



# Designing Solutions: Using Rooftop Models to Explore Surface Water Runoff

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Roanoke, Va

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# Who are we? Blandy Experimental Farm, University of Virginia



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# Clarke County PS & Blandy/UVA Partnership



## Blandy Experimental Farm Mission



*"To advance understanding of the natural world through **education, outreach, and research.**"*



*Together, as a community, we guide and nurture learning for all by encouraging, inspiring, & empowering.*



# Getting to Know You



# MWEE Connections

1. **Issue Investigation.** *Locally relevant environmental issue:*

Students observe that school roof top run-off during rainstorms causes erosion in their schoolyard.

2. **Student investigations.**

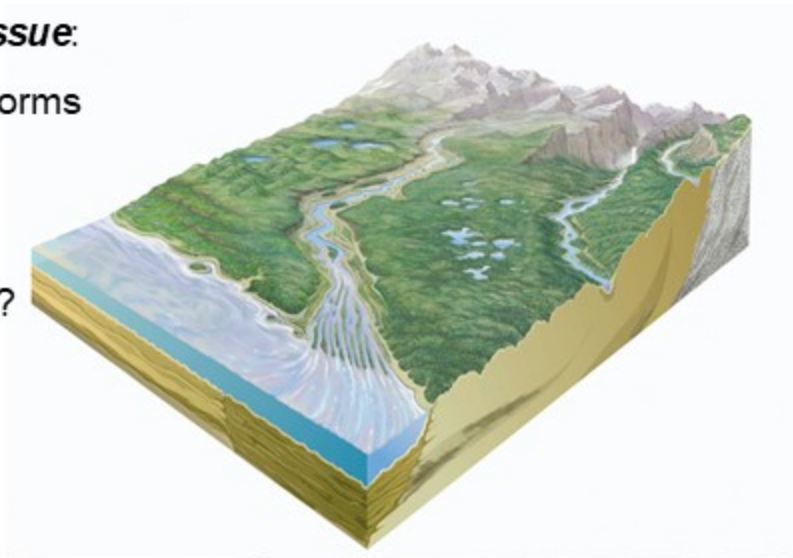
What happens to the water that falls on the roof at school?

3. **Synthesis & Conclusions.**

What have we learned about our environmental issue?

4. **Action Project.**

How can we apply our new knowledge to address the environmental issue?

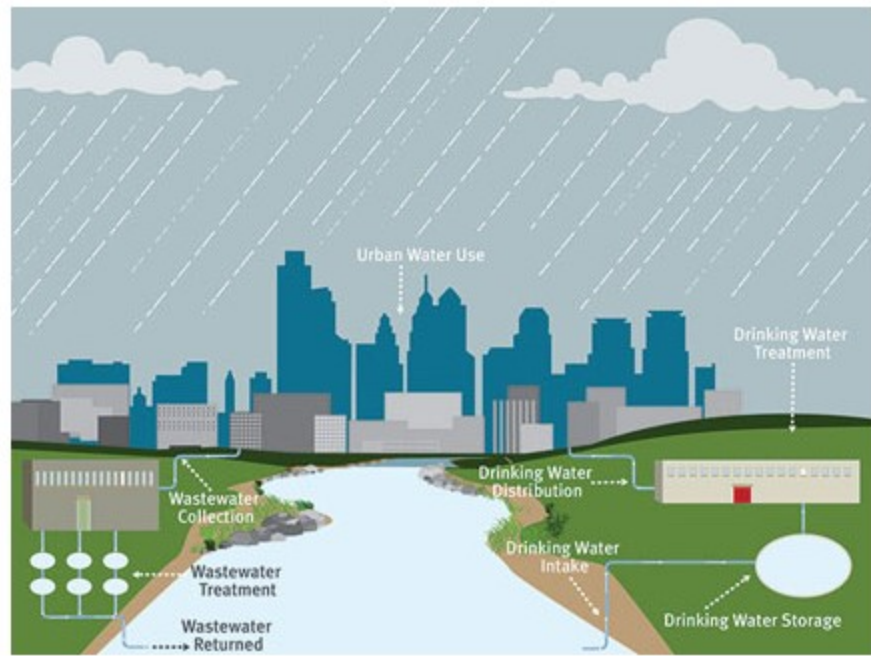


**MWEE** = **M**eaningful **W**atershed **E**ducation **E**xperiences

# Key Investigation Questions



1. How do our buildings impact the water cycle?
2. Can we design solutions to lessen the impacts of rooftop water run-off?



