

# **SNOWMAN STEM CHALLENGE**

**DESIGN AND BUILD THE TALLEST SNOWMAN**





**I CAN BE A RISK TAKER AND SHOW HOW I THINK  
CREATIVELY TO SOLVE A STEM CHALLENGE.**

# SNOWMAN STEM CHALLENGE



- **TODAY WE ARE GOING TO DO SOMETHING NEW.**
- **IT IS CALLED A STEM CHALLENGE.**



# SNOWMAN STEM CHALLENGE



- **A STEM CHALLENGE IS A WAY TO SHOW WHAT WE'VE LEARNED!**
- **WE ARE GOING TO IDENTIFY A PROBLEM AND THEN BUILD OR MAKE SOMETHING TO TRY TO SOLVE THAT PROBLEM.**
- **WE WILL USE ALL OF OUR SKILLS TO SOLVE THE PROBLEM. WE WILL USE CREATIVE THINKING TO SOLVE THE PROBLEM BY MAKING SOMETHING.**



# SNOWMAN STEM CHALLENGE



- THERE ARE FIVE STEPS WE WILL FOLLOW TO SOLVE THIS CHALLENGE.
- THESE STEPS ARE KNOWN AS THE ENGINEERING DESIGN PROCESS.

# SNOWMAN STEM CHALLENGE



## **CHALLENGE:**

Build the tallest free-standing snowman using only the materials provided.

# Do You Want to Build a Snowman?

STEM Engineering Challenge

**Can you create the  
tallest free-standing  
paper snowman?**





# MATERIALS:

- 5-6 sheets of white copy paper
- Assorted colors of construction or tissue paper
- Pipe cleaners (for a hat)
- Tape (masking tape works best)
- Scissors
- Tape measure or ruler
- Popsicle sticks or straws (if desired for stability)
- Copies of handouts



# CONSTRAINTS:



- The snowman must be free-standing.
- It cannot lean on or be attached to anything.
- You can only use the materials provided.
- The snowman must have 3 parts.
- You can decide if you want your snowman to have a hat.
- You must complete your prototype in the allotted time.



Look at the materials and think about what you might build. Be ready to share your ideas.





Discuss your ideas with your partner or group. Every person needs to take a turn to share.



Work with your team to come up with a plan for a design you will try first.

### BRAINSTORMING SHEET

How will you build the tallest snowman?

Draw a model of your snowman.

A large, empty rectangular box with a black border, intended for drawing a model of a snowman.

List all of the materials you will use.

A rectangular box with a black border, intended for listing materials. It is currently empty.

### BRAINSTORMING SHEET

How will you build the tallest snowman?

Sketch a diagram of your design. Be sure to label each part.

A large, empty rectangular box with a black border, intended for sketching a diagram of a snowman design.

List all of the materials you used in your design. Be sure to list quantities for each item as well.

A rectangular box with a black border, intended for listing materials. It is currently empty.

[Extend Page](#)

### BRAINSTORMING SHEET

How will you build the tallest snowman?

Snowman Design # \_\_\_\_\_

A large, empty rectangular box with a black border, intended for sketching a diagram of a snowman design.

Explain your rationale for this design.

A rectangular box with a black border, intended for explaining the rationale for the design. It is currently empty.

Detail your materials:

A rectangular box with a black border, intended for detailing materials. It is currently empty.



Get the supplies you need and begin to build your design. You must be done by the time the timer beeps.

[Enter a Design](#)

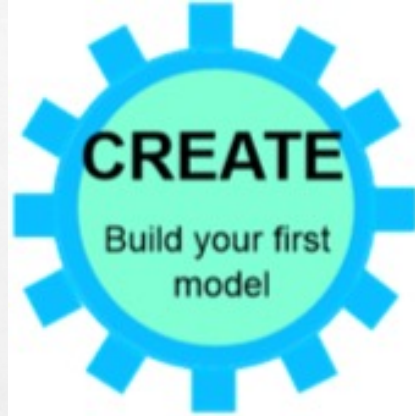




# Time to Test!

Use a tape measure or ruler to measure the height of your snowman.  
Measure from the floor up to the top point of your snowman.





Collect and record the measurement data from every team.

Which snowman was the tallest and why?

# DATA COLLECTION SHEET

## Snowman Height Data



Group Names	Height of Snowman

[Extend Page](#)



