BASKETBALL CATAPULT STEM CHALLENGE



Be the teacher students remember!
Students will:

- Learn about basketball
- Design a hoop
- Design a catapult
- Learn about levers

INCLUDES:

- 30 Printables
- 2 Posters
- Print & GO PLANS!
- Answer Keys
- Rubrics
- Journal

For Teacher

STEM BASKETBALL

Materials Needed: (You can change materials)

Basket Hoop Printable
Popsicle Sticks
Rubber Bands
Erasers
Pencils
Pennies, Buttons, or Pom Poms
Tape

1. Gather the materials
2. Decide on teams or if they work individually
3. Make STEM tubs with Materials or Baggies
4. Have students read "The Problem" (pg. II)
5. Students will use the printable to make a
6. DESIGN Your Catapult

SUGGESTED LESSON PLAN (BASKETBALL CATAPULT)

You can do everything in one day, IF you have 90 minutes, or I suggest breaking the activities into two or three days.

Day 1 - Ask students if they have ever played basketball. Discuss if they liked it and would want to play basketball for a living. Have them fill out the K and W on the KWL Chart. Share a video of a basketball game. Lead them to think about how the ball moves. Hopefully, they will think about force and motion. Read the passage (pg. 9) about basketball to the students. Have them answer the comprehension questions on page 10 about the passage.

Day 2 - Using pg. II (The Problem) Review with the class. Remind them about what they learned yesterday about basketball. Next, show students the materials. Tell them they must figure out how to make a catapult by using only the materials provided. Share the posters. Let them draw their design on the DESIGN IT sheet. (pg. 12) Ask them to label the picture. (see example) Pass out the basketball hoop printable. Let students build this today. Share the step-by-step instructions. (pg. 30)

Day 3 - Students use the DESIGN sheet to help guide the building of their catapult. They can use the suggested materials or use whatever materials you decide. Pg. II is premade with suggested materials, but there is a page at the end where you can add your own materials to complete the challenge. Materials can include small balls, bottle caps, cups, etc.

CATAPULT STEM Objectives

Students will design a catapult to get an object to travel through a hoop.

Science: Discover different objects they can use to design a catapult. Students will use models and drawings to solve a problem. They will ask questions to obtain information and communicate solutions.

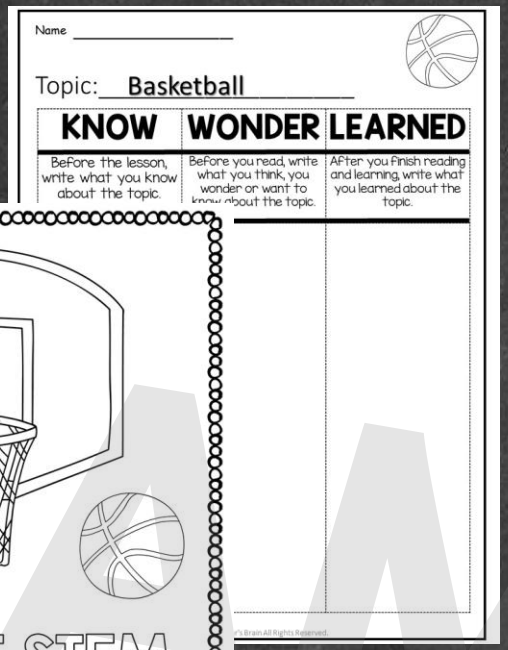
Technology: ISTE Standards- Innovative Designer
Students will watch a real basketball game online or with a video.

Engineering:
Design a simple plan for creating a catapult to move an object. They will adjust their designs as needed.

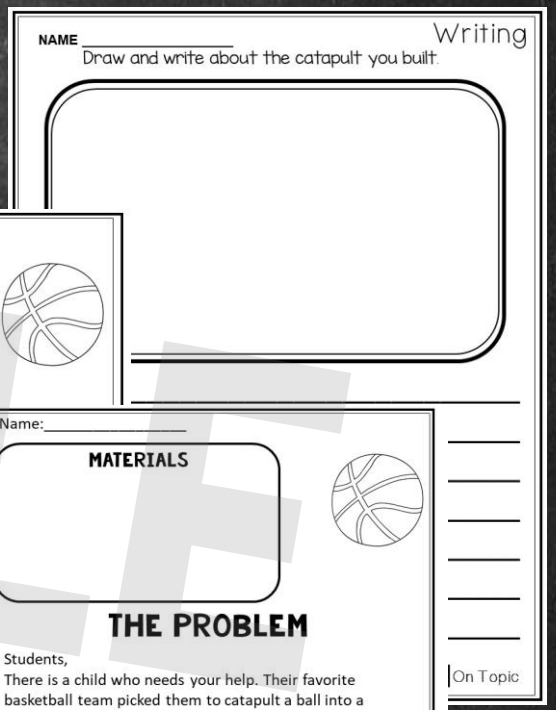
Mathematics: Numbers and Data
Students will record the number of tests and successful attempts to make a basket.