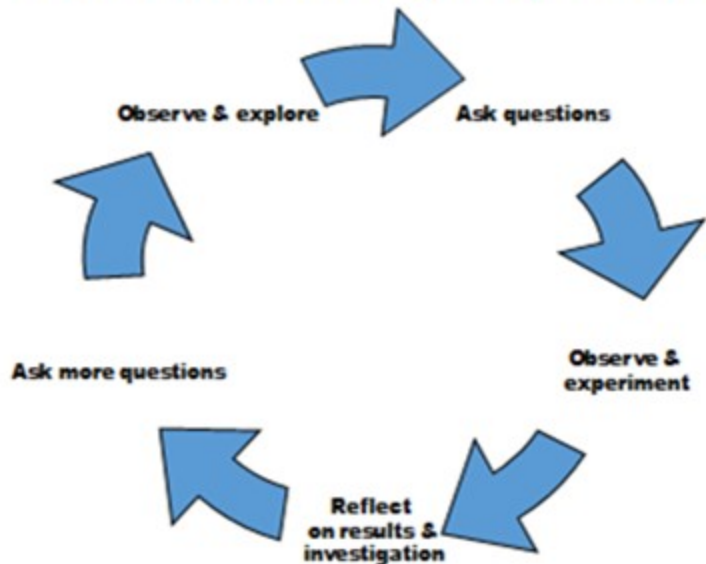
# Rooftop Models Investigation

## Key Concepts:

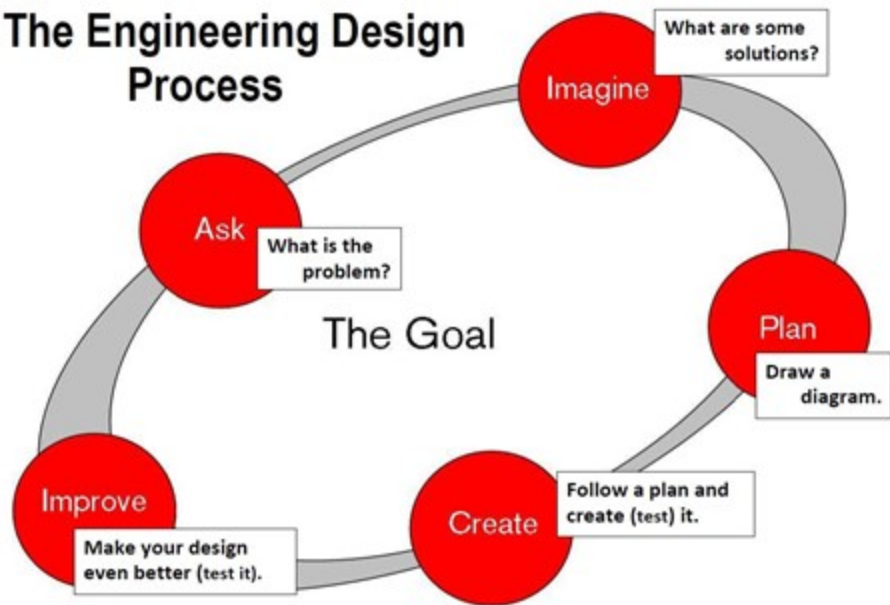
- ❖ Human impacts
- ❖ Runoff
- ❖ Erosion
- ❖ Permeable surface
- ❖ Impermeable surface
- ❖ Stormwater management



# Scientific Inquiry Process



# The Engineering Design Process



Credits: Engineering is Elementary, Museum of Science, Boston



# Explore

**Trial 1:** Use a flat roof model to explore how water flows on and off the roof.



# Design and Test

**Trial 2:** Design, build, and test a roof model.



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# Some Roof Designs



## Engineer to Solve a Problem

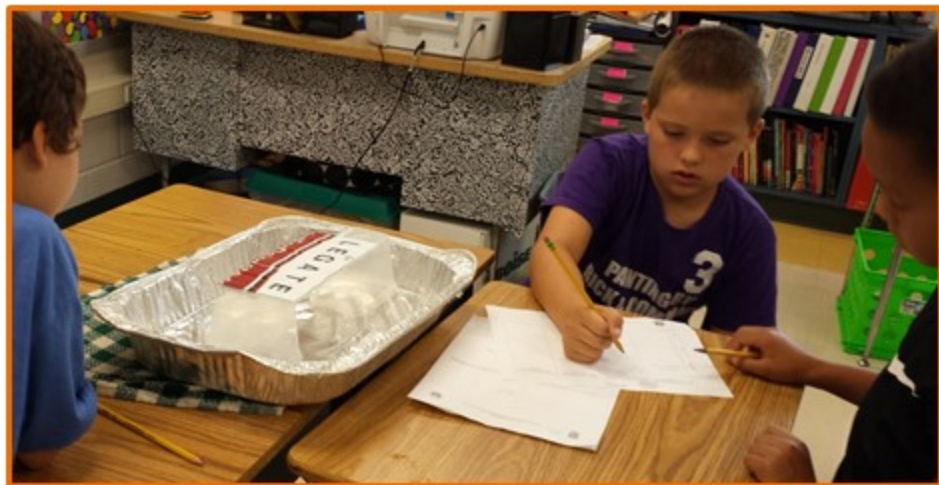
**Trial 3:** Design, build, and test a system to mitigate the impacts of water run-off from your roofs.

