YOU'RE INVITED: ANNUAL STEM FAMILY NIGHT

Dear Parents and Guardians of PS205 Students,

It's time to kick-off another year of our **DESIGN AND ENGINEER STEM Program at PS205**! This year we are planning not one, but **TWO** STEM nights. Get excited! Our first STEM night will be Jan. 30th 2018. The second will be held in May.

Last May, families worked together on three different STEM activities and completed the activity in a specific amount of time using the materials provided. Another highlight of that evening was the exhibition of the fifth grade students K'NEX engineer and science fair projects. It really was an amazing night to ***STEMabrate***!

Now that we have reminisced about our STEM night from last year let me fill everyone in on this year's **Annual STEM Family Night**. This STEM evening is titled, "STEM Design and Engineering Challenge". It will take place **on January 30th at 5 PM**. Every student from pre-k through fifth grade is **invited** to participate in their grade specific challenge.

The "STEM Design and Engineering Projects" WILL BE COMPLETED AT HOME, **prior** to the STEM night. Students will have the next few weeks to design and then redesign their projects if necessary. All materials will be supplied by the parents/guardians and all projects will be completed at home. All design projects have been chosen to keep material prices at a very low cost. The majority of materials will be everyday items found around your homes. I know you cannot wait to find out what the design and engineering challenges are, so let me introduce you to the STEM challenges for the grades:

- **Pre-K, Kindergarten and First Grade**: THE THREE LITTLE PIGS DESIGN/ENGINEERING CHALLENGE
- **Second and Third Grade**: BUILDING FOR HURRICANES DESIGN AND ENGINEERING CHALLENGE
- **Fourth and Fifth Grade**: BUILDING FOR STRENGTH DESIGN AND ENGINEERING CHALLENGE

Please read through the projects and encourage your child to participate in this STEMtastic opportunity. Each student that participates will receive an award. Design and engineering awards will be given to those students whose projects are able to succeed in their given challenge.

If interested, please detach the slip below and return to Mr. B by Friday Dec 8th. We need to know the number of participants to enable us to plan for our "STEM Design and Engineering Challenge Night."

Thank you parents/guardians for your support in building up our STEM program and helping to create 21st century designers and engineers!

Please note that this information can also be found on our school's website, PS205.org/stem

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PS 205Q STEM Design and Engineering Challenge Night Tuesday, January 30th 2018

Child's name _____ Class_____

Please check one and return to Mr. Berghorn by Friday December 8th, 2017

___ My child would love to participate in the STEM Design and Engineering Challenge Night

___ My child will not be able to participate in the STEM Design and Engineer Challenge Night

THE THREE LITTLE PIGS DESIGN & ENGINEERING CHALLENGE (PreK-1)

The Real World Problem: The Big Bad Wolf is at it again. He is trying to blow apart the homes of the three little pigs. The little pigs decided that instead of building three individual houses that they will engineer one house for all three pigs to live in using straw, sticks and/or brick. They have never attempted an engineering project like this before so they need your help!

The Task: Students will have to design(draw) and then engineer(build) a home for the three little pigs that will be able to withstand the huffing and puffing of the BIG BAD WOLF (Box fan)! He will be blowing at different speeds so please consider that when assisting your child.

Materials: Students are **only allowed** to choose from the **materials** below. No other materials are permitted.

___ Popsicle sticks (No more than 25 allowed in the project)

___Drinking straws (No more than 25 allowed in the project)

___Index cards (No more than 25 allowed in the project)

___1 piece of cardboard no bigger than 8 inches by 8 inches that has to be used as the foundation for the house

___1 piece of poster board of card stock no bigger than 8 inches by 8 inches that has to be used as the roof of the house

___1 foot of masking tape

___Scissors

Parents, please feel free to help students cut materials such as the tape or straws if needed and please prep the foundation and roof for them and then let your child(ren)'s brain work to its full potential. Provide guidance and encouragement, but please do not complete the project for them.

