

STEAM

When I Work with Others



Eyes

My eyes are on our project or who I am working with.

Ears

My ears are listening to my team's ideas.

Mouth

My mouth is quietly speaking to my team. Remember, kind words.

Hands

My hands are working on our project. They share supplies with my team.

Feet

My feet stay at our spot. I don't wander.

Remember, Tools Not Toys.

STEAM

Think like a STEAMer!



How can
we become
a
STEAMER?



Be brave,
try new
things,
and
if you fail,
try again!

Science

Use data to prove
your ideas like a
smart scientist!



Smart
Scientist

Technology

Be a confident
coder and discover
ways to take big
challenges and
organize them into
smaller pieces!



Confident
Coder

Engineering

Solve hard
problems like an
enthusiastic
engineer!

Enthusiastic
Engineer



Art

Be creative like an
awesome artist!

Awesome
Artist



"always"
BELIEVE
- in -
YOURSELF

Math

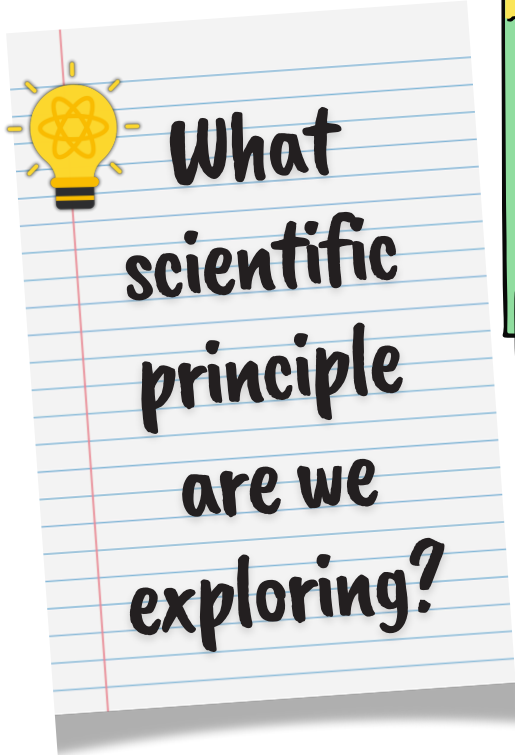
Prove your thinking
like a mighty
mathematician!

Mighty
Mathematician



SCIENCE

Think Like a Scientist



New Information

Learn from new information about a scientific phenomenon.

Step #1:
Inspire

Identify

Identify a question that needs to be answered based on a scientific principle

Step #2:
Question

Connections

Make predictions and connections based on your knowledge.

Step #3:
Research

Expect

Identify what you expect to happen when testing our question.

Step #4:
Hypothesize

Experiment

Gather data while we follow a procedure to test our hypothesis.

Step #5:
Experiment

Analyze

Look at the data, analyze the results, and make conclusions.

Step #6:
Conclude

Prove

Communicate your reasoning and conclusions with scientific data.

Step #7:
Communicate

Thinking

Find ways to think differently based on your experience with the experiment.

Step #8:
Reflect



TECHNOLOGY

Think Like a Technologist



What
technology
programs
are we
exploring?



Create

Be creative and try to code something you've never seen before.

Reminder

Joy

Be excited for new challenges you've never seen before.

Reminder

Tools

Use appropriate tech tools and handle with care.

Reminder

Structure

Look for patterns to program or decode.

Reminder

Problem-Solving

Find ways to solve problems you encounter.

Reminder

Schema

Make predictions about how the technology might function. Have you used something similar before?

Reminder

Connect



Connect the technology to a real-world application.

Reminder

Try

Know mistakes will happen and debug the issues after each discovery.

Reminder



ENGINEERING

Think Like an Engineer



**What
problem
are we
exploring?**

Problem

Engineers are problem solvers, think about how you will solve the STEAM problem and follow the constraints.

Step #1:
Ask

Schema

Use experiences and background knowledge to form initial ideas to solve the problem.

Step #2:
Imagine

Research

Learn something new through real-world research and information.

Step #3:
Analyze

Decisions

Make strategic decisions based on your knowledge to form an effective idea and plan.

Step #4:
Plan

Experiment

Be experimental and try to create something that solves the problem.