Use the  
same model  
from Trial 2.

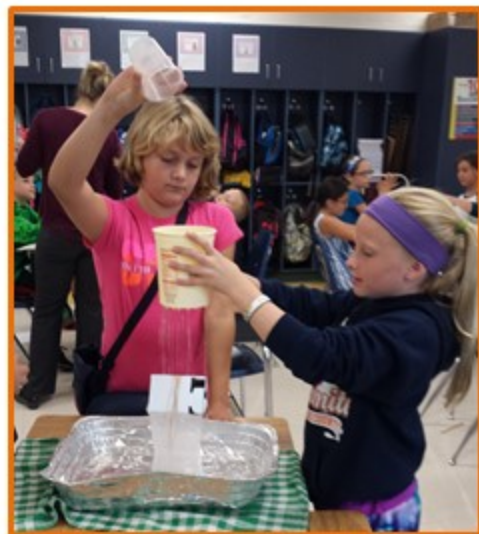


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# Students modeling & testing roof tops



**Trial 1.** Initial testing of flat roof model



**Trial 2.** Design, build & test your own roof model





# Modeling & Testing Roof Tops



**Trial 3. Designing a mitigation system**

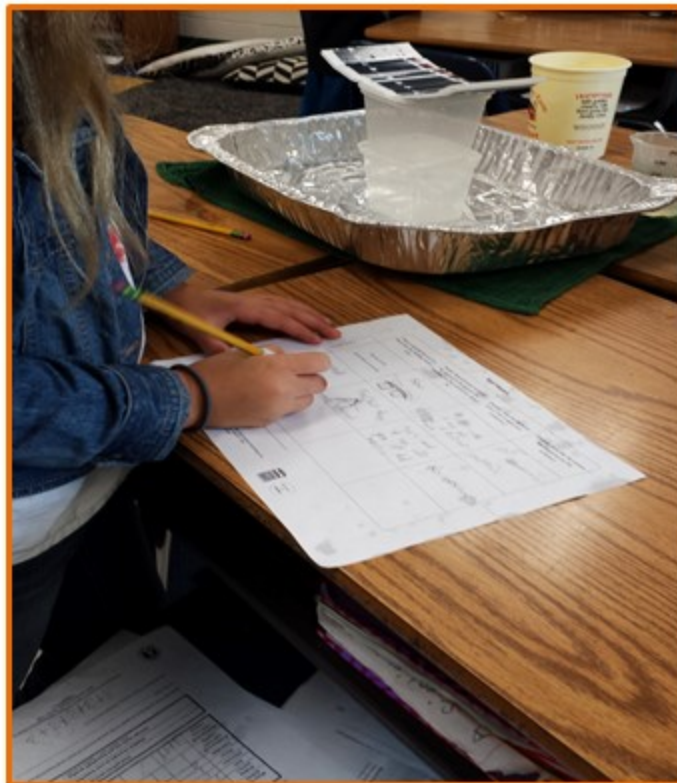
# Student Data Sheet Example

Roof Models				
	Draw or describe the roof and the surface the "building" model is on.	Predict: How will water move on the roof and to the ground? (Ex. fast/slow, in a line, spread out, soak in)	Observe: How did the water move? Did it match your prediction?	Observe: Describe the erosion that happened on the surface(s).
Sample Trial 1	The roof is flat water falls on concrete	Slow 	Fast and it ran off. No it DID NOT match.	it becomes puddles
Trial 2	curved waterfalls on concrete	Fast fall there  more erosion	Fast and it ran off yes it did match.	No erosion
Trial 3	Curved up	fall of off low end	Water fell through roof and got in house yes	no erosion

Student Names: \_\_\_\_\_



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www.k12va.edu/blandy 540-837-1758  
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## More Info

Download resources for Rooftop Run-off from our Blandy conference web page:

**Blandy Education Web Pages & Resources**

<http://blandy.virginia.edu/education/conference-resources>





# Contact Info

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# Thank you!