

# storybook **STEM** THE RECESS QUEEN

## PAPER PLAYGROUND

Can you design  
a working  
paper playground  
with at least two  
simple machines?

### YOU MAY USE:

- paper rolls
- construction paper
- tape
- scissors
- gummy bears

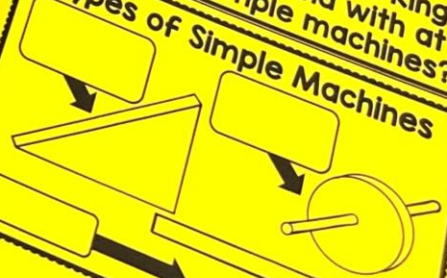
## PAPER PLAYGROUND

The Recess Queen

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

**STEM CHALLENGE**  
Can you design a working  
paper playground with at  
least two simple machines?

Types of Simple Machines



CREATED BY BROOKE BROWN AND KATIE KING

# PAPER PLAYGROUND



## SIMPLE MACHINE STEM





# STEM COMPONENTS

## LESSON PLAN

## KEY VOCABULARY

### STEM CHALLENGE: PAPER PLAYGROUND

**NGSS Standard Alignment: 2-PS1-3** Make observations to construct an evidence-based account of how an object made of a small set of pieces can be disassembled and made into a new object. **K-2-PS2-1** Then conduct an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object. **K-2-PS2-2** Develop a simple model to represent the motion of an object and the forces acting on it. **K-2-PS2-3** Ask questions, make observations, and to change to define a simple problem that can be improved on or tested. **K-2-PS2-4** Develop a simple model to represent the motion of an object and the forces acting on it. **K-2-PS2-5** How the shape of an object helps it function as a machine.

**Challenge Description:** Students will work in groups to construct a paper playground using construction paper, tape, and scissors to construct at least two simple machines. They may use and assemble the different playground features. They may also use their playgrounds such as slides, swings, seesaws, and other simple machines. **Eligible Materials:** 12" x 18" sheet of construction paper, 1/2" x 1/2" sheet of paper, 1/2" x 1/2" sheet of paper (8-10 per group), scotch tape, scissors, OPTIONAL: gummy bears.

#### LESSON PLAN

1. Ask students to transform different play features that are found on playgrounds. Google images of playgrounds and discuss the similarities and differences of the use of many different simple machines that are used in playgrounds such as slides and wheels and axles in merry-go-rounds. Ask students to transform different simple machines. Record student ideas on the provided teacher chart.
2. Share video clips about playgrounds and simple machines and introduce the challenge. Introduce permitted materials and share the challenge instructions. Bring students to cut out and assemble their paper rolls (i.e., paper strips, half of a prism, slots and tabs). Allow students time to transform playground ideas into their features with gummy bears, and record in their STEM journals.
3. Hold a whole class closing discussion and reflection, allowing students to point out the different simple machines included in their play areas.

### PAPER PLAYGROUND

Can you design a working paper playground with at least two simple machines?

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### PAPER PLAYGROUND

#### FORCE



a push or pull on an object

#### LEVER



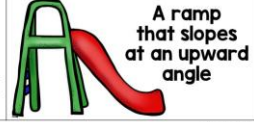
a bar that rests on a fulcrum that is used to move a load with one end when pressure is applied to the other end

#### SIMPLE MACHINE



a basic device that applies force and makes work easier

#### INCLINED PLANE



A ramp that slopes at an upward angle

## TEACHER CHART & VIDEO LINKS

## STUDENT BOOKLET

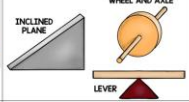
### PAPER PLAYGROUND

#### Real World Examples



What are some examples of pushes and pulls on a playground?

#### Types of Simple Machines



What are some examples of simple machines on a playground?

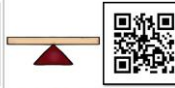
### LET'S EXPLORE SIMPLE MACHINES!

#### PLAYGROUND FORCES



What are some examples of pushes and pulls on a playground?

#### LEVERS



What are some examples of levers on a playground?

#### INCLINED PLANES



What are some examples of inclined planes on a playground?

#### SIMPLE MACHINES



What are some examples of simple machines on a playground?

### The Recess Queen

#### MAKER TASK CARDS

Use the following task cards in a Makerspace or with STEM Bins for students to make more creations.



Make a model of a new type of playground structure.



Make a poster about playground safety rules.



Make up a new outdoor recess game.



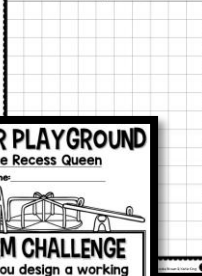
Make up a new indoor recess game.

### PLAYGROUND PLAN

PLAYGROUND FEATURE	DOES IT HAVE A SIMPLE MACHINE? IF SO, WHICH ONE?

### PLAYGROUND BLUEPRINT

Draw a picture of your playground. Label the simple machines.



My favorite part of our playground is:

It's my favorite because:

One new thing I learned about simple machines is:

### PAPER PLAYGROUND

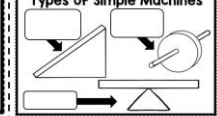
The Recess Queen



#### STEM CHALLENGE

Can you design a working paper playground with at least two simple machines?

#### Types of Simple Machines



## MAKER CARDS

# ELA COMPONENTS

### Playground Behavior

Negative	Positive
 kicking someone	 inviting people to play
 bad teamwork	 working together
 bad words	 taking turns

### The RECESS QUEEN

Name: SMITH

#### HOW TO BE A RECESS FRIEND

When my friends and I are playing at recess, we always take turns on the swings. It isn't nice to hog all the swings to yourself if others are waiting!

Positive	Negative
 talking with friends	 not taking turns
 comforting someone who is hurt	 being aggressive
 working together and having fun	 excluding people from games
 talking to an adult if there is a problem	 not keeping hands to yourself

## CHARACTERS CHANGE

What was Jean like in the beginning?

What was Jean like the end?

What caused the change in Jean?

### Characters CHANGE

Characters go through **PHYSICAL** and **PERSONALITY** changes in the books we read.

#### essential questions:

- What was Jean like in the beginning of the book?
- What was Jean like at the end of the book?
- What caused the change in Jean?

found something funny	gaped	stared with mouth open
ran forward with force	amused	charged
		growled angrily

charged

stared with mouth open

amused

snarled

growled angrily

found something funny

gaped

stared with mouth open

Name: NASH

### Characters Change

How can characters change? What causes Jean to change?

Sometimes characters start out being mean and then they turn nice! Jean became nice when Katie Sue invited her to play.

### JEAN in the BEGINNING

### JEAN at the END