**Time to make some  
improvements to your design**







# Discuss with your team

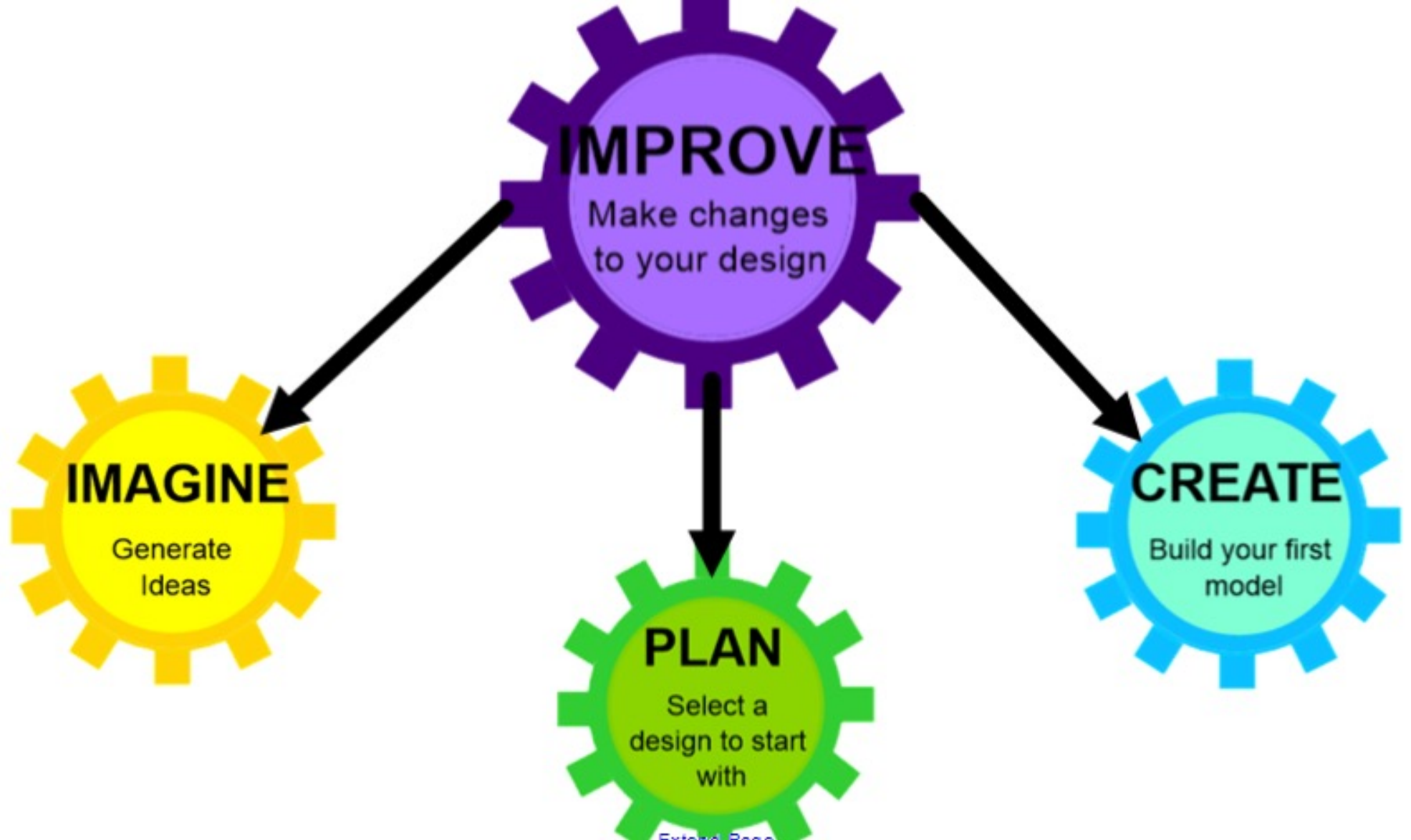


What worked and what didn't?

What would you change and why?

How can you make your snowman better?

**RETURN TO THE  
STEPS TO MAKE A  
NEW AND  
IMPROVED DESIGN.**





Work with your group to discuss  
what you want to change in your  
second build.





Draw a new plan for your improved  
(second) build.

**BRAINSTORMING SHEET**

How will you build the tallest snowman?

Draw a model of your snowman.

List all of the materials you will use.

A simple line drawing of a snowman wearing a black top hat, a red scarf, and having stick arms. It has three snowballs for its body.

**BRAINSTORMING SHEET**

How will you build the tallest snowman?

Sketch a diagram of your design. Be sure to label each part.

List all of the materials you used in your design. Be sure to list quantities for each item as well.

A simple line drawing of a snowman wearing a black top hat, a red scarf, and having stick arms. It has three snowballs for its body.

[Extend Page](#)

**BRAINSTORMING SHEET**

How will you build the tallest snowman?

Snowman Design # \_\_\_\_\_

Sketch and label a diagram of your design.

Detail your materials:

Explain your rationale for this design.

A small snowman icon wearing a top hat and scarf.



Get the supplies you need and begin to build your NEW design. You must be done by the time the timer beeps.



# Time to Test!

Use a tape measure or ruler to measure the height of your snowman.  
Measure from the floor up to the top point of your snowman.







Collect and record the NEW measurement data from every team.

Which snowman was the tallest this time and why?

Compare your data from the first build to the second. Did you improve your design?

# DATA COLLECTION SHEET

## Snowman Height Data



Group Names	Height of Snowman

[Extend Page](#)



Were you successful  
with this challenge?  
Why or why not?



What was the most  
difficult part of the  
challenge and why?



What was the best idea  
you came up with  
during this challenge?



What did you learn  
from this challenge?



What surprised you  
about this challenge?  
What did you enjoy, or  
not enjoy?



What, if any, frustrations  
did you have with this  
challenge?



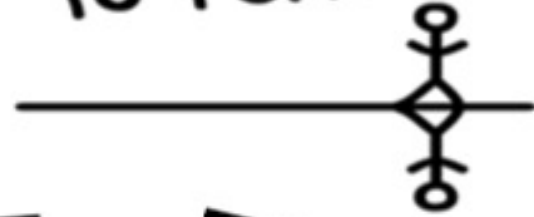
What do you think was  
the purpose of doing  
this STEM challenge?



What did you notice in  
designs that worked  
well and in designs that  
did not work well?

# REFLECTIONS

Take time  
to reflect



**REFLECTION SHEET**

Draw a sketch of your completed snowman, label with the height.

What did you enjoy about building your snowman?

**REFLECTION SHEET**

What is the best thing about your snowman?

Did your plan change while building your snowman? What did you decide to change and why?

How could you improve your snowman?

**REFLECTION SHEET**

What was successful about your design?

If you were to create another snowman, what would you change and why?

What information might help you improve your design?

**REFLECTION SHEET**

Look at your design and the designs of your classmates. What patterns do you notice that worked well or did not work well?

If you could add one new material to use for a future design, what would it be and why?