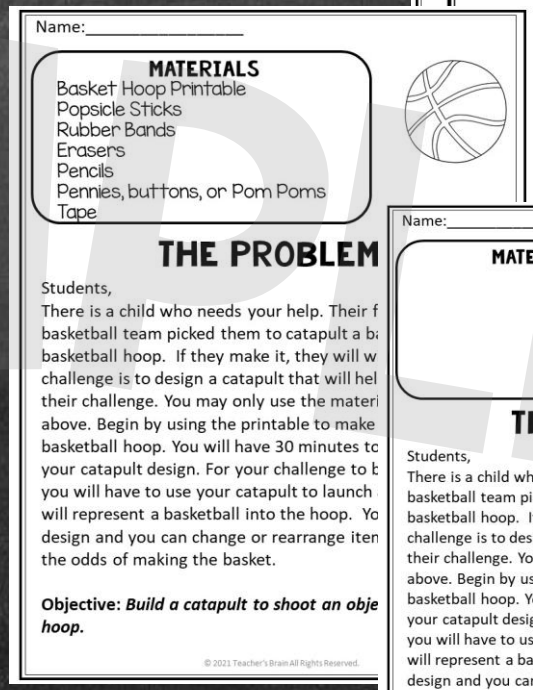
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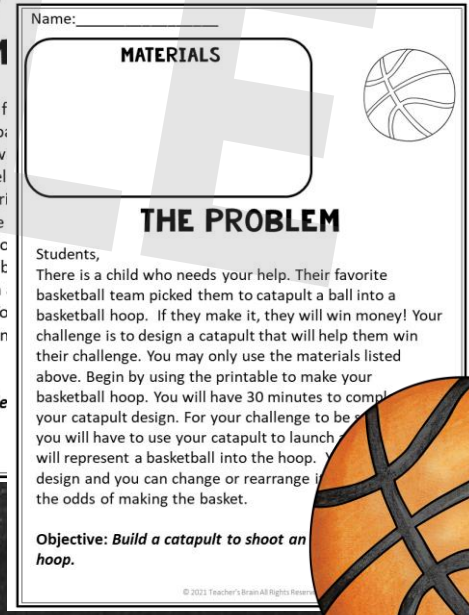
Primary and Intermediate Lines

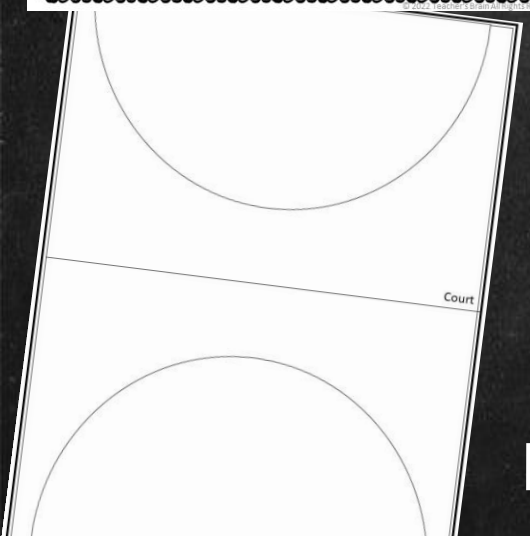












Add your own materials or use the pre-made version.



3 DAYS OF PLANS!
End it with students sharing their catapults!

SAMPLE

Name:_____

TEST IT!

Record your results for each test.

TEST#	Missed It	Made It	Did it go past the basket?
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

Total

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BUILD A BASKET

Attach Basket

Top of Basket

Attach this to the back on an

DEAR PARENTS,

We are working on an exciting STEM Engineering Challenge this week! We constructed a catapult that will toss an object into a basket. Students are learning about basketball, force, and levers. This challenge has the students creating projects using problem-solving and real-world skills.

Ask your child to tell you about the project. Ask questions like, "Did you get your object to go into the basket? How did you build your catapult? Did you feel frustrated while designing it? What was your favorite part of the activity?

