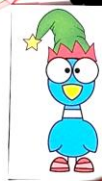
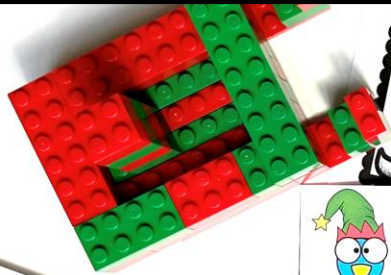


# storybook

# STEM

## DON'T LET THE PIGEON DRIVE THE SLEIGH



# SLEIGH RIDE

Can you create a sleigh to hold the pigeon and test it on an inclined plane?

**YOU MAY USE:**

- building bricks or linking cubes
- paper pigeon and tape
- hardback books

# SLEIGH RIDE

World Examples

Example

What is different?

How are Useful

## SLEIGH RIDE

Don't Let the Pigeon Drive the Sleigh

Name: \_\_\_\_\_

### STEM CHALLENGE

Can you create a sleigh to hold the pigeon and test it on an inclined plane?

# SLEIGH RIDE

## SIMPLE MACHINE

A basic device that applies force and makes work easier

## INCLINED PLANE

A simple machine that slopes at an upward angle, also called a ramp

## GRAVITY

the force of attraction of objects to each other

CREATED BY BROOKE BROWN AND KATIE KING

# SLEIGH RIDE

1st — 3rd  
GRADE



**FORCE &  
MOTION  
STEM**





# STEM COMPONENTS

## LESSON PLAN

### SLEIGH RIDE STEM CHALLENGE



**OVERVIEW:** This challenge allows students to experiment with ramps/inclined planes and how the height of a ramp affects the speed and distance of an object that slides down it. Students will also explore how friction and gravity affect the motion of an object. Handback picture books can be prepared up to create various ramp heights and students will build their sleighs out of building blocks or linking cubes with 3 different heights.

**KEY SKILLS:** Simple machines, 1-2-ETAS Engineering Design, 3-5-ETS Interactions, 3-5-2 Motion Forces and Interactions.

**MATERIALS:** PER GROUP: one stack of handback picture

#### LESSON

1. Activate students' prior knowledge by asking the questions and how they work. Discuss the differences.
2. Share and discuss the videos on "Sleigh Ramps".
3. Hold a class discussion, using the teacher chart to project the chart on an interactive whiteboard.
4. Introduce the STEM challenge and permitted materials.
5. Introduce and discuss key vocabulary cards related to the challenge.
6. Have students sketch blueprints of their designs.
7. Distribute materials and allow students 15-40 min. to build and test their sleighs.
8. Hold a whole class closing discussion and reflect on what they learned.

## SLEIGH RIDE



Can you create a sleigh to hold the pigeon and test it on an inclined plane?

#### YOU MAY USE:

- building bricks or linking cubes
- paper pigeon and tape
- hardback books

## KEY VOCABULARY

### SLEIGH RIDE

#### SIMPLE MACHINE



a basic device that applies force and makes work easier

#### INCLINED PLANE



a simple machine that slopes at an upward angle, also called a ramp

#### FRICTION

surface resistance to motion



#### GRAVITY



the force of attraction of objects to the center of the Earth

## TEACHER CHART & VIDEO LINKS

### SLEIGH RIDE

#### Real World Examples



What is similar? What is different?  
How Inclined Planes are Useful

#### Examples of Inclined Planes

### SLEIGH RIDE

#### INCLINED PLANES



#### SLEDDING



#### FRICTION



#### SLED FACTS



## STUDENT BOOKLET

What happened to the sleigh when you changed the height of the ramp or inclined plane?

Why do you think this happened?

#### THINK ABOUT IT!

What is the force that slowed your sleigh down?

What is the force that pulled your sleigh to the table or floor?

### SLEIGH RIDE

Don't Let the Pigeon Drive the Sleigh

Name: \_\_\_\_\_

#### STEM CHALLENGE

Can you create a sleigh to hold the pigeon and test it on an inclined plane?



How high is your ramp? How far did your sleigh go?

