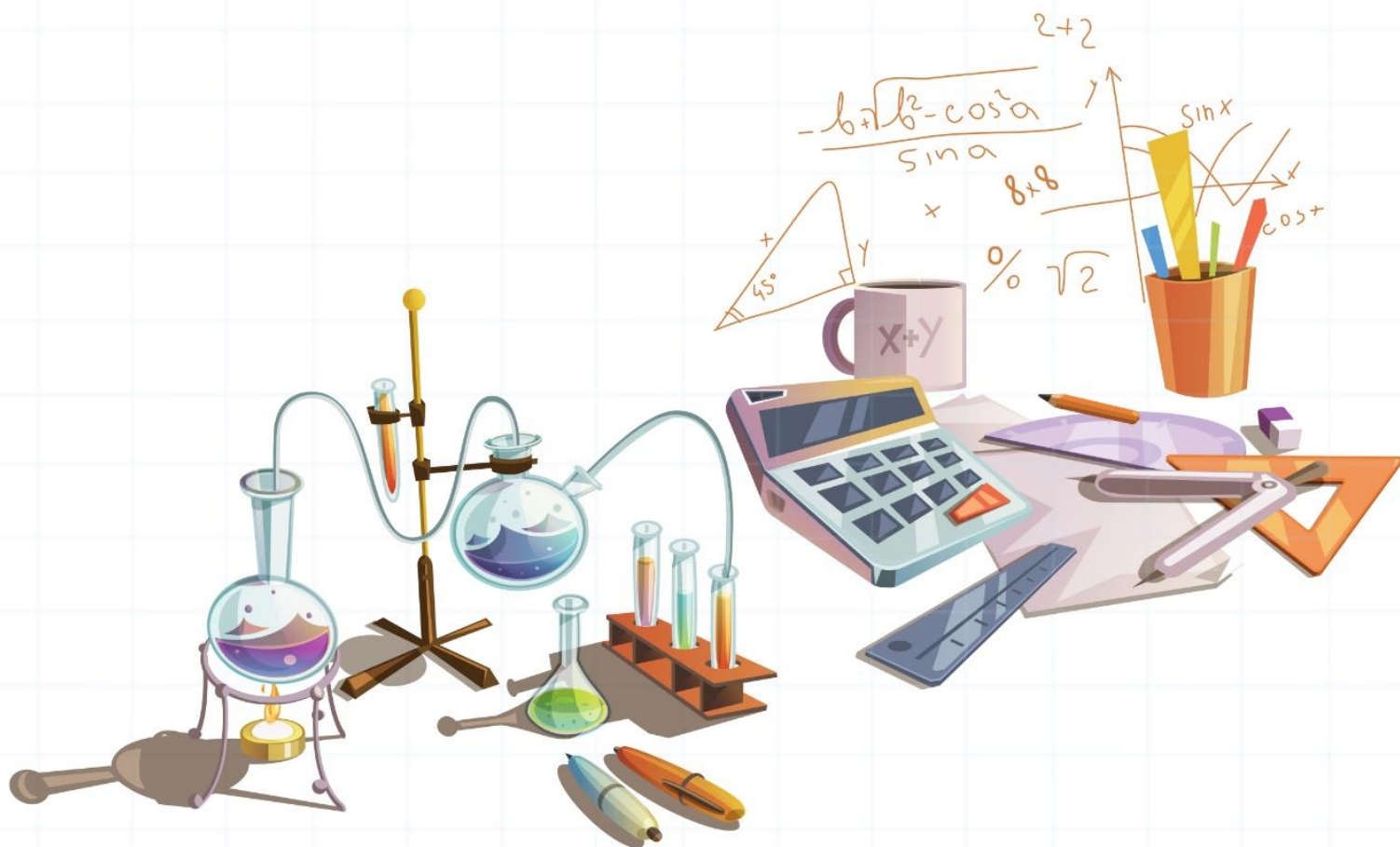


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A civil engineer learns lots of math and science.



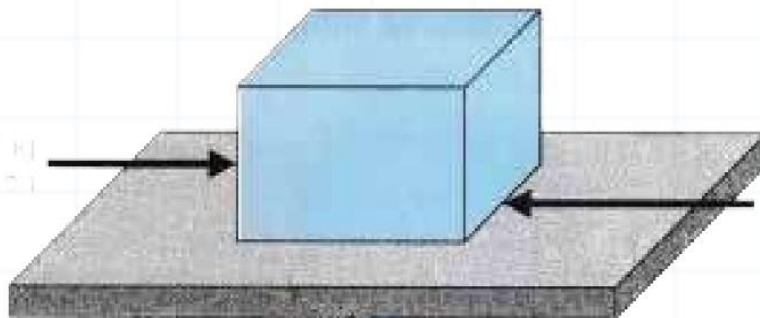
UNIT 1: LESSON 1: READER



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A civil engineer studies how an object moves when it is pushed or pulled.



UNIT 1: LESSON 1: READER

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"Hey!" said the little engineers. "When the wolf huffs and puffs, he is pushing on our house!"



UNIT 1: LESSON 1: READER



STEM TROOPERS LEVEL 1





What changes can we make to the houses so that it doesn't move when it is pushed?



UNIT 1: LESSON 1: READER



STEM TROOPERS LEVEL 1





# The Little Engineer and the Big Bad Wolf

CIRCLE THE CORRECT ANSWER

What did the engineers make their first house out of?



Why didn't the first house stand?



UNIT 1: LESSON 1: WORKSHEET



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## Fill-ins:

A house made out of \_\_\_\_\_ or \_\_\_\_\_ is not stable.

\_\_\_\_\_ is what engineers do to understand how to fix problems. The

first house was being \_\_\_\_\_ by the wolf's huffs and puffs. Civil

engineers build \_\_\_\_\_, \_\_\_\_\_, and

\_\_\_\_\_.

## Word Box:



Building



Bridges



Roads



Pushed



Straw



Sticks



Research



UNIT 1: LESSON 1: WORKSHEET

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# Build a Wind-Proof House



## Ask

HOW CAN WE MAKE A HOUSE THAT WON'T BLOW DOWN?



## Imagine

THINK OF DIFFERENT KINDS OF HOUSES..



## Plan

DRAW A PICTURE OF THE HOUSE YOU WANT TO BUILD.



## Create

BUILD A HOUSE USING THE MATERIALS YOUR TEACHER GIVES YOU.



## Improve

LOOK AT EVERYONE'S HOUSES. HOW COULD YOU MAKE YOUR HOUSE STRONGER?



UNIT 1: LESSON 2: ACTIVITY



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# Build an Earthquake-Proof House



## Ask

HOW CAN WE TEST THE HOUSES TO SEE IF THEY ARE STABLE?



## Imagine

THINK OF DIFFERENT KINDS OF STORMS AND NATURAL DISASTERS.



## Plan

DRAW A PICTURE OF THE SHAKE TABLE YOU WILL BUILD.



## Create

BUILD A SHAKE TABLE AND TEST YOUR HOUSE.



## Improve

LOOK AT EVERYONE'S HOUSES. WHAT KIND OF HOUSE STAYED STRONGEST ON THE SHAKE TABLE?



UNIT 1: LESSON 3: EXTENSION

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