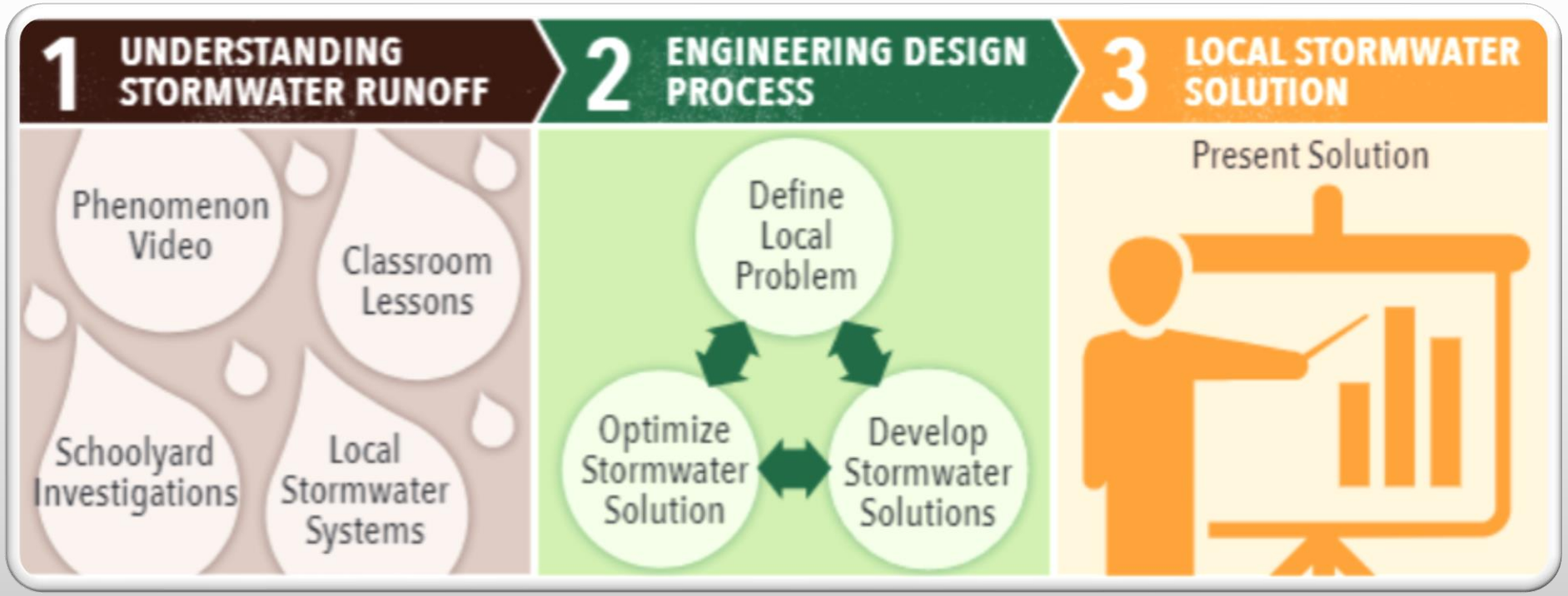


Community waters Science unit

4th grade

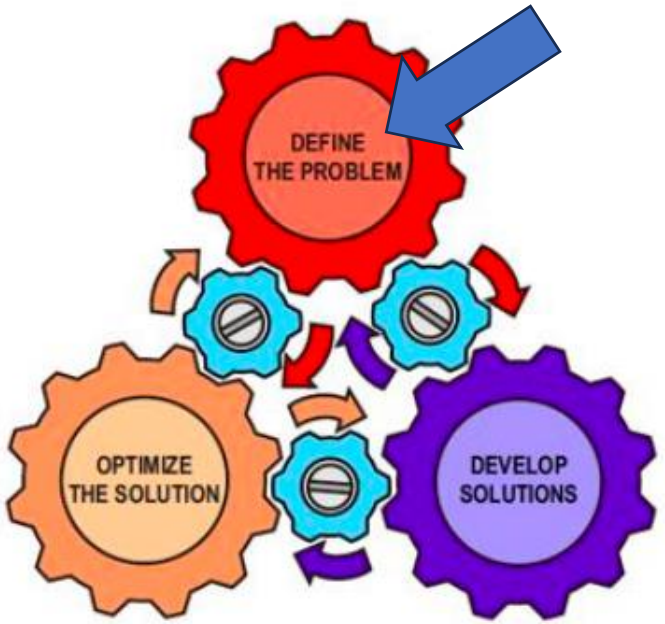
TACOMA PUBLIC SCHOOLS
EVERY STUDENT. EVERY DAY.

