

# Western Engineering Outreach

*The 3 Little Pigs*  
Grade Sk/2

*Meet Today's ENG HERO!*



*E. Savory* – Associate Professor with Western Engineering

Dr. Savory got her BSc and PhD from the University of Surrey, UK. She joined Western University in January 2002. Dr. Savory's research interests are within the general field of industrial fluid mechanics, with an emphasis on the experimental study of turbulent flows, particularly wind tunnel measurements. She is also part of The Three Little Pigs Project, a major CFI/OIT funded project, at the new insurance Research Lab for Better Homes, which is concerned with testing full-scale North American wood frame housing under realistic environmental loads. *To learn more about Dr. Savory visit:*

[https://www.eng.uwo.ca/mechanical/faculty/savory\\_e/index.html](https://www.eng.uwo.ca/mechanical/faculty/savory_e/index.html)

## *Learning Goal:*

- Explore structures and the importance of material properties.
- Curriculum Connections: Grade 1 - Materials, Objects, and Everyday Structures; Grade 2 - Movement.

## *Materials Needed:*

- Paper Plates
- Construction paper (cut into 8 rectangles)
- Markers
- Pens
- Heavy Jujubes or candy
- Toothpicks or Skewers (Cut each into 3)
- Glue Stick

- Hairdryer



## Engineering and Science Connections:

When designing structures, civil engineers must understand the material properties. Civil engineers must also make sure that the materials are strong and safe enough for the job.

### Structures

- A structure is something that is built or arranged in a definite way, such as buildings, your school, or even a bridge.
- A structure has both form and function.
- Structures are affected by forces acting on them.
- Structures need to be strong and stable to be useful.



### Forces

- **Gravity:** An invisible force that pulls objects toward each other. Earth's gravity is what keeps you on the ground and what makes things fall. When you throw a ball up and it falls down, that is gravity pulling it back to the ground.
- **Pushing:** Is the force of pressing upon or against a thing in order to move it away. For example: to push the door open.
- **Pulling:** Is the force of bringing an object closer. We use the force of a pull when we move our bowl of ice cream closer to us.



### Stability

- Structures need to be stable in order to stand.
- A structure will be stable if the base is stable. This means the structure needs to be secured well at the bottom.
- We now know about gravity and that it acts on structures.
- Since gravity is acting on structures, should the structure be heaviest on the top or the bottom?
- Answer: The Bottom! Having the structure be heavier at the bottom creates a more stable structure



*Video Recommendation: The Three Little Pigs Story*

<https://www.youtube.com/watch?v=gdcgnSrUvU>

## Activity:

Before beginning, think about the following questions:

- Using any kind of materials make different shapes (triangle, square, hexagon, etc.). Now try squishing them by pushing the sides in. Which shape was the strongest?
- Are shapes with more sides the strongest or shapes with the least number of sides?
- Answer: Triangle is the strongest shape. As the number of sides in the shape increases, the shape becomes weaker

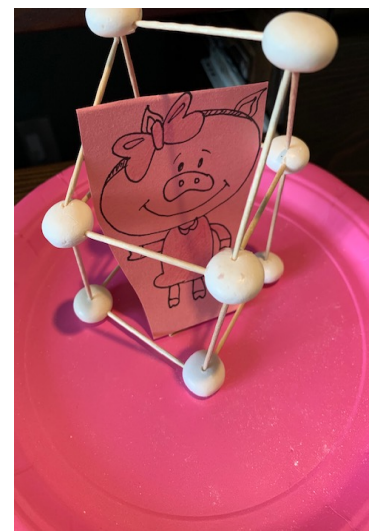
## Step 1: Little Pig

- Draw your pig on a piece of construction paper and colour it.
- Tape the bottom of the paper to a paper plate to make it look like the pig is standing up.



## Step 2: Safe House

- Using a maximum of 15 Jujubes, build a Jujube house around your pig to keep it safe from the Big Bad Wolf.
- You can use as many skewers or toothpicks as you want.
- You do not have to build the same house as the one shown in the picture. Be creative!
- Tip: Do NOT use Mentos like I did, it is hard and not fun.



## Step 3: Time to Test

- When you are done and happy with the house you built around your little pig, start the hairdryer on a light setting.

- Did the house collapse?
- If not try turning the speed up. Did it fall now?
- If your house survived all speeds of the hairdryer, your house is safe!
- If your house didn't survive, go back and try to make your house stronger.

## What Did You Learn?



- What is an example of a structure?
- What does gravity mean?
- Which shape is the strongest?
- Whose house was the strongest from the 3 Little Pigs story? What was used to build that house?

## Future Learning



- How can you make your current structure more stable and stronger?
- Instead of a hairdryer, try making your house strong enough to withstand a fan.

## Share your creations!

We would love to see what you made. Email us at [discover@uwo.ca](mailto:discover@uwo.ca) or tag us on social media.

Instagram: @westernueng

Twitter: @westernueng

Facebook: @westernueng

Thanks for discovering with us!