Step #5:
Create

Changes

Use mini-tests to make predictions and make changes while building.

Step #6:
Adapt

Prove

Make final improvements to your creation and conduct evaluations to test final results.

Step #7:
Evaluate

Thinking

Find ways to think differently based on your experience with the engineering process.

Step #8:
Share



ART

Think Like an Artist



Notice

Look at things closely to find shapes and patterns. What do you notice?

Step #1:
Inspiration

Schema

Make predictions about how the art style is possible. Have you seen this art before?

Step #2:
Inquiry

Connect

Find the STEAM elements involved and how the elements connect to the art process.

Step #3:
Connect

Process

Use the art process to create a piece of your own art in the same style.

Step #4:
Create

Complete

Use your knowledge and drafts to complete your final piece of art.

Step #5:
Finalize

Reflect

Think about this art style and reflect on your enjoyment and any changes you would make.

Step #6:
Reflect

Unique

Be creative and try to create something you've never seen before.

Reminder

Persevere

Know mistakes happen and keep trying again and again to create a new piece of artwork.

Reminder



MATH

Think Like a Mathematician

Relationships

Make sense of quantities and relationships in problems.

Reminder

Attempt

Persevere and try to solve problems you've never seen before.

Reminder

Tools

Use appropriate math tools.

Reminder

Structure

Analyze structure and patterns to solve challenging problems.

Reminder

Model

Create models to solve mathematical problems.

Reminder

Estimate

Use estimation to help get started and to test the reasonableness of solutions.

Reminder

Connect

Connect the math concept to real world application.

Reminder

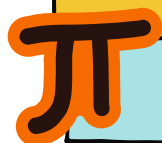
Thinking

Always prove your thinking and answers using models, representations, and math vocabulary.

Reminder



What math concepts are we exploring?

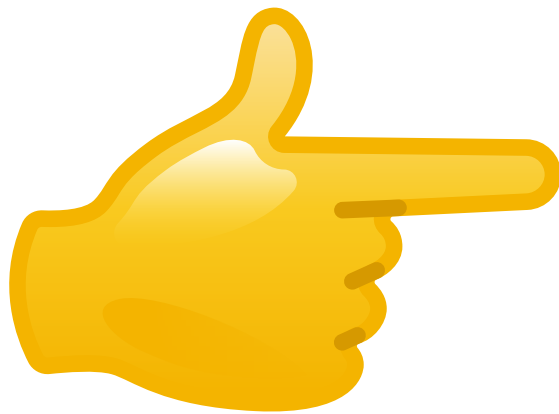


STEAM

Engineering



ENGINEERING DESIGN PROCESS



STEAM

Engineering



MAKE
CONNECTIONS
TO THINGS
YOU ALREADY
KNOW



Activate Schema:
Background Information

STEAM

Engineering



LEARN FROM
OTHERS AND
WORK WITH THEM
TO FIND
SOLUTIONS



1

Tell others your
“What”

⚙️ What will your creation look like?

⚙️ What will each part be made of?

I will make my _____
by _____.

2

Tell others your
“Why”

⚙️ Why do you think your idea will work?

- Based on your schema?
- Based on what we saw in the research?

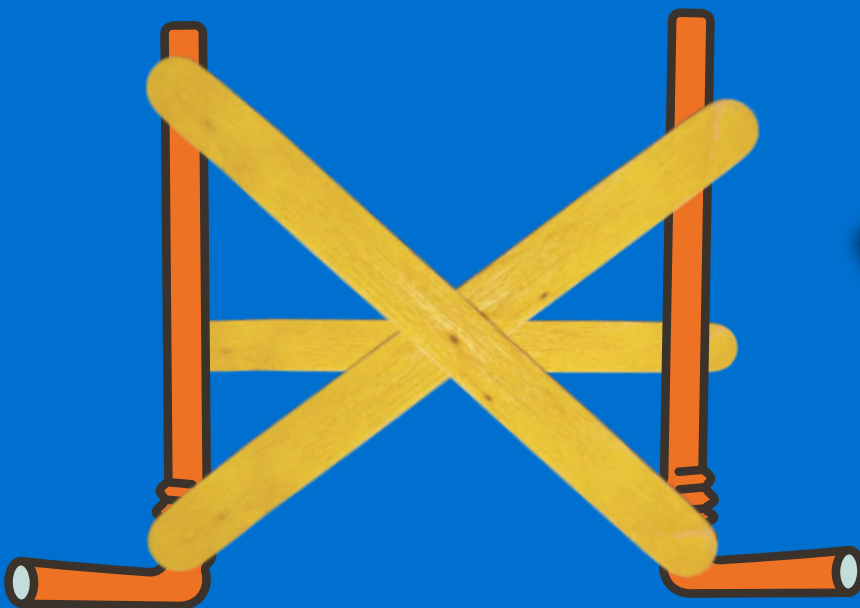
This should work
because _____.

