

# DECEMBER STEM CHALLENGE

## Santa's Sleigh



**CHALLENGE:** Santa's reindeer are in quarantine! Santa needs a new propulsion system for his sleigh ASAP, in case the reindeer aren't allowed out in public by Christmas Eve. Design and build a prototype for a flying sleigh.

### **CONSTRAINTS:**

- 🎄 Sleigh prototype must hover above the table, the higher the better.
- 🎄 Sleigh should be able to move through the air while hovering
- 🎄 Sleigh should *look* like a sleigh!
- 🎄 Use whatever materials you have available to you.

### **DESIGN:**

- 🎄 Brainstorm, then draw a labeled schematic (blueprint or outline) of your design *before* you start building
- 🎄 Decide what materials you need and how much of each item.

### **BUILD, TEST, ANALYZE:**

- 🎄 Did it work how you expected?
- 🎄 What changes could you make to improve the sleigh?

### **Tips for Teachers:**

- ★ Choose materials and size constraints at your convenience
- ★ Have students work in small teams to improve communication and collaboration skills
- ★ Need ideas? Check out these ones:
  - <https://www.education.com/science-fair/article/DIY-Hovercraft/>
  - <https://sciencebob.com/build-a-hovercraft-you-can-ride/>

## December Student Challenge Worksheet



**Design Challenge:** Santa's reindeer are in quarantine! Santa needs a new propulsion system for his sleigh ASAP, in case the reindeer aren't allowed out in public by Christmas Eve. Design and build a prototype for a flying sleigh.

Draw the design in the space below and label the materials.

**Build:** Build your design based on your plan.

**Test:**

Record the results of your hovercraft testing

<i>Santa's Hovering Sleigh</i>	<b>Trial</b>			
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
<b>Did the sleigh hover?</b>				
<b>Did the sleigh move?</b>				
<b>Changes to be made</b>				

**Analyze:**

What worked the best? What could you do differently with more time?