ISLANDWOOD™

DEFINING OUR PROBLEM

Community Waters Science Unit: Lesson 5

DEFINING OUR PROBLEM

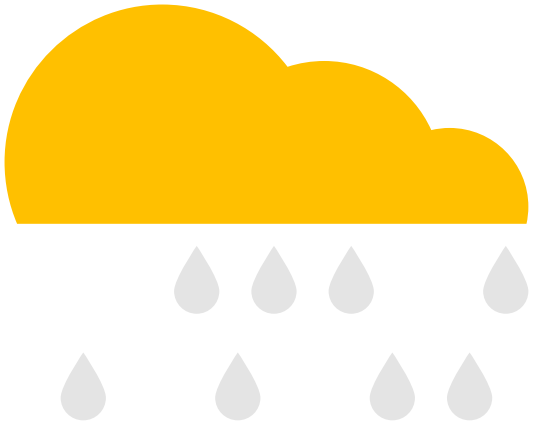


Focus Question: What do we need to know before we research solutions for our site?

Learning Target: I can define a solvable local stormwater runoff problem.

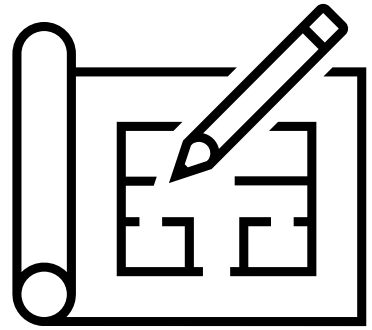
***Define a problem**: specify criteria and constraints that a possible solution to a simple problem must meet.*

In this lesson:
Students represent a stakeholder perspective when discussing their site.
Students decide on the criteria and constraints for a solution to too much stormwater runoff at their site.