STEAM

Engineering



ADD
SUPPORTS TO
KEEP
STRUCTURES
STURDY

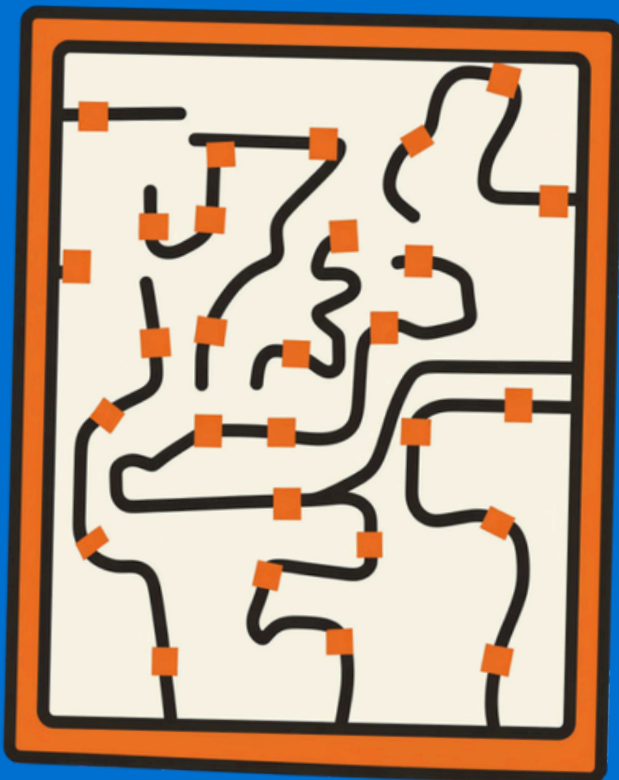


STEAM

Engineering



DON'T BE
AFRAID
TO
TRY NEW IDEAS



STEAM

Engineering



USE MINI-TESTS TO MAKE PREDICTIONS AND CHANGES



We use mini-tests to find *failure points* and determine what needs to change before final testing.

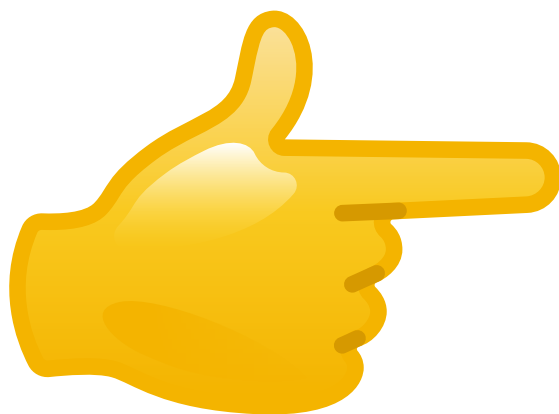
Then, during the final test, we can trust *that* our creation will be *successful*.