Encourage your child to find items at home to construct a catapult using everyday objects. It is a great challenge to help you bond with your child showing your support for their education. I would or have your child share their catapults with

Name:_____

MEASURE IT!

Record how far your object traveled.

TEST#	inches	feet
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

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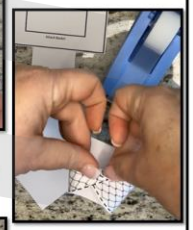
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PHOTOS OF STEM ACTIVITY

Directions for BASKET:

- Cut out the pieces.
- Fold the bottom base of the backboard backward.
- Roll the pointed corners of the basket and attach them together.
- Attach the basket to the backboard.
- Attach the rectangle piece to the back of the backboard at an angle and attach the other end to the base.









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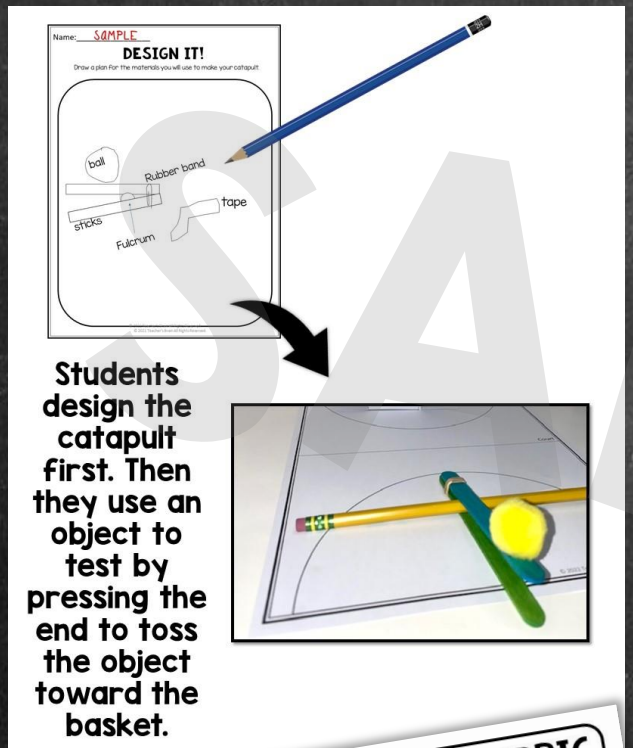


SAMPLE

Home Connection Letter

Build a hoop, a catapult to shoot an object into the hoop, test it, measure how far it goes and learn about basketball.

Example, Comprehension, Rubrics & POSTERS



Students design the catapult first. Then they use an object to test by pressing the end to toss the object toward the basket.

Name:_____

BASKETBALL

Basketball is a team sport. It is a game played be
two teams of 12 to 15 players. When teams play
other only five players play on the court from eac
Basketball is usually played indoors but can be pl
outside too. Each team tries to score by tossing t
through the other team's goal. The goal is an elev
hoop and net called a basket. The basket is 10 fe
the ground. There is a hoop at each end of the co

The court is divided into two main sections by the
court line. The ball is moved down the court by p
team members or dribbling. The team with the b
called the offense. The team without the ball is c
defense. The defense tries to steal the ball. A gar
keeps track of how much time is left to play.

Name: Example

BASKETBALL

How many players are on a basketball team?

There are 12 to 15 players on a team.

Explain how the ball

People dribb
members.

LEVER EXAMPLE

EFFORT

LOAD

FULCRUM

Name: Example

REFLECTION

RATE IT!

Didn't like it! | It was okay. | It was fun! | I want to do it again!

Is there anything you would change if you made this catapult again?

I would have made it with tape instead of the rubber bands.

What worked well?

The eraser worked bet
distance as the center
the pencil or sticks.

Explain your role in the group or how you mad

My team let me be in char
catapult for 4 tries. It was
fun to see my coin fly, but
made the basket.

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CATAPULT EXAMPLES



Catapults are types of machines used to launch objects at a great distance. They

STEM RUBRIC

Name:_____

3	2	1
Followed Instructions COMPLETELY	Followed Instructions SOME	Followed Instructions DID NOT
Completed Design COMPLETELY	Completed Design SOME	Completed Design DID NOT
Accurately Tested COMPLETELY	Accurately Tested SOME	Accurately Tested DID NOT
Participation COMPLETELY	Participation SOME	Participation DID NOT

TOTAL ____/12

Comments:

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SAMPLE