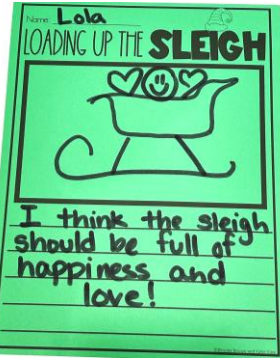
#### TEST 2

How high is your ramp? How far did your sleigh go?

#### TEST 3

How high is your ramp? How far did your sleigh go?

# ELA COMPONENTS



## OPINIONS

Giraffes could help Santa reach the roof.

Eagles are so fast that they would cause a sleigh wreck!

Bears might scare Santa and they require a lot of rest!

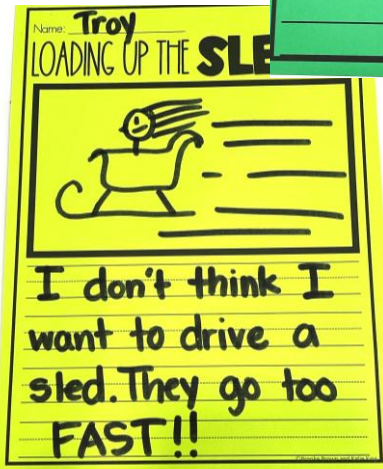
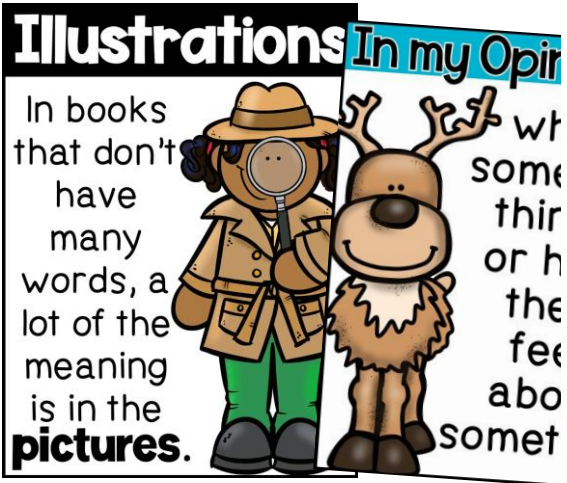
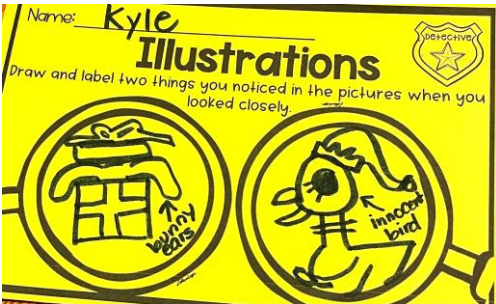
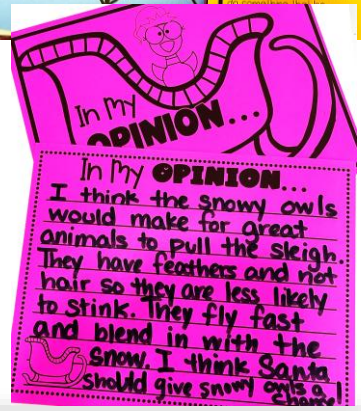
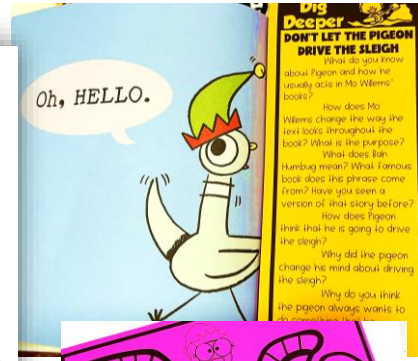
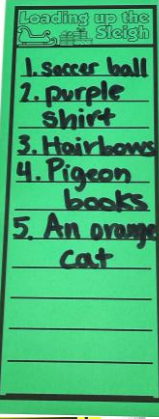
Even though lions can jump really high, I think they would cause all the presents to fly.

I think a flight!

I think zebras because they...

snowy owls because they...

I don't know if I would want...



## WHERE DO WE LOOK?



\*Pigeon tries to look sweet and innocent when asking to drive the sleigh.



\*When it is urgent, the letters get really bold and have color around them.



\*One of the presents is Knuffle bunny!