STEAM

Engineering



ENGINEERING DESIGN PROCESS



STEAM

Engineering



MAKE
CONNECTIONS
TO THINGS
YOU ALREADY
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Activate Schema:
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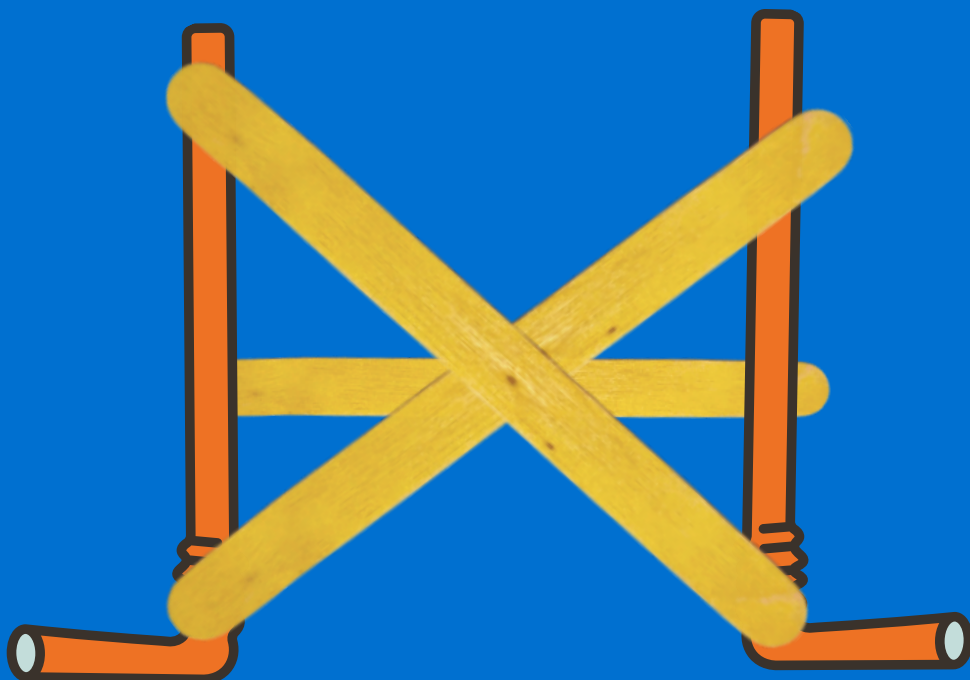
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STEAM

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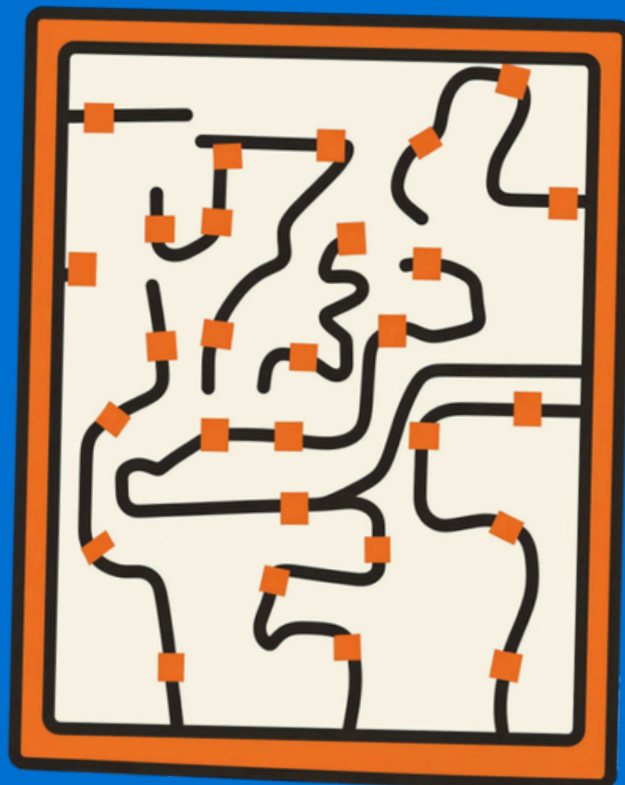


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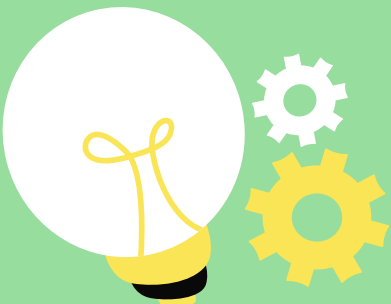
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STEAM

Think like a STEAMer!

How to Diagram

Brainstorm



1 Brainstorm your idea.

2 Draw your idea.

Picture



Pictures are pretty!

Diagrams help engineers determine the materials they'll use for different parts of their designs.