Final touches: Students will bring in their projects the night of the STEM DESIGN AND ENGINEER CHALLENGE. Students will take turns placing their structures in the "test zone" in front of the BIG BAD WOLF. The zone will be 2 feet away from the BIG BAD WOLF. Once placed in the test zone we will turn the fan on low (i.e., Huffing and Puffing Level 1) for 10 seconds. If it survives, it will go to medium (i.e., Huffing and Puffing Level 2) for 10 seconds. If it survives, we will turn the fan on high (i.e., Huffing and Puffing Level 3) for 10 seconds. If the house is still standing…. IT WAS AN ENGINEERING SUCCESS! If it did not…well there is always next year. Students will have an opportunity to fill out a reflection sheet if they choose to think about what may have gone wrong with their design and how they can improve for next year.

BUILDING FOR HURRICANES DESIGN & ENGINEERING CHALLENGE (2-3)

The Real World Problem: Students act as civil and structural engineers as they design and engineer a tower/building to withstand the forces of high winds that might occur during storms and hurricanes.

Damage to buildings can occur due to wind, storm surge, or heavy rainfall leading to flooding. For this STEM project, the focus is on wind damage. The tower must be as tall as you can make it, but also stable enough to stand up to a "wind load" (hurricane).

The Task: Students will have to design (draw) and then engineer (build) a structure that will be able to withstand the force of a hurricane (box fan). The structures will have to withstand the forces of multiple category hurricanes (box fan speeds). **It must be at least 12 inches off the ground and be able to hold a tennis ball at the top.**

Materials: Students are **only allowed** to choose from the **materials below.** No other materials are permitted.

___Index cards (No more than 8)

___Straws (No more than 10)

___Popsicle sticks (No more than 8)

___String (No more than 3 feet)

___Pipe Cleaners (No more than 8)

___Scotch tape (No more than 1 foot of scotch tape)

___Scissors to cut materials if necessary

Parents, please feel free to help students cut materials such as the tape or straws if needed. After that let your child(ren)'s engineering brain work to its full potential. I always encourage guidance and encouragement but please do not complete the project for them.

Final touches: Students will bring in their projects the night of the STEM DESIGN AND ENGINEER CHALLENGE. Students will take turns placing their structure in the "test zone" in front of the hurricane. The zone will be one foot away from the hurricane. Once placed in the test zone, we will turn the fan on low (Category 1 winds) for 5 seconds. If it survives, it will go to medium (Category 2-3 winds) for 5 seconds. If it survives, we will turn the fan on high (Category 4-5 winds) for 5 seconds. If the structure is still standing…. IT WAS AN ENGINEERING SUCCESS! If it did not…well there is always next year. Students will have an opportunity to fill out a reflection sheet if they choose to think about what may have gone wrong with their design and how they can improve for next year.

BUILDING FOR STRENGTH DESIGN & ENGINEERING CHALLENGE (4-5)

The Real World Problem: In the 20th century, engineers developed previously unimaginable things such as automobiles, mass transportation and space travel. Engineers often look back in history to learn from past engineering successes and failures as they design and build amazing new things.

Every day, engineers are thinking of ways to improve current technology. Fun Fact: In 2003, the tallest building in the world, the Taipei 101, was completed. Located in Taiwan, the Taipei 101 stands at 1,671 feet, more than a quarter mile tall! This design required creativity and "thinking outside the box." Now it's your turn…

The Task: Students will design (draw) and then engineer (build) a structure to support as many science textbooks as possible.

Materials: Students are **only allowed** to use the **materials** below. No other materials are permitted.

___Copy paper (No more than 10 sheets)

___Masking tape (1 roll)

___Drinking straws (No more than 20)

___Paper clips (No more than 20)

___Scissors

Parents, please feel free to help students cut materials such as the tape or straws if needed. After that let your child(ren)'s brain work to its full potential. Provide guidance and encouragement, but please do not complete the project for them.

Final touches: Students will bring in their projects the night of the STEM DESIGN AND ENGINEER CHALLENGE. Students will place their structures on the table. Beginning with one textbook and adding on one more textbook every ten seconds, we will investigate how much each structure is able to support. If the structure is still standing after 20 textbooks have been used…. IT WAS AN ENGINEERING SUCCESS! If it did not…well there is always next year. Students will have an opportunity to fill out a reflection sheet if they choose to think about what may have gone wrong with their design and how they can improve for next year.