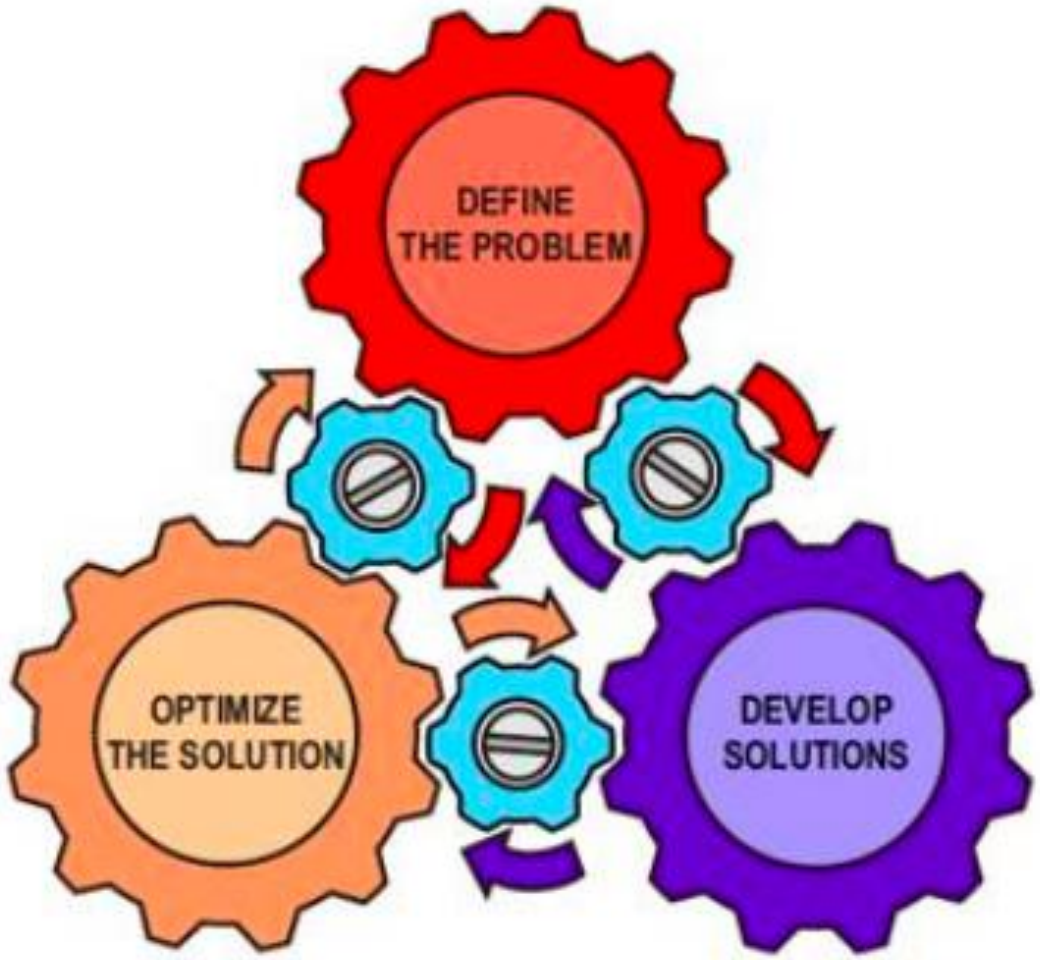


When have you had to solve a problem?

What did you do, and how did you do it?



ENGINEERING DESIGN PROCESS



Engineers use a process to solve problems.

1) **Define the Problem:** Research the problem and interview stakeholders so we can define our criteria for success and the constraints that limit our solutions.
2) **Develop Solutions:** Imagine possibilities and research solutions. Evaluate our solutions based on criteria and constraints.
3) **Optimize the Solution:** Use test results to improve solutions.

New terms? What do these words mean?

ENGINEERING SOLUTIONS: STORMWATER RUNOFF

Can you spot the steps of the engineering design process as you watch the video?

WHO ARE THE STAKEHOLDERS?

When engineers are thinking about problems, they need to figure out who might be affected and how. We call the people who care about the solution “stakeholders.”

Who are the stakeholders who might own, care about, or use the site we’re focusing on?

INCORPORATING STAKEHOLDER INPUT

Imagine yourself to be one of the stakeholders that you listed or interviewed, then find a partner and consider:

What do the stakeholders you are representing want included in any solution?

What are the stakeholders going to want to make sure stays the same?

CRITERIA FOR SUCCESS

How will we know our solution is successful?

Criteria for success

1) Helps our community-wide problem: less stormwater leaving the site and going into nearby bodies of water and Salish Sea.

2) Helps our site-specific problem: _____

3) Anything else?

CONSIDERING CONSTRAINTS

What are our limitations?

Constraints

1) Work within the space available at the site: Find solutions that can work within the limits of the space available in the site.

2) Keep costs low:
The solutions should be as inexpensive to build and maintain as possible.

3) Anything else?

Problem-Criteria-Constraints Table

Problem-Criteria-Constraints Table for Community Waters Science Unit		
Our Site:		
Problems to Solve	Criteria for Success	Constraints on Possible Solutions
Community-wide problem: Too much stormwater runoff in the city.		

Fill in this column with community-wide and site-specific criteria for success.

Add your constraints or limitations here.