Diagram

Yarn

Popsicle Sticks

Straws

Cardboard Base

Blue Paper

3 Determine what materials each part of your creation will be made of.

STEAM

Think like a STEAMer!

1

**Tell others your
“What”**

- ⚙️ What will your creation look like?
- ⚙️ What will each part be made of?

“I will make my

by



SHARE IDEAS WITH OTHERS

2

**Tell others your
“Why”**

- ⚙️ Why do you think your idea will work?
 - Based on your schema?
 - Based on what we saw in the research?

“This should work because



STEAM

Think like a STEAMer!

Positive Feedback

Try: "I think your idea will work well because_____."

Be specific! Focus on a specific aspect of their plan, like materials or structure.

Talk 

Talk 

Negative Feedback

Try: "I am concerned that_____,"
may not work because_____."

Be specific! Focus on a specific aspect of their plan, like materials or structure.

GIVING HELPFUL FEEDBACK

AGREEMENTS

TRY

Do your best to help the other person.

TRY

Try not to make it personal by focusing on the idea instead of the person.

TRY

Try to speak kindly.



STEAM

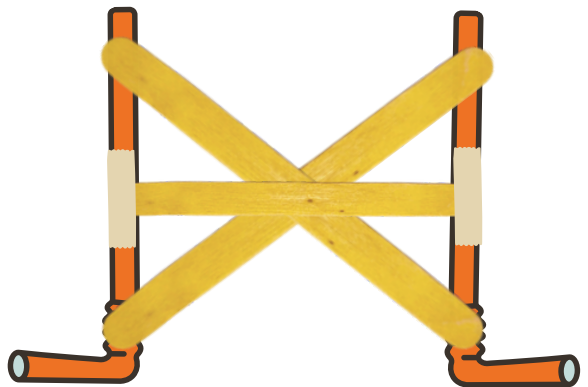
Think like a STEAMer!

ENGINEERING REMINDERS

REMEMBER

POSTS NEED BEAMS!

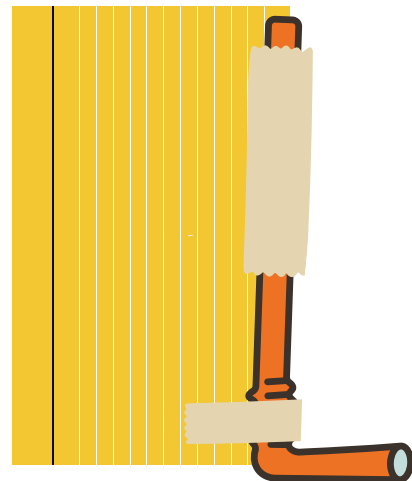
Posts stand upright.
Beams are necessary to keep
them stable and connected.



REMEMBER

MAKE CHANGES AS NEEDED!

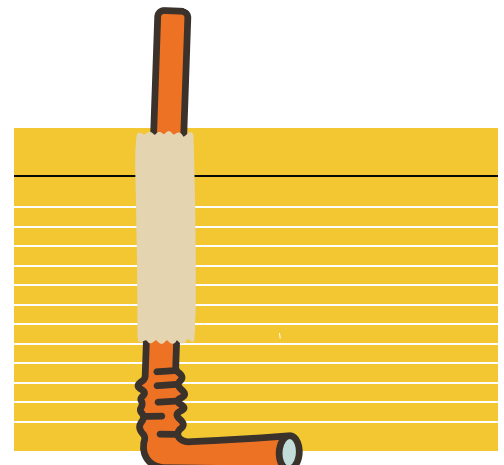
These are just prototypes;
adapt to challenges.



REMEMBER

KEEP JOINTS STRONG!

Joints happen where two
materials meet. Tape along
the joints, not just over them.



STEAM

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Engineering Process

STEP #1: Ask

STEP #2: Imagine

STEP #3: Analyze

STEP #4: Plan

STEP #5: Create

STEP #6: Adapt

STEP #7: Evaluate

STEP #8: Share

Engineering Learning Targets

Be presented with a big question and try and solve it.

Use our schema and new information to create prototypes that solve the problem.

Persevere when a challenge gets hard.



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Engineering Process

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